

**A Design-Oriented Framework for Customer Co-
Creation Development of New Digital Products
involving Cross-Functional Teams**
An Organisational Perspective in the Swiss Media Industry



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Abstract

This research addresses the limited exploration of hybrid processes for customer co-created new product development (NPD) involving cross-functional teams. While existing studies often focus on individual elements like hybrid NPD processes, customer co-creation, or cross-functional teams, this study combines all three. This research develops a unique design-oriented framework tailored for the Swiss media industry. It employs the design science research (DSR) process and a multi-phase qualitative research design, encompassing the five largest Swiss media companies. Data was collected through three interview phases of ten interviews, with five Swiss media companies embedded within. An inductive-deductive approach guided the data analysis along the DSR process, culminating in the development of a design-oriented framework of this study.

This study has four key findings. Firstly, customer co-creation is not widely used in the Swiss media industry due to misunderstandings and perceived obstacles such as resource constraints. Secondly, agile methods in product development often deviate from theoretical ideals, especially when implementing scrum. Thirdly, product managers are central to product development, but there is a lack of clarity regarding the distinction between product managers and product owners. Fourthly, the Swiss media industry is lacking a structured process for crucial NPD elements: overarching structure, technology, and quality control.

This research contributes to theory in three ways. First, it develops a design-oriented framework for hybrid NPD structures, merging application lifecycle management with design thinking, user-centred design, stage-gate processes, lean start-up methodologies, and scrum. Second, it explores customer co-creation barriers, highlighting the interplay of motivation and collaboration, the importance of dedicated communication management, and context-specific social media limitations. Third, it outlines cross-functional roles and structures across the entire NPD process, offering a broadly applicable framework for NPD of digital products.

Key words:

New product development, customer co-creation, cross-functional teams, Swiss media industry, customer centricity, digital product innovation, design thinking, user-centred design, stage gate, quality gates, most viable product, lean startup, agility, hybrid process

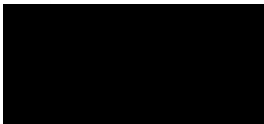
Declaration

I declare that the work in this thesis was carried out in accordance with the regulations of the University of Gloucestershire and is original except where indicated by specific references within the text.

No part of this thesis has been submitted for any other academic award, nor has it been presented to any other educational institution in the United Kingdom or overseas.

Any views expressed in this thesis are those of the author and do not represent those of the University of Gloucestershire.

Signed



Date

15 February 2025

Dedications

I am deeply grateful to my wife, Olivia, and children, Malou and Amiel, whose unwavering support and understanding were essential to this research. They patiently endured my long hours and occasional absences, providing the love and encouragement I needed to keep going. Their belief in me, even when I doubted myself, was a constant source of strength.

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1 Introduction

This chapter forms the basis for an in-depth analysis of customer co-created new product development (NPD) in the Swiss media industry, where cross-functional teams are involved. It begins by outlining the challenges facing the media industry in the digital age: declining revenues, changing audience behaviour and the looming presence of tech giants. To navigate this turbulent landscape, Swiss media companies need to focus on innovation and NPD, with a particular emphasis on customer co-creation and cross-functional collaboration. This chapter introduces the core themes of the study, outlines its aims, research questions, and research objectives, and emphasises the originality of the study. It also explains the assumptions, limitations and delimitations that form the framework for this study. Furthermore, this chapter addresses the specific challenges faced by both public service and private media organisations in Switzerland and highlights the urgent need for effective NPD strategies to ensure their survival and future success. Finally, a chapter map illustrates the organisation of this study, demonstrating the structure of the research.

1.1 Introduction to the topic

The increasing digitalisation of companies requires a reassessment of traditional business activities and established business models (Rachinger et al., 2019). The rising demand for mobile and internet applications is forcing these companies to reassess customer needs and utilise digital transformation to ensure their survival on the market (Gurusamy et al., 2016).

This trend is particularly striking within the Swiss media industry. Evidence suggests a significant decline in readership among younger demographics, who primarily consume news through social media, to the detriment of local journalism. Consequently, the Swiss media industry must look beyond simply replicating the traditional news model online (Tomaz, 2023). In addition, public trust in Swiss media organisations has decreased, as most of the population is not willing to pay for online news or is only willing to pay a small monthly fee (Udris et al., 2024). The dominance of technology giants and their aggressive advertising strategies have significantly undermined the business models of many news organisations (Newman et al., 2019).

Digitalisation has thus increased the need for innovation in business models (Heikkilä & Heikkilä, 2017), with technology playing a crucial role (de-Lima-Santos et al., 2022). This shift is reflected in the broader trend of developed economies to move from material goods to information-intensive offerings, favouring iterative and agile processes over traditional controlled approaches (Mills et al., 2020). To increase organisational agility, companies are relying on autonomous cross-functional teams to maintain flatter hierarchies and respond to customer needs, especially in situations of unforeseen uncertainty (Mero & Haapio, 2022).

In this context, NPD is proving to be a crucial business process to achieve innovation and competitive advantage (Papageorgiou et al., 2017). It is essential that customers are involved throughout the entire NPD process (El Nemar et al., 2022). For example, involving customers in the launch and ideation phase of NPD directly improves the financial performance of new products and indirectly enhances time to market (Chang & Taylor, 2016).

Consequently, digitalisation in Swiss media companies requires the development of an NPD process that promotes innovation and competitive advantage. This study focuses on integrating customer co-creation, cross-functional teams, and hybrid process elements into an NPD process designed specifically for digital (software-based) products.

1.2 Problem Description

The digital age has dramatically changed the traditional media landscape. Traditional, heavily advertising-dependent revenue models are faltering, forcing media companies to cut costs and reduce staff (Lischka, 2018). This precarious situation has been exacerbated by the COVID-19 pandemic and casts doubt on the long-term viability of some media companies (Gkanas & Antonopoulou, 2021).

In Switzerland, this challenge is exacerbated by a twofold change: the digitalisation of news itself and the need for media companies to diversify into digital markets outside the news sector (Lischka, 2019). To survive and thrive in this rapidly evolving environment, these companies must prioritise innovation and NPD (Zhu et al., 2019) and integrate cross-functional teams in product development (Spath & Dangelmaier, 2016). In this regard, customer co-creation offers a promising approach to NPD, with proven benefits for both financial performance and innovation (Leung et al., 2020).

1.3 Problem Statement

The news media industry operates in a dynamic environment characterised by rapid technological advances (de-Lima-Santos et al., 2022). The rise of streaming platforms, enabled by scalable cloud technologies, is an example of this trend and is revolutionising the way audiences consume content (Wiesböck et al., 2020).

The modern competitive landscape is shaped not only by emerging technologies but also by rapid product obsolescence and constantly evolving consumer demands (Dias et al., 2022). Consequently, new and innovative products must reach the market quickly (Melandner, 2020). In this context, El Nemar et al. (2022) argue that unless customers are involved in every phase of NPD and motivated to participate, there is a risk that customer intentions will not be recognised. Therefore, neglecting customer co-creation in today's dynamic market of media industries can lead to missed opportunities, irrelevant products, and ultimately, business failure.

Furthermore, effective NPD requires seamless cross-functional collaboration within media organisations. Research indicates that cross-functional teams can significantly improve product development performance (Ahmed et al., 2021). This is particularly crucial in the media industry, where the traditional advertising-based business model is becoming increasingly fragile (Tomaz et al., 2022), despite the opportunities offered by new markets and technologies in the digital age (Åkesson et al., 2018). Therefore, Swiss media companies need to foster collaboration between departments to drive innovation and ensure their long-term sustainability.

Despite the recognised importance of customer co-creation and cross-functional collaboration, there is a lack of research that specifically addresses their interplay in the context of the Swiss media industry. This research aims to address this gap by developing a theoretical artefact based on the existing literature on NPD processes, customer co-creation, as well as cross-functional teams, and developing and testing an empirical artefact in the Swiss media landscape through a multi-phase qualitative research design involving interviews with key decision makers in five Swiss media companies. This qualitative approach enables an in-depth exploration of the challenges and opportunities associated with customer co-creation and cross-functional collaboration in NPD and leads to the

development of a design-oriented framework. Ultimately, this research aims to generate new knowledge and contribute to the existing literature on innovation in the media sector.

1.4 Aim of the Research, Research Questions and Research Objectives

This section begins by outlining this study's research aim. It then details the research questions and their corresponding objectives, which are grouped into this study's three core areas: the NPD process, customer co-creation, and cross-functional teams.

1.4.1 Research Aim

The aim of this study is to investigate a new theoretical construct of how new product development from the organisational perspective can effectively use customer co-creation within the Swiss media industry.

To achieve this aim, this study intends to seek deep insights into the NPD process within Swiss media companies, specifically how they utilise customer-centred processes and cross-functional teams, and how this practice deviates from established theoretical models. In addressing this aim, this study will expand on the current research and develop a new design-oriented framework. In adopting this approach the intention is to understand how customer co-creation can reduce the failure rates of new products by fostering a deeper understanding of customer needs (Piller & Rwth, 2012), however its role in NPD remains underexplored (Sihvonen et al., 2021). To address this underexplored theme, the following research questions, which will guide this investigation, are outlined in the next section (1.4.2).

1.4.2 Research Questions and Objectives

This study investigates the hybrid (waterfall and agile) development process for new digital products within Swiss media companies, focusing on customer co-creation and the integration of cross-functional teams. This complex interplay is examined from two perspectives:

Firstly, an organisational perspective focused on the elements of NPD processes, customer-centric processes, and the establishment of cross-functional team structures. This perspective prioritises the company's viewpoint, rather than the customer's.

Secondly, a management perspective, gathering insights from managers involved in NPD of digital products within the Swiss media industry. This perspective focuses on NPD process structure, customer integration, and the dynamics of working within cross-functional teams.

In this regard, the research questions in the following sections 1.4.2.1, 1.4.2.2, and 1.4.2.3 are structured around three core themes: NPD processes, customer co-creation, and cross-functional teams. Each research objective, as defined by each research question, is explored at three levels: theory, empiricism, and evaluation and discussion. Additionally, a distinct design-level perspective is incorporated, focusing on providing recommendations to management within the Swiss media industry.

1.4.2.1 New Product Development Process

Within the field of NPD processes, there exists a limited understanding of how hybrid structures can be effectively integrated with customer co-creation in large, hierarchical organisations (Cooper, 2019; Kwon et al., 2021). This knowledge gap motivates the following research question:

“How can current agile and waterfall processes in NPD be united to ensure a good basis for collaboration between cross-functional teams, to integrate customers into the process and to act efficiently from the idea to the launch of the new digital product while reacting quickly to changes?”

This research contributes to existing NPD theory (section 9.2.3) by providing a holistic framework for integrating hybrid NPD structures with customer co-creation in large, hierarchical organisations. This design-oriented framework (Figure 7.12), which balances business and technical elements across the entire product lifecycle, extends beyond a mere synthesis of agile and waterfall methodologies and offers a more comprehensive approach than explored by Bianchi et al. (2020), Cooper (2019), and Kwon et al. (2021).

Table 1.1: Consistency matrix for the NPD process research objectives

NPD process			
Level	Problems	Research objectives	Results
Main level: Theory	Advertising incomes are fragile and therefore new innovative products must be produced which must quickly reach the market (Melander, 2020; Tomaz et al., 2022).	To critically analyse, compare and select NPD process models from the literature (sections 2.4.3, 2.4.4, 2.4.5, 2.7.2, 2.7.4, and 2.7.6)	Development of an NPD process in the theoretical artefact (sections 2.7.2, 2.7.4, and 2.7.6)
Main level: Empiricism	No overarching NPD structure is used in the Swiss media industry (sections 4.2.2, and 5.2.1).	To critically analyse the perceptions of managers involved in structuring an NPD process for digital products in the Swiss media industry (sections 4.2.1, 4.2.2, 4.2.4, 5.2.1, and 5.2.2)	Development of NPD process elements in the empirical artefact (section 6.1.1, and 6.1.2)
Main level: Evaluation and discussion	The Swiss media industry struggles with long-term planning in agile (section 7.2.2), focus on technology is split, and no standardised quality gates or overarching NPD structure are used (section 7.2.4).	Determination of elements for the NPD process (section 7.2.2, 7.2.4, 8.2, and 8.4)	Development of NPD process elements in the design-oriented framework (section 7.4.1, and 7.4.2)
Sub-level: Design		Describing two artefacts and one design-oriented framework based on this research's findings, offering practical guidance on implementing NPD process elements (sections 2.7.8, 6.2, and 7.4.4)	Offering practical guidance on implementing NPD process elements in Swiss media organisations (section 9.3.2, and 9.3.4).

Table 1.1 outlines the problems, research objectives, and results of this study across four levels, all of which address the research question within the field of NPD processes.

1.4.2.2 Customer Co-Creation

El Nemar et al. (2022) highlight the potential benefits of customer co-creation in NPD, while also acknowledging that customer co-creation does not always yield satisfactory outcomes. Morgan et al. (2019) emphasise the need for micro-level NPD analysis to optimise customer integration. While El Nemar et al. (2022) highlight the potential of customer co-creation, and Morgan et al. (2019) advocate for micro-level NPD analysis, the crucial step of how to effectively translate this micro-level analysis into consistently successful customer co-creation integration strategies within the NPD process remains unclear. This gap leads to the following research question:

“How can the customer co-creation approach be integrated into a hybrid NPD process based on cross-functional teams so that customers are involved in the entire process in the best possible way?”

This research makes a theoretical contribution to NPD (section 9.2.3) by providing actionable insights into addressing key challenges in customer co-creation, including motivating participation and balancing collaboration with efficiency (El Namar et al., 2022; Morgan et al., 2019). Through a combination of theoretical analysis and empirical findings, this study demonstrates how dedicated communication roles within cross-functional teams can facilitate effective customer integration and enhance NPD efficiency.

Table 1.2: Consistency matrix for the customer co-creation research objectives

Customer co-creation			
Level	Problems	Research objectives	Results
Main level: Theory	Products quickly become obsolete and customer needs change rapidly (Dias et al., 2022).	To critically analyse, compare and select customer-centred models and methods from the literature (sections 2.5, and 2.7.3, and 2.7.5)	Development of customer co-creation in the theoretical artefact (section 2.7.3, and 2.7.5)
Main level: Empiricism	User-centred thinking is not sufficiently applied in the Swiss media industry (section 6.1.3).	To critically analyse the perceptions and experiences of managers involved in structuring a customer co-created NPD process for digital products in the Swiss media industry (sections 4.2.3, and 5.2.3)	Development of customer co-creation in the empirical artefact (section 6.1.3)
Main level: Evaluation and discussion	Customer co-creation in the Swiss media industry is characterised by several difficulties and barriers, such as cultural and organisational resistance (section 7.2.1).	Determination of process elements for customer co-creation in the NPD process (section 7.2.1, and 8.1)	Development of customer co-creation in the design-oriented framework (section 7.4.2)
Sub-level: Design		Describing two artefacts and one design-oriented framework based on this research's findings, offering practical guidance on implementing customer co-creation (sections 2.7.8, 6.2, and 7.4.4)	Offering practical guidance on implementing customer co-creation in NPD of Swiss media organisations (section 9.3.1).

Table 1.2 outlines the problems, research objectives, and results of this study across four levels, all of which address the research question within the field of NPD processes.

1.4.2.3 Cross-Functional Teams

NPD research lacks a clear understanding of how cross-functional teams can be effectively utilised throughout the entire process, from ideation to product end-of-life (Ahmed et al., 2021). This knowledge gap leads to the following research question:

“How can optimal collaboration in cross-functional teams be ensured over the entire NPD process to constantly involve the customer and work efficiently at the same time?”

This research contributes to existing NPD theory (section 9.2.3) by providing a detailed design-oriented framework (section 9.2.3) for structuring cross-functional teams across all stages of the NPD process. This design-oriented framework, which specifies necessary roles at each NPD stage and details the composition of core and extended teams, addresses the lack of existing approaches for structuring cross-functional teams at every stage of the NPD process (Ahmed et al., 2021).

Table 1.3: Consistency matrix for the cross-functional teams research objectives

Cross-functional teams			
Level	Problems	Research objectives	Results
Main level: Theory	As products become more complex and require expertise in technology areas, companies need cross-functional teams to bring these specialised skills together and drive innovation (Spath & Dangelmaier, 2016).	To critically analyse, compare and select cross-functional team roles and team structure in the NPD process of digital products from the literature (sections 2.7.7, and 2.7.8)	Development of a theoretical artefact involving cross-functional roles and team structure (sections 2.7.7, and 2.7.8)
Main level: Empiricism	It is not clear in the Swiss media industry which role is responsible for communicating with customers (section 5.2.4).	To critically analyse the perceptions and experiences of managers involved in structuring cross-functional teams for the NPD process of digital products in the Swiss media industry (section 5.2.4)	Development of an empirical artefact involving cross-functional roles and team structure (sections 6.1.4, and 6.2)
Main level: Evaluation and discussion	There is no consensus in the Swiss media industry on which roles are used in cross-functional teams in the NPD process (section 7.2.3).	Determination of cross-functional roles and team structure in the NPD process (section 7.2.3, and 8.3)	Development of a design-oriented framework involving cross-functional roles and team structure (sections 7.4.3, and 7.4.4.1.1)
Sub-level: Design		Describing two artefacts and one design-oriented framework based on this research's findings, offering practical guidance on implementing cross-functional	Offering practical guidance on implementing cross-functional roles and team structure in NPD of Swiss media organisations (section 9.3.3).

		roles and team structure (sections 2.7.8, 6.2, and 7.4.4)	

Table 1.3 outlines the problems, research objectives, and results of this study across four levels, all of which address the research question within the field of cross-functional teams.

1.5 Originality of the Study

This study provides a unique contribution by examining the interplay between three core areas: NPD processes, customer co-creation, and cross-functional teams.

Firstly, this study investigates the most suitable NPD process models for the rapid and targeted introduction of new digital products. It evaluates approaches that integrate quality control gates, iterative feedback mechanisms with customers, agile practices, and project management approaches to effectively bring both minimum viable products (MVPs) for non-business-critical requirements and fully developed products or functions for business-critical requirements to market. Based on Bianchi et al. (2020) and Marzi et al. (2020), this study proposes a novel, flexible, and iterative approach that combines stage-gate with scrum, lean startup, and customer-centric processes in an overarching framework based on application lifecycle management (ALM).

Secondly, it examines the integration of customer centricity into corporate culture, looking at both the prerequisites and obstacles to successful implementation of customer co-creation. It further analyses customer-centric processes and identifies key elements from different approaches that can be combined to ensure continuous customer engagement throughout the entire digital product lifecycle as part of the NPD process. One such approach involves examining design thinking (DT), a human-centred, user-needs-driven process that fosters business innovation (Kwon et al., 2021).

Finally, this study culminates in the presentation of a unique, design-oriented framework detailing the composition of cross-functional teams within an NPD process – an element notably absent from current literature (Ahmed et al., 2021; Cooper, 2019). This design-oriented framework encompasses all roles, both within and external to the NPD core team, clarifying leadership responsibilities and designating primary responsibility for customer involvement.

This multifaceted approach, which combines these three core areas, positions this study as a significant and original contribution to the field. Ultimately, by providing a theoretical and empirical artefact, and a design-oriented framework, this study offers valuable knowledge and a new theory for the customer co-created NPD where cross-functional roles are involved.

1.6 Assumptions, Limitations and Delimitations

This section outlines the assumptions, limitations, and delimitations of this study. Key assumptions include the validity of existing NPD models and the accuracy of collected data. Limitations encompass the study's focus on the Swiss media industry and digital products. To maintain a clear scope, the study delimits itself by excluding pure technical aspects of software development and external partnerships.

1.6.1 Assumptions

This study assumes that the existing models and frameworks for NPD, customer co-creation, and cross-functional teams, as identified in the literature review (chapter 2), provide a valid basis for understanding and analysing the phenomena under investigation, which are five companies in the Swiss media industry. This includes the assumption that the general principles and concepts derived from these models are applicable to the specific context of the Swiss media industry.

Furthermore, the study assumes that the information obtained from both the literature review and the interviews with key managers who have decision-making authority around NPD in Swiss media companies is accurate and reflects the reality of NPD practices in these organisations. It also assumes that the interviewees selected for the three interview phases have the necessary knowledge and experience to provide meaningful insights.

In addition, while this study recognises the limitations of a qualitative study with a specific industry focus, it assumes that the results and the resulting artefacts offer valuable insights and potentially transferable knowledge for other contexts that face similar challenges in customer co-created NPD where cross-functional roles are embedded. This includes the assumption that customer co-creation has a positive influence on the success of NPD, especially for digital products, and that cross-functional teams provide an effective structure for fostering collaboration and innovation.

Finally, this study's research strategy employs a design science research (DSR) process, incorporating a multi-phase qualitative research design. This approach is deemed suitable to answer the research questions (section 1.4.2) and provide practical solutions for the identified problems in a real-world setting.

1.6.2 Limitations and Delimitations

This research is restricted to the Swiss media industry and focuses particularly on companies categorised under the "Information and Communication" category in the NOGA classification system of the Swiss Federal Statistical Office (Bundesamt für Statistik, 2008). This includes companies involved in film and television production, rental, and distribution (excluding cinemas and wholesalers); television broadcasters (with a focus on television rather than radio); and newspaper and magazine publishing (Bundesamt für Statistik, 2008). This sectoral focus inherently limits the generalisability of the results to other industries.

Furthermore, this study focuses exclusively on digital products, particularly software applications, and excludes other types of digital offerings or physical products. This product-specific focus may limit the transferability of the results to NPD processes for other product types.

In addition, while the research aims to provide a comprehensive understanding of customer co-creation and cross-functional collaboration in NPD, it does consider the inherent limitations of a qualitative research approach, including verification bias and subjective interpretation of interview data (Flyvbjerg, 2006).

This study deliberately focuses on specific areas, excluding others, to establish a clear and manageable research framework. Specifically, it investigates the integration of customer co-creation within the NPD process, encompassing cross-functional roles and emphasising its importance for digital product development within the Swiss media industry. The study concentrates exclusively on digital products, particularly software applications, acknowledging the increasing importance of digital transformation within the media landscape. The research aims to develop a new design-oriented framework for customer co-created NPD. This design-oriented framework will move beyond static process models by treating technical and business-driven processes separately, incorporating customer

requirements, ensuring continuous customer involvement, and identifying the specific cross-functional roles required for each NPD process step.

While this study focuses on digital products, it does not address the technical aspects of software programming. Factors such as alliances, partnerships, and supply chains, while potentially relevant to product development, are not directly considered. This ensures a focused analysis of the core research topics: NPD processes, customer co-creation, and cross-functional teams.

1.7 Challenges in the Media Industry

The media industry is in a constant state of flux, struggling with a digital revolution that has fundamentally changed the way news is produced, distributed and consumed. This shift towards a digital, social and mobile environment requires all news organisations to adapt (Sehl et al., 2017). However, in the media industry, there is a difference between public and private media companies in terms of digitalisation.

This section examines the status quo of both public and private media companies and looks at how each sector is affected and could potentially respond to the ongoing digital revolution in a unique way. It begins by analysing the situation of public media companies, followed by an examination of private media companies.

1.7.1 Public Service Media Industry Background

Public media organisations face a significant challenge in the digital age: engaging younger audiences. These audiences increasingly rely on mobile devices as their primary source of information, requiring public media organisations to adapt their strategies. This necessitates a shift in focus from traditional desktop platforms to mobile devices (Sehl et al., 2016). In this context, public service media companies must engage with their young audiences on their preferred platforms.

Despite this challenge, public media organisations can be distinguished from private media organisations. For example, the quality of information provided by public media organisations is considered to be better than that of other media outlets (Sehl, 2020). Therefore, despite facing challenges, public media companies distinguish themselves through higher information quality compared to private media companies.

1.7.2 Private Media Industry Background

Cornia et al. (2016) highlight the challenges and opportunities faced by the private media sector due to the advent of digital media technologies. Audiences are migrating from offline to online media, with print media experiencing a rapid decline in readership and television experiencing a slower transition. This shift has led to falling print and stagnant broadcasting revenues, although the print sector still accounts for a significant share of total revenues.

Cornia et al. (2016) further argue that this is due to a lack of focus on building digital news business and a delayed response to the rise of digital media in the broadcasting sector; consequently, digital initiatives are often funded through cross-subsidies and cost-cutting measures elsewhere in the organisation.

Other challenges to generating digital revenues include the dominance of tech giants such as Google and Facebook (Meta) in online advertising and the widespread use of ad blockers. This has led to a shift towards pay models, albeit with limited success due to low user acceptance (Cornia et al., 2016). To compensate for this, private news organisations are looking for alternative sources of income, such as diversifying the content they offer beyond their core brand (Cornia et al., 2016).

1.7.3 Conclusion

Both public and private media companies face major challenges in the digital age. Public media companies are struggling to reach younger target groups who have shifted to mobile platforms for consuming information. While public media companies are perceived as providers of high-quality information, they must adapt their strategies and content delivery to remain relevant to younger audiences. Private media companies are facing declining revenues from print and are struggling to monetise digital content due to the dominance of tech giants in online advertising and the widespread use of ad blockers. This requires a shift towards alternative revenue streams.

These challenges demonstrate that Swiss media companies urgently need to prioritise innovation and the NPD of digital products to survive and thrive. This study aims to address this need by examining how Swiss media companies can effectively use customer co-creation and cross-functional collaboration within their NPD processes. By thoroughly examining the interplay of these crucial elements, this study aims to provide valuable

insights into how Swiss media companies can develop digital products that are not only innovative and customer-centric but also contribute to their long-term sustainability. The results will contribute to a deeper understanding of how customer co-creation can be successfully integrated into the NPD process structure, particularly in the unique context of the Swiss media landscape. This, in turn, will provide practical guidance for media companies seeking to navigate the complexities of the digital age and secure their future in a rapidly evolving market.

1.8 Organisation of this Study

This section outlines the structure of this study, chapter by chapter.

Table 1.4: Chapter map of this study

Chapter number	Chapter title	Chapter summary based on keywords
2	Literature review	Literature review on NPD (including cross-functional teams) and customer co-creation, development of the theoretical artefact, and research gaps
3	Research methodology	Research philosophy, research strategy, research design, combination of research strategy and design, data collection and sampling, data analysis process, and the application of artificial intelligence (AI) in this study
4	Awareness phase	Theoretical coding tree, preliminary empirical coding tree, theoretical problems, and the first interview phase
5	Suggestion phase	Empirical coding tree, integration of the first and second interview phases, and suggestion of variants for the empirical artefact
6	Development phase	Selection of one variant from chapter 5, development of empirical artefact, and emerging patterns
7	Feedback and evaluation phase	Third interview phase, feedback on the empirical artefact, cross-company analysis, evaluation of the empirical artefact, and development of the design-oriented framework
8	Discussion	Addressing research gaps and discussing key findings in relation to existing literature
9	Conclusion	Answering the research questions, theoretical contributions, management implications, quality criteria, limitations, and future research

Table 1.4 shows the chapter map of this study, which provides a summary based on keywords. These keywords are explained in more detail below:

Chapter 2 provides a comprehensive overview of the literature on NPD (including cross-functional teams) and customer co-creation with a focus on digital products in the Swiss media industry. It defines key terms, outlines the literature research strategy, and analyses

relevant research papers. The core of this chapter is the construction of the theoretical artefact. Finally, this chapter concludes with the identification of important research gaps.

Chapter 3 outlines the methodological choices underpinning this research on customer co-creation in NPD within the Swiss media industry. It presents a philosophical approach to understanding subjective experiences within a complex, real-world setting. This chapter showcases a multi-phase qualitative research as the chosen research design, situated within a DSR process framework as the overarching research strategy. It elucidates how both the research strategy and research design can be effectively combined. Furthermore, this chapter details the data collection process, participant selection criteria, qualitative interview procedures, and the approach to data analysis based on Yin (2015). Ethical considerations and the utilisation of Google's "Gemini" AI tool are also addressed.

Chapter 4 presents the results of the awareness phase of the DSR process. It demonstrates the development process for both the theoretical and preliminary empirical coding trees. Furthermore, it presents a cross-company analysis of the first interview phase, drawing on three Swiss media companies. Additionally, this chapter illustrates the problem identification process and compares theoretical problems with empirical findings. It also presents initial insights into the NPD process in the three Swiss media companies and compares them with the theoretical artefact.

Chapter 5 outlines the findings from the second interview phase conducted with two further Swiss media companies during the suggestion phase of the DSR process. It details the empirical coding tree used to develop the empirical artefact. Through a cross-company analysis of all five interviews within the five Swiss media companies, this chapter illustrates how these findings led to suggested variants for the empirical artefact.

Chapter 6 presents the development phase of the DSR process. It demonstrates the selection of one variant for the empirical artefact of this study from those variants suggested in chapter 5, informed by current literature. This contributes to the development of the empirical artefact. Finally, this chapter presents the emerging patterns within the empirical artefact, which highlight new research gaps.

Chapter 7 focuses on the feedback and evaluation phase of the DSR process. This chapter provides a detailed account of the feedback on the empirical artefact gathered from five

interviewees in five Swiss media companies during the third interview phase, drawing on the within-company analysis presented in Appendix 1.2. While focusing on individual company feedback, it also identifies emerging patterns across the companies. These patterns are further explored through a cross-company analysis, which reveals key similarities and differences between the five Swiss media companies. This cross-company analysis highlights the newly identified requirements and characteristics for the empirical artefact. This step forms the basis for evaluating the empirical artefact. The evaluation compares the requirements and characteristics in the empirical coding tree, which were essential for developing the empirical artefact, with the requirements and characteristics identified in the cross-company analysis of the third interview phase. This evaluation provides the basis for refining the empirical artefact, thereby informing the development of this study's design-oriented framework. The design-oriented framework is therefore developed based on the empirical artefact, but by integrating elements from the theoretical artefact and drawing on current literature.

Chapter 8 addresses the identified research gaps and discusses the key findings emerging from the cross-company analysis presented in chapter 7. This discussion centres on customer co-creation, agile adoption, team structure, and key elements of the NPD process, comparing these findings with existing literature.

Chapter 9 addresses the conclusion phase of the DSR process. It answers the central research questions, emphasising the importance of a hybrid NPD process, customer co-creation, and cross-functional teams. This chapter highlights this study's three main theoretical contributions, offers practical implications for managers, assesses the study's quality, acknowledges its limitations, and suggests directions for future research.

2 Literature Review

This chapter presents a review of relevant literature. Initially, the organisational perspective and two key terms central to this work are defined. Subsequently, the literature search methodology is outlined, with implications for the following two sections. These two sections explore the core elements of this research: a literature review in NPD incorporating cross-functional teams, and a literature review in customer co-creation. Following this, the research gap matrix, derived from the literature search, is presented, outlining identified research gaps and formulating corresponding gap statements. Finally, the development of the theoretical artefact linking all three topics (NPD process, customer co-creation, and cross-functional teams) is introduced.

Furthermore, Figure 2.1 illustrates the nine literature review stages relevant to this study's theoretical artefact (Figure 2.29) and the resulting theoretical coding tree (Table 4.1)

Figure 2.1: Literature review process

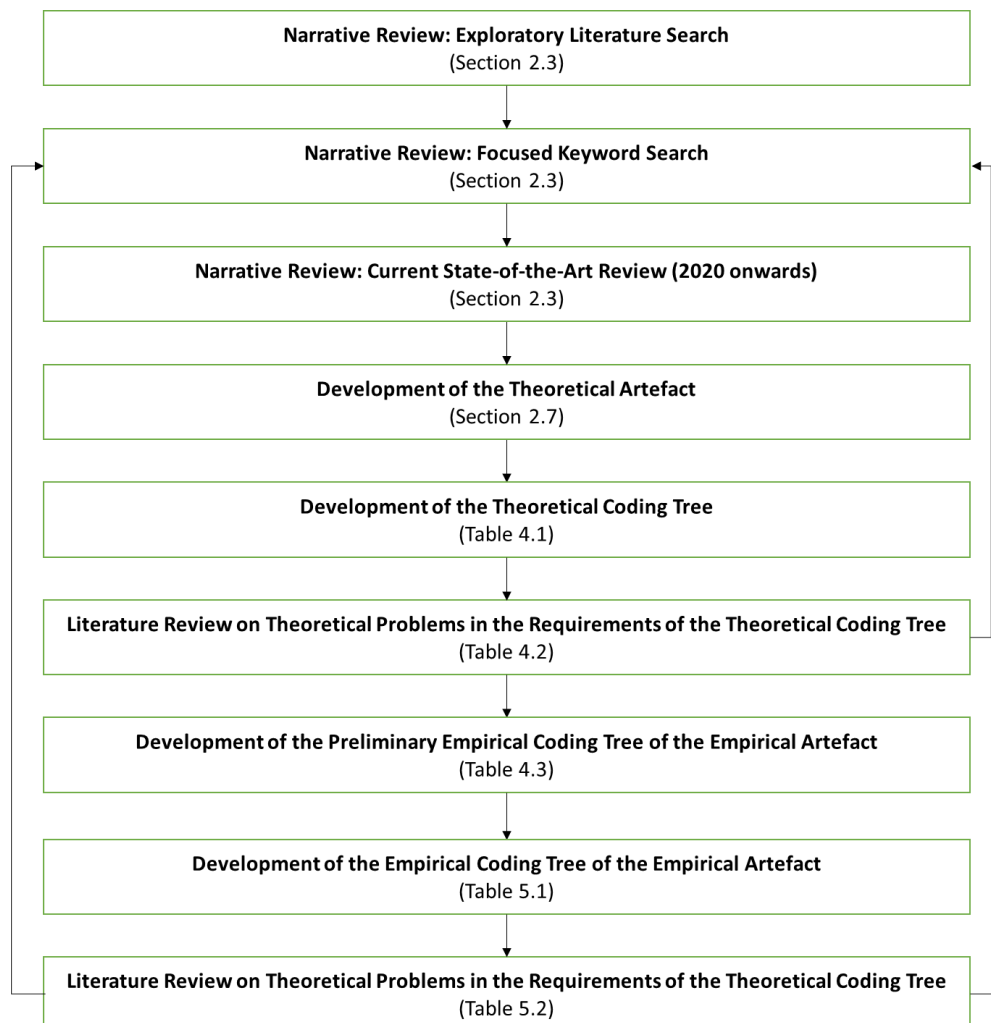


Figure 2.1 illustrates the literature review process. Initially, a narrative review (detailed in section 2.3) was conducted. This began with an exploratory search to gain a comprehensive understanding of new product development and customer co-creation. Following this, targeted keyword searches were carried out to explore specific areas within these fields. Subsequently, to ensure the review reflected the state of the art and directly aligned the literature with this study's contemporary context, only studies published since 2020 were considered as a further step. Ultimately, these three steps of the narrative review provided the literature base for new product development (Table 2.1, and Table 2.2) and customer co-creation (Table 2.3, and Table 2.4), offered insights for the identification of the research gaps (Figure 2.15), and informed the development of the theoretical artefact (section 2.7).

Furthermore, the literature review in sections 2.4 and 2.5, and the development of the theoretical artefact in section 2.7 facilitated the construction of a theoretical coding tree in Table 4.1. Consequently, this theoretical coding tree, derived from the most important theoretical requirements and characteristics for a theory-based, customer co-created NPD process, served as the foundation for incorporating empirical requirements and characteristics gathered during the first interview phase in the awareness phase of the DSR process (chapter 4).

Using the requirements of the theoretical coding tree (Table 4.1), a further literature review of theoretical problems was conducted (Table 4.2). Based on these findings, the keyword search for the narrative review could be refined to look closer at topics such as digital service development. Ultimately, together with the first interview phase, this aided in the creation of a preliminary empirical coding tree (Table 4.3) for the empirical artefact in the awareness phase of DSR, illustrating the initial relevant requirements and characteristics for developing the empirical artefact of this study. All newly identified characteristics – those that were new in the preliminary empirical coding tree and therefore not part of the theoretical coding tree – were directly compared in section 4.1.3 with the literature to assess whether these new characteristics also exist in theory.

Based on the second interview phase, the empirical coding tree (Table 5.1) for the empirical artefact in the suggestion phase of DSR could be established, outlining the relevant requirements and characteristics for developing the empirical artefact. As with the preliminary empirical coding tree, all newly identified characteristics – those that were new

in the empirical coding tree and therefore not part of the theoretical or preliminary empirical coding trees – were directly compared with the literature in section 5.1.1 to assess whether these new characteristics also exist in theory. Furthermore, the second interview phase proved important for revisiting the theoretical problems in Table 4.2, some of which could not be addressed in the first interview phase. This was also significant in providing new directions for the keyword search of the narrative review, highlighting themes such as cross-functional collaboration.

Ultimately, this comparison between theory and empirical evidence was crucial for generating initial ideas for variations of the empirical artefact (sections 5.1.3, and 5.2) and subsequently for developing the empirical artefact as depicted in Figure 6.5 within the development phase of DSR.

2.1 Organisational Perspective in this Study

This study examines the organisational perspective on NPD processes within the Swiss media industry. It adopts a company-centric viewpoint throughout, acknowledging that the company ultimately determines the development trajectory of a new digital product. Consequently, the organisation typically assumes responsibility for the NPD process framework, financing, and content of a new product. This encompasses consideration of how customers can contribute as co-creators during the NPD process.

2.2 Definition of Terms

This section defines the terms “digital products”, and “digital media” as used in this study.

2.2.1 Definition of Digital Products and Services

Digital products are considered intangible goods, eliminating the need for physical stock, and are distributed and sold online (Völgyi, 2024). Unlike physical goods, they are available indefinitely (Aiello et al., 2001). More precisely, a digital product invariably comprises software, or a combination of software and hardware, that processes data (Sustainable Digital Infrastructure Alliance, 2021). Examples include mobile applications or streaming services for film and music (Zorgle, 2024).

In this respect, it is important to differentiate between a digital product and a digital service. A digital service is defined as a service fully executed by a technical system upon user

request to generate a desired outcome (Pakkala & Spohrer, 2019). Online shopping serves as an example of a digital service, providing a digital experience through processes and flows that enable consumers to engage with a business (MacVittie, 2022). To clarify the distinction, a digital product, such as a smartphone application, is typically obtained for its inherent features and content, whereas a digital service is characterised by its on-demand execution via a technical system to produce a specific result and can consequently also constitute the primary offering of an independent development. Thus, the distinction between digital products and services, and its implications for NPD in the Swiss media landscape, is discussed further in section 8.5.

Whilst the use of digital products is evident within the Swiss media landscape – with younger audiences (18-24 years old) increasingly accessing their online news via smartphone apps from social media platforms like Instagram and TikTok, and those over 55 often using websites or smartphone apps from established Swiss media companies to access online news (Siegen & Schneider, 2024) – the specific focus of this study is on the development of new digital products, for example, smartphone apps.

Therefore, this study focuses on how Swiss media companies can best develop new digital products by involving customers throughout the NPD process and using cross-functional teams. It aims to develop a new design-oriented framework for this “customer co-created NPD” specifically for the Swiss media industry, which is facing the challenges of digital disruption (see section 1.2).

2.2.2 Definition of Digital Media

The digital revolution is characterised by the transition from analogue to digital media (Feldman, 1997). Digital media encompasses a wide range of content that is encoded in a digital format for consumption on electronic devices such as smartphones and computers. Common examples include videos, blogs, and e-books (Acerbi, 2016). In the Swiss media landscape, it is evident that digital information sources on news sites are now consumed more frequently than traditional channels such as print media (Udris et al., 2024).

This study explores how Swiss media companies can utilise customer co-creation and cross-functional teams to develop successful digital media products for an increasingly online audience (see section 2.2.1). By examining current processes for developing new digital

products, the study aims to create a design-oriented framework that encourages innovation and a customer-centric approach in the digital media landscape.

2.3 Applying a Narrative Review for Literature Searching

This research uses a narrative literature review approach. This involves a non-systematic analysis of the literature, incorporating a wide range of studies to provide a comprehensive overview of the research topics (Sukhera, 2022).

The study focuses on two central research topics: new product development, which includes working with cross-functional teams, and customer co-creation. As depicted in Figure 2.1, the narrative review involved three distinct stages: an exploratory literature search, a focused keyword search, and a state-of-the-art review.

As an initial exploratory literature search, a screening process to explore new product development and customer co-creation was conducted using Google Scholar as the primary database. Its ability to access articles from various online repositories, including ScienceDirect and ProQuest (Google, n.d.), made it an effective gateway. This exploratory literature search, involving the review of numerous studies and books, facilitated the definition of specific focal points for subsequent keyword searches.

The targeted focused keyword search, conducted in four rounds for new product development and three rounds for customer co-creation (detailed in sections 2.3.1 and 2.3.2), aimed to gather specific information on aspects of new product development and customer co-creation. In each round, keyword combinations were progressively refined. Following each refinement, articles were reviewed, and forward and backward searches were performed to collect more detailed information on each topic.

Finally, the literature search was limited to studies published since 2020 to include recent research outcomes. This ensured the review reflected the current state-of-the-art and facilitated further research development by incorporating new theories and insights (Sukhera, 2022).

Ultimately, this narrative review approach is particularly well suited to support the design science research (DSR) process as research strategy (section 3.2) and multi-phase qualitative research as research design (section 3.3) of this study. The multi-phase qualitative research

design benefits from the comprehensive overview provided by the narrative review and allows for in-depth analysis within a specific topic. Additionally, the iterative nature of the DSR process aligns with the iterative keyword refinement and forward and backward searches employed in this literature review. These two methodological research approaches facilitated the creation of the theoretical artefact (section 2.7), which served as the foundation for developing both the empirical artefact (sections 6.1 and 6.2) and the design-oriented framework (section 7.4) in this study.

2.3.1 Search Description for New Product Development

As detailed in section 2.3 and visualised in Figure 2.1, the narrative literature review for new product development comprised three rounds: an exploratory literature search (initial screening), a focused keyword search (four rounds), and a state-of-the-art review (articles since 2020).

In this regard, over 500 studies were analysed, of which 50 were deemed relevant to this research. In this regard, Figure 2.2 provides a detailed overview of the literature review process in NPD, last updated in December 2024.

Figure 2.2: Search description for the literature review in new product development (from December 2024)

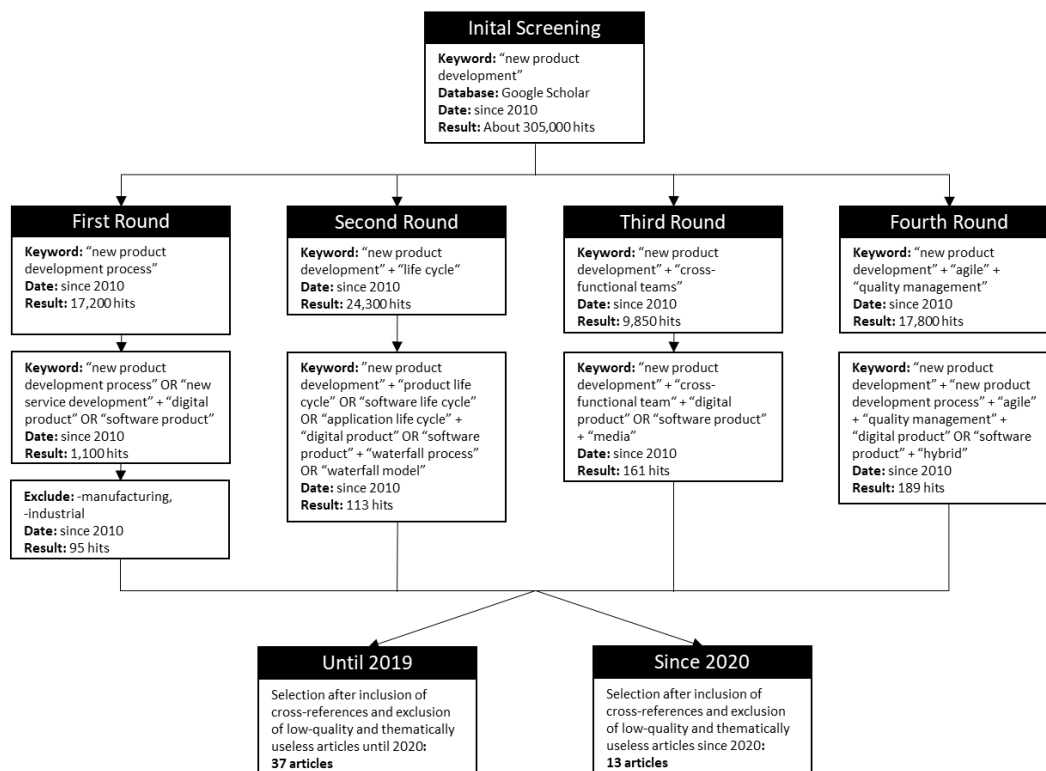


Figure 2.2 displays the 50 articles selected for the literature review in new product development, identified through four rounds of keyword searches (see boxes in Figure 2.2). These articles are detailed in Table 2.1 and Table 2.2 demonstrating their topic relevance and allocation to specific sections within the literature review of this research. These articles formed the foundation for identifying relevant research gaps (section 2.6) and developing the theoretical artefact (section 2.7).

Table 2.1: Selection of articles until 2020 for literature review in new product development

Author	Keywords	Topic relevance	Can be found in
(Ehrlenspiel & Meerkamm, 2017)	"new product development" + "product life cycle"	Stages of product development	Section 2.4.1
(Spath & Dangelmaier, 2016)	"new product development" + "cross-functional team"	Cross-functional collaboration	Section 2.4.1
(Crawford & Di Benedetto, 2011)	"new product development" + "product life cycle"	Costs of technical NPD phases	Section 2.4.1
(Göpfert, 1998)	"new product development process"	Complexity in component-heavy development	Section 2.4.1
(Loch & Kavadias, 2008)	"new product development process" + "product life cycle"	Scope of NPD	Section 2.4.1
(Cooper, 1994)	"new product development process" + "quality management"	Impact of formal NPD processes	Section 2.4.2
(Brax et al., 2017)	"new product development process" OR "new service development"	Importance of services in the global economy	Section 2.4.2
(Kampker et al., 2018)	"new product development process" OR "new service development"	Customer collaboration in early new service development (NSD) stages	Section 2.4.2
(Biemans et al., 2016)	"new product development process" OR "new service development"	Limited scholarly attention in NSD compared to NPD	Section 2.4.2
(Haines-Gadd et al., 2018)	"new product development" + "product life cycle" OR "software life cycle" OR "application life cycle"	"Evolvability" for multiple product lifecycles	Section 2.4.3
(Schweitzer et al., 2019)	"new product development" + "product life cycle" OR "software life cycle" OR "application life cycle" + "digital product" OR "software product"	Digital product lifecycle management in NPD	Section 2.4.3

(Donoghue et al., 2018)	"product life cycle"	Integrative approach to product lifecycle management	Section 2.4.3.1
(Stark, 2018)	"product life cycle"	Five phases of the product lifecycle	Section 2.4.3.1
(Schicker & Strassl, 2019)	"product life cycle"	Key performance indicators for product lifecycle analysis	Section 2.4.3.1
(Tüzün et al., 2019)	"application life cycle" + "digital product" OR "software product"	Application lifecycle management (ALM) paradigm in software product development	Section 2.4.3.2
(Chappell, 2010)	"application life cycle" + "digital product" OR "software product"	ALM activities: governance, development, operations	Section 2.4.3.2
(Schwaber, 2006)	"application life cycle" + "digital product" OR "software product"	Coordination of development lifecycle within ALM	Section 2.4.3.2
(Sommerville, 2015)	"digital product" OR "software product" + "waterfall process" OR "waterfall model"	Definition and structure of the waterfall model	Section 2.4.3.3
(Yamada et al., 2013)	"quality management"	Impact of quality management on customer satisfaction and competitiveness	Section 2.4.4
(Cooper, 1990)	"new product development process" + quality management	Early stage-gate process and cost control	Section 2.4.4.1
(Cooper, 2008)	"new product development process" + "agile" + quality management	Iterations and flexibility in the stage-gate model	Section 2.4.4.1
(Cooper & Sommer, 2016)	"new product development" + "agile" + "hybrid" + quality management	Integration of agile and customer feedback in hybrid models	Section 2.4.4.1
(Pyzdek & Keller, 2018)	quality management	Definition and implementation of Six Sigma	Section 2.4.4.2
(Liverani et al., 2019)	quality management	Design for six sigma (DFSS) and customer needs	Section 2.4.4.2
(Kwak & Anbari, 2006)	quality management	Six Sigma process and continuous improvement	Section 2.4.4.2
(Mader, 2002)	"new product development process" + quality management	DFSS's enhancement of NPD process	Section 2.4.4.2
(Ashraf & Aftab, 2017)	"new product development" + "agile" + "digital product" OR "software product"	Scrum as a leading agile approach in software	Section 2.4.5.1
(Rubin, 2012)	"new product development" + "agile" + "digital product" OR "software product"	Scrum process and its components	Section 2.4.5.1
(de Cerff et al., 2018)	"new product development" + "agile" + "digital product" OR "software product"	Lack of prescribed structure in scrum	Section 2.4.5.1
(Huang & Kusiak, 1996)	"new product development" + "agile"	Origin and initial application of kanban	Section 2.4.5.2

	+ “digital product” OR “software product”		
(Ahmad et al., 2018)	“new product development” + “agile” + “digital product” OR “software product”	Kanban’s application in software development.	Section 2.4.5.2
(Turetken et al., 2017)	“new product development” + “agile” + “digital product” OR “software product”	Challenges of scaling agile in large projects	Section 2.4.5.3
(Ulrich et al., 2019)	“new product development” + “cross-functional team”	Cross-functional nature of product development	Section 2.4.6
(Bai et al., 2017)	“new product development” + “cross-functional team”	Role of NPD teams and impact of cross-functional integration	Section 2.4.6
(Rekonen, 2014)	“new product development” + “cross-functional team”	Challenges of cross-functional collaboration: role ambiguity	Section 2.4.6
(Blanco et al., 2019)	“new product development” + “cross-functional team”	Design thinking’s value in cross-functional teamwork	Section 2.4.6
(Grashiller et al., 2017)	“new product development” + “agile” + cross-functional team	Comparison of design thinking and scrum regarding cross-functional teams	Section 2.4.6

As shown in Table 2.1, all 37 articles published until 2020 for the literature review of new product development (see Figure 2.2) are listed. This table details the authors, keywords, topic relevance, and the location of each article within the literature review of this research.

Table 2.2: Selection of articles since 2020 for literature review in new product development

Author	Keywords	Topic relevance	Can be found in
(Sjödén et al., 2020)	“new product development process” OR “new service development”	Digital servitisation definition and impact	Section 2.4.2
(Hargrave, 2022)	“new product development” + “product life cycle” OR “software life cycle” OR “application life cycle”	Stages of a product lifecycle	Section 2.4.3
(Dwarakanath et al., 2020)	“digital product” OR “software product” + “waterfall process” OR “waterfall model”	Unidirectional phase system of the waterfall model	Section 2.4.3.3
(Kwon et al., 2021)	“digital product” OR “software product” + “waterfall process” OR “waterfall model”	Applicability of the waterfall model in large organisations	Section 2.4.3.3
(Smolnik & Bergmann, 2020)	“new product development” + “agile” + “hybrid”	Evolution of the stage-gate process and hybrid models	Section 2.4.4.1
(Niñerola et al., 2021)	quality management	Industry-wide application of six sigma	Section 2.4.4.2

(Patel & Patel, 2021)	quality management	Lean six sigma methodology	Section 2.4.4.2
(Šimíčková et al., 2021)	"new product development" + "agile" + "digital product" OR "software product"	Requirements for successful scrum implementation	Section 2.4.5.1
(Aurisch et al., 2021)	"new product development" + "agile" + "digital product" OR "software product"	Scrumban: combining scrum and kanban	Section 2.4.5.1
(Barraood et al., 2021)	"new product development" + "agile" + "digital product" OR "software product"	Key instruments of kanban: board, WIP limits, and lead time	Section 2.4.5.2
(Scaled Agile Inc., 2023d)	"new product development" + "agile" + "digital product" OR "software product"	Comprehensive framework of SAFe 6.0	Section 2.4.5.3
(Leinonen & Roto, 2023)	"new product development" + "cross-functional team"	Importance of communication in cross-functional NPD	Section 2.4.6
(de Raedemaeker et al., 2020)	"new product development" + "agile"	Integration of design thinking and agile methods	Section 2.4.6

As shown in Table 2.2, all 13 articles published since 2020 for the literature review of new product development (see Figure 2.2) are listed. This table details the authors, keywords, topic relevance, and the location of each article within the literature review of this research.

In conclusion, Table 2.1 and Table 2.2 list all 50 articles selected in Figure 2.2 through the narrative review. This forms the basis for the discussion of the literature in section 2.4, for identifying research gaps (section 2.6), and subsequently for providing the components (Figure 2.16) for the development of the theoretical artefact in section 2.7. In this context, the development of the theoretical artefact encompasses an overarching NPD structure (section 2.7.2), agile (section 2.7.4) and quality management (section 2.7.6) process elements, while also providing the basis for a focus on cross-functional teams (section 2.7.7).

2.3.2 Search Description for Customer Co-Creation

As detailed in section 2.3 and visualised in Figure 2.1, the narrative literature review for customer co-creation comprised three steps: an exploratory literature search (initial screening), a focused keyword search (three rounds), and a state-of-the-art review (articles since 2020).

In this regard, over 100 studies were analysed, of which 31 were identified as relevant to this research. Figure 2.3 provides a detailed overview of the customer co-creation literature review, last updated in December 2024.

Figure 2.3: Search description for the literature review in customer co-creation (from December 2024)

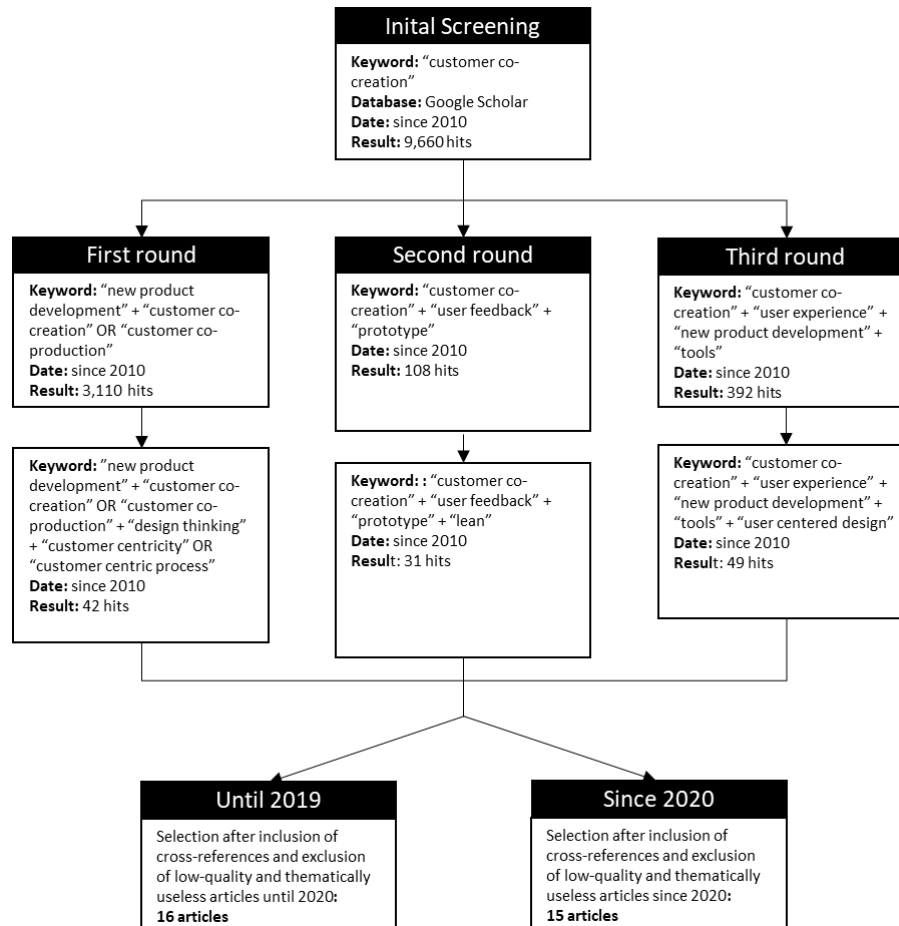


Figure 2.3 displays the 31 articles selected for literature review in customer co-creation, identified through three rounds of keyword searches (see boxes in Figure 2.3). These articles are detailed in Table 2.3 and Table 2.4, demonstrating their topic relevance and allocation to specific sections within the literature review of this research. These articles formed the foundation for identifying relevant research gaps (section 2.6) and developing the theoretical artefact (section 2.7).

Table 2.3: Selection of articles until 2020 for literature review in customer co-creation

Author	Keywords	Topic relevance	Can be found in
(Lusch & Vargo, 2006)	"customer co-creation" + "customer co-production"	Concepts of value co-creation and co-production	Section 2.5.1

(Hoyer et al., 2010)	"new product development" + "customer co-creation"	Intensity of co-creation with customer involvement	Section 2.5.1
(Wagner & Majchrzak, 2006)	"new product development" + "customer co-creation"	Customer-centric management in NPD	Section 2.5.1
(Shah et al., 2006)	"customer centricity" OR "customer centric process"	Importance of customer centricity for market success	Section 2.5.1
(Cooper, 2019)	"new product development" + "lean"	Need for new approaches like design thinking (DT) and lean startup	Section 2.5.1
(European Committee for Standardization, 2019)	"user centered design" + "prototype" + "user feedback"	Stages of the user-centred design (UCD) process, including prototyping and feedback	Section 2.5.2.1
(Kahraman, 2010)	"user centered design"	Aims of UCD: efficiency, safety, effectiveness	Section 2.5.2.1
(Dhandapani, 2016)	"user experience" + "user centered design"	UCD as a framework for customer engagement in NPD	Section 2.5.2.1
(Liedtka, 2015)	"new product development" + "design thinking"	DT as a problem-solving method for innovation	Section 2.5.2.2
(Hasso Plattner Institute of Design at Stanford, 2010)	"user feedback" + "prototype"	Five-phase DT process	Section 2.5.2.2
(Ostrom et al., 2015)	"tools" + customer co-creation + user experience	Need to strengthen "service" design thinking	Section 2.5.2.2
(Stickdorn et al., 2018)	"new product development" + "tools" + user centered design	Definition and multifaceted applications of service design	Section 2.5.2.3
(Drew, 2019)	"user centered design"	The double diamond process in service design	Section 2.5.2.3
(Osterwalder & Pigneur, 2010)	"tools" + user experience	Business model canvas as a service design tool	Section 2.5.2.3
(Miao et al., 2019)	Customer co-creation + "lean"	Spread of lean startup methods	Section 2.5.3
(Ries, 2011)	user feedback + "prototype" + "lean"	Minimum viable product (MVP) and customer testing	Section 2.5.3

As shown in Table 2.3, all 16 articles published since 2020 for the literature review of customer co-creation (see Figure 2.3) are listed. This table details the authors, keywords, topic relevance, and the location of each article within the literature review of this research.

Table 2.4: Selection of articles since 2020 for literature review in customer co-creation

Author	Keywords	Topic relevance	Can be found in
(Habel et al., 2020)	"customer centricity" OR "customer centric process"	Company-wide and individual salesperson customer focus	Section 2.5.1
(Fader, 2020)	"customer centricity" OR "customer centric process"	Integrating customer needs for long-term profitability	Section 2.5.1

(Lahiri et al., 2021)	"design thinking" + customer centricity	Design thinking (DT) for understanding and meeting customer needs	Section 2.5.1
(Magistretti et al., 2021)	"new product development" + "design thinking"	DT as a driver of innovation	Section 2.5.1
(Zhang et al., 2020)	"customer co-creation" + "tools" + user experience	Leveraging social media for value co-creation in NPD	Section 2.5.1
(El Namar et al., 2022)	"new product development" + "customer centricity" OR "customer centric process"	Importance of customer involvement throughout NPD	Section 2.4.1, and 2.5.2
(Shrivastav & Joshi, 2021)	"new product development" + "design thinking"	Underutilisation of DT in large companies	Section 2.5.2.2
(Wang et al., 2024)	"new product development" + "design thinking"	Success factors for integrating DT into NPD	Section 2.5.2.2
(Kwon et al., 2021)	"new product development" + "design thinking"	Limited DT engagement in large, hierarchical organisations	Section 2.5.2.2
(Meinel et al., 2020)	"customer co-creation" + "user feedback" + "prototype"	DT as a user experience-driven approach with prototyping	Section 2.5.2.2
(Piirman, 2022)	"user experience" + "tools" + "user centered design"	Explanation of the discover, define, develop, and deliver phases in the double diamond	Section 2.5.2.3
(Mansoori & Lackéus, 2020)	"user feedback" + "prototype" + lean	Lean startup for continuous learning from stakeholders	Section 2.5.2.3
(Najafi-Tavani et al., 2022)	Customer co-creation + "lean"	Lean management for streamlining NPD and enhancing performance	Section 2.5.3
(Zorzetti et al., 2022)	"prototype" + "user feedback" + "lean"	Experiment-driven development in lean startup	Section 2.5.3
(Felin et al., 2020)	User feedback + "lean"	Criticisms of lean startup's focus on measurable feedback and incremental innovation	Section 2.5.3

As shown in Table 2.4, all 15 articles published since 2020 for the literature review of customer co-creation (see Figure 2.3) are listed. This table details the authors, keywords, topic relevance, and the location of each article within the literature review of this research.

In conclusion, Table 2.3 and Table 2.4 list all 31 articles selected in Figure 2.3 through the narrative review. This forms the basis for the discussion of the literature in section 2.5, for identifying research gaps (section 2.6), and subsequently for providing the components (Figure 2.16) for the development of the theoretical artefact in section 2.7. In this context, the development of the theoretical artefact incorporates elements of user-centred design

and the design thinking process (section 2.7.3), alongside the integration of principles from the lean start-up method (section 2.7.5).

2.4 New Product Development

This section explores the theoretical requirements underpinning the development of a theoretical artefact in section 2.7, with a specific focus on NPD. To that end, the following sections gather key requirements central to constructing the artefact. These include new service development (section 2.4.2) lifecycle management models (section 2.4.3), quality management methods (section 2.4.4), agile models (section 2.4.5), and cross-functional teams (section 2.4.6).

2.4.1 Introduction to (New) Product Development

Product development is a key element within the broader process of product creation. Alongside development, this process encompasses other crucial stages such as product planning and design (Ehrlenspiel & Meerkamm, 2017). Thereby, the entire product lifecycle is integral to product development. This means that the phases of development are no longer strictly sequential, but often occur simultaneously, leading to a more rapid development process. Consequently, product development necessitates cross-functional collaboration between experts from diverse fields (Spath & Dangelmaier, 2016).

In this respect, an NPD process for creating a theoretical artefact should ideally be based on a comprehensive product lifecycle (see section 2.4.3). This process should incorporate iterative elements (see section 2.4.5) and integrate cross-functional teams (see section 2.4.6).

New products are seen as big business. Worldwide, over 100 billion dollars are spent annually purely on the technical phase (Crawford & Di Benedetto, 2011). However, the complexity of product development increases significantly when a product comprises numerous individual components (Göpfert, 1998). Therefore, to evaluate the effectiveness of product development, five key dimensions, all linked to profitability, should be considered: product quality; product costs; development time; development costs; and development capability (Ulrich et al., 2019). In this regard, customer co-creation in NPD offers potential benefits, including cost reduction, increased market share, improved product performance, and the elimination of imperfections (El Nemar et al., 2022).

Accordingly, customer co-creation (see section 2.5) and the above discussed inclusion of a focus on cross-functional teams for collective ability (development capability) can be considered to offer a relevant integration to increase the profitability of product development. This is particularly relevant for this study as it focuses on customer co-created NPD involving cross-functional teams.

NPD consists of company activities that lead to a stream of new or modified product offerings on the market over time. It also includes services offered to customers and the institutionalisation of improvements in the NPD activities themselves (Loch & Kavadias, 2008). In this regard, formal new product processes have a significant impact on how new product programmes are managed, controlled and measured by some companies (Cooper, 1994).

In this context, the literature reviewed indicates that formal processes are necessary within NPD to maintain overarching governance. This ensures ongoing product development (see section 2.4.4) and effective control mechanisms (see section 2.4.4.1). Furthermore, the service component is examined in detail in section 2.4.2.

The following sections address the points raised above, specifically in relation to NPD. Beginning with new service development (NSD), and next offering a comparison of three distinct lifecycle models, the discussion then moves to quality management methods. This is followed by an exploration of flexible agile methodologies for technical development, incorporating iterative and incremental approaches. Finally, the focus shifts to the importance of cross-functional teams.

2.4.2 New Service Development

As discussed in section 2.4.1, this section addresses NSD as part of the NPD process.

Services are becoming increasingly important in our service-driven global economy (Brax et al., 2017). Digital servitisation can be defined as the transformation of offerings, capabilities, and processes within organisations and their ecosystems to capture, create, and deliver increased service value through the application of digital technologies (Sjödén et al., 2020). For media companies, this might involve, for example, offering “time savings” as a customer value proposition. This could be achieved through a digital subscription service, allowing users to access magazines instantly rather than having to physically purchase them. Kampker

et al. (2018) demonstrated that close collaboration with customers, particularly in the early stages of NSD, fosters trust and acceptance. This allows customers to directly recognise the service's benefits and influence its features. However, as described by Biemans et al. (2016), research on NSD, compared to NPD, within the scientific community remains relatively underdeveloped. This may be partly attributable to previous research over-relying on NPD methods, concepts, and frameworks for NSD.

This presents a compelling argument for this study. Although this study does not focus on developing complete digital services in themselves, but rather products that may incorporate them, it empirically investigates how digital services are perceived within Swiss media companies in the context of NPD. The results are presented in section 4.2.1, and further discussed in Table 4.2, and Table 5.2.

2.4.3 Lifecycle Management Models for New Product Development

A key question in NPD is how to ensure sustained customer engagement. In this regard, Haines-Gadd et al. (2018) suggest that incorporating “evolvability” as a design aspect can enable a product to have multiple lifecycles. To this end, many companies utilise digital product lifecycle management systems to support NPD (Schweitzer et al., 2019). A lifecycle encompasses the stages a product undergoes from conception and growth to maturity and decline (Hargrave, 2022).

As defined in section 2.4.1, this section explores three distinct lifecycle models, with a comparative analysis provided in section 2.7.2 to justify their selection as an overarching NPD structure for integration into the theoretical artefact.

2.4.3.1 Product Lifecycle Management

This first lifecycle model, based on the established product lifecycle concept, offers a compelling illustration for its integration into this study's theoretical artefact. It provides an overarching structure for NPD, specifically tailored to the creation of digital products.

Product lifecycle management is an information-driven and integrative approach encompassing all aspects of a product's life and its environment. This spans from development and production through to use and eventual disposal (Donoghue et al., 2018).

Figure 2.4: Visualisation of a product lifecycle



Source: Stark (2018)

Figure 2.4 illustrates the five phases of the product lifecycle: ideation, definition, realisation, use and service, and disposal, recycling and retirement. Initially, in the ideation phase, the product exists solely as a concept. This concept is then refined into a detailed specification during the definition phase. The realisation phase encompasses the actual creation of the product. Subsequently, the product enters the use and service phase where it is utilised by the customer. Finally, in the disposal, recycling and retirement phase, the product reaches the end of its useful life and is discarded (Stark, 2018).

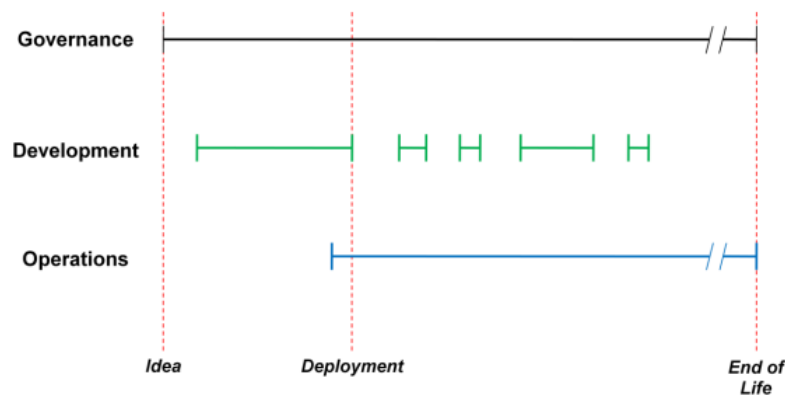
To accurately determine the specific lifecycle phase of a product, key performance indicators such as turnover, sales figures, costs, and contribution margins must be visually represented and analysed over time (Schicker & Strassl, 2019).

Accordingly, the product lifecycle offers a framework for integrating the static lifecycle of a new digital product, from conception to retirement, providing a foundation for the overarching NPD structure of the theoretical artefact in this study.

2.4.3.2 Application Lifecycle Management

Application lifecycle management (ALM) is a paradigm used in software product development. It encompasses the management and integration of various activities related to the governance, development, and operation of a software product (Tüzün et al., 2019). This is particularly relevant to this study's theoretical artefact because, as identified in section 2.4.1, a model should be found that incorporates governance and operational perspectives for the NPD of digital products.

Figure 2.5: Visualisation of three activities within the application lifecycle management



Source: Chappell (2010)

Chappell (2010) describes that ALM refers to the whole time, from the initial idea to the end of life, in which a company spends money on the software product. Accordingly, ALM includes three activities (see Figure 2.5): governance, development, and operations. The governance activity ensures that the software product delivers exactly what the business requires. The development activity refers to the development of the software product. The operations activity relates to the monitoring and management of the software product (Chappell, 2010).

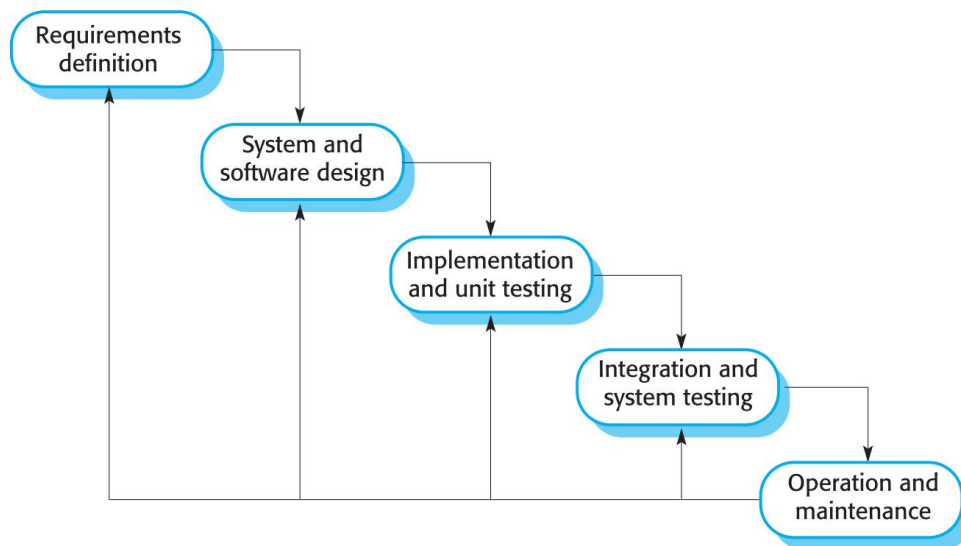
For the theoretical artefact in this study, ALM offers a compelling method for providing an overarching NPD structure that encompasses governance, development, and operations. In this regard, Tüzün et al. (2019) refine these three core activities: governance, which orchestrates the entire process; operations, focused on deployment, monitoring, and customer feedback; and development, which aligns with the traditional software development lifecycle (SDLC), including requirements engineering, architecture and design, development, build management, and test management. This perspective resonates with the view of Schwaber (2006), which emphasises the coordination of the development lifecycle activities within ALM, encompassing requirements, modelling, development, build, and testing.

Therefore, for the theoretical artefact of this study, ALM provides a comprehensive framework that guides the NPD process by integrating governance, development, and operations, effectively extending the classic product lifecycle model. Discussion of ALM's integration into the theoretical artefact is provided in section 2.7.2.

2.4.3.3 Waterfall Model as Part of a Software Process Model

A waterfall model is regarded as a software process model, which demonstrates that each stage must be completed before progressing to the next (Sommerville, 2015). In the context of this study, which focuses on customer co-creation in the NPD of digital products, understanding these models is crucial for analysing and optimising the collaborative journey of creating digital products (software products) with customers. Additionally, Sommerville (2015) defines a software process model as SDLC, which is of further interest to this study due to its potential alignment with the ALM development activity defined by Schwaber (2006) and Tüzün et al. (2019) in the previous section 2.4.3.2.

Figure 2.6: Visualisation of a waterfall model



Source: Sommerville (2015)

As illustrated in Figure 2.6, a waterfall-oriented model is a plan-driven process, meaning all process activities are planned and scheduled before software development begins (Sommerville, 2015). Furthermore, the waterfall model is a unidirectional phase system, with each phase requiring completion before progressing to the next (Dwarakanath et al., 2020).

While the waterfall model may not fully encapsulate the iterative and dynamic nature of customer co-creation, examining it within this study's theoretical artefact can yield valuable insights. This is because large, hierarchically structured organisations often favour a waterfall approach (Kwon et al., 2021). Considering the context of large Swiss media companies in this study, this suggests that a waterfall-oriented process must be incorporated into this study's

theoretical artefact for NPD. This relevant combination of iterative, flexible models with waterfall-driven structures is further defined in section 2.4.4.1.

2.4.4 Quality Management Methodologies

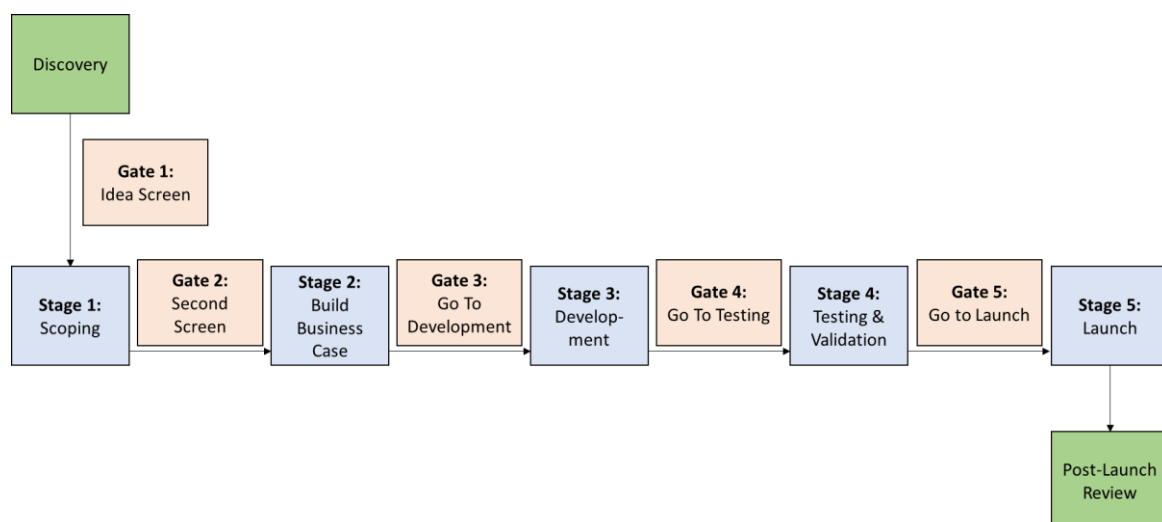
A key aim of quality management is to enhance customer satisfaction. Consequently, implementing quality management enables some companies to boost their productivity and competitiveness (Yamada et al., 2013). This approach supports the controlled NPD approach outlined in section 2.4.1, thus forming a crucial element of this study's theoretical artefact. This section examines two specific quality management methods: stage-gate and (lean) six sigma.

2.4.4.1 Stage-Gate

In the late 1980s, Robert Cooper introduced the stage-gate process to structure NPD (Smolnik & Bergmann, 2020). This system manages innovation through simple process controls. Each stage, or workstation, is followed by a gate, or control point, ensuring quality. Progression to the next stage depends on meeting quality standards. This helps control costs, which decrease as information improves with each stage (Cooper, 1990).

As noted in section 2.4.1, cost and quality are crucial in NPD. Therefore, this study's theoretical artefact emphasises control mechanisms within the NPD process to achieve profitability.

Figure 2.7: Stage-gate process



Source: Cooper (2008)

Figure 2.7 shows an updated stage-gate process, still structured in stages and gates. However, this does not imply a strictly linear progression. Iterations within stages are possible, and new stages can begin before previous ones are fully completed (Cooper, 2008).

This approach effectively addresses the need, outlined in section 2.4.3.3, for a software process model combining iterative elements with waterfall-oriented structures within the theoretical artefact.

To reflect modern practices, the stage-gate system has evolved into a hybrid model, incorporating agile methods like scrum. Crucially, this involves integrating customers at every step through feedback (Cooper & Sommer, 2016). This highlights the need for flexibility in NPD to adapt to changing customer and market demands (Smolnik & Bergmann, 2020).

This finding provides a crucial framework for developing this research's theoretical artefact. Specifically, it suggests using hybrid process models that embody an iterative core through agile practices, while maintaining a purposeful structure through the sequenced, waterfall-driven elements of the NPD process. Accordingly, agile process elements are reflected in more detail in section 2.4.5.

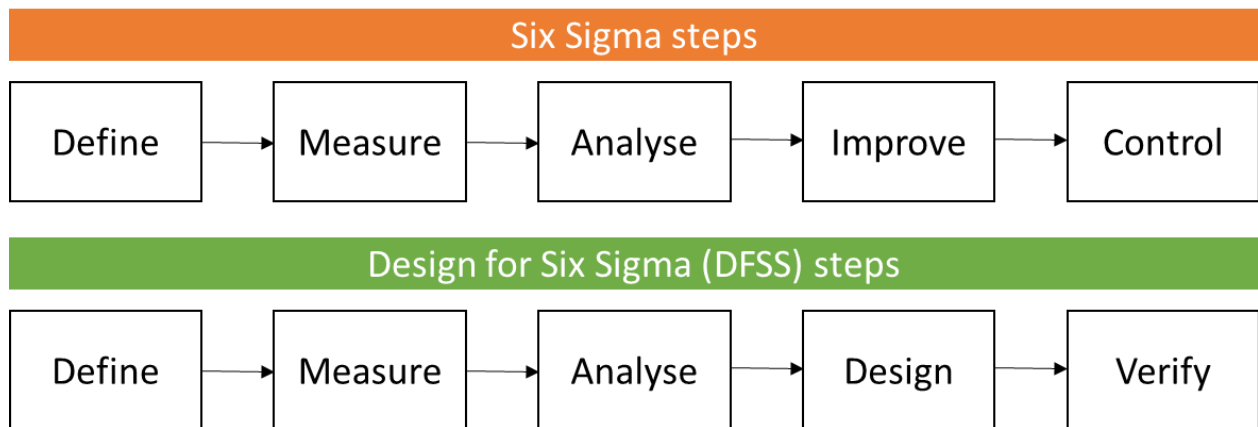
2.4.4.2 (Lean) Six Sigma

Six sigma is a highly effective, goal-oriented implementation of established quality principles and techniques. It involves training internal technical leaders, known as “six sigma black belts”, to apply these methods (Pyzdek & Keller, 2018). Widely used across industries as a quality improvement strategy (Niñerola et al., 2021), six sigma offers a robust framework.

In recent years, lean six sigma has emerged as a key quality improvement methodology. This approach combines lean and six sigma principles, synergistically eliminating waste and minimising variations (Patel & Patel, 2021).

To gain a deeper understanding of customer needs, which is central to this research of customer co-created NPD, design for six sigma (DFSS) is particularly relevant. DFSS focuses on meeting customer expectations by minimising inconsistencies and defects in existing products (Liverani et al., 2019).

Figure 2.8: Steps from six sigma and design for six sigma



Source: adapted from Kwak & Anbari (2006)

Figure 2.8 illustrates the six sigma process, focused on the six sigma steps. This closed-loop process eliminates unproductive steps, emphasises new measurements, and leverages technology for continuous improvement (Kwak & Anbari, 2006). DFSS enhances the NPD process by providing greater structure and optimising resource management, deliverables, and trade-offs (Mader, 2002).

While six sigma is not explicitly incorporated into the theoretical artefact of this study, as the focus is not to eliminate unproductive NPD steps in a currently operating NPD process, its underlying principles remain pertinent. As described above, six sigma emphasises the creation of a robust and efficient NPD process that minimises disruptions and maximises efficiency, ultimately leading to reduced development times. This approach shares similarities with the minimum viable product (MVP) in the lean startup approach by Ries (2011), which is discussed in more detail in section 2.5.3.

2.4.5 Flexible Agile Models

As highlighted in section 2.4.1 and further emphasised in section 2.4.4.1, incorporating agile models into the NPD process of the theoretical artefact is crucial to this study. This section presents three agile development methods: scrum, kanban, and scaled agile framework.

2.4.5.1 Scrum

Scrum is a leading agile approach within the software industry (Ashraf & Aftab, 2017).

Although this study focuses on the Swiss media industry rather than the software industry,

the development of digital, and therefore software-based products suggest that scrum could offer a compelling agile development approach.

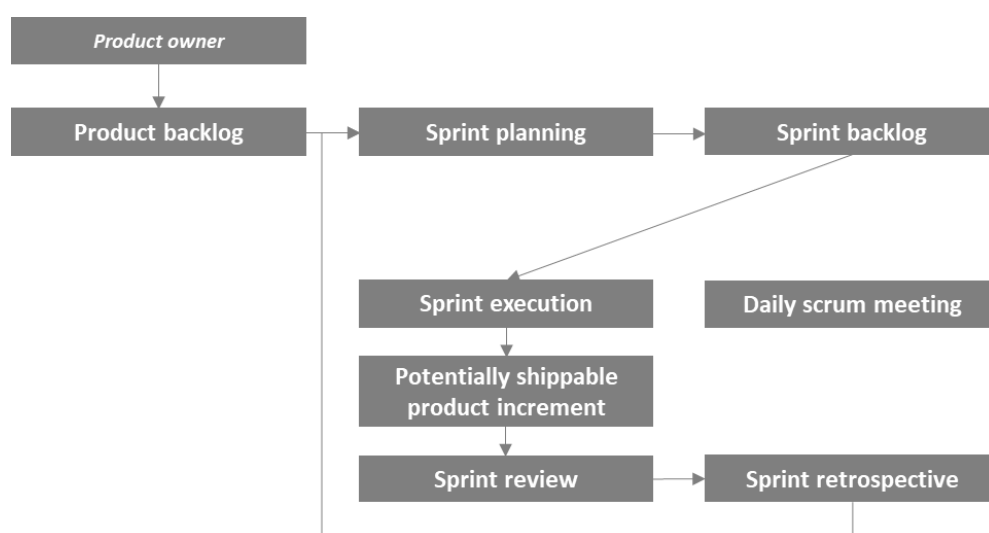
In this regard, Figure 2.9 illustrates the scrum process, initiated by the product owner, who holds the vision for the product. This vision is broken down into prioritised features, compiled in the product backlog (Rubin, 2012).

As the product backlog usually exceeds what the scrum team can deliver within a single sprint, the team determines a realistic workload during sprint planning. This selection forms the sprint backlog, detailing the tasks involved in designing, building, integrating, and testing the chosen features (Rubin, 2012).

Sprint execution follows, guided by daily scrum meetings where the team coordinates workflow. Each sprint aims to produce a potentially deliverable product increment, contributing to the product owner's vision (Rubin, 2012).

The sprint review involves all stakeholders inspecting the resulting increment. The sprint retrospective then focuses on reviewing the scrum process itself. These final activities identify necessary adjustments, feeding back into the product backlog or development process. The scrum process then repeats (Rubin, 2012).

Figure 2.9: Scrum process



Source: adapted from Rubin (2012)

Scrum is renowned for boosting productivity, enabling rapid responses to market changes, optimising collaboration, and accelerating the delivery of quality products (Ashraf & Aftab,

2017). These promising arguments form an important basis for integration into the theoretical artefact of this study aimed at the Swiss media industry to quickly develop high-quality digital products.

However, as Šimíčková et al. (2021) note, scrum requires all team members to possess both technical expertise and familiarity with the methodology. Since scrum masters in the scrum process have no direct authority, they rely on their experience to lead the team. Any attempt to exert control can jeopardise the project. Furthermore, precisely defined goals and meticulous planning are essential to prevent sprints from becoming protracted and tasks from losing focus.

In addition, scrum does not prescribe a specific scrum board structure (de Cerff et al., 2018). For greater flexibility, allowing changes at any point, scrum can be combined with kanban, creating “scrumban” (Aurisch et al., 2021). Kanban is further discussed in the next section, 2.4.5.2.

Finally, scrum presents an intriguing option for illustrating a technical development process within the theoretical artefact of this study. Furthermore, the above-mentioned challenges associated with scrum provide a valuable foundation for the empirical data collection in this study. In this regard, these results can directly address interview questions related to the scrum master role, the effective practical application of agile practices, and issues of scaling and prioritisation within the product backlog.

2.4.5.2 Kanban

As noted in the previous section 2.4.5.1, this section discusses kanban in the context of its potential integration with scrum (scrumban).

Kanban systems, initially developed using the just-in-time approach for controlling repetitive manufacturing processes (Huang & Kusiak, 1996), have seen successful integration within manufacturing and are now increasingly applied in the software industry. This involves the continuous delivery and development of value (Ahmad et al., 2018).

As described by Barraod et al. (2021), kanban employs three key instruments: the kanban board, work-in-progress (WIP) limits, and lead time. The kanban board uses columns to represent different states, such as analyse, develop, and test, allowing activities to be tracked as they move between these states. WIP restrict the number of tasks, or user

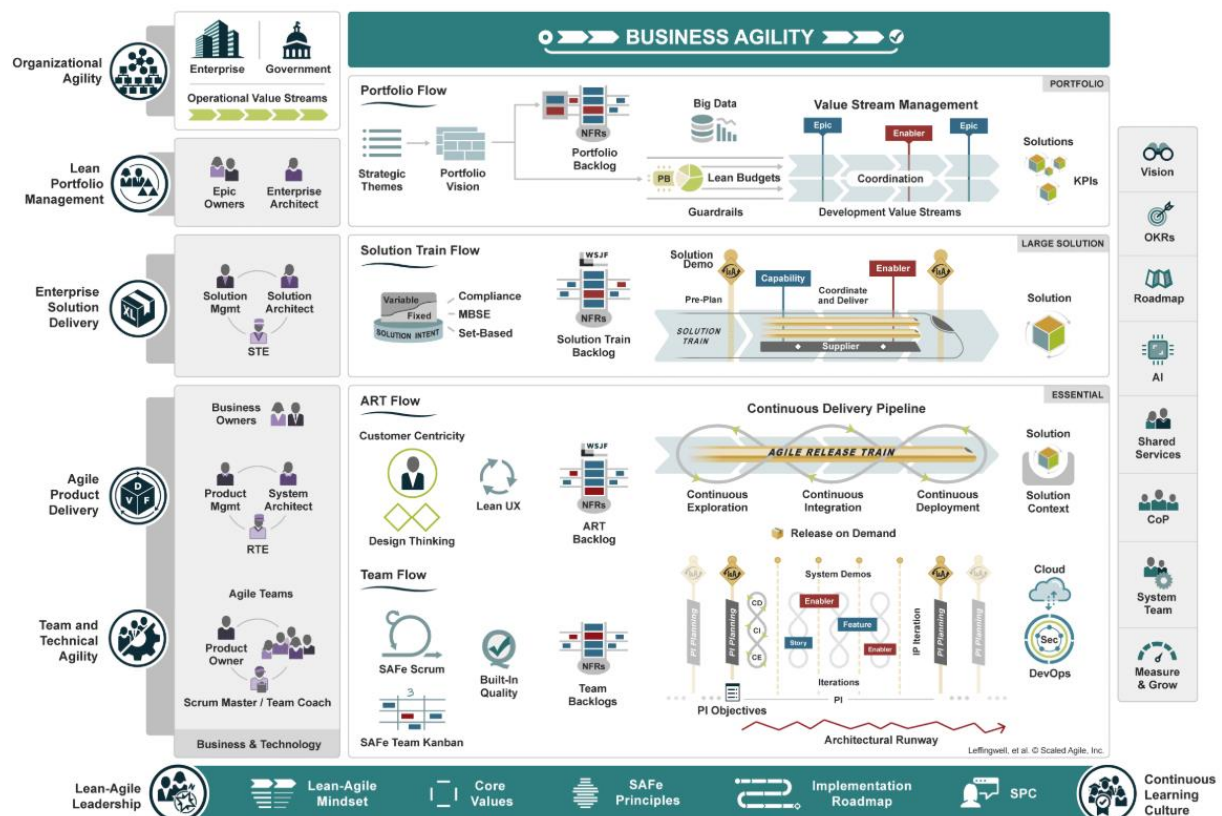
stories, that can be handled per station, as defined by the team and test managers. Lead time focuses on using kanban to reduce the time taken for the full value stream. To achieve this, completed tasks are immediately passed to the next station, unless that station is already at its WIP limit.

The explanation of kanban above offers a compelling addition to scrum, as discussed in section 2.4.5.1, allowing teams to opt for a kanban board instead of a scrum board. While this might not be a concrete process element within the theoretical artefact in this study, it highlights the flexibility available to scrum teams in their choice of board structure.

2.4.5.3 Scaled Agile Framework

Turetken et al. (2017) highlight that despite the widespread adoption of agile software development approaches, challenges remain in large system development projects, particularly concerning the integration of agile practices and scalability. Therefore, this study presents another established model alongside scrum, namely the scaled agile framework (SAFe).

Figure 2.10: Scaled agile framework 6.0



Source: Scaled Agile Inc. (2023d)

Figure 2.10 illustrates the comprehensive framework of SAFe 6.0 derived from Scaled Agile Inc. (2023d). It is immediately apparent that SAFe is an extensive model focused on business agility, advocating for a cultural shift where business and technology leaders form a strong partnership. However, achieving business agility is a significant undertaking, requiring substantial investment and organisational change (Scaled Agile Inc., 2023a).

Therefore, SAFe is not entirely suitable for this study, as the primary aim is not to integrate business agility per se, but to delve deeper into the structures of a customer co-created NPD process. Nevertheless, as shown in Figure 2.10, SAFe 6.0 offers a valuable perspective with its integration of various cross-functional roles, such as the business owner (Scaled Agile Inc., 2023b), product manager (Scaled Agile Inc., 2023e), and solution architect (Scaled Agile Inc., 2023f). This concept of cross-functional roles in SAFe is further explored within this study's theoretical artefact in section 2.7.8. The broader topic of cross-functional teams is discussed in detail in the next section, 2.4.6.

2.4.6 Cross-functional Teams for New Product Development

As highlighted in section 2.4.1 and emphasised in the previous section 2.4.5.3, the use of cross-functional teams within this study's theoretical artefact is crucial. Therefore, this section focuses on examining cross-functional teams in more detail.

Product development is inherently cross-functional, involving almost every function within a company (Ulrich et al., 2019). Therein, effective communication is vital for knowledge transfer (Leinonen & Roto, 2023). Furthermore, as outlined by Bai et al. (2017) developing new products is crucial for a company's sustainability and survival, driven by rapid advancements in technology, science, and market demand. NPD teams provide an effective means of leveraging a company's knowledge resources, accelerating product innovation, and ultimately enhancing competitiveness and profitability. Cross-functional integration significantly impacts the performance of these teams.

Therefore, this study's theoretical artefact must incorporate different cross-functional roles within the NPD process and recognise the critical importance of communication between those roles to accelerate product innovation and obtain a better team performance.

However, cross-functional collaboration presents challenges: role ambiguity can significantly affect team members' autonomy and freedom. Therefore, establishing clear working

practices that foster open communication and minimise ambiguity from the outset of the NPD process is paramount (Rekonen, 2014).

Consequently, the theoretical artefact for a customer co-created NPD process must incorporate a clear allocation of roles and a structured procedural flow to effectively guide the cross-functional teams.

To better address the challenges inherent in cross-functional teamwork, Blanco et al. (2019) suggest the incorporation of design thinking (DT). Their study effectively demonstrates how DT showcases the value of both cross-functional teamwork and a user-centred approach. Building on this, de Raedemaecker et al. (2020) highlight research indicating that integrating DT with agile methods led to a 90% reduction in problem-solving time and a 30% increase in customer satisfaction. Furthermore, they emphasise the potential of combining lean management and agile methodologies.

Similar to DT, scrum utilises iterations and cross-functional teams, involving various stakeholders. However, it is important to note that while DT focuses on finding solutions, scrum provides the framework for developing them (Grashiller et al., 2017). This, therefore, shows the value of a combined approach: first finding solutions through DT and then developing them with the structure of scrum.

Therefore, the theoretical artefact of this study must link different roles and process elements to integrate customer co-creation into an NPD process containing cross-functional roles. In other words, it requires the integration of user-centred processes such as DT, lean principles such as lean startup (already mentioned in section 2.4.4.2), and agile process models for technical development, such as scrum, which was described in section 2.4.5.1.

To focus specifically on customer co-creation, further literature research will be conducted in section 2.5, where DT is presented in section 2.5.2.2 and lean startup in section 2.5.3.

2.5 Customer Co-Creation

This section explores the theoretical foundations for developing the theoretical artefact presented in section 2.7, focusing on customer co-creation in NPD. The following sections outline key requirements for the artefact's construction, including customer-centred processes (section 2.5.2) and lean startup principles (section 2.5.3).

2.5.1 Introduction to Customer Co-Creation

This section focuses on identifying how customer co-creation can be effectively integrated into the NPD process of the theoretical artefact in this study.

Co-creation of value can be understood through two key components. Firstly, there is the co-creation of value itself, typically captured as exchange value, or price (Lusch & Vargo, 2006). However, the “service-dominant logic” model by Lusch and Vargo (2006) posits that value (value-in-use) is determined by the user during consumption of a good. Secondly, there is co-production, which centres on the joint creation of a core offering. This occurs in collaboration with customers or partners through activities like joint production, design development, and innovation (Lusch & Vargo, 2006).

While this study primarily focuses on co-production, it also acknowledges the importance of value-in-use. This is because value is generated for both customers and companies. Customers derive value from digital products developed in line with their needs and ideas, while companies gain value through active customer involvement in the NPD process. This involvement allows for knowledge sharing and ultimately drives consumption of the new digital products.

Within the context of NPD, customer co-creation in development of products is particularly intensive when customers are involved throughout the entire NPD process (Hoyer et al., 2010). This necessitates customer-centric management, which considers the needs and resources of individual customers as the starting point for NPD or product improvement (Wagner & Majchrzak, 2006). In this regard, companies are only perceived as customer-centric when this focus is evident both at the overall company level and in individual salesperson interactions (Habel et al., 2020). Indeed, customer centricity is widely regarded as essential for market success in the 21st century (Shah et al., 2006), requiring businesses to fully integrate the needs and desires of their most valuable customers into their products and services to drive long-term profitability (Fader, 2020).

Therefore, this highlights the necessity of incorporating customer-centric processes within the NPD process of the theoretical artefact in this study. This will ensure that customer

needs are effectively integrated and serve as a foundation for NPD. This will be discussed further in section 2.5.2.

In this regard, design thinking (DT) offers a user-oriented paradigm for understanding and meeting customer needs. It involves problem formulation, identifying unmet needs, and incorporating user feedback into processes and systems (Lahiri et al., 2021). Consequently, DT is recognised in academic literature as a driver of innovation (Magistretti et al., 2021).

However, many companies still fail to prioritise a market or customer focus, often leading to detrimental outcomes and contributing significantly to product failure. To address this, new approaches to NPD are required, such as DT and lean startup methodologies (Cooper, 2019).

Having established the importance of DT, section 2.5.2.2 provides a detailed illustration of how this approach can be integrated into the theoretical artefact of this study. Similarly, the lean start-up methodology, previously highlighted in sections 2.4.4.2 and 2.4.6, is further explored in section 2.5.3. Examining these innovative NPD practices lays a robust foundation for this study.

In contemporary NPD processes, businesses increasingly leverage social media for value co-creation. Research indicates that structural linkage via social media positively impacts knowledge transfer effectiveness and absorptive capacity, ultimately enhancing firm performance (Zhang et al., 2020).

This provides a compelling basis for this study to investigate whether social media is considered a suitable method for achieving shared value in the NPD process within the Swiss media industry. This is illustrated in section 4.2.3 through the findings of the first interview phase.

Consequently, the following sections focus on two specific areas of interest, which serve as theoretical requirements for the development of the theoretical artefact in this study: customer-centred processes in section 2.5.2, and lean startup in section 2.5.3.

2.5.2 Customer-Centred Processes

As mentioned in the previous section 2.5.1, this section examines customer-centric process models. Specifically, it discusses three distinct methods: user-centred design, design

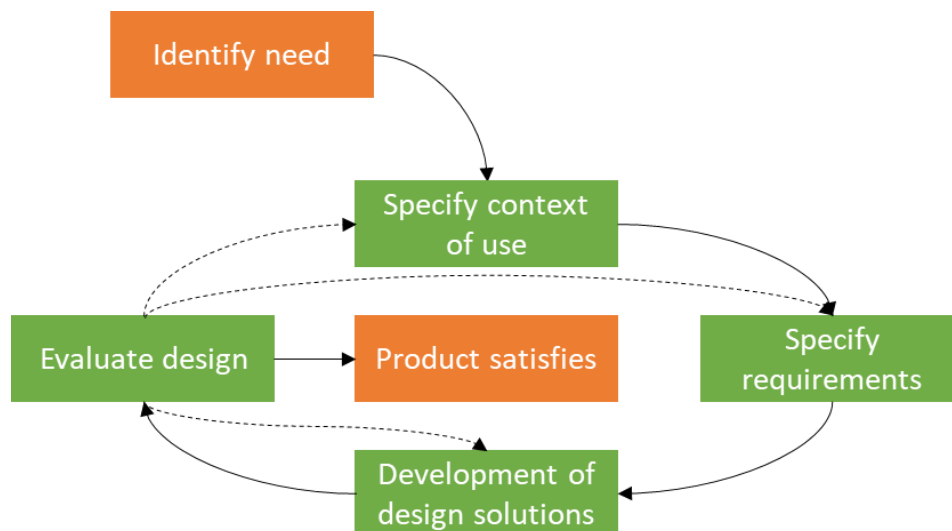
thinking, and service design. This is pertinent because El Nemar et al. (2022) highlight the critical importance of involving customers throughout the entire NPD process. Consequently, the theoretical artefact must incorporate theoretical customer-centred process models into its NPD process.

2.5.2.1 User Centred Design

User-centred design (UCD), grounded in ISO 9241-210:2019, provides guidelines for human-centred design principles and activities throughout the entire lifecycle of computer-based interactive systems (European Committee for Standardization, 2019). It involves the active participation of users in every phase of the design process, aiming to develop products that are more efficient, safe, and effective (Kahraman, 2010). Therefore, UCD provides a robust framework for addressing the assertion by El Nemar et al. (2022) that customers should be actively engaged throughout the entire NPD process. This is increasingly important in product development, particularly as more products with similar functionalities emerge, and software development shifts towards end-user customisation (Dhandapani, 2016).

Therefore, UCD appears to be a promising model for integration into the theoretical artefact of this study.

Figure 2.11: General phases of UCD process



Source: adapted from European Committee for Standardization (2019)

Figure 2.11 illustrates the UCD process. Initially, the need to develop a new product must be established (Identify need) before proceeding to the UCD cycle (European Committee for Standardization, 2019).

The UCD cycle begins with understanding the context of use (specify context of use). This involves identifying the user, their characteristics, goals, tasks, and the environment in which the product will be used (European Committee for Standardization, 2019).

Next, requirements are specified (specify requirements). These are categorised into customer, business, and technical requirements (European Committee for Standardization, 2019).

The third stage involves developing design solutions (development of design solutions). These solutions influence the user experience and can be tested with prototypes, where customer feedback is involved. The evaluated and refined design solutions are then prepared for implementation (European Committee for Standardization, 2019).

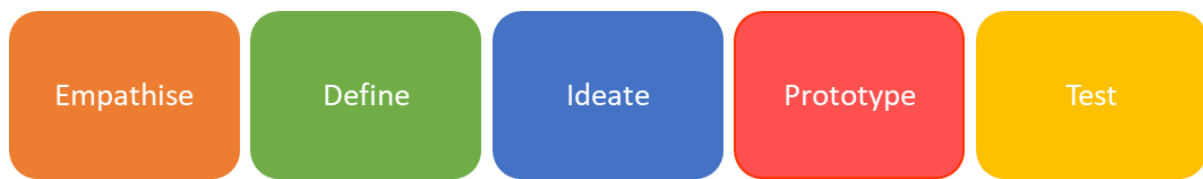
Finally, the developed solutions are evaluated (evaluation design) with customers to determine whether the product meets the usage requirements (product satisfies). If not, iterations (indicated by the dashed arrows in Figure 2.11) are introduced to improve the product (European Committee for Standardization, 2019).

In this regard, the UCD process offers a well-defined framework for integrating customers into the NPD process of this study's theoretical artefact. However, as highlighted in section 2.4.6, DT, as another user-centred process, appears to be a highly effective method for cross-functional collaboration in NPD. This will be explored further in the next section 2.5.2.2.

2.5.2.2 Design Thinking

Design thinking (DT) is widely recognised in the literature as a problem-solving method that promotes innovation and growth (Liedtka, 2015). However, despite its potential, DT is often not fully utilised for product development in large companies (Shrivastav & Joshi, 2021). To address this gap, research by Wang et al. (2024) has identified two key success factors for effectively integrating DT into NPD. Firstly, companies must address innovation bottlenecks, such as an insufficiently innovative NPD process. Secondly, fostering an open corporate culture that encourages innovation is crucial. This presents a significant opportunity for the theoretical artefact of this study to demonstrate how DT can be effectively incorporated into the NPD process of large companies, with a focus on creating an innovation-driven approach.

Figure 2.12: Design thinking process



Source: adapted from Hasso Plattner Institute of Design at Stanford (2010)

Figure 2.12 shows the five-phase DT process. Devised by the Hasso Plattner Institute of Design at Stanford (2010), it begins with the “empathise” phase by observing and engaging with users, conducting casual interviews and asking “why” to understand their behaviour. Next, the “define” phase analyses these insights to understand the target group and their needs, leading to a problem statement based on the users, their needs, and the gathered insights. The “ideate” phase focuses on generating ideas using techniques like brainstorming. This is followed by the “prototyping” phase, where prototypes are built to test specific questions. Finally, the “test” phase involves observing how users interact with the prototypes, allowing them to interpret and explore on their own (Hasso Plattner Institute of Design at Stanford, 2010).

In summary, DT is a user experience-driven approach that conducts empathic, in-depth user research and incorporates iterative prototyping (Meinel et al., 2020). However, two problems arise in this respect. Firstly, there is a tendency to treat the user experience separately from software or product development (Dhandapani, 2016). Secondly, larger, hierarchically structured organisations often limit their engagement with DT to the ideate, prototype, and test phases (Kwon et al., 2021), which could also be the case for large Swiss media companies.

Therefore, this study’s theoretical artefact must seek to integrate customer-centric processes directly into both technical and business-based product development, rather than managing them as separate activities. To maintain a practical theoretical perspective of the Swiss media industry, only the final three phases of the DT process must be used. This suggests that relying solely on user-centred design (section 2.5.2.1) and the DT process described above may be insufficient. Therefore, it is crucial that this study’s theoretical artefact merges the discussed NPD models (see section 2.4) with aspects of customer-centred processes.

Finally, Ostrom et al. (2015) highlight the need to strengthen “service” design thinking throughout companies. To further explore the concept of service design, the next section (2.5.2.3) provides a further literature review.

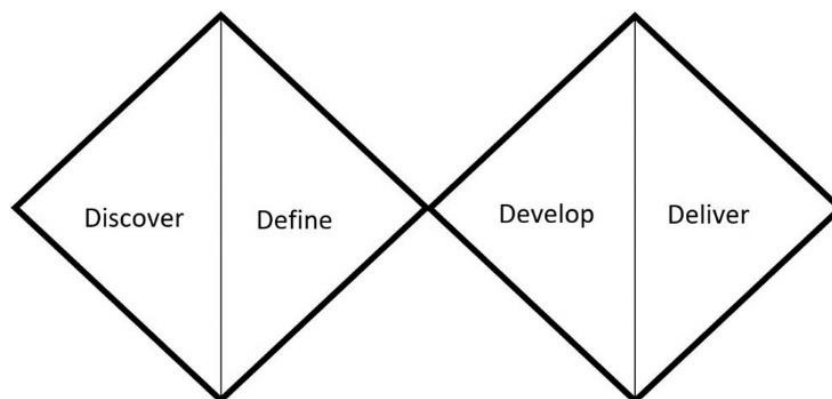
2.5.2.3 Service Design

This section focuses on service design (SD), as introduced previously in section 2.5.2.2.

As described by Stickdorn et al. (2018), SD is a user-centred approach with multifaceted applications. It encompasses a mindset, process, toolset, and common language, promoting collaboration and innovation across disciplines. SD seeks a balance between human needs, business goals, and technological possibilities, utilising iterative development cycles to achieve simple and innovative solutions. When applied strategically, SD can drive both incremental and radical innovation, leading to improved existing offerings and the development of new digital products and services.

Consequently, DT provides valuable insights which can inform the application of user-centred methods within the theoretical artefact.

Figure 2.13: Double diamond



Source: Piirman (2022) based on Drew (2019)

The service design process can be illustrated by the double diamond process (see Figure 2.13) developed by the Design Council (Drew, 2019). Thereby, the first diamond (discover and define) concerns the problem, while the second (develop and deliver) focuses on its solution (Piirman, 2022).

In this respect, the SD process closely resembles the problem-solving process found in UCD (section 2.5.2.1) and DT (section 2.5.2.2) processes. All prioritise understanding the “what”

and “why” of a new digital product to be developed before considering the “how” of its development. This aligns with Stickdorn et al. (2018), who argues that the core design process of other design disciplines and SD are fundamentally very similar. However, the key difference lies in the methods and tools employed in SD.

Table 2.5: Overview of tools used in service design

Name of the tool	Description
Personas	A persona can be described as an archetype that represents a specific group of users. Based on real research, personas—though fictional—help to better understand groups with similar needs regarding a service (Stickdorn et al., 2018).
Journey maps	A journey map visually represents a person’s experience over time. For example, an end-to-end customer journey map can illustrate a customer’s total experience with a digital product (Stickdorn et al., 2018).
Service blueprint	A service blueprint expands upon journey maps by linking customer experiences to frontstage (customer-facing) and backstage (invisible to the customer) employee processes, as well as support processes, revealing the interdependencies between them and how they influence customer activities (Stickdorn et al., 2018).
Service prototypes	Service prototypes are staged simulations or pilots that replicate parts of the service’s frontstage and backstage, often incorporating traditional prototypes like physical mock-ups or wireframes as key elements (Stickdorn et al., 2018).
Business model canvas	The business model canvas from Osterwalder and Pigneur (2010) helps analyse how different choices affect customer and employee experiences, business outcomes, and competitor differentiation by comparing the business model of a specific organisation to others (Stickdorn et al., 2018).

Table 2.5 presents five service design tools relevant to this study, offering cross-functional teams in the NPD process diverse tools for managing individual customer-centric process steps within the theoretical artefact.

However, in addition to these methods, further techniques are required to facilitate interaction with customers. One such method is the lean startup approach, which incorporates continuous learning derived from interaction with stakeholders and customers (Mansoori & Lackéus, 2020). Therefore, lean startup is examined in greater detail in the subsequent section 2.5.3.

2.5.3 Lean Startup

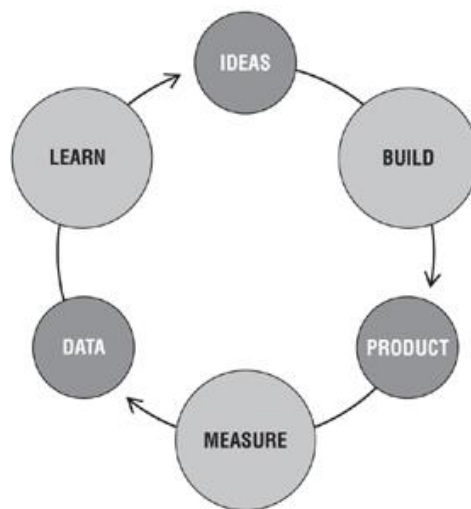
As indicated in sections 2.4.4.2, 2.4.6, and 2.5.2.3, this section refers to the lean startup method.

Companies seek effective ways to streamline their NPD processes and enhance performance. Lean management techniques offer a proven approach to achieving this goal by improving product quality and minimising waste (Najafi-Tavani et al., 2022). Building on

the principles of lean management, practitioners like Ries (2011) have pioneered lean startup methodologies (Miao et al., 2019). These lean startup methods have spread quickly, for example in Silicon Valley, and have been able to reach a global audience (Mansoori & Lackéus, 2020).

These insights are valuable for developing the theoretical artefact of this study, which aims to achieve high performance in the NPD process by integrating established lean management methods. Furthermore, it addresses the call by Cooper (2019) to explore new NPD approaches that incorporate both DT (section 2.5.2.2) and lean startup principles.

Figure 2.14: Build-measure-learn feedback loop



Source: Ries (2011)

The build-measure-learn feedback loop (see Figure 2.14) is central to the lean startup methodology. As described by Ries (2011) it focuses on testing key assumptions, specifically the value and growth hypotheses. Once these assumptions are clarified, the goal is to rapidly integrate a minimum viable product (MVP) into the “build” phase of the loop. An MVP is a product version that can traverse the entire build-measure-learn cycle with minimal effort and development time. While it may lack certain features deemed important at later stages, it is crucial that the impact of an MVP can be measured. This necessitates that all testing, such as prototype trials, be conducted with potential customers, not solely within the company.

In this regard, Zorzetti et al. (2022) develop a model where the lean startup approach and experimentation with the build-measure-learn cycle drive the entire development process.

They highlight that participating teams identify this experiment-driven mechanism as a crucial concept. Therefore, this finding is highly relevant to the theoretical artefact of this study, which advocates for continuous interaction with customers throughout the NPD process.

However, lean startup also has its critics. Felin et al. (2020) point out that the approach's emphasis on easily observable feedback and instant validation can lead to a search for value only where it is easy to measure. In this context, they argue that lean startup incorrectly specifies the nature of hypothesis development and encourages incremental experimentation, which in most cases only generates incremental value and potentially hinders the pursuit of more radical innovation.

Therefore, a method for determining the suitability of the MVP approach must be established within this study's theoretical artefact. This, along with the other theoretical requirements outlined in sections 2.4 and 2.5, will inform the development of a theoretical artefact in the subsequent section 2.7.

2.6 Research Gaps

This section identifies the research gaps addressed in this study. It begins by referencing relevant research gaps, followed by a detailed discussion of these research gaps. Finally, the section presents the specific gap statement that this study aims to address.

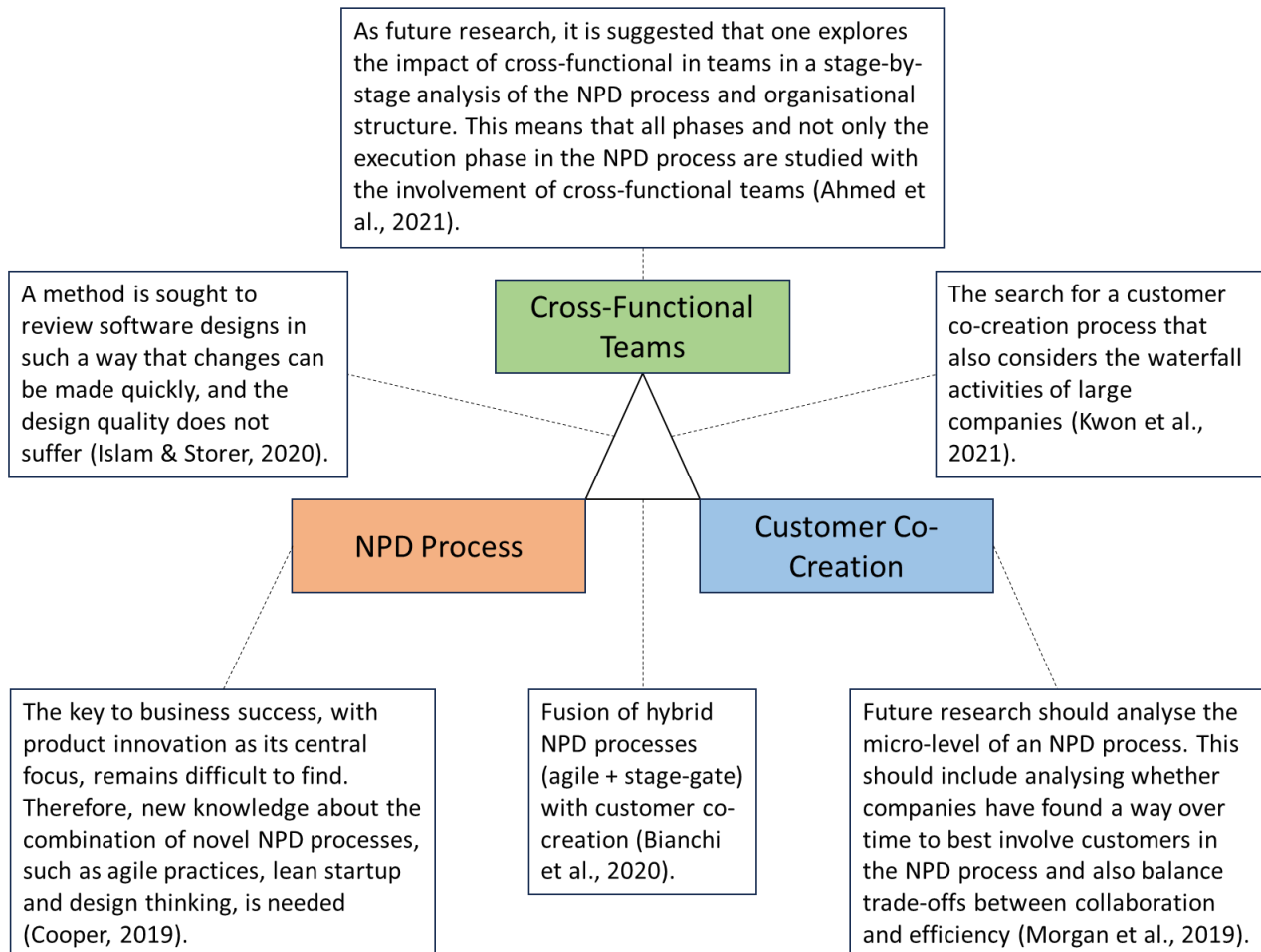
2.6.1 Overview of the Research Gap Matrix

This section provides an overview of the research gaps identified through the comprehensive literature review conducted in sections 2.4, and 2.5. As illustrated in the research gap matrix (Figure 2.15), this analysis revealed six key research gaps that this study aims to address. These research gaps are subsequently expanded in Table 6.1 through emerging topics in empirical findings.

These identified research gaps informed the development of the research questions outlined in section 1.4.2, which focus on three core areas of this study: NPD process, customer co-creation, and cross-functional teams. Consequently, drawing on these identified research gaps, the development of the theoretical artefact outlined in section 2.7 can be constructed to incorporate them.

Finally, chapter 8 addresses the research gaps, drawing upon empirical key findings (section 7.2) which have informed the development of the design-oriented framework (Figure 7.12).

Figure 2.15: Research gaps matrix



2.6.2 Description of the Research Gaps

This section provides a detailed description of the research gaps identified in Figure 2.15.

Firstly, a central gap in NPD research, highlighted by Cooper (2019), is the need to explore novel NPD practices in conjunction with approaches like DT. This is crucial because the keys to successful product innovation and business prosperity remain elusive. Bianchi et al. (2020) investigated the relationship between hybrid approaches, such as stage-gate and agile models, and their impact on NPD performance. However, there is no research yet integrating user-experience driven approaches, such as DT and UCD, to analyse whether this leads to NPD processes focused on market demand. This gap is linked to the prevalence of waterfall methodologies in large, hierarchical companies. Further research is needed to

examine how such waterfall structures can effectively incorporate user-centred design approaches like DT (Kwon et al., 2021), which are inherently iterative (Mononen, 2017).

This study addresses this gap in sections 8.1.1 and 8.2.1 by presenting a modern, innovative NPD process that combines hybrid process structures (customer centric, agile, and waterfall) with a strong emphasis on customer involvement throughout the entire NPD process.

Secondly, El Nemar et al. (2022) highlight the potential benefits of customer co-creation in NPD, including cost reduction, increased market share, improved product performance, and the elimination of defects. However, they also acknowledge that customer co-creation does not always yield a satisfactory outcome; further research is needed to fully understand the customer co-creation process. Therefore, as explained by Morgan et al. (2019), analysing the NPD process at a micro-level is essential to determine the optimal points and methods for customer integration. This analysis should consider the balance between collaboration and efficiency.

This study capitalises on this opportunity in section 8.1.1 to explore how to effectively involve customers in the NPD process, aiming to avoid unsatisfactory results and highlight the balance between collaboration and efficiency.

Thirdly, regarding stakeholder involvement, the collaboration between cross-functional teams warrants closer examination. It's important to analyse the impact of these teams throughout the entire NPD process, not just during the execution phase (Ahmed et al., 2021).

This study will therefore analyse cross-functional collaboration from the initial problem identification stage through to product launch until the end of its life, closing the gap in section 8.3.1.

Fourthly, Islam and Storer (2020) sought a method for rapidly adapting software designs without compromising quality.

This study addresses this gap in section 8.4.1, where a method employing a technical prototype and a build-measure-learn cycle is presented. This approach involves testing initial software designs with customers and directly integrating their feedback into the existing technical prototype without compromising the software design quality.

2.6.3 Gap Statement

While research exists on hybrid NPD processes (Bianchi et al., 2020) and customer co-creation (El Nemar et al., 2022), there is a gap in understanding how to optimally integrate customer co-creation within these hybrid structures (Cooper, 2019) in large, hierarchical companies (Kwon et al., 2021), such as Swiss media companies, particularly concerning the balance between collaboration and efficiency (Morgan et al., 2019), and the impact of cross-functional teams throughout the entire NPD process, from problem identification to product end-of-life (Ahmed et al., 2021).

2.7 Theoretical Artefact Development

This section outlines the framework for the theoretical artefact. Building on this artefact, a modern theoretical model for customer co-created NPD is presented, illustrating the involvement of cross-functional roles. This new and unique theoretical customer co-created NPD artefact, in which a specific focus is placed on cross-functional roles in the media industry, provides the building block of this study. Therefore, it serves as the basis for the empirical findings, which are discussed in chapters 4, 5, 6, and 7, where the empirical artefact and the design-oriented framework of this study are developed.

This section first introduces the core components essential to the creation of the theoretical artefact. Each component is then examined in detail to develop a theoretical customer-co-created NPD artefact that incorporates an integrated cross-functional team structure. In this regard, models and techniques are successively examined for the following topics: overarching NPD structure, customer co-creation, agile development, lean start-up, quality control gates, and composition of the cross-functional team structure. Finally, a detailed description of the theoretical artefact is provided.

2.7.1 Components of the Theoretical Artefact

As outlined in the research questions (section 1.4.2), and research gaps (section 2.6), the theoretical artefact focuses on three core components: NPD process, customer co-creation, and cross-functional teams.

Figure 2.16: Components of the theoretical artefact

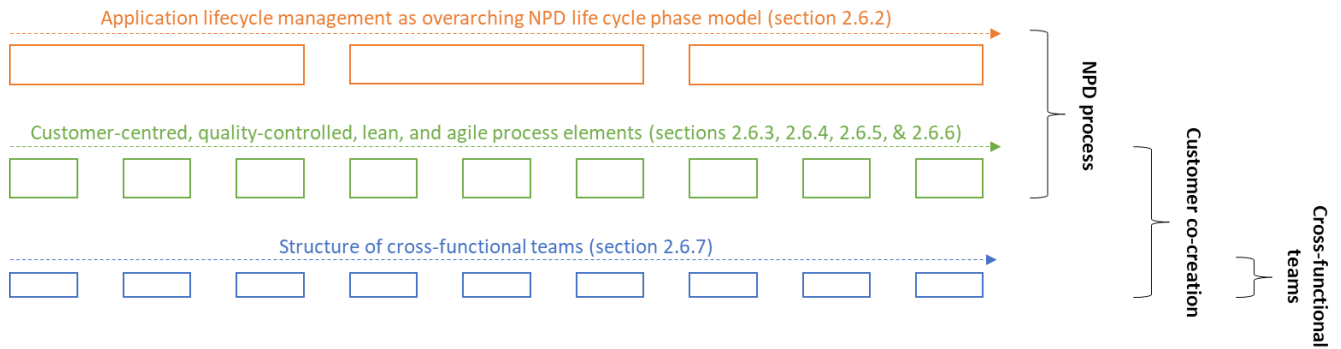


Figure 2.16 illustrates the interplay of the three core components within the theoretical artefact: the NPD process, customer co-creation, and cross-functional teams. The NPD process component encompasses two key elements: the overarching NPD structure grounded in application lifecycle management, and the hybrid process structure combining waterfall and agile methodologies. Customer co-creation emphasises the integration of elements from various process models to facilitate continuous customer collaboration. The cross-functional teams component shows the team structure and encompasses all roles involved in the NPD process, including customers.

2.7.2 Lifecycle Model for the Overarching Structure in the Theoretical Artefact

This section is grounded in the top-level structure of the theoretical artefact, specifically the overarching NPD structure based on application lifecycle management (ALM), as depicted in Figure 2.17.

Figure 2.17: Top-level structure of the theoretical artefact



Academic literature has presented various lifecycle models over the past decade. However, three fundamental models stand out: the product lifecycle (Donoghue et al., 2018; Stark, 2018), the waterfall model (Dwarakanath et al., 2020; Sommerville, 2015), and ALM (Chappell, 2010; Schwaber, 2006; Tüzün et al., 2019).

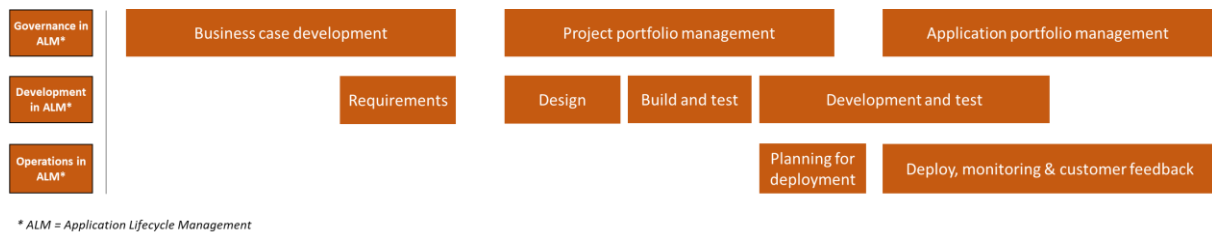
Selecting an appropriate lifecycle model requires careful consideration because the model depends heavily on the product type and thus affects the company's business processes (Terzi et al., 2010). This study requires an overarching lifecycle model for the structure of the theoretical artefact that is specifically tailored to the development of software-driven digital products. In this regard, traditional product lifecycle management may not be suitable for managing the software creation of systems or digital products (Deuter & Imort, 2021). This could be because the generic nature of the product lifecycle might not adequately adapt the NPD process to the specific digital product under development.

The waterfall model is based on the principle of sequential processing of phases, whereby one phase must be completed before the next begins. While it is suitable for hardware development due to its high production costs, it is less suitable for software development. In practice, a software process is rarely linear and should allow for feedback loops between phases (Sommerville, 2015). Consequently, pure focus on waterfall models is unsuitable for the overarching artefact structure of this study. This is because the NPD process is geared towards the customer co-created development of new digital software products and necessitates feedback loops, for example, to test and adapt software designs with customer input.

In contrast to the waterfall model, modern software development is characterised by a high degree of complexity and a significant error rate. To capture not only development but also deployment and maintenance within software lifecycles, ALM has emerged as an important trend (Akgun et al., 2020). ALM is a recognised concept for coordinating development activities in the creation of software applications and offers added value in conjunction with related disciplines such as project portfolio management and IT operations. It ensures that activities in the lifecycle are coordinated and focuses on delivering applications that meet business requirements (Schwaber, 2006).

Importantly, ALM goes beyond a purely development-oriented approach: it incorporates a governance perspective and encompasses the operational dimension (Tüzün et al., 2019). These three dimensions make ALM well suited for the overarching structure of the theoretical artefact of this study, which goes beyond traditional software development and incorporates the organisational view of NPD with various cross-functional teams from business and technical departments.

Figure 2.18: Overarching structure of the theoretical artefact



Source: based on ALM derived from Chappell (2010), Schwaber (2006), and Tüzün et al. (2019)

Figure 2.18 illustrates the overarching structure for the theoretical artefact of this study, based on the principles of ALM. This structure encompasses three main dimensions: governance, development and operations.

The governance dimension based on Chappell (2010), covers the entire NPD process and is divided into three lifecycle activities: business case development, project portfolio management, and application portfolio management.

The development dimension in ALM extends from NPD ideation to deployment and continues with the subsequent development of new features or the enhancement of existing features (Chappell, 2010). To effectively represent this process in a lifecycle model that encompasses the complete journey from ideation to launch, it is essential to identify appropriate lifecycle activities. ALM 2 provides a framework for these activities, which include: requirements gathering, design, build, testing, and development (Schwaber, 2006).

Therefore, within the overarching NPD structure of the theoretical artefact presented in Figure 2.18, the requirements lifecycle activity defined by Schwaber (2006) aligns with business case development from Chappell (2010). This alignment is crucial to ensure a comprehensive analysis of all business case requirements. In this regard, Chappell (2010) highlights the necessity of business case approval before effective product development can begin. This subsequent product development phase, encompassing the design, build, development, and test lifecycle activities as outlined by Schwaber (2006), falls under the remit of project portfolio management (Chappell, 2010). This specific order of lifecycle activities from Schwaber (2006) is chosen to ensure consistency with the NPD process elements detailed in sections 2.7.3 to 2.7.6.

Furthermore, as described in section 2.7.3, an additional test loop with prototypes is integrated during the build lifecycle activity, corresponding to the “test” lifecycle activity defined by Schwaber (2006). Consequently, in Figure 2.19, the build lifecycle activity is presented as “build and test”. Additionally, because existing products are subject to updates and new feature development (Chappell, 2010), the “development” lifecycle activity within the development aspect is represented in both project portfolio management and application portfolio management.

The third dimension, operations, focuses on running and managing an application. This begins just before deployment and continues until the application is retired (Chappell, 2010). As shown in Figure 2.18, product deployment is planned in product portfolio management before being deployed in application portfolio management. Subsequently, the monitoring lifecycle activity commences and continues until the application is withdrawn from the market (Chappell, 2010).

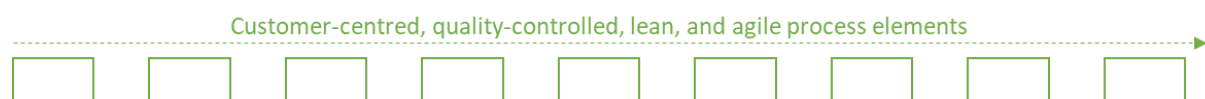
Finally, Tüzün et al. (2019) extend the operations dimension by adding a “customer feedback” lifecycle activity for “deploy and monitoring”. As this study aims to ensure the full involvement of the customer in the NPD process, this addition is adopted. Consequently, it is incorporated into Figure 2.18 as “development and test” on the development dimension and “deploy, monitoring and customer feedback” on the operations dimension.

This overarching NPD structure provides the foundation for designing an NPD process that prioritises customer co-creation, which is elaborated further in section 2.7.3.

2.7.3 Models for Customer Co-Creation in the Theoretical Artefact

This section details the middle structure of the theoretical artefact, as illustrated in Figure 2.19, with a specific focus on customer-centred process elements.

Figure 2.19: Structure of customer-centred process elements in the theoretical artefact



To achieve sustained profitability, businesses must deeply integrate the needs and desires of their most valuable customers into their products and services (Fader, 2020). Design thinking (DT) offers a framework for achieving this, extending beyond mere translation of customer

needs into solutions to encompass the cultivation of exceptional user experiences (Meinel et al., 2020).

Crucially, DT excels at identifying unmet needs and incorporating the “voice of the customer” into processes and systems (Lahiri et al., 2021). Recognising its potential as an innovation driver (Liedtka, 2015), this study adopts DT as a guiding model in the theoretical artefact. Specifically, it focuses on the five-stage DT process – empathise, define, ideate, prototype, and test (Hasso Plattner Institute of Design at Stanford University, 2010) – developed at Stanford University (Brenner & Uebernickel, 2016). This well-established, ideal-typical process (Reinecke, 2016) provides a robust framework for the theoretical artefact of this research.

In this regard, Beverland et al. (2015) suggest that further research should explore the organisational barriers to adopting DT practices. In this context, Kwon et al. (2021) highlight two key organisational challenges. Firstly, larger, hierarchically structured organisations frequently favour a waterfall approach, limiting their engagement with DT to the ideate, prototype, and test phases. Secondly, these companies often overlook preliminary user research with a small group, relying instead on traditional market research methods. This results in pre-defined problems (Kwon et al., 2021).

This mechanistic paradigm, as described by Stickdorn et al. (2018), leads companies to focus on optimising individual business processes. This focus is often related to cost cutting, since cost and efficiency are simple metrics for management to target. However, a challenge arises when organisational units are built based on work functions that fail to align with the customer’s perspective

Consequently, the theoretical artefact of this study requires a user experience-driven model that accommodates predefined problems and integrates the three most utilised DT process steps, starting with “ideate”. In this context, user-centred design (UCD) offers a suitable solution.

UCD champions the active involvement of users throughout the design process, aiming to deliver safer, more effective, and efficient products (Kahraman, 2010). Grounded in ISO 9241-210:2019 (European Committee for Standardization, 2019), UCD provides guidelines for human-centred design principles and activities across the entire lifecycle of computer-

based interactive systems. This is particularly relevant to this study, as these systems encompass standard software products (European Committee for Standardization, 2019), aligning with the focus on digital products in this study.

Prior to the UCD process, a crucial step involves establishing the need for a new product, service, or system using a human-centred approach. This preliminary stage is termed, as visualised in Figure 2.11, “identify need” (European Committee for Standardization, 2019).

The initial phase within the UCD cycle, “specify context of use”, focuses on understanding users and stakeholders, including their characteristics, preferences, skills, goals, and tasks. It also entails specifying the system’s environment, encompassing software, hardware, and materials.

The second phase, “specify requirements”, addresses user and stakeholder requirements within the context of use. Additionally, it incorporates organisational requirements that directly impact users (European Committee for Standardization, 2019).

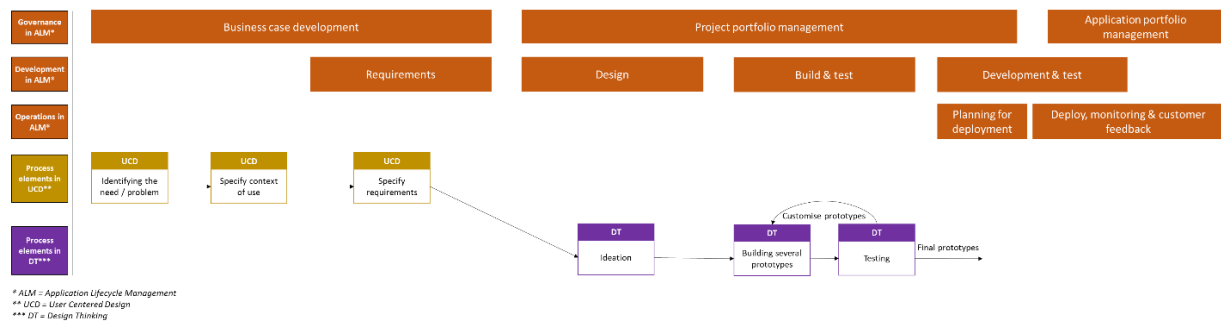
To address the challenges of starting with a predefined problem and aligning the DT phases of ideate, prototype, and test with UCD outlined by Kwon et al. (2021), the theoretical artefact of this study integrates the pre-phase and the first two phases of the UCD process.

The UCD pre-phase, “identify need”, and the first phase, “specify context of use”, are adaptable to scenarios with predefined problems. Regardless of the problem’s origin, understanding the target audience and their product usage remains crucial. However, this study modifies the pre-phase from “identify need” to “identify need/problem” to acknowledge that predefined problems in large companies often stem from management decisions (Kwon et al., 2021).

The second UCD phase, “specify requirements”, aligns with the overarching NPD structure (Figure 2.18) based on ALM. This emphasises the importance of requirements within the development cycle and ensures consistency.

Finally, the transition from UCD to DT is seamless. This coherence arises because, after “specify requirements”, the UCD process focuses on “development of design solutions” (European Committee for Standardization, 2019). This mirrors the “ideate” phase in DT (Hasso Plattner Institute of Design at Stanford University, 2010).

Figure 2.20: Theoretical artefact with a focus on customer co-creation



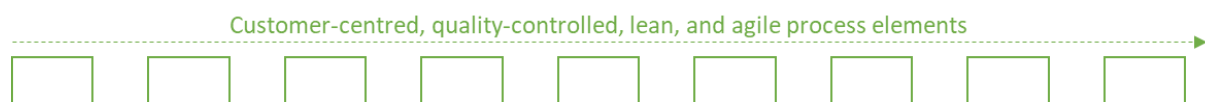
Source: adapted from European Committee for Standardization (2019) and Hasso Plattner Institute of Design at Stanford (2010)

Figure 2.20 illustrates the integration of two user experience-driven approaches: UCD, based on European Committee for Standardization (2019), and DT, based on Hasso Plattner Institute of Design at Stanford (2010). Drawing upon the overarching NPD structure provided by ALM (Figure 2.18), this theoretical artefact integrates the preliminary stage and first two process steps from UCD followed by the subsequent three process steps from DT.

2.7.4 Models for Agile Development in the Theoretical Artefact

This section aligns with the middle structure of the theoretical artefact, as depicted in Figure 2.21. The specific focus here is on agile development process elements.

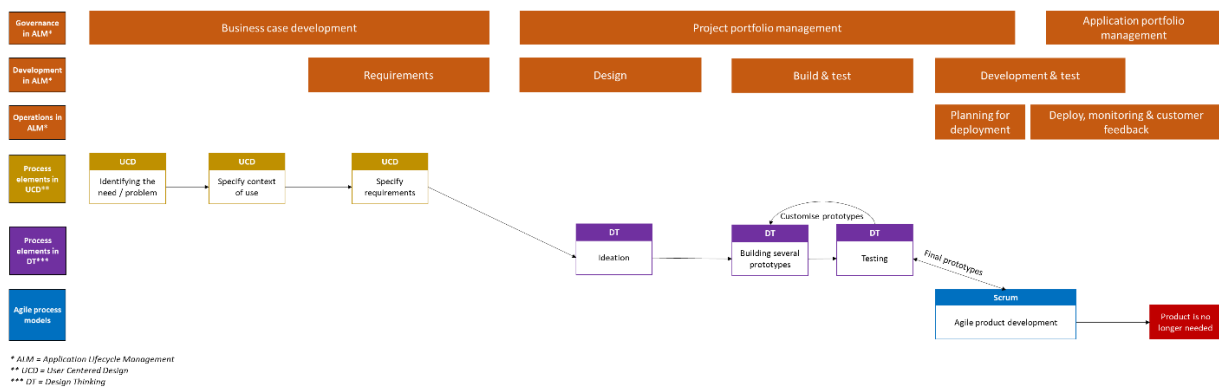
Figure 2.21: Structure of the agile process elements in the theoretical artefact



Agile development and user experience are intrinsically linked in the development of digital products. Agile development focuses on the “how” of product development, while user experience addresses the “what” and “why” (Schön et al., 2023). To effectively translate the problem (what and why) into a targeted product solution (how) with rapid implementation, combining DT and scrum is a compelling approach (Al-Faridzqi et al., 2022).

Furthermore, empirical evidence demonstrates that scrum often accelerates time-to-market (Ajila, 2023). Therefore, incorporating scrum as agile process framework within this study’s theoretical artefact offers both a customer-centric approach (through UCD and DT) and a rapid development process (through scrum).

Figure 2.22: Theoretical artefact with a focus on agile development



As illustrated in Figure 2.22, the theoretical artefact employs scrum to facilitate iterative and incremental development, utilising sprints (see section 2.4.5.1), throughout the digital product's lifecycle. This agile approach continues even as the product matures and evolves, persisting until the product is eventually retired from the market.

2.7.5 Models for Lean Startup in the Theoretical Artefact

This section, as depicted in Figure 2.23, aligns with the middle structure of the theoretical artefact. It specifically focuses on lean process elements, with a particular emphasis on lean startup principles.

Figure 2.23: Structure of the lean process elements in the theoretical artefact



Existing literature suggests that combining lean startup, agile development, and user-centred designs facilitates the development of successful software with effective user involvement. However, there is limited documentation on the practical application of this combined approach (Zorzetti et al., 2021). Furthermore, research on hybrid models integrating DT and lean startup remains scarce (Cocchi et al., 2021).

By incorporating lean startup into an agile process framework (scrum) and user-centred (UCD and DT) NPD process, this study contributes novel insights into how such a combined approach can be implemented for digital products, thereby addressing a need in the existing literature.

Figure 2.24: Theoretical artefact with a focus on lean startup

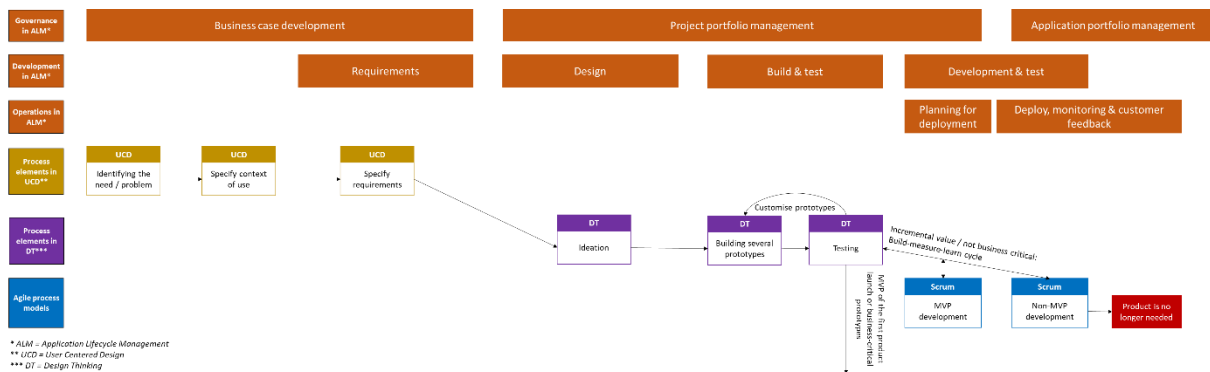


Figure 2.24 illustrates the integration of the lean startup “build-measure-learn” cycle; focusing on the transition from the “testing” phase in DT to scrum, two distinct areas are identified: MVP development and non-MVP development.

Following the approach of Cano et al. (2021), the MVP is defined as a potentially releasable product increment, with customer feedback as the primary outcome. This aligns with the customer-centric perspective adopted in this study’s theoretical artefact.

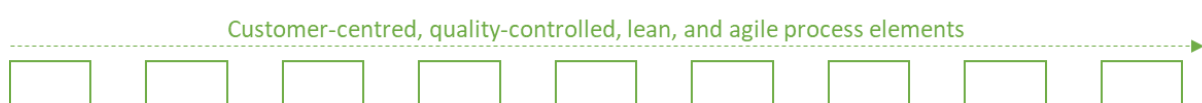
However, in line with Felin et al. (2020), the “build-measure-learn” cycle within this theoretical artefact is primarily applied to feature development within an increment. For features that are business-critical, introduce novel market functionalities, or deliver significant new customer value, an additional loop is utilised, as detailed in section 2.7.6.

Finally, recognising the importance of prototyping in user-centred design, particularly for refining graphical user interfaces (Salinas et al., 2020), the theoretical artefact emphasises incorporating test results into prototype optimisation via the “build-measure-learn” cycle. This reinforces the iterative and user-centric nature of the proposed development process.

2.7.6 Models for Quality Control Gates in the Theoretical Artefact

This section, depicted in Figure 2.25, aligns with the middle structure of the theoretical artefact. The specific focus here is on quality-controlled process elements.

Figure 2.25: Structure of quality-controlled process elements in the theoretical artefact

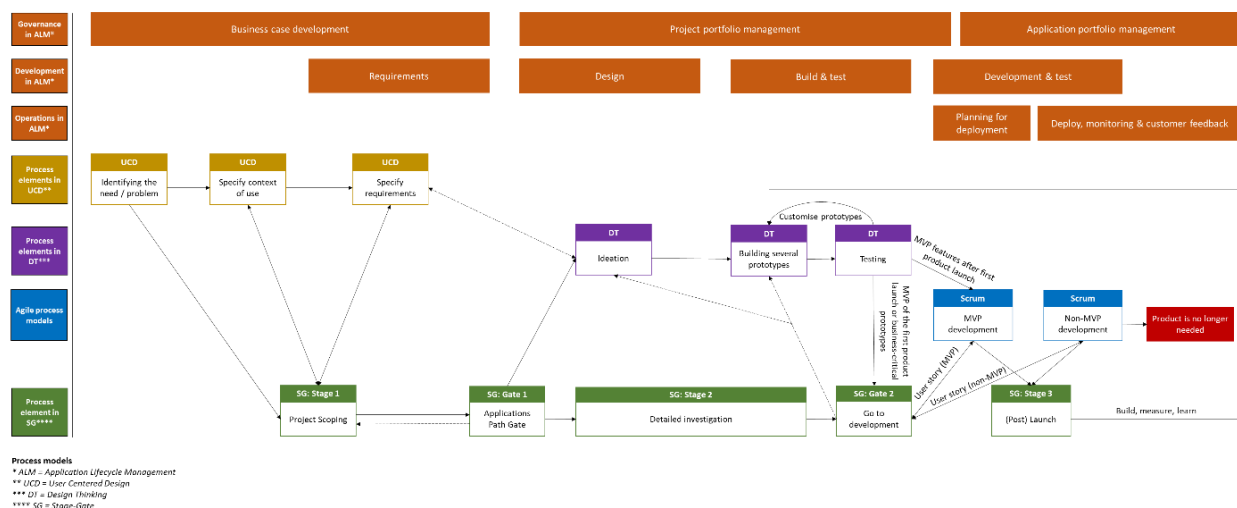


Building upon the pre-development process illustrated in Figure 2.24, which incorporates UCD and iterative DT processes, the integration of stage-gate elements is deemed appropriate. This is because stage-gate processes can effectively reduce uncertainty in the early stages of development (Bianchi et al., 2020) and help maintain control over predefined management goals (Paluch et al., 2020). This aligns with the observation of Kwon et al. (2021) that predefined problems in large companies often originate from management decisions.

Empirical evidence further supports the effectiveness of the agile stage-gate model in NPD throughout the entire development lifecycle. Specifically, Hirisatja et al. (2021). demonstrate the positive impact of combining stage-gate and agile methodologies in established companies, particularly during the business case creation, testing, and product development phases.

The advantages of this hybrid structure are further reinforced by the distinct roles of its components. While stage-gate processes contribute to effective budgeting and planning, agile components enable faster time-to-market and adaptability to changing market conditions or customer requirements (Sarangee et al., 2022).

Figure 2.26: Theoretical artefact with a focus on stage-gate



Source: adapted from Cooper (2017)

As depicted in Figure 2.26, the initial stages draw from the stage-gate-TD model by Cooper (2017), encompassing “project scoping”, the “applications path gate”, and “detailed investigation”.

“Project scoping” establishes the foundation for the (technology) development project, involving conceptual and preparatory activities (Cooper, 2017). The “applications path gate” acts as a gateway for the NPD project, where decisions on subsequent steps are made. This involves reviewing technical specifications and reaching consensus on the value, applicability, and scope of the new technology (Cooper, 2017). “Detailed investigation” is a comprehensive stage involving the development plan, assessing the technology’s value and scope, and demonstrating its feasibility (Cooper, 2017).

In this study’s theoretical artefact, “project scoping” gathers essential technical information. This utilises the first three elements of user-centred design: defining the problem, understanding the context of product use, and documenting all requirements (technical, business, and customer). This information culminates in a business case, outlining the project’s foundational requirements and informing the final technical architecture. The “applications path gate” assesses whether the business case meets all technical and business requirements to proceed to development. If the business case is accepted, the process advances to the design phase, initiating ideation and detailed investigation. However, should new requirements emerge, or further research become necessary during this phase, an iteration loop back to “specify requirements” occurs (indicated by the dotted lines in Figure 2.26 from ideation to specify requirements). Conversely, if the business case is rejected, the NPD process terminates. In cases where the business case is only partially accepted, with unclear or vaguely defined aspects, it necessitates returning to “project scoping” (specifically, “specify context of use” and “specify requirements”) until finalised, followed by re-evaluation at the “applications path gate” (illustrated by the dotted lines in Figure 2.26).

Upon business case approval, “ideation” commences alongside the “detailed investigation” stage. While Cooper (2017) positions “detailed investigation” before the “applications path gate”, this study reverses the order. This adaptation prioritises the business case decision at the gate, with detailed technical implementation subsequently elaborated upon.

The “go to development” gate and the “(post) launch” stage are further elements derived from the agile-stage-gate hybrid model by Cooper (2017). The “go to development” gate assesses concept feasibility before transitioning to full development, while the “(post) launch” stage signifies the first market launch, with “post” denoting the final product (Cooper, 2017).

Within this study's theoretical artefact, the "go to development gate" involves evaluating tested prototypes for final feasibility and confirming the completion of the technical development plan for the new digital product. Regardless of whether a product comprises business-critical and non-business-critical features or solely non-business-critical features (which is a full MVP product), the "go-to-development" gate remains a crucial step before the initial launch of the first version of the digital product. This ensures that the technical feasibility of the first digital product and the required development time can be estimated, providing initial backlog estimations for agile development with scrum. Accordingly, this initial assessment of technical feasibility at the "go-to-development" gate is particularly crucial for the first product launch, as it establishes a baseline for subsequent development cycles. This aligns with the assertion of Sly and Crowne (2023) that technology plays a crucial role in product development. Without sufficient technological consideration, products may be built on an inadequate foundation, addressing the wrong problem, and hindering project progress. Therefore, a "go to development" control gate for the first version of a digital product launch is essential to ensure alignment with all underlying customer, business, and technical requirements.

However, to ensure that the MVP concept and its associated minimal effort and development time objectives (Ries, 2011) are realised for a product version after the first product launch consisting entirely of non-business-critical features, further testing before launch is omitted, unlike the process for business-critical features. This streamlines the process for MVPs, allowing for a faster launch without a second check at the "go to development" gate. This is visualised in Figure 2.26 as dotted arrow between "testing" and "MVP development".

In addition, already launched MVP features can be further developed through live testing using the build-measure-learn cycle to gather rapid user feedback. This is illustrated in Figure 2.26, where an arrow is visible from "(post) launch" to "building several prototypes".

For business-critical features, obtaining final approval from testing and the user experience team remains essential throughout the entire development lifecycle, ensuring robust validation before launch. This is reflected in Figure 2.26 by the dotted lines representing iterative process paths that allow for revisiting previous phases, specifically from "go to development" to "ideation" or "building several prototypes". Like MVPs, the build-measure-

learn cycle is employed for live testing of launched non-MVP features. This is illustrated in Figure 2.26, where an arrow is visible from “(post) launch” to “building several prototypes”. However, as already described, unlike MVP features, non-MVP features must then pass through the “go to development” gate again.

Furthermore, the “(post) launch” stage in the theoretical artefact represents the go-live of the first digital product, encompassing both MVP and non-MVP features, as well as the go-live of any subsequent further feature developments or new product versions.

Finally, stages and gates were selected from two distinct stage-gate models from Cooper (2017): the stage-gate-TD model and the agile-stage-gate hybrid model. The stage-gate-TD model was chosen to emphasise technological expertise and new technological capabilities crucial for digital products (Cooper, 2017), particularly regarding technical requirements and technology selection. Conversely, the agile-stage-gate hybrid model facilitates the inclusion of customers, a key research focus of this study. This is achieved through the model’s inherent integration of continuous customer feedback (Cooper, 2017).

2.7.7 Cross-Functional Teams Structure in the Theoretical Artefact

This section, shown in Figure 2.27, aligns with the last structure of the theoretical artefact. The specific focus here is on cross-functional team structures.

Figure 2.27: Structure of the cross-functional teams in the theoretical artefact



Figure 2.26 depicts the overarching structure of ALM and its underlying process elements, drawn from various process models. This structure necessitates cross-functional teams collaborating to maintain a customer-centric approach. However, this theoretical artefact, being unique and novel, requires the establishment of a foundational structure for cross-functional teams before specific departments or functional roles can be defined.

Salvato and Laplume (2020) propose a team composition within a hybrid NPD approach, featuring a core team consistently engaged in the NPD process and an extended team deployed flexibly. Given that this theoretical artefact also addresses a hybrid NPD process, this approach of core and extended teams is adopted for the development of digital products.

Figure 2.28: Cross-functional team structure within the NPD process for digital products

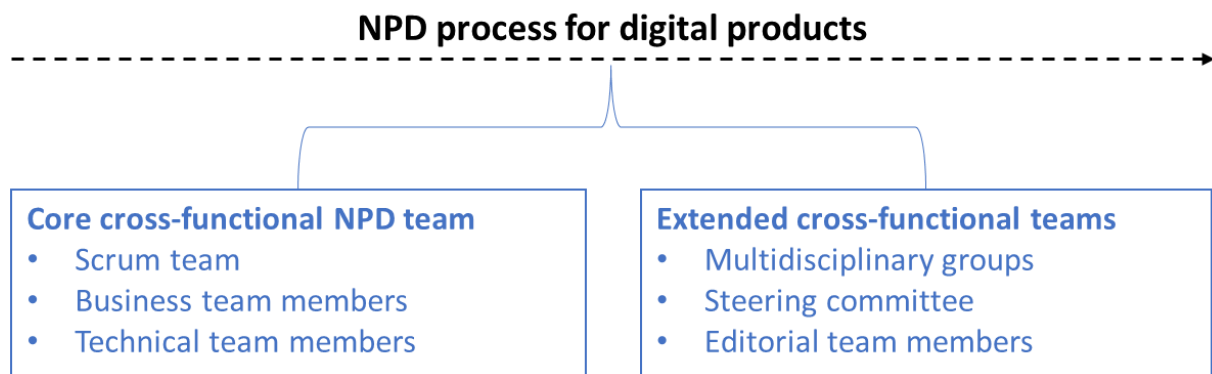


Figure 2.28 illustrates the structure of the cross-functional teams. As this study's theoretical artefact integrates various process models, the literature is consulted to determine the functional roles within both the core and extended cross-functional teams.

Given that this study's theoretical artefact is founded on an overarching ALM structure for the NPD process, it is logical for the core team to be integrated within this structure to manage the NPD project holistically. Effective governance, including appropriate personnel allocation, is crucial for project success and business value generation (Chappell, 2010).

In this context, it is valuable to examine the stakeholder involvement in the Scaled Agile Framework (SAFe) 6.0, which also employs a higher-level team structure. SAFe utilises epic owners and enterprise architects for lean portfolio management; solution managers, solution architects, and solution train engineers for enterprise solution delivery; product managers, system architects, and release train engineers for agile product delivery; and product owners and scrum masters for team and technical agility (Scaled Agile Inc., 2023d). Business owners are identified as key leaders guiding agile release trains towards optimal business outcomes (Scaled Agile Inc., 2023b).

Regarding team and technical agility, there is a clear parallel with scrum team members, as Schwaber and Sutherland (2020) emphasise the necessity of a product's owner, developers, and a scrum master within the scrum framework. Since this study's theoretical artefact employs scrum as its agile process framework (see Figure 2.22), these three stakeholders, designated as the "scrum team" in Figure 2.28, can be considered core team members.

Further core team members, initially designated as “business team members” and “technical team members” in Figure 2.28, are assigned to their respective process phase elements in Figure 2.29, with their precise functional job titles specified.

Human-centred approaches, such as DT, require generic management skills to achieve added value (Mahmoud-Jouini et al., 2016). Ideally, DT team members possess in-depth expertise in their respective fields while also contributing to areas beyond their primary specialisation (Schneider, 2023). This aligns with the European Committee for Standardization (2019) recommendations for UCD, which highlight the benefits of diverse skillsets within project teams. A multidisciplinary approach enables team members to recognise the limitations of other disciplines, fostering greater understanding and collaboration. For example, technical specialists can develop increased sensitivity towards user concerns. Consequently, as illustrated in Figure 2.28, human-centred approaches necessitate extended cross-functional groups with multidisciplinary expertise.

Furthermore, Feeney and Pierce (2018) demonstrate the utilisation of steering committees in stage-gate processes to assess project suitability for progression to subsequent phases. The prevalence of steering committees is further supported by Eljayar and Busch (2021), who focus on the application of hybrid models, as employed in this study’s theoretical artefact. Given that this artefact also demonstrates a hybrid NPD approach incorporating stage-gate elements, steering committees are adopted as extended cross-functional teams (see Figure 2.28).

Additionally, a core competency within media companies is the development of specific use cases and the generation of editorial/content knowledge. Strategic focus often prioritises strong editorial products over the development of reusable technological expertise (Zabel & Telkmann, 2021). Therefore, editorial teams, as operational teams, must be integrated into this study’s theoretical artefact as extended cross-functional teams to ensure the effective development of products delivering editorially driven content. Figure 2.28 depicts the inclusion of these editorial teams within the extended cross-functional teams.

The functional roles within these two cross-functional team structures are illustrated in Figure 2.29 and detailed in section 2.7.8.

2.7.8 Description of the Theoretical Artefact for Customer Co-Created New Product Development

Figure 2.29: Theoretical artefact of this study

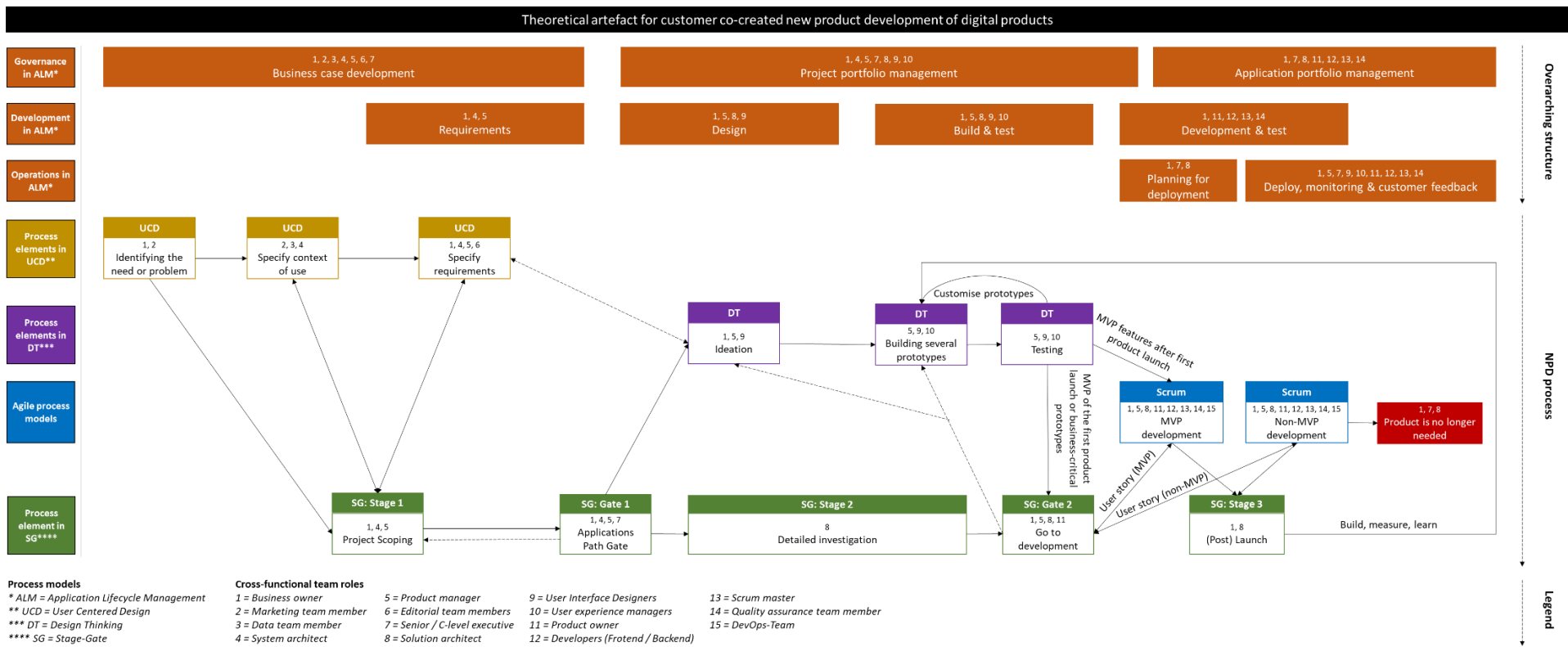


Figure 2.29 presents the theoretical artefact for customer co-created NPD of digital products developed in this study, involving cross-functional roles. In addition to a detailed process description, the cross-functional roles within the framework are outlined below.

Within the overarching NPD structure based on ALM, Figure 2.29 illustrates the functional roles of cross-functional team members assigned to individual elements within the NPD process models: UCD, DT, stage-gate (SG), and scrum. As detailed in section 2.7.7, this encompasses a core cross-functional NPD team and an extended cross-functional team.

Up to the ideation and detailed investigation stages of the NPD process, only extended cross-functional team roles are involved. This is due to the necessity of business case approval before commencing the actual development phase, which involves the core cross-functional NPD team. From the ideation and detailed investigation stages onwards, the core cross-functional NPD team is formed.

Given the limited research on cross-functional team composition throughout the NPD process (Ahmed et al., 2021), this study draws upon established agile process frameworks such as SAgile 6.0 and scrum to inform the selection of cross-functional roles. To augment this perspective, additional cross-functional roles identified in the literature are incorporated into Figure 2.29.

The first stage depicted in Figure 2.29 within the overarching NPD structure based on ALM involves the development of a business case at the governance level, drawing from Chappell (2010), complemented by requirements analysis at the development level, derived from ALM 2 of Schwaber (2006). This initial stage initiates the customer co-created NPD process, focusing on the discovery of a customer problem or need, based on the principles of UCD as outlined by the European Committee for Standardization (2019).

As discussed in section 2.7.3, Kwon et al. (2021) highlight that problems within large organisations are often predefined by management. This management function is represented by the “business owner” role within this research’s theoretical artefact (Figure 2.29). This designation is appropriate as business owners frequently occupy management positions and communicate the vision for change projects (Scaled Agile Inc., 2023b). Moreover, business owners define problems, propose solutions, and establish success metrics (Filipova & Vilão, 2018b).

However, innovation necessitates more than simply developing something novel. It is crucial that the innovation addresses a genuine customer problem, offers a new benefit, or fulfils an unmet market need. Integrating this customer perspective requires marketing expertise (Azzam et al., 2021).

Therefore, given the emphasis on customer co-creation within the theoretical artefact illustrated in Figure 2.29, it is essential that a predefined problem identified by the business owner is challenged by a marketing team member to ensure a customer-centric approach. Consequently, the initial NPD process stage of identifying the need or problem (Figure 2.29) necessitates the involvement of both a business owner and a marketing team member.

The subsequent NPD process stage involves specifying the context of use for the digital product. This stage, based on UCD principles outlined by the European Committee for Standardization (2019), entails defining the customer profiles that will utilise the digital product. In addition to specifying the customer profile, this stage involves creating an initial customer journey (see Table 2.5) and documenting the technical components, such as hardware, software, and other materials required for the product's development (European Committee for Standardization, 2019).

The digital transformation, with the emergence of new channels like mobile devices and social media, coupled with the availability of vast amounts of data, has significantly altered the work of marketing teams (Kalaighnam et al., 2021). Consequently, the creation of open and real-time customer profiles now relies on data from customer data platforms. This data, aggregated from across the organisation, is utilised by marketing experts to analyse customer behaviour and design relevant customer journeys (Lewnes, 2021).

Therefore, the “specify context of use” stage in Figure 2.29 necessitates the involvement of marketing team members to create customer profiles and customer journeys. Furthermore, working with this data requires a qualified data team, comprising data analysts, data scientists, data managers, and data engineers (Tancharoen & Pongpech, 2023). Hence, at least one data team member is also included in this stage (Figure 2.29).

To visualise customer profiles, the concept of “personas” (see Table 2.5) can be employed. Personas represent personalised users, typically a group of individuals sharing a specific problem that the new product aims to solve (Filipova & Vilão, 2018c).

Furthermore, as depicted in Figure 2.29, a system architect is also required during the “specify context of use” stage. The system architect, in collaboration with other technical teams, is responsible for developing the system architecture and implementing technical alternatives (Scaled Agile Inc., 2023g). Therefore, within the theoretical artefact illustrated in Figure 2.29, the system architect holds primary responsibility for estimating and documenting the necessary technical components during business case development. This can be achieved in coordination with other functions within the technical domain, such as an enterprise architect.

The next stage, “specify requirements” focuses on UCD, drawing from the European Committee for Standardization (2019), and aligns with the overarching NPD structure from ALM 2 of Schwaber (2006), which emphasises requirements analysis. Thereby, the European Committee for Standardization (2019) states that when applying UCD, it is crucial to clearly identify and address customer/user (usage requirements), business (business objectives), and technical requirements (optimise technical systems).

To identify business requirements and associated financial resources, the business owner is essential, holding overall responsibility for return on investment (ROI) (Scaled Agile Inc., 2023b). Additionally, the business owner ensures project viability by addressing legal conditions and requirements (Filipova & Vilão, 2018b).

Identifying customer/user requirements necessitates the involvement of the product manager, who maintains direct customer contact throughout the product lifecycle, ensuring their needs are prioritised from the outset (Scaled Agile Inc., 2023e). The product manager also develops the product roadmap (Filipova & Vilão, 2018b), underscoring the importance of a roadmap that incorporates customer/user requirements.

The system architect is crucial for identifying technical requirements and, validating technological assumptions (Scaled Agile Inc., 2023g).

Finally, considering the strategic focus on high-quality editorial products within media companies (Zabel & Telkmann, 2021), it is vital to include requirements from the editorial team to address their specific needs for the new digital product.

All documented information from the first three NPD process stages—identifying the problem/need, specifying the context of use, and specifying the requirements—feeds into

the first stage-gate, “project scoping” derived from the stage-gate-TD model of Cooper (2017). In this stage, all information is consolidated to prepare a concept for development (Cooper, 2017). This involves defining the most important business, technical, and customer aspects for the business case in the theoretical artefact in Figure 2.29.

Business aspects encompass financial considerations, crucial for financing the NPD project and defining and measuring strategic goals. Ultimately, the business owner evaluates the project’s value proposition for the company, considering not only financial value but also its contribution to the overall corporate strategy (Filipova & Vilão, 2018b).

This “project scoping” stage aligns with the findings of Lobo & Samaranayake (2020), who emphasise the necessity of a clear project definition, preliminary investment examination, and competitive analysis. To achieve this, the three primary cross-functional roles responsible for the business, customer, and technology domains—the business owner, product manager, and system architect—are utilised in the theoretical artefact of this study in Figure 2.29. These roles were previously established as key stakeholders in the “specify requirements” stage.

The subsequent NPD process stage involves submitting the finalised business case concept to the “applications path gate”, a concept originating from the stage-gate TD model of Cooper (2017). This stage determines whether the NPD project proceeds and involves reviewing technical specifications to reach an agreement on the scope, applicability, and value proposition of the new technology for the company (Cooper, 2017).

Therefore, in summary, the business case must address three central points: defining the financial value (ROI) and strategic value contribution from a business perspective, while demonstrating how the new digital product addresses customer problems and needs; creating a roadmap outlining the required resources (personnel) and the scope of the NPD project; and documenting the IT architecture and other technical specifications to demonstrate product applicability, potentially including an initial technical roadmap.

This final business case is then evaluated in the “applications path gate” stage (Figure 2.29) to determine its approval. The business owner (business perspective), product manager (customer perspective), and system architect (technical perspective) are involved in presenting the business case, with senior executives conducting the evaluation for project financing (Zwikaël et al., 2018). Three scenarios can arise during this stage: business case

acceptance, where the NPD project proceeds to the “ideation” and “detailed investigation” stages (Figure 2.29); conditional acceptance, where the business case is accepted but requires further analysis and is returned to the “project scoping” stage (represented by a dotted line in Figure 2.29 as a conditional scenario) before being re-evaluated; and business case rejection, where the NPD project is terminated.

If the business case is approved and the NPD project proceeds, the second stage of the overarching structure is initiated. This stage initiates two concurrent NPD process steps: “detailed investigation” and “ideation”. It utilises the project management portfolio at the governance level, as derived from Chappell (2010), while integrating “design”, and “build and test” at the development level, drawn from ALM 2 of Schwaber (2006).

The “detailed investigation” stage originates from the stage-gate-TD model of Cooper (2017). In this stage, the complete technology development plan is created, technical feasibility is demonstrated, and the value and scope of the technology are defined (Cooper, 2017). As depicted in Figure 2.29, this stage focuses on finalising the technological development plan derived from the business case.

Detailed investigation is crucial to enable subsequent technical development. Therefore, the business case must be thoroughly defined from a technical perspective, including the technology underpinning the new digital product. Detailed analyses of the technical implementation must be documented, culminating in a final technical roadmap that outlines all required technical resources.

This necessitates the involvement of a solution architect, a cross-functional role responsible for creating a final solution, validating technological assumptions, and evaluating implementation alternatives. The solution architect collaborates with other technical experts to reach a consensus on the final solution (Scaled Agile Inc., 2023f). Given that the specific technical experts involved may vary depending on the nature of the digital product (such as smartphone app, AI-based system, or streaming service), only the solution architect is depicted in Figure 2.29 as a key function within the core cross-functional NPD team.

Effective coordination, such as weekly meetings, between the business owner, product manager, and solution architect, is vital to ensure alignment across business, customer, and technical perspectives. Regular meetings with the steering committee, which includes C-level

executives (Amarilli et al. 2023), are also necessary to communicate progress and address potential challenges.

Ideation is a key component of the DT process, as defined by Hasso Plattner Institute of Design at Stanford University (2010). This stage aims to generate a wide range of solutions that address the initial problem and fulfil user needs (Hasso Plattner Institute of Design at Stanford University, 2010). Based on the business case analysis, solutions must be identified that not only solve the problem but also deliver customer value.

To provide structure for solution development, the first step in ideation involves creating portfolio epics based on the problem and objectives outlined in the business case. Epics represent significant initiatives that contribute to solution development and deliver business value (Scaled Agile Inc., 2023c). This entails breaking down the digital product into its most crucial components (epics) and then, in the second step, identifying potential solutions for these epics that deliver value to both customers and the business.

The MVP approach is essential for defining epics (Scaled Agile Inc., 2023c). An MVP is not simply the cheapest and simplest product; it is a market-ready product with the most essential features to ensure viability and deliver customer value (Sońta-Drączkowska, 2019).

To provide customer value in the second step of ideation, this study adopts a customer co-creation approach, directly and actively involving customers in the process. This may involve inviting customers to workshops or brainstorming sessions to explore potential solutions and provide feedback. If unforeseen requirements emerge during this step, an iteration back to the “specify requirements” stage can be initiated. This iteration is optional, hence the dotted line connecting “ideation” and “specify requirements” in Figure 2.29.

Figure 2.29 illustrates the involvement of two cross-functional roles within the core NPD team during the “ideation” phase: the product manager and the business owner. These roles collaborate to develop an implementable concept for the technical team (Filipova & Vilão, 2018b). The product manager, with their technical knowledge (Filipova & Vilão, 2018b), is responsible for identifying feasible, sustainable, and desirable solutions that address customer needs (Scaled Agile Inc., 2023e). The business owner oversees business and technical governance and evaluates solution suitability (Scaled Agile Inc., 2023b). This enables them to jointly design epics in the first step and develop solution suggestions in

workshops or brainstorming sessions with customers and other stakeholders in the second step.

As previously discussed in section 2.7.7, multidisciplinary groups are crucial in DT projects, with specialists contributing expertise beyond their primary areas (Schneider, 2023).

Therefore, workshops and brainstorming sessions should include diverse functional roles with varied expertise. Given the importance of editorial/content knowledge in the media industry (Zabel & Telkmann, 2021), individuals from the editorial team must be involved in finding solutions for epics related to editorial topics.

The third step in “ideation” focuses on initial workshops concerning the product interface and its constituent epics. In addition to the customer, business owner, and product manager, this requires user interface designers (UIDs), who ensure consistency, branding, and visual appeal (Filipova & Vilão, 2018b). Hence, Figure 2.29 includes UIDs in the ideation phase.

Once feasible solutions for the portfolio epics and detailed sketches for the product interface have been generated in the “ideation” phase, the next NPD process stage involves “building several prototypes” and “testing” them with customers, as illustrated in Figure 2.29. These two steps are intrinsically linked, forming an iterative cycle. Test results inform prototype improvements, which are then retested with customers (Hasso Plattner Institute of Design at Stanford University, 2010). Figure 2.29 depicts this iterative process with an arrow labelled “customise prototypes” leading from “testing” back to “building several prototypes”.

Building prototypes requires understanding how users interact with a product and incorporating those insights into the design. This is a key responsibility of the design team, who observe click behaviour, design transitions, and ensure consistency in elements such as colours and shapes (Filipova & Vilão, 2018b). This necessitates the involvement of user experience managers (UEMs) to analyse user interactions with the product, and UIDs to design the final appearance, ensuring consistency and branding (Filipova & Vilão, 2018b).

Therefore, in the theoretical artefact depicted in Figure 2.29, UEMs and UIDs are involved in both “building several prototypes” and “testing”. Based on the solutions from the ideation phase, UEMs design interaction journeys in the form of prototypes and conduct tests with (potential) users, potentially employing usability tests (Filipova & Vilão, 2018c). Test results inform prototype customisation. Subsequently, UIDs design the digital product’s interface based on the sketches from the ideation phase and the results from the UEMs’ prototype

testing. This may involve virtual designs, where elements such as borders, colours, button sizes, and other visual components are defined (Filipova & Vilão, 2018c).

Figure 2.29 also shows the product manager's involvement in these two stages. The product manager is responsible for translating ideas and concepts into functionalities and approving the designs (Filipova & Vilão, 2018b).

The final MVP prototypes are then passed on to the next NPD process stage, the “go-to-development” gate, which originates from the stage-gate hybrid model of Cooper (2017). This gate serves as a quality control checkpoint, ensuring that only concepts deemed feasible are passed on to the development phase (Cooper, 2017). As illustrated in Figure 2.29, the “go-to-development” gate verifies that the final prototype concepts fulfil the technical, customer, and business requirements before proceeding.

This evaluation is contingent upon the completion of the full technology development plan from the “detailed investigation” stage. Without this plan, development cannot commence, as the technological foundation for the new digital product remains undefined. Therefore, incorporating clear deadlines within the roadmap is crucial.

Given the involvement of C-level managers in the steering committee (Amarilli et al. 2023), escalation and prioritisation within the roadmap can occur at the highest management level. This is essential to avoid blockages stemming from the “detailed investigation” stage. However, even with C-level executives on the steering committee, it is crucial that they possess a clear understanding of their roles and responsibilities and are empowered to make decisions (Brix & Horsager, 2022). This enables them to request additional resources, if necessary, further ensuring that the NPD process progresses smoothly and avoids delays caused by the “detailed investigation” stage.

The “go-to-development” stage initiates the agile development process, based on the scrum framework. Initially, the roadmap is analysed and agreed upon by the product owner, business owner, and other team members (Filipova & Vilão, 2018b). Within the theoretical artefact illustrated in Figure 2.29, these other team members include the solution architect and the product manager. The solution architect provides insights from the “detailed investigation” stage regarding the technical foundation, while the product manager utilises the final prototypes to identify the most user-relevant functions within the epics.

Next, a product backlog is created, and user stories are developed and prioritised within this backlog (Hernández-Cruz et al., 2023). The product manager writes these user stories—concise descriptions of use cases—focused on user needs. Along with each user story, the product manager defines acceptance criteria that determine when a function is considered complete (Filipova & Vilão, 2018b).

In addition to the product backlog, which lists all prioritised feature developments and bug fixes, there is also a sprint backlog. This backlog contains an estimated list of functions to be addressed in the next iteration. The product owner is responsible for creating and prioritising these backlogs (Filipova & Vilão, 2018b).

If user stories are deemed not ready for development during the “go-to-development” stage, perhaps due to unmet business requirements, they can be iterated back to the “ideation” or “building several prototypes” stages. These iterations are conditional, hence the dotted lines connecting “go-to-development” with “ideation” and “building several prototypes” in Figure 2.29.

Finally, the user stories are technically developed. Figure 2.29 depicts the transition of these stories to the next NPD process stage, “scrum”. Iterations can also occur during development, with user stories potentially being returned to the “go-to-development” stage by the development team, for example, due to necessary design adaptations (Filipova & Vilão, 2018b).

The theoretical artefact in Figure 2.29 distinguishes between two scrum elements: “MVP development” and “non-MVP development”. This distinction arises from the development of either non-business-critical products or features (MVPs) or business-critical products or features (non-MVPs), as detailed in section 2.7.6. Regardless of whether an MVP or non-MVP is being developed, the preceding “go-to-development” stage is essential for the initial product launch. This stage enables estimating the development duration under scrum and planning the launch date within the overarching structure “planning for deployment”, corresponding to the operations dimension within the overarching structure, based on Chappell (2010).

Effective coordination of “planning for deployment” is crucial, particularly when communicating launch dates to external parties like the press. Therefore, this stage involves

three key roles: the business owner, the solution architect, and the steering committee (comprising executive management), who collectively determine the launch date.

Once the initial product is launched, pure MVP features no longer need to proceed through the entire cycle, including the “go-to-development” stage. This allows for faster delivery of these features to the market. This approach is inspired by the lean startup methodology advocated by Ries (2011), which emphasises rapid hypothesis development and live testing through experimentation, eliminating the need for prolonged strategic planning. This direct pathway is illustrated by the line connecting “testing” and “MVP development” in Figure 2.29. Furthermore, all launched products or features, whether MVP or non-MVP, are subjected to the build-measure-learn cycle for live testing and continuous improvement.

The transition to technical development under scrum initiates the application portfolio management at the governance dimension by Chappell (2010). The development level begins with “development and test” (Schwaber, 2006; Tüzün et al., 2019). Thereby, new elements introduced at the operations level of the overarching NPD structure include “deploy and monitoring” based on Chappell (2010), and “customer feedback” based on Tüzün et al. (2019). “Deploy” corresponds to the “(post) launch” gate, while “monitoring” entails overseeing the newly launched product. “Customer feedback” is integrated through the build-measure-learn cycle. This cycle involves testing launched features in the market, using the results to create new prototypes (build), testing these prototypes (measure), developing and launching them, and finally conducting further live testing in the market (learn).

The commencement of the technical development under scrum initiates two-to-four-week sprint iteration cycles. Each sprint begins with a sprint planning meeting (Filipova & Vilão, 2018b). While the kanban board approach can be integrated with scrum (forming scrumban), it is not mandatory (further details on kanban and scrumban are provided in section 2.4.5).

During the sprint planning meeting, the tasks for the sprint are discussed, and developers estimate workloads and commit to completing them within the sprint timeframe (Filipova & Vilão, 2018b). This meeting involves developers, specifically backend and frontend developers. The backend of the software handles requests from client applications, running on dedicated servers typically hosted by server providers or cloud services. The frontend,

comprising any application with a graphical or command-line interface, is what the end-user interacts with (such as web, TV, or mobile applications) and runs on the client-side (Filipova & Vilão, 2018b).

In addition to developers, the sprint planning meeting includes other cross-functional roles: the business owner, product manager, solution architect, product owner, and a quality assurance team member. The business owner and solution architect participate to ensure alignment with the product and company vision. The solution architect regularly updates the vision and strategy for the solution architecture (Scaled Agile Inc., 2023f), while the business owner, responsible for the budget and knowledgeable about portfolios, value streams, and business requirements, develops and reviews the solution vision (Scaled Agile Inc., 2023b). Their participation ensures they remain informed about progress, enabling them to provide updates in regular exchanges with the steering committee.

The product manager, who writes new user stories daily and defines acceptance criteria (Filipova & Vilão, 2018b), is crucial for clarifying user stories and acceptance criteria during the sprint planning meeting. The presence of a quality assurance team member is essential to ensure that the developed features meet the defined requirements and function correctly (Filipova & Vilão, 2018b). The product owner, responsible for the backlog (Filipova & Vilão, 2018b), plays a central role in the sprint planning meeting.

Each sprint concludes with a retrospective meeting. The scrum master analyses the sprint using a burndown chart, calculates the team's velocity, and facilitates a discussion about the sprint's progress, challenges encountered, and potential improvements for future sprints (Filipova & Vilão, 2018b). This meeting involves the same cross-functional roles as the sprint planning meeting, with the addition of the scrum master as moderator.

Short daily meetings occur throughout the sprint. Moderated by the scrum master, these meetings provide a forum for each team member to share their daily goals, identify any blockers, and report progress (Filipova & Vilão, 2018b). Given the focus on development work, these daily meetings typically involve only the scrum master, product owner, and frontend and backend developers.

The final stage involves the (post) launch of the product. "Post" refers to all feature launches after the initial product launch. This "(post) launch" stage originates from the stage-gate hybrid model of Cooper (2017). As previously described, MVP features, after prototype

testing, proceed directly to technical development under the “MVP development” scrum element. In contrast, non-MVP features undergo evaluation in the “go-to-development” stage, potentially leading to iterations with “building several prototypes” or “testing” before being translated into user stories for technical development under the “non-MVP development” scrum element in Figure 2.29.

Following the initial product launch, monitoring key performance indicators and business metrics becomes crucial. The business owner must track these metrics for the new digital product and respond swiftly to market changes to facilitate product improvement (Filipova & Vilão, 2018b).

Furthermore, establishing development and operations (DevOps) teams is essential to conduct tests, such as stress tests, to assess product performance under heavy load. DevOps teams are primarily responsible for all operational aspects of infrastructure and development (Filipova & Vilão, 2018b).

Additionally, the technical depts must also be managed by the developers and the product manager (Filipova & Vilão, 2018b). Examples of technical debts, which are unfortunately unavoidable, include incoherent code style, weak architectural choices, missing structure, and inefficient test coverage (Filipova & Vilão, 2018a).

The final stage, as depicted in Figure 2.29, involves withdrawing the product from the market when it reaches the end of its lifecycle. This decision involves the same individuals responsible for deployment: the business owner, the solution architect, and the executive management team.

The business owner, responsible for the budget (Scaled Agile Inc., 2023b), assesses the financial viability of continuing to support the digital product. The solution architect, possessing in-depth knowledge of the solution architecture and technological implications (Scaled Agile Inc., 2023f), determines whether the underlying technology is outdated and requires replacement, potentially leading to the development of a new digital product. This collaborative decision-making process ensures that product withdrawal is strategically aligned with business goals and technological advancements.

To summarise the cross-functional team structure discussed in section 2.7.7, the preceding analysis of the theoretical artefact depicted in Figure 2.29 clarifies the roles within the core and extended cross-functional NPD teams.

The core cross-functional NPD team comprises the following roles: business owner; product manager; solution architect; UIDs; UEMs; product owner; frontend and backend developers; scrum master; quality assurance team members; and the DevOps team.

Extended cross-functional roles include: marketing team members; data team members; editorial team member; system architects; other technical specialists (required in the “specify requirements” and “detailed investigation” stages); and, if needed, other multidisciplinary team members contributing to solution finding in workshops or brainstorming sessions during the “ideation” stage.

3 Research Methodology

This chapter establishes the philosophical foundations of this research into customer co-created NPD within the Swiss media industry. Adopting an interpretivist perspective, this study acknowledges the subjective nature of knowledge and aims to understand the experiences and perspectives of individuals involved in this process. This approach is reflected in the research design, which prioritises qualitative data collection and analysis to generate meaningful insights. Furthermore, this chapter emphasises the importance of ethical considerations throughout the research process, ensuring the responsible and respectful treatment of participants and their contributions.

In addition, this chapter details the research strategy and design employed to investigate customer co-created NPD within the Swiss media industry. Design science research is utilised as the research strategy to guide the iterative development and evaluation of artefacts that address the research questions. A multi-phase qualitative research design provides rich, contextualised insights into the NPD process within five leading Swiss media companies. This chapter outlines the rationale for selecting this combined approach, demonstrating how it enables the generation of a new design-oriented framework that is both theoretically grounded and practically relevant to industry practitioners. Furthermore, this chapter provides a comprehensive account of the data collection and analysis methods, including the use of semi-structured interviews and a rigorous thematic analysis process, ensuring the transparency and trustworthiness of the research findings. This chapter concludes with a description of how artificial intelligence is applied in this study.

3.1 Research Philosophy

This section explores the key theoretical foundations underpinning the empirical content, drawing specifically on ontology, epistemology, and axiology (Lauer, 2017). In essence, ontology concerns itself with the nature of existence and what can be known (Allen & Varga, 2007), which for this study is qualitative. The epistemology of the study is focused on how knowledge is generated (Allen & Varga, 2007), therefore aligned to the ontology positionality of the researcher. Finally, the axiological assumptions, is centre on the researcher's ethical framework and values (Muhaise et al., 2020), which is vitally important consideration for a qualitative project.

3.1.1 Ontology

Ontology relates to the supposed nature of reality (Veal, 2017). Within the social sciences, this leads to two distinct philosophical perspectives: “positivism” and “anti-positivism” (Tharakan, 2006). Positivism asserts that all knowledge must stem from logical conclusions grounded in observable facts (Easterbrook et al., 2008). These characteristics are gathered objectively by the positivist to test pre-existing hypotheses deductively (Veal, 2017).

However, this objective stance is at odds with the inherently subjective nature of this research. Rather than seeking to uncover objective truths, this study acknowledges the role of social construction in shaping the understanding and interpretation of scientific theories. This position resonates with the argument for constructivism by Easterbrook et al. (2008), which is closely linked to interpretivism (Klein & Myers, 1999). This interpretivist approach allows for a deeper understanding of individuals perspectives (Veal, 2017), which is inherently subjective.

This research draws on constructivism and interpretivism, recognising that knowledge is actively constructed through ongoing interactions between individuals and their social environment. This is particularly relevant in the context of customer-co-created NPD with cross-functional teams within the transforming Swiss media industry, because the reality is based on the shared interpretations and understandings of the individuals involved in the customer co-created NPD process. This perspective aligns with van der Walt (2020), who suggests that human behaviour and reality are characterised by constant adaptation, transformation and fluctuation.

Interpretivism is embraced in this study through the emphasis placed on understanding the subjective meanings and interpretations that individuals hold. This resonates with the interpretivist’s use of qualitative approaches (Tikly, 2015), as employed in this research.

This study reflects this constructivist approach by first developing a theoretical artefact based on a comprehensive literature review (see chapter 2), followed by an empirical artefact derived from initial interviews with industry practitioners from five Swiss media companies (see chapters 5 and 6). Building on this foundation, a design-oriented framework is created (see section 7.4) through an iterative process in which the theoretical and empirical artefacts are merged, and recent literature is incorporated to confirm and refine the emerging insights. The design-oriented framework is not presented as a static truth, but

as a co-created product of continuous dialogue and refinement through empirical and theoretical investigation.

Through this interpretivist lens, semi-structured interviews were conducted, allowing for an exploration of the interviewees' perspectives on customer co-created NPD processes and cross-functional teams, challenges, and opportunities within their specific organisational context. This emphasis on understanding how individuals in the Swiss media industry interpret and make sense of their experiences is consistent with the interpretivist focus on subjective meaning-making. Furthermore, following Neuman (2014), the research prioritises depth of analysis over breadth of sample (see section 3.5). By focusing on a smaller group of participants, the study achieves a comprehensive and nuanced understanding of their perspectives.

In essence, this study's ontological stance recognises that the "reality" of customer co-created NPD within the Swiss media industry is not a fixed entity, but rather a fluid and dynamic construct shaped by the shared experiences and interpretations of the individuals involved. This aligns with an interpretivist ontology, which emphasises the subjective and socially constructed nature of reality. By acknowledging the role of human interaction and meaning making in shaping this reality, the research provides valuable insights into the complexities of co-creation processes within a dynamic and evolving industry. This understanding of being, in turn, informs the epistemological approach of the study, which prioritises qualitative methods to delve into the subjective experiences and perspectives of participants.

3.1.2 Epistemology

Epistemology refers to the relationship between the researcher and the phenomenon under investigation (Veal, 2017), and, therefore, how knowledge is acquired (Allen & Varga, 2007). As described in ontology (section 3.1.1), it is also within epistemology that a clear difference between interpretivists and positivists can be seen. Positivists are objective, while interpretivists are subjective (Veal, 2017).

An interpretive approach is ideally suited to this study, enabling the development of theoretically driven artefacts and addressing the research questions outlined in section 1.4.2. This aligns with the conclusion of Iivari (2007) that, from an epistemological standpoint, design science research (DSR) provides the necessary and appropriate

framework for developing artefacts grounded in theoretical knowledge. Consequently, this study adopts a multi-phase qualitative research design, to examine a real-world phenomenon in the context Swiss media companies: the customer co-created NPD process with cross-functional teams.

Accordingly, this study uses the DSR paradigm as a research strategy (see section 3.2) and a multi-phase qualitative research design (see section 3.3) to create a theoretical and empirical artefact, and a design-oriented framework. This iterative process between theory and empiricism facilitates the acquisition of new knowledge about the customer co-created NPD process and cross-functional teams. Subsequently, a qualitative analysis inspired by Yin (2015) is conducted to analyse qualitative data. This analysis involves coding to enable a clear structure within each interview phase. Following Mayring (2015), the units of analysis of the text elements within the interview transcripts are clearly defined to ensure a thorough thematic analysis.

This combination of methods enables an inductive-deductive approach for data analysis (see section 3.4.1) within the DSR process and thereby acquires new knowledge, which is the aim of epistemology. In essence, this study's epistemological stance is rooted in interpretivism, acknowledging the subjective nature of knowledge and the researcher's role in its co-creation. By embracing an inductive-deductive data analysis approach within the DSR paradigm, this research aims to generate new knowledge through an iterative process of theoretical development and empirical investigation. This process, involving the creation and refinement of artefacts and a rigorous qualitative analysis of interview data, allows for a deeper understanding of the complexities of customer co-created NPD within the specific context of the Swiss media industry. The emphasis on qualitative methods, such as semi-structured interviews and thematic analysis, reflects the study's commitment to exploring the subjective meanings and interpretations that individuals hold, thus aligning with the core principles of interpretivist epistemology.

3.1.3 Axiology

Axiology explores the role of values in research (Muhaise et al., 2020). A commitment to values and ethical research is reflected in several ways in this study. Firstly, the study adheres to the Research Ethics Handbook of the University of Gloucestershire (2024), which provides guidelines for ethical research conduct. Additionally, the study follows the ethical

considerations outlined by Tracy (2010), emphasising ethics from different perspectives: procedural; situational and cultural; relational; and exiting ethics.

As to the procedural ethics, informed consent is obtained from all respondents prior to participation in this study to ensure ethical treatment of participants. This is shown in Appendix 1.4 (without mention of names). This includes providing all respondents with a clear and comprehensive information sheet explaining the purpose of the research, the procedures, and their right to withdraw from the study at any time. All interviews were recorded on video and on a smartphone only with their explicit permission, and the transcripts are anonymised to protect their identity. Any recordings will be deleted after the publication of this study.

With reference to situation- and culture-specific ethics, this research considers the specific context of the Swiss media industry and is sensitive to cultural norms or industry-specific expectations that could influence ethical considerations. For example, no names of new digital products will be published that are not yet available on the market or that can be traced back to a specific Swiss media company.

In terms of relational ethics, building and maintaining trust with the participants is of crucial importance in this study. This is achieved through open communication, active listening, and consideration of their perspectives throughout the research process. To provide a safe and comfortable environment for participants to share their experiences, the interviews were conducted online via Microsoft Teams. This approach allowed for flexibility and convenience while also potentially reducing the emotional intensity of the interviews, which was especially important given the sensitive nature of some of the topics discussed. For example, discussions around the perceived tension between prioritising the needs of journalists over those of customers could evoke strong emotions or potentially touch on internal power dynamics. The online format allowed for some emotional distance, which may have allowed for more open and honest consideration of these sensitive topics.

Referring to exiting ethics, after the research is completed, the participants will be informed about the results of the study and given the opportunity to ask questions. In this regard, this research will be sent to them via email. The research results will be disseminated responsibly, ensuring the anonymity of the participants.

This comprehensive approach to axiology is consistent with the ontological (see section 3.1.1) and epistemological (see section 3.1.2) perspectives of the study. The emphasis on ethical considerations, subjective meaning-making and co-creation of knowledge is consistent with the constructivist and interpretive approach that recognises the importance of values, and social context in the research process.

In essence, this study demonstrates a strong commitment to axiology, going beyond ethical considerations to encompass a broader understanding of value within the research process. While adhering to ethical guidelines and prioritising the well-being of participants, the research also recognises the value of subjective experiences and the co-creation of knowledge. By embracing an interpretivist approach, the study values the insights and perspectives of individuals within the Swiss media industry, acknowledging their role in shaping the “reality” of customer co-created NPD. This emphasis on valuing diverse perspectives and fostering collaborative knowledge generation aligns with the study’s commitment to generating meaningful and impactful findings that resonate with the lived experiences of participants and contribute to a deeper understanding of the phenomenon under investigation.

3.2 Research Strategy

This study aims to investigate a new theoretical construct of how, from the organisational perspective, NPD can effectively use customer co-creation within the Swiss media industry. To achieve this, this study applies design science research (DSR) as its guiding research strategy.

DSR is a research paradigm in which researchers address specific human problems by creating innovative artefacts (Hevner & Chatterjee, 2010). More specifically, it centres on the search for suitable components to develop an artefact that solves a problem (Baskerville, 2008). This creates new knowledge that contributes to existing scientific knowledge. The developed artefacts thus serve both to provide a practical solution to a problem and to provide a deeper understanding of the underlying problem (Hevner & Chatterjee, 2010).

In this study, DSR provides the paradigm for investigating customer co-created NPD, guiding the development of a theoretical and empirical artefact, and a design-oriented framework

that can contribute to both theory and practice. This strategy is particularly well-suited for achieving the research objectives, which are illustrated in section 1.4.2.

By using DSR, these research objectives not only generate new theoretical insights but also develop practical solutions that can improve customer co-creation practices in the NPD process for cross-functional teams of Swiss media companies.

3.3 Research Design

This study employs a research design specifically crafted to enable the development of a new design-oriented framework within the field of customer co-creation in NPD for digital products. This involves the exploration of cross-functional teams, the NPD process, and utilises the creation of an empirical artefact (see chapter 6), where the development process is initially theory-led, but iteratively refined through ongoing engagement with qualitative empirical data, allowing existing theoretical insights to be extended and challenged.

To determine the most appropriate research design for answering the research questions in section 1.4.2, five approaches are compared: multi-phase qualitative research, grounded theory, survey research, experimental research, and action research.

As Dornonville de la Cour et al. (2023) describe, multi-phase qualitative research entails progressing through several phases. This approach is well-suited for investigating a specific phenomenon (Jain et al., 2025). This makes it particularly appropriate for this study as it allows to link the multi-phase qualitative research design to the DSR process, which is this study's research strategy (see section 3.2). In this way, empirical data can be gathered at various phases within the DSR process to explore the phenomenon of customer co-created new product development for digital products.

In contrast, the time-intensive nature of grounded theory, coupled with its potential for misinterpretation (Glaser & Strauss, 2017), renders it unsuitable for this study. This is because grounded theory's inductive approach eschews pre-existing design-oriented frameworks and excels at generating entirely new theories from the data (Charmaz, 2014). Conversely, this study aims to refine and extend existing theoretical understanding through empirical investigation within a specific context, ultimately contributing a new perspective on customer co-created NPD.

Furthermore, this research necessitates the examination of complex phenomena within their real-world context, rendering quantitative surveys unsuitable. While such surveys can gather data on a variety of topics and enable broad generalisations, their inherent reliance on a sampling frame ultimately limits their generalisability (Fowler, 2014).

Similarly, experimental research, with its limitations regarding participant attrition (MacCoun, 2003) and tendency to disregard the context of the phenomenon (Yin, 2018), is inappropriate. This study examines the unique factors that characterise customer co-created NPD with cross-functional teams in the Swiss media industry, through interviews with NPD managers. Yin and Davis (2007) suggest that understanding such a phenomenon requires examining its context. This study examines how factors such as technology, organisational structures, NPD process elements and structures, agility, customer-centric processes, and cross-functional team structure within Swiss media companies relate to customer co-created NPD and the functioning of cross-functional teams.

Moreover, this study does not seek to actively implement a specific framework to address a company-specific problem, as would be characteristic of action research with its inherent risk of research bias (George, 2024). Rather, it aims to develop a design-oriented framework through the interplay of theory and empirical data. Consequently, action research is not an appropriate methodology.

Finally, comparing the five approaches highlights the rationale for employing a multi-phase qualitative research design in this study. In total, three interview phases with managers in five Swiss media companies, employing a semi-structured approach, are conducted across three distinct DSR phases (see section 3.5.1). The first interview phase (see section 3.5.1.4.1), during the awareness phase of DSR (chapter 4), involves three interviews to gain initial insights into the customer co-created NPD process within the Swiss media industry. The second interview phase (see section 3.5.1.4.2), in the suggestion phase of DSR (chapter 5), comprises further two interviews to build upon the findings from the first interview phase and suggest variants for the upcoming development of the empirical artefact in chapter 6. The third interview phase (see section 3.5.1.4.3), conducted during the feedback and evaluation phase of DSR (chapter 7), then involves five interviews to gather feedback on and evaluate the empirical artefact, ultimately leading to the development of this study's design-oriented framework (see Figure 7.12).

3.4 Combining Design Science Research and Multi-Phase Qualitative Research

This section explains how this research combines DSR as a research strategy with multi-phase qualitative research as a research design. This combined approach is deemed essential to achieve the study's goal of developing a new design-oriented framework for customer co-created NPD with cross-functional teams in the Swiss media industry.

DSR provides the structured and iterative process for this research, taking it from initial problem identification, through variant suggestion and development of an empirical artefact, which is evaluated to construct a design-oriented framework, to final conclusions. The multi-phase qualitative research design offers the necessary context and empirical richness to ground the research in real-world practice through the perspectives of NPD managers from Swiss media companies. It allows an in-depth examination of the actual implementation of customer co-creation in NPD processes involving cross-functional teams.

This section will explore the specifics of this combined approach in more detail. It will illustrate how the DSR process, with its iterative phases and cycles of relevance, design, and rigour, is operationalised within the multi-phase qualitative research design. This detailed exploration will demonstrate how the strengths of both approaches are utilised to develop, evaluate and refine a solution that is both theoretically sound and practically relevant to the Swiss media industry.

3.4.1 Research Argument

This study adopts an interpretative approach, a key aspect of the inductive approach employed in qualitative methods (Veal, 2017). Therefore, this research takes a predominantly inductive approach with the aim of developing a new design-oriented framework for customer co-created NPD with cross-functional teams. However, to facilitate discovery and verification during data analysis, the study oscillates between inductive and deductive reasoning (Patton, 2015). This inductive-deductive data analysis process is guided by the DSR process and the DSR research cycle (see Figure 3.3), with the phases of data analysis structured according to Yin (2015).

In the awareness phase of DSR, a theoretical coding tree (section 4.1.1), outlining requirements and characteristics, is developed from the theoretical artefact (section 2.7). This serves as the theoretical foundation for developing the preliminary empirical coding tree of the empirical artefact (section 4.1.3). Within the awareness phase of DSR, the first three of five Swiss media companies (first interview phase) within the Swiss media industry are analysed to identify and discuss problems originating from the theory and to draw a comparison between the data and the theoretical artefact (section 4.2).

This is followed by the suggestion phase of DSR, where the two remaining Swiss media companies are included in the second interview phase. This informs the thematic analysis across all five Swiss media companies to identify patterns in the empirical data from both the first and second interview phases. This process forms the empirical coding tree of the empirical artefact (section 5.1.1) and, through a cross-company analysis of all five Swiss media companies, suggests variants for the empirical artefact based on the collected data (section 5.2).

During the development phase of DSR, existing literature and interviews inform the most relevant variant and develop the empirical artefact, which is an inductive-deductive approach (sections 6.1, and 6.2).

The feedback and evaluation phase of DSR involves gathering feedback on the empirical artefact through the third interview phase, as well as identifying emerging patterns (section 7.1) based on the within-company analysis detailed in Appendix 1.2. The cross-company analysis (section 7.2) further develops these patterns by identifying similarities and differences across the five Swiss media companies and establishing their requirements and characteristics. This analysis informs the evaluation of the empirical artefact from both empirical and theoretical perspectives (section 7.3). This evaluation, in turn, guides the refinement of the artefact, which constitutes the development of this study's design-oriented framework (section 7.4). Chapter 8 addresses any remaining research gaps and discusses the study's most significant findings in relation to current literature.

Finally, the conclusion phase of DSR marks the culmination of this research. This phase addresses the study's research questions (section 9.1), describes its theoretical contributions (section 9.2), offers implications for management (section 9.3), outlines the quality criteria

employed, describes any limitations, and provides recommendations for future research (section 9.4).

3.4.2 Applying Multi-Phase Qualitative Research in this Study

This research employs a multi-phase qualitative research design within a DSR process (the research strategy). This approach aligns with existing literature by employing the established DSR process to provide a clear roadmap for the research process and generate an empirical model applicable to real-world situations (Peffer et al., 2007). With the combined strengths of multi-phase qualitative research and DSR, this study aims to provide a new design-oriented framework for customer co-created NPD of digital products involving cross-functional teams. This integrated approach enables the development of a robust and practical solution that is both theoretically grounded and empirically evaluated and can be used in a real-world environment.

This study employs a multi-phase qualitative research design, which underpins the empirical data collection. Similar to the multi-phase approaches used by Dornonville de la Cour et al. (2023), Elston et al., (2022), and Jain et al. (2025), this study also gathers data across distinct phases. Specifically, to facilitate the connection with DSR in this study, data are collected during individual stages of the DSR process to develop both an empirical artefact and a design-oriented framework.

To explore this, this study involved three interview phases with a total of ten semi-structured interviews with managers from five Swiss media companies (as detailed in section 3.5.1.1), conducted across the three distinct stages of the DSR process. The initial interview phase (see section 3.5.1.4.1), taking place during the awareness phase of DSR (chapter 4), comprised three interviews aimed at gaining preliminary insights into customer co-created NPD within the Swiss media industry. Building on these initial findings, a second interview phase (see section 3.5.1.4.2) was conducted during the suggestion phase of DSR (chapter 5) to suggest variants for the subsequent development of the empirical artefact in chapter 6. Finally, the third interview phase (see section 3.5.1.4.3), involving five interviews during the feedback and evaluation phase of DSR (chapter 7), focused on gathering feedback on and evaluating the empirical artefact. This ultimately led to the development of the design-oriented framework presented in Figure 7.12. Thus, this multi-phased interview approach enabled a systematic and thorough analysis of the qualitative data gathered.

Furthermore, this study employs thematic analysis, a method used to identify, analyse and present patterns, or themes, within data (Braun & Clarke, 2006). For this research, thematic analysis is particularly important to identify common patterns across all five Swiss media companies regarding the customer co-created NPD process and the cross-functional team structure involved. Thus, the thematic analysis in this study is based on the code scheme developed by Richards and Hemphill (2018) and can be found in Appendices 1.3.1, and 1.3.2. Building on this, one of the key recommendations put forward by Castleberry and Nolen, (2018) for carrying out thematic analyses is to draw upon established data analysis methods, such as those outlined by Yin (2015). Consequently, this research employs Yin's (2015) data analysis method across all three interview phases, which is described in considerable detail in sections 3.5.2.2, 3.5.2.3, and 3.5.2.4.

Finally, although the study is aware of the subjectivity and verification bias inherent in all research methods (Flyvbjerg, 2006), special care is taken to maintain objectivity. This is achieved through data triangulation (see Table 3.12), the comparison of empirical results with existing theories and the inclusion of industry reports (such as Reuters). The thematic analysis of the empirical data further enhances objectivity by focussing on thematically objective text modules in the interview transcripts rather than only subjective interpretations of individual interviews. The iterative nature of this study, with its interplay between theory and empirical observation, further strengthens objectivity. Finally, the rigorous documentation of each primary code and subcode in the feedback and evaluation phase of DSR based on the codebook approach of Mackieson et al. (2019) provide an additional level of objectivity (see Appendices 1.3.3, and 1.3.4).

3.4.3 Applying Design Science Research Process in this Study

This study develops a theoretical and empirical artefact, and a design-oriented framework. To achieve this, this study relies on the design process model proposed by Takeda et al. (1990), which comprises iterative design cycles. These cycles include the following steps: awareness; suggestion; development; evaluation; and conclusion. This study builds upon this foundation by examining the application of the DSR process model developed by Vaishnavi and Kuechler (2004). This model focuses on the contribution of new knowledge, which aligns with the aim of this research (see section 1.4). However, as the evaluation phase explicitly includes obtaining feedback on the empirical artefact (Hevner & Chatterjee, 2010), the

evaluation phase in this study has been supplemented with a dedicated “feedback” component (see Figure 3.1).

Figure 3.1: Design science research process steps

Process steps	Outputs
Awareness	Justification of problem and requirements
↓	
Suggestion	Suggestion of components in the artefact
↓	
Development	Development of artefact
↓	
Feedback and evaluation	Feedback and evaluation of artefact
↓	
Conclusion	Conclusion of the research findings

Source: adapted from the process steps of Vaishnavi and Kuechler (2004)

Figure 3.1 shows the DSR process developed by Vaishnavi and Kuechler (2004) and expanded with the “feedback” stage by Hevner & Chatterjee (2010). Comparing Figure 3.1 with other doctoral theses, such as Fakorede (2020), Kouptsov (2020), and Souza De Souza (2015), it becomes apparent that the application of research methods within a DSR process can vary considerably when developing artefacts. Consequently, it can be assumed that the specific methodological choice depends on the research objectives.

In this regard, this research seeks to establish the nature of a theoretical artefact, explore how an empirical artefact functions within the real-world setting of the Swiss media industry, and ultimately develop a design-oriented framework presenting a new theory for customer co-created NPD involving cross-functional teams. Consequently, this study develops a theoretical as well as empirical artefact, and a design-oriented framework. DSR is therefore crucial for effectively developing these artefacts and the design-oriented framework. A multi-phase qualitative research design, interviewing managers from the five largest Swiss media companies, allows for a focus on the real-world setting of the Swiss media industry and the identification of which methods are effective, ineffective, or desired within an NPD process.

Figure 3.2: Combination of design science research process and multi-phase qualitative research in this study

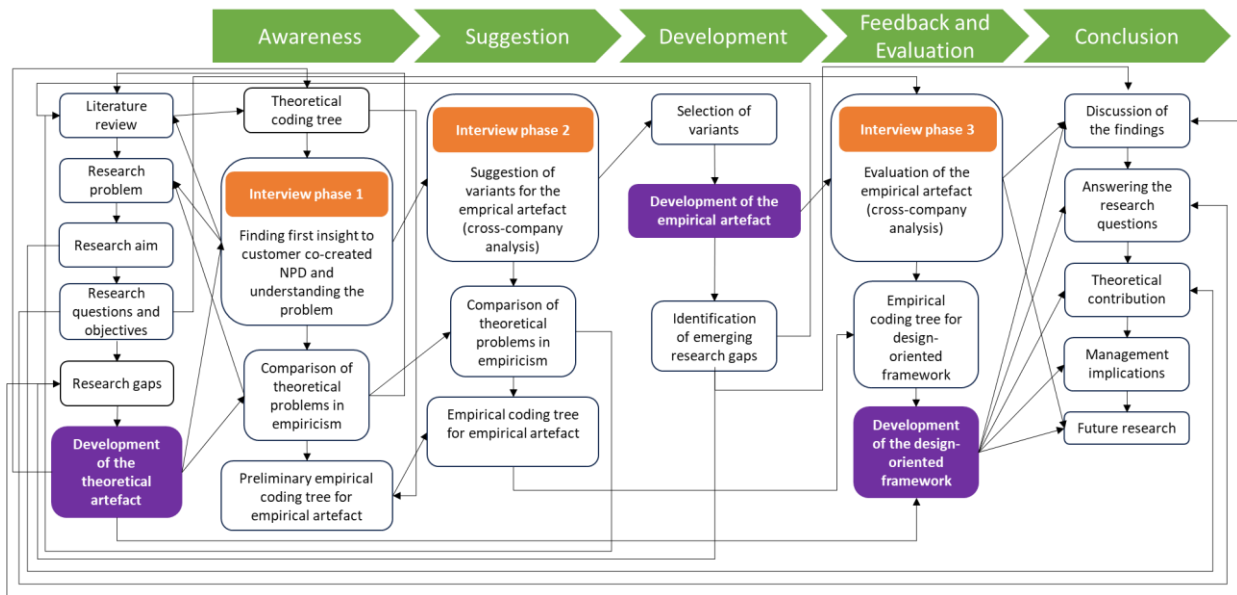


Figure 3.2 illustrates how the three interview phases in the multi-phase qualitative research design are integrated within the DSR process in this study.

The DSR process provides the overarching iteratively driven research strategy, by going through the five process elements: awareness, suggestion, development, feedback and evaluation, and conclusion. In this context, Figure 3.2 highlights the focus on the multi-phase qualitative research design with three interview phases, which reflect the empirical data collection through interviews (orange fields). Similarly, the development of the theoretical and empirical artefacts, and the design-oriented framework are represented (violet fields). Initially, a theoretical artefact was developed. Following this, the first and second interview phases were conducted within the awareness and suggestion phase of the DSR process. This culminated in the development of the empirical artefact during the development phase of DSR. Subsequently, during the feedback and evaluation phase of DSR, this empirical artefact was evaluated against the identified requirements and characteristics of the third interview phase. Finally, the empirical artefact was refined. This refinement process ultimately contributed to the construction of this study's design-oriented framework.

Multi-phase qualitative research, employed as the specific research design method, enables the exploration of the “how” questions posed in the research questions in section 1.4.2. This research design further incorporates real-world insights from the Swiss media industry gathered through qualitative interviews, which can then be compared with theoretical findings to generate a design-oriented framework for customer co-created NPD involving

cross-functional teams. This emphasises the use of the DSR cycles, which are discussed in the next sections (3.4.3.1, 3.4.3.2, and 3.4.3.3).

In this context, Hevner (2007) highlights the importance of a three-phase cycle: relevance, design, and rigour (see Figure 3.3). Hevner (2007) also emphasises the need for multiple iterations within the design cycle before proceeding to field testing in the relevance cycle.

Figure 3.3: Design science research cycles with multi-phase qualitative research illustrated in this study

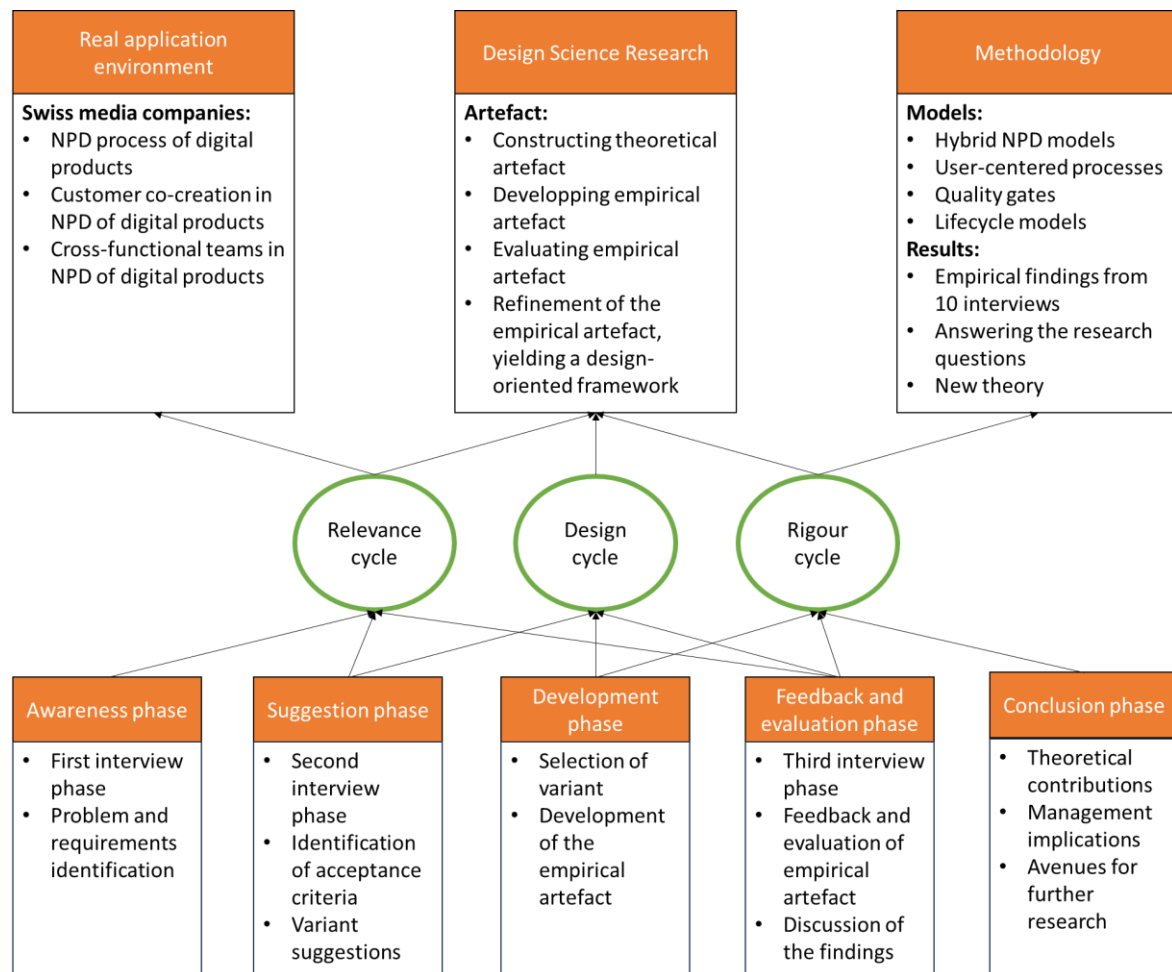


Figure 3.3 illustrates the DSR cycle for this study. This cycle, comprising relevance, rigour, and design cycles, is linked to the DSR process depicted in Figure 3.1. A detailed examination of these three cycles follows, with each cycle explored in a dedicated section: 3.4.3.1 for the relevance cycle; 3.4.3.2 for the design cycle; and 3.4.3.3 for the rigour cycle.

3.4.3.1 Relevance Cycle

Scientific research in the field of optimal design usually begins with the identification of problems and opportunities within a real application environment. This application context

is addressed within the relevance cycle, which provides both the requirements and the acceptance criteria that are ultimately used to evaluate the research results (Hevner, 2007).

In this study, and with reference to the research questions outlined in section 1.4.2, the relevance cycle is first applied during the awareness phase in DSR. This involves understanding the real-world context of customer co-creation, NPD processes, and cross-functional teams in Swiss media organisations. The initial requirements and characteristics derived from the literature form the theoretical coding tree (see Table 4.1), help to identify the problems (see Table 4.2), and are mapped to the preliminary empirical coding tree for the empirical artefact (see Table 4.3). These problems identified in the awareness phase in DSR (Table 4.2) are taken up again in the suggestion phase in DSR (Table 5.2).

Importantly, the relevance cycle also provides information on the acceptance criteria used in the suggestion phase in DSR. These acceptance criteria are considered as characteristics of potential solutions that fulfil the requirements and are most emphasised during the second interview phase. In this context, the initial characteristics derived from the literature (Table 4.1) and identified in the first interview phase (Table 4.3) are further refined in a second interview phase to create the empirical coding tree of the empirical artefact in the suggestion phase in DSR (Table 5.1). This process forms the basis for the creation of different variant suggestions for the empirical artefact (section 5.2).

Finally, the relevance cycle informs the creation of the design-oriented framework (section 7.4) in the feedback and evaluation phase of DSR. This is achieved by evaluating the empirical artefact (section 7.3) against the requirements and characteristics identified in the cross-company analysis of the third interview phase (section 7.2). This evaluation forms the basis of the empirical coding tree for the design-oriented framework (Table 7.14), which is then used to develop the refined empirical artefact that constitutes the design-oriented framework.

3.4.3.2 Design Cycle

The design cycle forms the core of any design science research. It utilises the requirements from the relevance cycle, and the methods and theories from the rigour cycle. While the design cycle depends on these other cycles, it operates relatively independently in conducting the actual research. This involves iterative cycles of constructing, evaluating, and refining the artefact based on feedback. Crucially, a balance must be maintained between

the effort dedicated to construction and evaluation (Hevner, 2007). This is because, as Hevner (2007) notes, robust arguments for an artefact's construction are futile if the evaluation is inadequate.

In line with the research objectives outlined in section 1.4.2, this study develops a theoretical and empirical artefact, and a design-oriented framework.

The development of the theoretical artefact (section 2.7) provides the theoretical basis for this research, informing the initial theoretical coding tree created during the awareness phase of DSR (Table 4.1). This theoretical coding tree then provides the foundation for the subsequent preliminary empirical coding tree used to develop the empirical artefact (Table 4.1).

In the suggestion phase of DSR, refined requirements and characteristics from the second interview phase form the empirical coding tree (Table 5.1), which informs the design of different variant suggestions for the empirical artefact through the cross-company analysis of the first and second interview phases (section 5.2). The development phase in DSR involves selecting one variant from the suggested variants (section 6.1) and developing the chosen variant into an empirical artefact (section 6.2).

During the feedback and evaluation phase, feedback on the empirical artefact is gathered through within-company analysis (section 7.1), leading to a cross-company analysis (section 7.2) and subsequent evaluation of the empirical artefact (section 7.3). This evaluation informs the refinement of the empirical artefact within the DSR design cycle, contributing to the development of this study's design-oriented framework (section 7.4). This design-oriented framework presents a new theory for both research and practice concerning customer co-created NPD involving cross-functional teams.

3.4.3.3 Rigour Cycle

Rigorous DSR necessitates a knowledge base grounded in both engineering methods and scientific theories. It is crucial to integrate extensions of existing models and theories, developed during the research process, which lead to new design processes and products. Equally important is the integration of results gathered during artefact evaluation and research execution. These results form the central outcome of the research, enabling the generation of new knowledge from existing research (Hevner, 2007).

With reference to the research questions in section 1.4.2, this study utilises the rigour cycle to provide a scientific and methodological foundation for creating the empirical artefact and design-oriented framework focused on customer co-created NPD involving cross-functional roles. Various process and design methods are analysed to establish a robust basis for understanding the NPD process, customer co-creation, and cross-functional teams. The rigour cycle demonstrates how a new design methodology, centred on customer co-creation, is constructed within an NPD process using a multi-phase qualitative research design.

In this context, the rigour cycle within the DSR process in this study begins with the first interview phase during the awareness phase of DSR. This initial phase involves comparing empirical findings with the theoretical artefact (section 4.2). In the suggestion phase in DSR, the second interview phase is conducted, involving a cross-company analysis across all five Swiss media companies to suggest variants for the empirical artefact (section 5.2). During the development phase in DSR, empirical research findings from the awareness and suggestion phases are synthesised. One variant is selected for the empirical artefact of this study by comparing it with current literature (section 6.1).

In the feedback and evaluation phase of the DSR process, the empirical artefact is evaluated through a third interview phase. The resulting design-oriented framework (Figure 7.12), generated within the design cycle of DSR, offers a new theory of customer co-created NPD involving cross-functional teams. These findings, derived from the cross-company analysis in the feedback and evaluation phase (section 7.2), are discussed in chapter 8 and address the research gaps (sections 8.1.1, 8.2.1, 8.3.1, and 8.4.1). Finally, the feedback and evaluation phase in DSR provides the core scientific results that inform the conclusion phase of the DSR process in chapter 9. In the conclusion phase, the rigour cycle of DSR addresses the three research questions (section 9.1), strong theoretical contributions (section 9.2), management implications (section 9.3), and avenues for future research (section 9.4.3).

3.5 Research Method Applied in the Research Strategy

The research method encompasses two topics, aligning with both the multi-phase qualitative research design and the DSR process. First, a description is given of how the data is collected and which sampling is used. Secondly, the method used to analyse the collected empirical data is presented.

3.5.1 Data Collection and Sampling

This section describes the data collection and sampling methods used in this study.

Following Mayring (2015), this section explains how the source material was identified. This process involved three analytical steps: defining the material, analysing its context of origin, and identifying its formal characteristics. Finally, each interview phase of the multi-phase qualitative research design is examined in detail.

3.5.1.1 Definition of the Material

This study is based on the qualitative content analysis according to the process model of Mayring (2015). The first step in the determination of the source material process is to describe the definition of the material.

3.5.1.1.1 Population

The population comprises all Swiss media companies that deal with customer-centred NPD. As an analysis of all Swiss media companies in this population would go beyond the scope of this study, a sample was selected.

3.5.1.1.2 Sample

The sample consists of five of the largest Swiss media companies. The companies were selected primarily based on size and market significance to analyse the dominant players in the industry and their specific challenges around customer-centred NPD. In terms of revenue in 2023, the largest private Swiss media companies were: TX Group, CHF 982.5 million; Ringier AG, CHF 918.9 million; CH Media, CHF 445.3 million; and Neue Zürcher Zeitung, CHF 250.9 million (Eisenegger et al., 2024). In addition, the public broadcaster SRG SSR, which comprises Schweizer Radio und Fernsehen, has a considerable market share of 26.7 % for information media in German-speaking Switzerland (Rivière, 2024). Therefore, TX Group, Ringier AG, CH Media, Neue Zürcher Zeitung, and Schweizer Radio und Fernsehen are analysed as individual companies in this study.

Furthermore, the selection of interviewees within these five Swiss media companies was highly targeted. Table 3.1 illustrates the required profile that candidates needed to meet to be considered for participation. This precise and rigorous selection process was of paramount importance to ensure the collection of effective and reliable information

regarding their respective NPD processes. Furthermore, it aimed to guarantee that interviewees possessed a thorough understanding of the study's focus, which is customer co-created NPD for digital products and cross-functional team structures.

Table 3.1: Interviewee profiles

Area	Criteria to meet
Job position	Must have a leading position in product management
Product type	Must be working with digital products (software-based)
Decision-making authority	Must be able to have a say in the NPD process constellation
Collaboration	Must have experience in the team constellation of NPD teams
Technical understanding	Must have a technical understanding that is necessary for digital product development
Experience with customer co-creation	Must have a familiarity with various customer co-creation methodologies (such as user testing, surveys, co-creation workshops)
Perspective of the NPD process	Must have experience across different phases of the digital product development lifecycle, from ideation to market launch
Company-specific context	Must have a clear understanding of their company's overall digital strategy and the role of NPD within it
Swiss media industry specific know-how	Must have a familiarity with the evolving digital landscape within the Swiss media market and the challenges and opportunities it presents for NPD

As illustrated in Table 3.1, the participants held a variety of managerial positions with direct responsibility for, or influence over, NPD strategies and their implementation. The roles represented leaders in product management for new digital products. Collectively, the participants possessed a broad range of experience in NPD and the Swiss media industry, spanning approximately four to twelve years. This diverse yet pertinent experience base facilitated a comprehensive exploration of the research questions (see section 1.4.2).

The author's previous experience in the Swiss media industry and associated professional network aided in identifying potential interviewees. These individuals were contacted and informed of the selection criteria detailed in Table 3.1. Through this process, the final interview participants were secured, with initial contact being made via email (four instances) and LinkedIn (one instance). At CH Media, while a senior leader was initially approached, the interview was ultimately conducted with a manager directly overseeing the NPD of digital products to ensure the most pertinent information was obtained. This highlights that the selection of suitable candidates was highly specific and that, in principle, only one individual per company was deemed to effectively possess the required criteria and, consequently, the necessary depth of expertise on the topic of customer co-created NPD of digital products.

This led to the selection of the following five roles for the interviews: “Head of Product Management”, “Chief Product Owner”, “Chief Product Officer”, “Head of Digital Activities and Business Development”, and “Lead Product Manager”.

Finally, a total of 10 interviews were conducted (two per Swiss media company). The initial five interviews (one per Swiss media company), in the first and second interview phase, were carried out to develop the empirical artefact. The subsequent five interviews (again, one per Swiss media company) with the same interviewees were conducted in the third interview phase to gather feedback on the empirical artefact. This feedback was crucial for developing the proposed design-oriented framework of this study (Figure 7.12). Further details regarding the associated interviewee database are explained in sections 3.5.1.4.1 to 3.5.1.4.3, and theoretical saturation by Guest et al. (2020) is discussed in section 3.6.

3.5.1.1.3 Source Material for Qualitative Content Analysis

The source material consisted of transcripts from semi-structured interviews conducted in three phases with representatives of five media organisations. Each organisation participated in two interviews, resulting in a total of ten interviews. All interviews were recorded and transcribed verbatim.

It is important to acknowledge that eight interviews were conducted in German and two in English. As German is the predominant language in German-speaking Switzerland, and it could not be assumed that all interviewees would be fluent in English, the interviews were transcribed in German and subsequently translated into English by the researcher of this study. These interview transcripts were translated before coding to ensure all transcripts could be coded in English, which in turn facilitated the development of a consistent and coherent code structure.

The translation was undertaken using the software “DeepL Pro” (paid account), a sophisticated and robust translation tool. To ensure complete accuracy, the researcher meticulously checked each sentence to guarantee the German statements were faithfully translated into English. Since the interviews were conducted in everyday German, rather than using specialist scientific terminology, the translation process was straightforward.

The semi-structured format was chosen to ensure that responses remained open-ended while still adhering to the thematic framework of the study (George, 2023). This structure allowed for a focussed exploration of key themes such as NPD processes, customer co-creation, and cross-functional teams, as outlined in the research questions (section 1.4.2).

Participants were carefully selected from a pool of managers directly involved in the NPD processes (see Table 3.1). This selection was strategic as it directly supported the research objectives outlined in section 1.4.2. By focusing on managers with significant influence and responsibility around NPD, the study was able to gain an organisational perspective that enabled an examination of cross-functional team collaboration, hybrid NPD processes, and the integration of customer co-creation within the Swiss media companies. Their expertise provided detailed and insightful answers to the interview questions (see Appendix 1.1) and provided extensive data to achieve the research objectives (see section 1.4.2).

Participation was voluntary and all interviewees signed a confidentiality agreement provided by the University of Gloucestershire to ensure data protection (see Appendix 1.4). Interviews were conducted in accordance with university guidelines, ensuring the selection of individuals with specific expertise while maintaining their anonymity.

This research builds on a pilot study entitled “A system of customer co-creation for new product development of digital products with a pilot study of the Swiss media industry” (Le Cunff & Schlick, 2023), which is available as a freely accessible study.

3.5.1.1.4 Accessibility of the Material

Access to the data was granted with the consent of the interviewees and in compliance with data protection regulations (see Appendix 1.4). No names were mentioned, nor which job description was selected in which company, to ensure anonymity. Likewise, to maintain the anonymity and confidentiality of the participating Swiss media companies, the interview transcripts were not submitted as complete documents. Instead, the data was analysed thematically, with relevant excerpts organised by topic rather than by individual company. This approach protects the identity of the participants while allowing for a comprehensive analysis of the key topics and findings. The thematic analyses can be found in Appendices 1.3.1 and 1.3.2.

3.5.1.1.5 Documentation

The selection of interviewees and the conduct of the interviews are documented in detail in section 3.5.1.4 to ensure the traceability and transparency of the analysis. Further procedural documentation is available in the quality criteria section of this research (section 9.4.1.2).

3.5.1.2 Analysis of the Context of Origin

According to the process model by Mayring (2015), the second step in qualitative content analysis in the determination of the source material process, is the analysis of the context of origin.

In this regard, participation in the interviews was voluntary. All interviewees received the interview questions in advance and signed a confidentiality agreement (see Appendix 1.4). The aim of the study was made clear. In addition, all interviewees were promised a copy of the doctoral thesis as soon as it was published.

3.5.1.3 Formal Characteristics of the Material

According to the process model by Mayring (2015), the third step in qualitative content analysis in the determination of the source material process, is to describe the formal characteristics of the material.

In this regard, all interviews took place online via Microsoft Teams. The interviews were recorded, and the interviewees were informed that they were being recorded for transcription purposes. The interview was also recorded with a smartphone to have additional security should the recording via Microsoft Teams not work.

3.5.1.4 Detailed descriptions of the individual interview phases

This section describes the three interview phases of the ten interviews that took place in the awareness phase, the suggestion phase, and the feedback and evaluation phase of DSR, the research strategy on which this study is based.

3.5.1.4.1 First Interview Phase

The first data collection was conducted during the awareness phase in the DSR process to reinforce the research problem and identify unresolved empirical problem areas that need to be examined more closely in the second interview phase (see section 3.5.1.4.2). Here,

semi-structured interviews were conducted in German in three interviews. The interview questions can be found in Appendix 1.1.1.

It was of great importance that not all five Swiss media companies of this study were included in the first interview phase so that an initial comparison could be made between the identified requirements and characteristics within the five Swiss media companies in the second interview phase in section 3.5.1.4.2. In addition, the interview questions could be adapted in the second interview phase due to new findings in the first interview phase to obtain detailed information, which was ultimately relevant for the creation of the empirical artefact in Figure 6.5.

Table 3.2: Database of interviewee 1

Field	Description	Information in this study
Interviewee ID	Unique ID for each interviewee	Interviewee 1
Job title	Job title of the interviewee	Head of Product Management
Company ID	Link to the company this interview belongs to	Swiss media company 3
Interview phase	Interview phase 1, 2, or 3	1
Date	Date conducted the interview	06.01.2023
Language	Original language	German
Recording	Source of the recording	Microsoft teams, and smartphone
Transcript	Cross-reference to the thematic analysis, which contains text blocks of the transcripts	Appendix 1.3.1

Table 3.3: Database of interviewee 2

Field	Description	Information in this study
Interviewee ID	Unique ID for each interviewee	Interviewee 2
Job title	Job title of the interviewee	Chief Product Owner
Company ID	Link to the company this interview belongs to	Swiss media company 1
Interview phase	Interview phase 1, 2, or 3	1
Date	Date conducted the interview	12.01.2023
Language	Original language	German
Recording	Source of the recording	Microsoft teams, and smartphone
Transcript	Cross-reference to the thematic analysis, which contains text blocks of the transcripts	Appendix 1.3.1

Table 3.4: Database of interviewee 3

Field	Description	Information in this study
Interviewee ID	Unique ID for each interviewee	Interviewee 3
Job title	Job title of the interviewee	Chief Product Officer
Company ID	Link to the company this interview belongs to	Swiss media company 4
Interview phase	Interview phase 1, 2, or 3	1
Date	Date conducted the interview	16.01.2023
Language	Original language	German
Recording	Source of the recording	Microsoft teams, and smartphone

Transcript	Cross-reference to the thematic analysis, which contains text blocks of the transcripts	Appendix 1.3.1

Table 3.2, Table 3.3, and Table 3.4 show the databases for the interviewees in the first interview phase. Three managers from three different Swiss German media companies, “Ringier AG”, “TX Group”, and “Schweizer Radio und Fernsehen” were interviewed. The interviewees had the job title “Head of Product Management”, “Chief Product Owner”, and “Chief Product Officer”. These three managers were chosen because they held a central position in the NPD process of digital products and were able to provide detailed information about the NPD process in the respective Swiss media companies (see Table 3.1).

Based on identified requirements and characteristics from the theory and the theoretical artefact in Figure 2.29, a theoretical coding tree was created in Table 4.1. To link the theoretical coding tree with empirical findings, relevant information was first collected to find out how an NPD process was structured in each of the three Swiss media companies and how customers were involved in this process. Furthermore, specific problem areas originating from the theory were also addressed and new problem areas identified, which were subsequently compared with the theory in Table 4.2. This ultimately resulted in a preliminary empirical coding tree for the empirical artefact in the awareness phase of DSR, which can be seen in Table 4.3, in which the requirements and characteristics of the theory were compared with the empirical data. The insights gained were compared with the theoretical artefact in Figure 2.29 to obtain an initial interpretation of the empirical and theoretical findings.

3.5.1.4.2 Second Interview Phase

To deepen the results and relevant topics of the first interview phase and emphasise individual requirements and characteristics in the second interview phase, the second interview phase took place in the suggestion phase of the DSR process with two further Swiss media companies. The interview questions can be found in Appendix 1.1.2. The aim hereby was to create variant suggestions for the creation of an empirical artefact based on the three core areas of this study, namely the NPD process, customer co-creation, and cross-functional teams. This approach enabled new characteristics to be determined, which can be seen in the empirical coding tree of the empirical artefact (Table 5.1).

Table 3.5: Database of interviewee 4

Field	Description	Information in this study
Interviewee ID	Unique ID for each interviewee	Interviewee 4
Job title	Job title of the interviewee	Head of Digital Activities and Business Development
Company ID	Link to the company this interview belongs to	Swiss media company 5
Interview phase	Interview phase 1, 2, or 3	2
Date	Date conducted the interview	15.01.2024
Language	Original language	English
Recording	Source of the recording	Microsoft teams, and smartphone
Transcript	Cross-reference to the thematic analysis, which contains text blocks of the transcripts	Appendix 1.3.1

Table 3.6: Database of interviewee 5

Field	Description	Information in this study
Interviewee ID	Unique ID for each interviewee	Interviewee 5
Job title	Job title of the interviewee	Lead Product Manager
Company ID	Link to the company this interview belongs to	Swiss media company 2
Interview phase	Interview phase 1, 2, or 3	2
Date	Date conducted the interview	26.01.2024
Language	Original language	German
Recording	Source of the recording	Microsoft teams, and smartphone
Transcript	Cross-reference to the thematic analysis, which contains text blocks of the transcripts	Appendix 1.3.1

Table 3.5 and Table 3.6 show the databases for the interviewees in the second interview phase. Two further managers in the field of NPD of digital products were interviewed using semi-structured interviews. Compared to the first interview phase in section 3.5.1.4.1, these managers came from two other Swiss media companies, namely “Neue Zürcher Zeitung”, and “CH Media”. The interviewees had the job title “Head of Digital Activities and Business Development” and “Lead Product Manager”. Together with the first interview phase, five interviews were thus conducted in five different Swiss media companies.

By merging the requirements from the first interview phase and the second interview phase, the basis for the variant suggestion for the empirical artefact in section 5.1.3 could be created, which was then deepened by a cross-company analysis of the identified characteristics in section 5.2. These suggested variants were finally compared with the theory to select one variant for the development of an empirical artefact in section 6.1 in the development phase of DSR. The resulting empirical artefact is shown in Figure 6.5.

3.5.1.4.3 Third Interview Phase

The third and final interview phase was conducted during the feedback and evaluation phase of the DSR process. The interview questions can be found in Appendix 1.1.3. These five semi-structured interviews served as feedback interviews in which the theoretical artefact in Figure 2.29 and the empirical artefact in Figure 6.5 were shown and feedback was collected to evaluate the empirical artefact. The same five Swiss media companies participated in the third interview phase as in the first and second. Therefore, all five Swiss media companies, namely “TX Group”, “Schweizer Radio und Fernsehen”, “Ringier AG”, “CH Media”, and “Neue Zürcher Zeitung” were included.

Table 3.7: Database of interviewee 6

Field	Description	Information in this study
Interviewee ID	Unique ID for each interviewee	Interviewee 6
Job title	Job title of the interviewee	Chief Product Owner
Company ID	Link to the company this interview belongs to	Swiss media company 1
Interview phase	Interview phase 1, 2, or 3	1
Date	Date conducted the interview	22.04.2024
Language	Original language	German
Recording	Source of the recording	Microsoft teams, and smartphone
Transcript	Cross-reference to the thematic analysis, which contains text blocks of the transcripts	Appendix 1.3.2

Table 3.8: Database of interviewee 7

Field	Description	Information in this study
Interviewee ID	Unique ID for each interviewee	Interviewee 7
Job title	Job title of the interviewee	Lead Product Manager
Company ID	Link to the company this interview belongs to	Swiss media company 2
Interview phase	Interview phase 1, 2, or 3	2
Date	Date conducted the interview	03.05.2024
Language	Original language	German
Recording	Source of the recording	Microsoft teams, and smartphone
Transcript	Cross-reference to the thematic analysis, which contains text blocks of the transcripts	Appendix 1.3.2

Table 3.9: Database of interviewee 8

Field	Description	Information in this study
Interviewee ID	Unique ID for each interviewee	Interviewee 8
Job title	Job title of the interviewee	Chief Product Officer
Company ID	Link to the company this interview belongs to	Swiss media company 3
Interview phase	Interview phase 1, 2, or 3	1
Date	Date conducted the interview	03.05.2024
Language	Original language	German
Recording	Source of the recording	Microsoft teams, and smartphone

Transcript	Cross-reference to the thematic analysis, which contains text blocks of the transcripts	Appendix 1.3.2

Table 3.10: Database of interviewee 9

Field	Description	Information in this study
Interviewee ID	Unique ID for each interviewee	Interviewee 9
Job title	Job title of the interviewee	Chief Product Officer
Company ID	Link to the company this interview belongs to	Swiss media company 4
Interview phase	Interview phase 1, 2, or 3	1
Date	Date conducted the interview	10.05.2024
Language	Original language	German
Recording	Source of the recording	Microsoft teams, and smartphone
Transcript	Cross-reference to the thematic analysis, which contains text blocks of the transcripts	Appendix 1.3.2

Table 3.11: Database of interviewee 10

Field	Description	Information in this study
Interviewee ID	Unique ID for each interviewee	Interviewee 10
Job title	Job title of the interviewee	Head of Digital Activities and Business Development
Company ID	Link to the company this interview belongs to	Swiss media company 5
Interview phase	Interview phase 1, 2, or 3	2
Date	Date conducted the interview	10.05.2024
Language	Original language	English
Recording	Source of the recording	Microsoft teams, and smartphone
Transcript	Cross-reference to the thematic analysis, which contains text blocks of the transcripts	Appendix 1.3.2

Table 3.7, Table 3.8, Table 3.9, Table 3.10, and Table 3.11 show the databases for the interviewees in the third interview phase. To pursue a qualitative feedback approach that provided in-depth details of the NPD process in the respective Swiss media companies, the same people who were previously interviewed in the first and second interview phases were again selected as interview partners. These interviewees are of great relevance for this research because all interviewees had a high level of expertise in the NPD process in the respective Swiss media company and the empirical artefact was developed through the interviews conducted with them. Consequently, it would be almost impossible for other people without prior knowledge to understand the empirical artefact.

One interviewee had been promoted and had a new job title at the time of the third interview phase: the new job title of this interviewee was “Chief Product Officer”.

The aim of the third interview phase was to evaluate the empirical artefact from the previous interview phases. This was done through a detailed within-company analysis of

each individual company (Appendix 1.2) to analysis the feedback on the empirical artefact (section 7.1), followed by a cross-company analysis (section 7.2) looking for patterns of similarities and differences. These findings informed the empirical and theoretical evaluation (section 7.3) and subsequent refinement of the empirical artefact, ultimately contributing to the development of the design-oriented framework (section 7.4). This framework integrates the most important requirements and characteristics identified in the study.

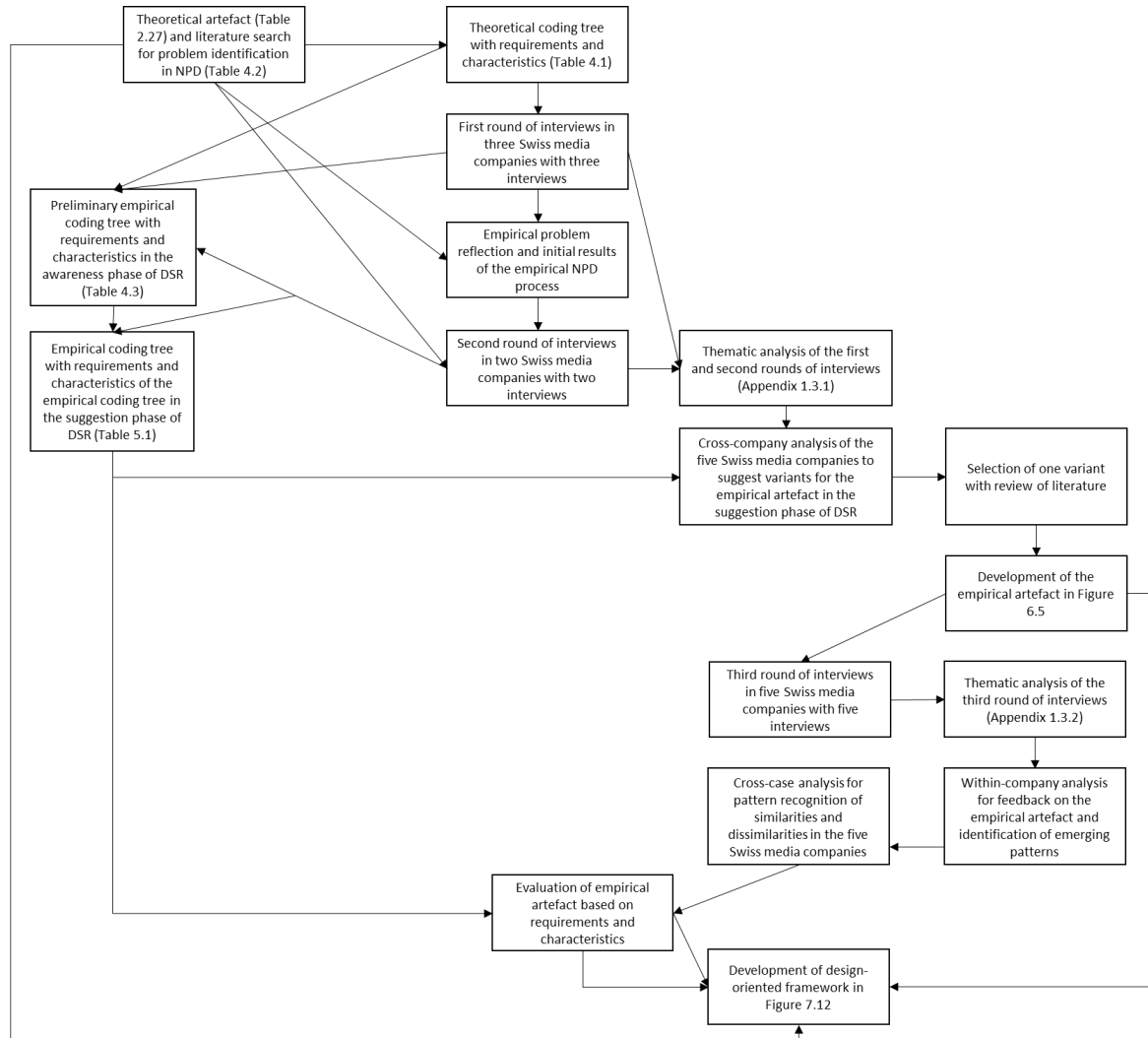
3.5.2 Data Analysis

This section describes the data analysis process used in this study. It begins by outlining the overall process, including a visual representation and a discussion of data triangulation. Subsequently, it details the specific data analysis approach by Yin (2015) undertaken for each of the three interview phases of this study.

3.5.2.1 Description of the Overall Data Analysis Process

This study utilised a rigorous and iterative process for data analysis, using both the process model of Mayring (2015) for the thematic analysis to define the units of analysis and the process phases of data analysis by Yin (2015), namely the stages of compiling, disassembling, reassembling, interpreting, and concluding.

Figure 3.4: Visualisation of the data analysis process



Crucially, as Figure 3.4 illustrates, this research took an inductive-deductive approach for the data analysis (see section 3.4.1), whereby theoretical patterns were continuously compared with observed patterns from the empirical data. This iterative process of pattern matching allowed the refinement of the initial understanding and led to the identification of new requirements, their prioritisation, and the development of alternative solutions for the empirical artefact in Figure 6.5. The iterative nature of data collection and analysis, which is characteristic of both DSR process and the chosen data analysis approach by Yin (2015), enabled a dynamic interplay between theory and empirical findings.

Initially, in the awareness phase of DSR, the requirements and characteristics were based on the theoretical artefact in Figure 2.29 to derive theory-driven requirements and characteristics in Table 4.1 that were presumptively central to the construction of the empirical artefact in Figure 6.5. By applying and comparing these requirements and

characteristics with empirical results from two interview phases, they could be emphasised, removed, or adapted, culminating in the empirical coding tree for the empirical artefact shown in Table 5.1. This allowed for a systematic exploration of the requirements and characteristics of customer-co-created NPD within these Swiss media organisations.

Based on this empirical coding tree, variants for the empirical artefact were suggested (sections 5.1.3 and 5.2) during the suggestion phase of DSR. In the development phase of DSR, one variant was selected (section 6.1), and an empirical artefact was subsequently developed (section 6.2). These requirements and characteristics were then reviewed (Table 7.13), based on those identified in the cross-company analysis of the third interview phase (section 7.2), to evaluate the empirical artefact (section 7.3.1) and establish an empirical coding tree for the development of the design-oriented framework (Table 7.14).

To enhance the structured data analysis, two thematic analyses were conducted, exploring the nuances of customer co-created NPD with cross-functional teams. Building on this, a two-step qualitative analysis was used during the feedback and evaluation phase of DSR for the within-company and cross-company analysis. This involved using the primary codes and subcodes identified in the within-company analysis as a foundation for the cross-company analysis. However, these codes were then adapted and refined into specific primary codes and subcodes appropriate for the cross-company comparison. Further details on the thematic analysis and the two-step qualitative analysis approach are provided in sections 3.5.2.2, 3.5.2.3, and 3.5.2.4.

Finally, data was analysed through triangulation, comparing empirical findings with existing theories and incorporating industry reports (such as Reuters).

Table 3.12: Data triangulation

Data source	Used in chapter	Description
Data from theory	Chapter 1	Data from theory was used to initiate the research (section 1.1), to define the research problem (sections 1.2 and 1.3), and to emphasise the research aim (section 1.4).
Industry report and NOGA codes	Chapter 1	This study utilised NOGA codes (Bundesamt für Statistik, 2008) to categorise the Swiss media industry into distinct segments (section 1.6.2). Reuters industry reports (Cornia et al., 2016; Newman et al., 2019; Sehl et al., 2016; Sehl et al., 2017) were used to describe the challenges in the private and public media sector and enrich the introduction of this research (sections 1.1 and 1.6.2).
Data from theory	Chapter 2	The literature review informed the development of the theoretical artefact and the identification of research gaps (section 2.4 to 2.5) throughout.

Data from theory	Chapter 3	Throughout the research process, the selection and application of the research methodology (section 3.1 to 3.5.2.4) was informed by a comprehensive review of the relevant literature.
Media report	Chapter 3	To assess the revenue indicators and market share of media companies in Switzerland (section 3.5.1.1.2), the five largest Swiss media companies were selected using data from the 2024 media report (Eisenegger et al., 2024).
Data from theory	Chapter 4 (awareness phase in DSR)	The theoretical coding tree (section 4.1.1), theoretical problems (section 4.1.2) and initial comparison of theory and empirical research (section 4.2) were based on existing literature.
Empirical Data	Chapter 4 (awareness phase in DSR)	The preliminary empirical coding tree (section 4.1.3), its relationship to theoretical problems (section 4.1.2), and the initial cross-company analysis of three Swiss media companies of the first interview phase (section 4.2), were related to empirical data.
Empirical Data	Chapter 5 (suggestion phase in DSR)	The empirical coding tree for the empirical artefact (section 5.1.1), the identification of relevant requirements (section 5.1.3), and the creation of variants for the empirical artefact based on those requirements' characteristics in the cross-company analysis of five Swiss media companies of the first and second interview phases (section 5.2) were derived from empirical data.
Data from theory	Chapter 5 (suggestion phase in DSR)	The theoretical alignment with the empirical coding tree (section 5.1.1) was achieved through a review of relevant literature.
Empirical Data	Chapter 6 (development phase in DSR)	The selection of the variant (section 6.1), the development of the empirical artefact (section 6.2), and emerging topics (section 6.3) were informed by the identified requirements and characteristics within the empirical coding tree (Table 5.1).
Data from theory	Chapter 6 (development phase in DSR)	The selection of the variant (section 6.1) was further supported by a comparison with existing literature. Similarly, the emerging topics highlighted new research gaps (section 6.3.2), prompting an updated literature review in chapter 2.
Empirical Data	Chapter 7 (feedback and evaluation phase in DSR)	The identification of feedback (based on within-company analysis in section 7.1) and the determination of patterns (based on cross-company analysis in section 7.2) of the third interview phase were derived from the empirical data. This informed the evaluation of the empirical artefact based on the identified requirements and characteristics (section 7.3.1). Consequently, the refinement of the empirical artefact (and the construction of this study's design-oriented framework) was grounded in the empirical data (section 7.4).
Data from theory	Chapter 7 (feedback and evaluation phase in DSR)	New and extended characteristics derived from cross-company analysis in section 7.2 were evaluated through a review of relevant literature (section 7.3.2). The development of the design-oriented framework was similarly supported by current literature and the integration of elements from the theoretical artefact (section 7.4).
Empirical Data	Chapter 8	The discussion of the results was based on the key findings from the cross-company analysis in section 7.2. Furthermore, the research gaps identified in sections 2.6 and 6.3.2 were addressed using the empirical findings.
Data from theory	Chapter 8	The discussion of the empirical results was informed by current literature (sections 8.1.2, 8.2.2, 8.3.2, and 8.4.2).
Industry reports and research reports	Chapter 8	To provide a more in-depth discussion of the results, industry reports from Reuters (Udris et al., 2024), and research reports from Capgemini Invent (2020) and Deloitte (Schwartz et al., 2020) were used.
Data from theory and	Chapter 9 (conclusion phase in DSR)	The last chapter of this study integrated empirical and theoretical insights. For instance, the theoretical contributions (section 9.2.3) drew on existing literature and were refined or expanded based on the

empirical Data		empirical data of this study. Similarly, the management implications (section 9.3) were informed by both theoretical perspectives and empirical observations, while suggestions for future research (section 9.4.3) originated from empirical findings enriched by insights from the literature.

Table 3.12 illustrates the data triangulation employed in this study. It provides a chapter-by-chapter breakdown, detailing the specific data sources utilised. This table demonstrates the interplay between theoretical data, empirical data, a media report, industry reports, NOGA codes, and research reports, ultimately achieving data triangulation.

3.5.2.2 First Interview Phase in Awareness Phase in Design Science Research

Based on the phase model of Yin (2015), the five analysis steps used in the semi-structured interviews in the awareness phase in DSR are presented below.

3.5.2.2.1 Compile Database

In the first step, a theoretical coding tree was created, which can be traced back to the literature and can be seen in Table 4.1.

Table 3.13: Example of the codebook structure of the theoretical coding tree in Table 4.1

Requirements from theory	Characteristics from theory
Definition of the requirement, which needs to be embedded in a customer co-created NPD process for digital products.	Definition of the theoretical characteristics of this requirement, which can be incorporated into a customer co-created NPD process for digital products.

Table 3.13 presents the structure of the codebook underpinning the theoretical coding tree in Table 4.1. This structure illustrates the initial approach used to gather requirements and characteristics in the awareness phase of DSR. This data will subsequently be compared with the empirical results obtained from the first interview phase (see section 3.5.2.2.2).

Furthermore, problem areas from the literature around customer co-created NPD processes were listed, which can be seen in Table 4.2. Based on the requirements and the characteristics in the coding tree as well as the theoretical problem identifications, interview questions were formulated. The interview questions in Appendix 1.1.1 aimed to understand the customer co-created NPD process in three Swiss media companies but also to identify the problems contained therein. These problems served as important insights to mirror them with the theory. After conducting the three interviews in the first interview phase, which were conducted in a semi-structured way, all interviews, which were recorded using Microsoft Teams and a smartphone, were transcribed one after the other. All three

interviews were conducted in German and translated into English (as explained in section 3.5.1.1.3). These three interviews took place in three different Swiss media companies (see section 3.5.1.4.1), thus covering three Swiss media companies.

3.5.2.2.2 Disassemble Data

In the second step, the data of the first interview phase was disassembled.

In this step, for the subsequent thematic analysis described in section 3.5.2.2.3, the units of analysis were defined with reference to Mayring (2015). The smallest unit in the text (coding unit) was defined as partial sentences (for example, if the separation was indicated by a comma), and the largest unit in the text (context unit) as whole text sections. The unit of analysis was each interview, with the three interviews being analysed in turn.

Thereby, the codes gathered from theory using requirements as primary codes and characteristics as subcodes from Table 4.1 were recorded in the NVivo software and each interview was individually assigned to these preliminary codes. This data disassembly was then downloaded from NVivo and inserted into a Microsoft word file to create a preliminary empirical coding tree in Table 4.3 that compares the characteristics from theory with the empirical results.

Table 3.14: Example of the codebook structure of the preliminary empirical coding tree of the empirical artefact in Table 4.3

Requirements from theory	Characteristics from theory	Characteristics from interviews in the awareness phase of DSR
Definition of the requirement, which needs to be embedded in a customer co-created NPD process for digital products.	Definition of the theoretical characteristics of this requirement, which can be incorporated into a customer co-created NPD process for digital products.	Characteristics identified in the first interview phase during the awareness phase of DSR, which correspond to the characteristics established in the theoretical coding tree.

Table 3.14 presents the codebook structure of the preliminary empirical coding tree of the empirical artefact in the awareness phase of DSR, as detailed in Table 4.3. Characteristics identified in the first interview phase in the awareness phase of DSR that correspond to those in the theoretical coding tree were subsequently integrated into this preliminary empirical coding tree.

3.5.2.2.3 Reassembling Data

The third step involved conducting a thematic analysis to facilitate a subsequent cross-company analysis of the three Swiss media companies. To achieve this, only essential text

components were retained, with irrelevant information removed. Characteristics present in the theoretical coding tree but not mentioned in the first interview phase (awareness phase of DSR) in the preliminary empirical coding tree (Table 4.3) were incorporated into the second interview phase in the suggestion phase of DSR to gather further information. Similarly, for characteristics identified in the first interview phase and integrated in the preliminary empirical coding tree in Table 4.3 but not present in the theoretical coding tree (Table 4.1), a supplementary literature review was conducted to identify relevant theoretical information for these characteristics. This is where a first iteration between theory and empiricism took place in the DSR process.

As detailed in section 3.5.2.3.3, the first and second round interview data were merged during the suggestion phase of the DSR process. This facilitated a thematic analysis, building upon the initial analysis conducted in the awareness phase of DSR, and a cross-company analysis across all five Swiss media companies, ultimately informing the suggested variants of the empirical artefact. Therefore, a provisional codebook was created in the awareness phase in DSR for the first interview phase, which was then combined in the suggestion phase to create a single codebook for all five interviews in the first and second interview phases of the awareness and suggestion phases in DSR.

This process was conducted in accordance with the codebook scheme proposed by Richards and Hemphill (2018). Their study developed a method for collaborative qualitative analysis, combining thematic analysis and the constant comparison method. While this research did not employ a collaborative approach within a research group, the method proved highly relevant, due to the need to compare and analyse data from both the first and second interview phases, spanning the awareness and suggestion phases of DSR.

Consequently, the structure of the codebook for the thematic analysis in this study mirrors the approach in Richards and Hemphill (2018). However, to align with the research strategy of DSR, “themes” are represented as “requirements” and “subthemes” as “characteristics”.

Table 3.15: Example of the codebook structure for the thematic analysis of the awareness and suggestion phase of DSR in Appendix 1.3.1

Requirement	Indicate the respective requirement
Characteristic	Indicate the respective characteristic
Code definition	Explanation of which text segments from the interview transcripts can be used.
Text block	Text block numbering (for example TB 1)
Interviewee	Identify the interviewee (for example, interviewee 3)

Text	Text from the interview transcript, according to Mayring (2015) (see sections 3.5.2.2.2 and 3.5.2.3.2)

Table 3.15 presents the codebook used for the thematic analysis of data gathered in the first and second interview phases, encompassing both the awareness and suggestion phases of DSR. This codebook includes assigned requirements and characteristics, a description of the code, numbered text blocks, identification of interviewees, and corresponding interview transcript excerpts. These excerpts are based on the units of analysis described by Mayring (2015) in sections 3.5.2.2.2 and 3.5.2.3.2. The complete codebook is available in Appendix 1.3.1.

Furthermore, the theoretically identified problems were compared with the empirical results in Table 4.2 to explore potential solutions, confirm or refute the theoretical problems, and develop countermeasures. Theoretical problems that were not identified in the first interview phase, or where further investigation was necessary, were explored in the second interview phase during the suggestion phase of DSR.

3.5.2.2.4 Interpret Data

To interpret the data, a cross-company analysis of the three Swiss media companies was carried out in sections 4.2.1, 4.2.2, 4.2.3, and 4.2.4, which provided initial insights into the NPD process from the empirical data. In this process, a comparison between the empirical findings and the theoretical artefact in Figure 2.29 was illustrated.

3.5.2.2.5 Concluding

Finally, section 4.2.5 presents a conclusion regarding the problems identified in the awareness phase. This conclusion highlights three specific areas: the NPD process, customer co-creation, and cross-functional teams, which constitute the key aspects of this study. Furthermore, in the first interview phase, the relevance cycle of DSR was utilised by focusing this research on the real-world challenge of customer co-creation in NPD processes in Swiss media companies. The design cycle of DSR was initiated by developing a theoretical coding tree (Table 4.1) based on existing literature and the theoretical artefact. This theoretical coding tree provided the basis for developing the preliminary empirical coding tree. Finally, the rigour cycle of DSR began with the first interview phase, where the empirical results were compared with the theoretical artefact in a cross-company analysis (section 4.2).

3.5.2.3 Second Interview Phase in Suggestion Phase in Design Science

Research

Based on the phase model of Yin (2015), the five analysis steps used in the semi-structured interviews in the suggestion phase in DSR are presented below.

3.5.2.3.1 Compile Database

In the second interview phase in the suggestion phase of DSR, two further interviews (section 3.5.1.4.2) were conducted in two other Swiss media companies than in the awareness phase, thus integrating two additional Swiss media companies. Consequently, together with the first interview phase, a total of five interviews were covered in the suggestion phase in DSR. In this process, individual characteristics were included in the interview questions in Appendix 1.1.2, which were available from the literature in Table 4.3 but remained unanswered in the preliminary empirical coding tree of the empirical artefact in the awareness phase of the DSR process in Table 4.3. In addition, unanswered problem areas from the theory were identified in Table 4.2 so that these could also be examined in more detail in the second interview phase in the suggestion phase of DSR. Further questions were also formulated to find out which requirements and characteristics are decisive for the suggestion of variants of the empirical artefact. The two semi-structured interviews in the suggestion phase of DSR were recorded using Microsoft Teams as well as a smartphone and were transcribed one after the other. One interview was conducted in German and then translated into English; the other interview took place directly in English (as explained in section 3.5.1.1.3).

Initially, the preliminary codebook for the thematic analysis presented in Table 3.15, which was based on the empirical data of the awareness phase, was employed to establish a foundation for the preliminary analysis of the two interviews conducted in the second interview phase in the suggestion phase of DSR. This was done so that a later thematic analysis could be carried out across all Swiss media companies of the first and second interview phases in the awareness and suggestion phase of DSR.

3.5.2.3.2 Disassemble Data

In this phase, the data was disassembled by examining the text elements of the two interviews in the second interview phase in the suggestion phase in DSR that had already been inserted into the preliminary codebook structure (Table 3.15). In doing so, all text

elements that were not relevant because they were either extraneous to the topic or resulted in repetitive sentences were removed. The units of analysis for the subsequent thematic analysis described in section 3.5.2.3.3 were based on Mayring (2015), in which the smallest unit in the text (coding unit) referred to partial sentences (for example, if the separation was indicated by a comma), and the largest unit in the text (context unit) referred to entire sections. The unit of analysis was based on each interview, with the first interview being analysed first, followed by the second interview.

Additionally, theoretical problems identified in Table 4.2, which were not adequately addressed or required further investigation based on the first interview phase in the awareness phase of DSR, were further examined in light of the empirical results obtained from the second interview phase in the suggestion phase of DSR (Table 5.2).

3.5.2.3.3 Reassembling Data

During the data disassembly phase (section 3.5.2.3.2) in the suggestion phase of DSR, only the textual data from the two transcripts of the second interview phase were examined. However, this phase also involved data reassembly, whereby all five interviews from both the awareness and suggestion phases of DSR were thematically analysed.

Building upon the preliminary codebook structure developed for the thematic analysis of the awareness phase in DSR (Table 3.15), the codebook was expanded to create a codebook structure with new characteristics based on the empirical coding tree of the empirical artefact in Table 5.1, which can be seen in Appendix 1.3.1. This codebook facilitated the thematic analysis of both the first and second interview phases, encompassing the awareness and suggestion phases of DSR, and enabled a cross-company analysis across all five Swiss media companies. Maintaining the structure established in Table 3.15, this codebook is informed by the study of Richards and Hemphill (2018).

Moreover, the thematic analysis of all five interviews, encompassing both the awareness and suggestion phases of DSR, revealed new characteristics that were not initially identified in the theoretical coding tree (Table 4.1) or the preliminary empirical coding tree for the empirical artefact (Table 4.3). This prompted a further review of the relevant literature. Subsequently, these newly identified characteristics were integrated into the empirical coding tree of the empirical artefact (Table 5.1). This comprehensive analysis facilitated a

thorough cross-company examination of all five Swiss media companies, drawing upon data from the first and second interview phases. Ultimately, this enabled the suggestion of variants for the empirical artefact.

Table 3.16: Example of the codebook structure of the empirical coding tree of the empirical artefact in Table 5.1

Requirements from theory	Characteristics from theory	Emphasised characteristics of suggestion phase interviews
Definition of the theoretical requirement, which needs to be embedded in a customer co-created NPD process for digital products.	Definition of the theoretical characteristics of this requirement, which can be incorporated into a customer co-created NPD process for digital products.	Identification of the characteristics most strongly emphasised in the second interview phase in the suggestion phase of DSR aimed to inform the subsequent suggestion of variants for the empirical artefact.

Table 3.16 presents the codebook structure for the empirical artefact (see Table 5.1). Within this table, the most prominent characteristics identified in the second interview phase are highlighted in colour. This informs the subsequent suggestion of variants for the empirical artefact in section 5.2. Ultimately this leads to the selection of one variant and the development of the empirical artefact in chapter 6 (development phase of DSR).

3.5.2.3.4 Interpret Data

The thematic analysis conducted during the suggestion phase of DSR informed a two-step process of empirical artefact development. Initially, requirements were synthesised to establish a preliminary structure for the artefact (section 5.1.3). Next, a comprehensive cross-company analysis of all five Swiss media companies was performed (section 5.2). This analysis, drawing upon the identified characteristics in the empirical coding tree of the empirical artefact (Table 5.1) and integrating the findings of the thematic analysis, led to the suggestion of multiple variants in the suggestion phase of DSR. These variants were integrated within a predefined structure, established through the synthesis of requirements. During the subsequent development phase of DSR in chapter 6, these variants were evaluated through current literature and finally one variant was selected (section 6.1), culminating in the development of the empirical artefact (section 6.2).

3.5.2.3.5 Concluding

During the second interview phase in the suggestion phase of DSR, an empirical coding tree was developed (section 5.1.1), strengthening the relevance cycle of DSR. This also involved a thematic and cross-company analyses to suggest variants for the empirical artefact (section

5.2), thus promoting the rigour cycle of DSR. Finally, the design cycle of DSR was addressed by selecting a variant during the development phase of DSR (section 6.1), which resulted in the development of the empirical artefact of this study (section 6.2).

3.5.2.4 Third Interview Phase in the Feedback and Evaluation phase in Design Science Research

Based on the phase model of Yin (2015), the five analysis steps used in the semi-structured interviews in the feedback and evaluation phase in DSR are presented below.

3.5.2.4.1 Compile Database

In the third interview phase in the feedback and evaluation phase of DSR, five semi-structured interviews were conducted (section 3.5.1.4.3) and recorded with Microsoft Teams and a smartphone. The corresponding interview questions can be found in Appendix 1.1.3. Four interviews were conducted in German and translated into English. One interview was conducted directly in English (as described in section 3.5.1.1.3).

In third interview phase in the feedback and evaluation phase of DSR, three different purposes were addressed. Initially, a within-company analysis was conducted to examine each Swiss media company individually. Each company was examined in detail to identify the feedback on the empirical artefact and emerging patterns. Next, a cross-company analysis delved deeper into these patterns, comparing findings across all five Swiss media companies. This step was crucial in answering the research questions, generating new scientific insights, and facilitating discussion of the empirical results in relation to existing literature. Finally, the cross-company analysis enabled evaluation of the empirical artefact by confirming, reducing, extending, and adding requirements and characteristics. This yielded the basis for refining the empirical artefact and, in turn, constructing this study's design-oriented framework.

In this context, initially, the empirical coding tree of the empirical artefact was used as a preliminary codebook (Table 3.17) to create a basis for the coding of the third interview phase. The text elements of each interview transcript of the third interview phase in the feedback and evaluation phase in DSR were entered one after the other into the scheme of this preliminary coding tree.

Table 3.17: Example of the preliminary codebook structure for the third interview phase in the feedback and evaluation phase of DSR in Table 5.1

Requirements from theory	Characteristics from theory	Characteristic of the empirical coding tree of empirical artefact
Definition of the theoretical requirement, which needs to be embedded in a customer co-created NPD process for digital products.	Definition of the theoretical characteristics of this requirement, which can be incorporated into a customer co-created NPD process for digital products.	Integration of text elements from the transcript of the third interview phase in the feedback and evaluation phase in DSR into the identified characteristics from the empirical coding tree of the empirical artefact.

Table 3.17 presents the preliminary codebook, derived from the empirical coding tree of the empirical artefact (Table 5.1). Informed by the characteristics identified in the first and second interview phases (awareness, suggestion and development phases of DSR), initial text modules were incorporated from all five interviews conducted during the third interview phase (feedback and evaluation phase of DSR).

3.5.2.4.2 Disassemble Data

At first, useless information in the preliminary codebook in Table 3.17 that had nothing to do with the topic, and repetitive sentences were removed. Then, the focus was on conducting a within-company analysis of all Swiss media companies, which means that these companies were analysed individually (see Appendix 1.2). Unlike in the two previous interview phases, the aim in the within-company analyses was not yet to identify the requirements and characteristics for the construction of an artefact, but to receive feedback on the empirical artefact and to filter out emerging patterns based on the preliminary codebook in Table 3.17. To identify these emerging patterns, thematic analysis, consistent with the approach used in the awareness and suggestion phases of DSR, was employed. This thematic analysis facilitated a targeted and structured examination of topics, ultimately providing a comprehensive overview of the themes emerging in the third interview phase. In this regard, the same codebook structure for the thematic analysis (Table 3.15) was used in the feedback and evaluation phase of DSR proposed by Richards and Hemphill (2018), as detailed in Appendix 1.3.2. This thematic analysis served as the foundation for the subsequent detailed within-company and cross-company analyses.

For the thematic analysis, the units of analysis were defined with reference to Mayring (2015). The smallest unit in the text (coding unit) was defined as partial sentences (for example, if the separation was indicated by a comma), and the largest unit in the text (context unit) as whole text sections. The unit of analysis for the within-company analysis

was each interview, with the five interviews being analysed in succession. However, a two-step qualitative analysis process was used for the cross-company analysis that took place later, as detailed in section 3.5.2.4.3. In this context, the units of analysis for the cross-company analysis reflected that of the within-company analysis, but with new codes and subcodes being identified across the entire set of interviews.

To perform the thematic analysis, Google's generative artificial intelligence (AI) tool "Gemini" was used in several iterations until specific patterns reflecting the requirements and characteristics were found. This thematic analysis served as the basis for the within-company analysis and the cross-company analysis.

3.5.2.4.3 Reassembling Data

In the next phase, the data were reassembled, for which a two-step qualitative analysis process was used. The aim of the third interview phase in the feedback and evaluation phase of DSR was to identify weaknesses in the empirical artefact, to refine the empirical artefact through the development of a design-oriented framework, and to answer the research questions. As mentioned in section 3.5.2.4.2, this two-step data analysis started with a within-company analysis to detect feedback on the empirical artefact and emerging patterns in each individual Swiss media company. This was followed by cross-company analysis, where new codes were identified to capture patterns for similarities and dissimilarities across the data set in all five interviews of the third interview phase in the feedback and evaluation phase of DSR. This in-depth analysis, which went beyond the initial thematic analysis in section 3.5.2.4.2, required a comprehensive codebook to detect nuanced patterns and disparities, which led to the development of another codebook based on Mackieson et al. (2019).

To be able to carry out a within-company analysis, each interview was transferred individually to Microsoft Excel with the corresponding text blocks from the interview transcripts based on the requirements and characteristics from the thematic analysis.

The initial primary codes were formed individually for each interview based on the identified requirements and subcodes based on the identified characteristics from the thematic analysis, by searching for similarities in the individual requirements and characteristics. Unusable information that was present in the text elements was deleted. In addition,

Google’s generative AI-tool “Gemini” was used to consolidate the final primary codes and subcodes for the within-company analysis of each individual interview in several iterations.

Table 3.18: Example of the codebook structure in Appendices 1.3.3 and 1.3.4 for primary codes in the within and cross company analysis in the feedback and evaluation phase of DSR

Code	Name of the primary code
Level	Level 1 = primary code
Short definition	Short definition of the primary code
Full definition	Long description of the primary code
When to use	Description of when the primary code can be used
Example	Example of a text in the interview transcript that belongs to this primary code
When not to use	Description of when the primary cannot be used

Table 3.19: Example of the codebook structure in Appendices 1.3.3 and 1.3.4 for subcodes in the within and cross company analysis in the feedback and evaluation phase of DSR

Code	Name of the subcode
Level	Level 2 = subcode
Links to	Linking to the primary code for this subcode
Short definition	Short definition of the subcode
Full definition	Long description of the subcode
When to use	Description of when the subcode can be used
Example	Example of a text in the interview transcript that belongs to this subcode
When not to use	Description of when the subcode cannot be used

Table 3.18, and Table 3.19 present an example of the codebook structure, illustrating both a primary code and a subcode, for the within-company and cross-company analysis in the feedback and evaluation phase of DSR. This structure is based on the framework developed by Mackieson et al. (2019). The complete codebook for the within-company analysis can be found in Appendix 1.3.3 and the codebook for the cross-company analysis is available in Appendix 1.3.4.

In addition to a within-company analysis, a cross-company analysis (see section 7.2) was conducted during the feedback and evaluation phase of DSR. This aimed to identify patterns of similarity and difference across the individual Swiss media companies. Building upon the within-company codes, new primary codes and subcodes for cross-company topics were developed through iterative analysis, aided by Google’s generative AI tool, “Gemini”. This process involved initially comparing all text elements within the primary and subcodes from the within-company analysis, seeking similar themes across each company to identify preliminary patterns of similarity and dissimilarity. Gemini was then employed to discern further patterns, ultimately informing the manual creation of the final primary and subcodes. The codebook for the cross-company analysis in the feedback and evaluation phase of DSR follows the same structure as that presented in Table 3.18, and Table 3.19.

This precise coding in the cross-company analysis allowed patterns of similarities and differences to be identified across all five Swiss media companies. This, in turn, enabled the identification of requirements and characteristics (derived from the empirical coding tree in Table 5.1), which informed the central requirements and characteristics for refining the empirical artefact.

This precise coding in the cross-company analysis allowed for the identification of patterns of similarity and difference across all five Swiss media companies. This, in turn, enabled the identification of requirements and characteristics (based on those identified in the empirical coding tree shown in Table 5.1), which then enabled the determination of the central requirements and characteristics (see, for example, Table 7.6) for evaluating and refining the empirical artefact.

To evaluate the empirical artefact, an assessment was conducted based on the requirements and characteristics of the empirical coding tree shown in Table 5.1. This involved aligning the empirical coding tree with the central requirements and characteristics identified in the cross-company analysis of the third interview phase. This process, illustrated in Table 7.13, involved confirming, reducing, extending, and adding requirements and characteristics within the empirical coding tree for the empirical artefact (section 7.3.1), based on the cross-company analysis in the feedback and evaluation phase of DSR. New and extended requirements and characteristics were then compared with existing literature (section 7.3.2). These evaluated requirements and characteristics then formed the basis for refining the empirical artefact, which constituted the development of this study's design-oriented framework.

Table 3.20: Example of the codebook structure for the empirical coding tree of the evaluation of the empirical artefact in Table 7.13

List of requirement and characteristics from the empirical artefact	Evaluation of requirements and characteristics from the empirical artefact
Definition of the requirement or characteristic of the empirical artefact.	Evaluation of the requirement or characteristic from the empirical artefact based on the cross-company analysis of the third interview phase.

Table 3.20 presents the codebook structure of the evaluation of the requirements and characteristics of the empirical artefact in the feedback and evaluation phase of DSR (Table 7.13). This structure illustrates how the requirements and characteristics of the empirical

artefact were evaluated, providing the basis for its refinement, integrated in the construction of a design-oriented framework.

3.5.2.4.4 Interpret Data

A within-company analysis of the five Swiss media companies from the third interview phase was conducted initially. This involved a detailed examination of each individual company, which is described in Appendix 1.2. This formed the feedback of the interviewees of the empirical artefact in section 7.1. Building on this, a cross-company analysis in the feedback and evaluation phase of DSR was conducted in section 7.2, which identified important patterns of similarities and dissimilarities across Swiss media companies. With the help of the cross-company analysis, empirical requirements and characteristics that were decisive for the construction of the design-oriented framework could then be identified. To do this, the empirical coding tree of the empirical artefact in Table 5.1 was taken as a basis and evaluated through the identified requirements and characteristics from the cross-company analysis in Table 7.13. This resulted in evaluated and refined requirements and characteristics (Table 7.14), which were crucial for the development of the design-oriented framework.

3.5.2.4.5 Concluding

In the third interview phase, the focus was on evaluating and refining the empirical artefact. In this respect, the evaluation of the empirical artefact strengthened the relevance cycle in DSR. This was achieved by evaluating the requirements and characteristics of the empirical coding tree (Table 5.1), against the requirements and characteristics identified in the cross-company analysis of the feedback and evaluation phase of the DSR process in Table 7.13. This resulted in an empirical coding tree that informed the development of this study's design-oriented framework. The design cycle of DSR at this stage culminated in the development of a design-oriented framework (section 7.4) – a refined and improved solution based on the evaluation of the empirical artefact. This involved a thorough analysis of the interview data using thematic analysis and AI-powered coding to identify key requirements and characteristics. The rigour cycle of DSR was strengthened through a two-step qualitative analysis process, including the development of comprehensive codebooks and an iterative refinement of the design-oriented framework based on empirical findings and existing literature. This ensured the design-oriented framework was not only relevant to real-world

challenges, but also rigorously designed and validated, ultimately contributing to new theory. Finally, the key results of the cross-company analysis in section 7.2 were discussed in chapter 8, which also addressed the research gaps identified in sections 2.6, and 6.3.2.

3.6 Theoretical Saturation

The study by Guest et al. (2020) provides an important basis for calculating the theoretical saturation. In this context, theoretical saturation is reached when new incoming data provides little or no new information.

In this regard, Guest et al. (2020) refers to three elements: base size, run length, and the threshold for new information. Base size refers to the minimum number of initial data collection events, such as interviews. The denominator for calculating the saturation rate is the available base themes, which emerge from the new information gathered in these initial interviews. The run length is the number of consecutive data collection events (such as interviews) where new themes are identified. These new themes form the numerator of the saturation rate. The new information threshold represents the pre-defined acceptable value (proportion) of new information obtained in a run, below which data collection can be considered saturated.

To utilise these saturation elements in this study, the context of this study must first be explained. A total of three interview phases were conducted in this research (see sections 3.5.2.2 to 3.5.2.4). Based on the theoretical coding tree (Table 4.1), a preliminary empirical coding tree (Table 4.3) was developed using the first interview phase during the awareness phase in DSR. In the second interview phase, which took place during the suggestion phase of DSR, the preliminary empirical coding tree was further developed into an empirical coding tree (Table 5.1) to suggest variants for the empirical artefact. In the third interview phase, feedback was gathered in the feedback and evaluation phase of DSR to evaluate the empirical artefact (Table 7.13), resulting in an empirical coding tree (Table 7.14) for the construction of the design-oriented framework.

This explanation highlights two key differences from Guest et al. (2020), even though the underlying principle of the approach can be adapted:

Firstly, the findings of this study originated from a pre-conceived theoretical basis. Consequently, in contrast to Guest et al. (2020), the “base themes” in this study must be derived from the theoretical coding tree (Table 4.1), rather than emerging from the initial interviews. These base themes were subsequently expanded through the incorporation of new empirical information.

Secondly, Guest et al. (2020) examined the interviews sequentially. This study, however, considers interview phases, meaning the interviews are analysed collectively rather than individually to elicit new information or findings. This implies that a “run length” is not applicable in this study. Therefore, it is important to emphasise that this does not alter the principle of Guest et al. (2020) but merely considers interview phases instead of individual interviews to obtain new themes. Furthermore, to enhance alignment with Guest et al. (2020), the new information threshold is likewise set at <5%. This is further demonstrated in Table 3.21.

Table 3.21: Elements of theoretical saturation

	Base size	Base themes	New themes	New information threshold (quotient)
Theoretical coding tree	-	31	-	-
Preliminary empirical coding tree	3 interviews	31	4	12.90%
Empirical coding tree (empirical artefact)	2 interviews	31	2	6.45%
Empirical coding tree (design-oriented framework)	5 interviews	31	1	3.23%

Table 3.21 illustrates the changes in the quotient of new information. Based on the 31 base themes within the theoretical coding tree (Table 4.1), the initial interview phase of three interviews yielded four new themes for the preliminary empirical coding tree (Table 4.3), resulting in a 12.9% quotient of new information (calculation: $4/31 \times 100$). The second interview phase, comprising two interviews, added a further two new themes to the empirical coding tree for the empirical artefact (Table 5.1) resulting in a 6.45% quotient of new information (calculation: $2/31 \times 100$). In the third interview phase, one new theme was identified during the evaluation of the empirical artefact (Table 7.13), and this was subsequently incorporated into the empirical coding tree for the design-oriented framework (Table 7.14). This resulted in a quotient of 3.23% of new information (calculation: $1/31 \times 100$). As this final value is below 5%, it suggests that the theoretical saturation has been reached.

The achievement of theoretical saturation, adapted from Guest et al. (2020) with a new information threshold of <5%, suggests that for this highly specific research topic – customer co-creation in NPD involving cross-functional teams in the Swiss media industry – the necessary depth of information was obtained. This was facilitated by a very specific interviewee profile (see Table 3.1). As highlighted in section 3.5.1.1.2, the highly specialised nature of the topic meant that only a limited number of individuals possessed the detailed knowledge required to answer the interview questions comprehensively, which explains the total of 10 interviews conducted across two managers at each Swiss media company.

3.7 Use of Generative Artificial Intelligence in this Study

This study utilised Google’s generative AI-tool, “Gemini”. As already explained in the data analysis section 3.5.2.4, this AI tool facilitated pattern identification and aided in the design of appropriate primary codes and subcodes. Additionally, Gemini was employed to refine individual code descriptions within Appendices 1.3.3 and 1.3.4.

Furthermore, given that English is not the author’s native language, Gemini assisted in enhancing the stylistic formulation of the text to ensure high-quality language throughout. It is crucial to emphasise that Gemini did not author this study; its role was limited to textual adjustments to achieve a polished, UK English style. The content of this study was written by the author, with Gemini merely embellishing or adapting the text. However, the primary purpose of utilising Gemini was to perform data analysis, identifying intricate patterns that would prove challenging for human researchers to discern.

To further ensure linguistic accuracy and clarity, this study was subsequently proofread by a professional proofreader in England. This rigorous proofreading process adheres to the highest standards of academic writing.

4 Awareness-Phase

This chapter addressed the results derived from the awareness phase of the design science research (DSR) process, the chosen research strategy for this study (see section 3.2). Three interviews were conducted in the first interview phase. These involved decision-makers in the field of new product development (NPD) for digital products within three Swiss media companies.

In the awareness phase of DSR, requirements and characteristics were identified from the theory and subsequently mapped onto a theoretical coding tree in Table 4.1. Guided by the empirical results, a preliminary empirical coding tree in Table 4.3 was then developed. This allowed for a comparison between the theoretical requirements and characteristics, and the empirical results gathered from the first interview phase.

The results presented in this chapter were generated through a cross-company analysis of these three Swiss media companies. The awareness phase of the DSR process focused on identifying real-world problems within the Swiss media industry. This served to, firstly, corroborate the research problem outlined in section 1.3, and secondly, compare the theoretically derived problems with empirical findings presented in section 4.1.2. Moreover, a cross-company analysis yielded insights into the NPD process across the three Swiss media companies, comparing these processes with the theoretical artefact in section 4.2.

4.1 Introduction

This section is divided into three areas. First, the theoretical coding tree, developed from the literature review in chapter 2, is presented. Next, the theoretical problems identified and discussed in the first interview phase are presented. Finally, the preliminary empirical coding tree for the development of the empirical artefact is illustrated.

4.1.1 Theoretical Coding Tree of this Study

The development of the theoretical artefact in section 2.7 facilitated the construction of a theoretical coding tree. This coding tree, derived from the most important theoretical requirements and characteristics, served as a foundation for incorporating empirical requirements and characteristics gathered during the first interview phase in the awareness

phase of the DSR process. Table 4.3 presents a comparison between the theoretical and empirical requirements and characteristics.

Table 4.1: Theoretical coding tree for awareness phase in DSR

Requirements	Characteristics from theory
Agile process frameworks (Ikonne, 2021)	Scrum (Marion et al., 2021)
	SAFe (Liu et al., 2020)
	Kanban (Jana & Pal, 2020)
	Lean startup (Zorzetti et al., 2022)
Project framework conditions (Kiselev et al., 2020)	Governance (Kiselev et al., 2020)
	Lifecycle management (Houston & Kennedy, 2020)
	Quality management (Abdullah et al., 2021)
New product development methods (Khannan et al., 2021)	Hybrid development (agile + waterfall) (Bianchi et al., 2020)
	Agile development (Bianchi et al., 2020)
	Waterfall development (Bianchi et al., 2020)
	User-centred process methods (Kim et al., 2022)
Cross-functional interaction (Ahmed et al., 2021)	Functional roles (Larson, 2022)
	Team efficiency (Zalpuri & Hamlin, 2020)
	Dependency between teams (Alhammadi & Bashir, 2021)
	Team structure (Larson, 2022)
Testing methods with customers (Salinas et al., 2020)	Prototyping (Salinas et al., 2020)
	Usability evaluation method (Salinas et al., 2020)
	Social media (El Nemar et al., 2022)
Customer centricity (Habel et al., 2020)	Corporate culture (Habel et al., 2020)
	Customer centred corporate strategy (Colleoni et al., 2021)
	Customer co-creation (El Nemar et al., 2022)
Customer value (Kristensson, 2019)	Digital services (Kristensson, 2019)
	Product characteristics (Abdu Raffi & Chaldun, 2022)
	Personalisation (Basaran & Ventura, 2022)

Table 4.1 shows the theoretical coding tree, which, together with the theoretical requirements and characteristics, formed the underlying coding structure for the data analysis of the first interview phase and, accordingly, for the preliminary empirical coding tree. From all three interview transcripts, relevant text elements were assigned to the respective requirements and characteristics in Table 4.1. First, Interview 1 was assigned, then Interview 2 and then Interview 3.

The individual requirements and their characteristics from theory are described in greater detail below:

One process framework for knowledge generation, developed through long-lasting collaborative and iterative software development, was scrum (Marion et al., 2021). Scrum was identified as an agile process framework (Ikonne, 2021). Consequently, the first requirement, “agile process frameworks”, and its first characteristic, “scrum”, were specified in the theoretical coding tree in Table 4.1.

Further, Liu et al. (2020) described how SAFe had been utilised as a framework to circumvent the limitations of agile methods, such as their suitability primarily for small projects requiring constant customer feedback integration. Therefore, “SAFe” was categorised as the second relevant characteristic.

Another established practice within agile process frameworks was “kanban” (Jana & Pal, 2020), which led to its inclusion as a further characteristic.

As agile methods often presented limitations in problem understanding and solution finding, some authors, including Zorzetti et al. (2022), proposed combining discovery-orientated methods, such as lean startup, with agile approaches to overcome these limitations. Although not strictly an agile process framework itself, “lean startup” was included as another characteristic in Table 4.1 due to its synergy with agile process frameworks.

A study by Kiselev et al. (2020) revealed that weak governance was a major factor in the failure of IT projects. This finding highlighted the critical role of governance in establishing project framework conditions for NPD projects, particularly for software-based digital products. Consequently, “governance” was identified as the first key characteristic within the “project framework conditions” requirement.

Furthermore, Houston and Kennedy (2020) emphasised the importance of a comprehensive portfolio management framework for new applications. This framework needed to support the entire lifecycle management process, ensuring that new applications were thoroughly evaluated and remained relevant and aligned with organisational requirements post-implementation. Thus, managing the entire lifecycle emerged as the second crucial characteristic in structuring projects related to the development of new digital products, such as applications.

An analysis by Abdullah et al. (2021) examined six prominent project management standards, guidelines, and methods: ISO16000, PMBOK®, APMBOK, PRINCE2, P2M, and ICB. The analysis found that “quality management” was the sole common element across all six. This underscored the significance of quality management as the third vital characteristic of project framework conditions.

Research in the field of NPD yielded methods designed to enhance product development (Khannan et al., 2021). These NPD methods constituted the third requirement identified from the literature. Thereby, Bianchi et al. (2020) identified three key characteristics for these methods, which were integrated in Table 4.1: hybrid development, agile development, and waterfall development. Their study described the relationship between plan-driven and flexible agile processes, which resulted in a hybrid NPD approach.

Furthermore, Kim et al. (2022) noted that user-centred roadmap processes deeply incorporated current and future user needs. Consequently, user-centred design and technology selection were linked to strategy in practice. As this study pertained to customer integration in NPD, “user-centred design” was deemed a relevant characteristic for new product development methods.

Analysis by Ahmed et al. (2021) showed that introducing cross-functional interaction improved NPD process performance. Therefore, cross-functional interaction emerged as the fourth requirement in Table 4.1, further subdivided by characteristics of cross-functional teams. In this regard, Larson (2022) defined functional roles as those based on an employee’s function, such as analyst or accountant. Thus, defining these functional roles was crucial, reflecting a key characteristic. Furthermore, Zalpuri and Hamlin (2020) highlighted the need for effective cross-functional teams throughout the NPD lifecycle to ensure delivery

and problem-solving. The efficiency of these teams appeared vital for product success and was selected as a characteristic.

Moreover, Alhammadi and Bashir (2021) demonstrated that developing complex products required managing information flow between individuals from diverse specialisms.

Understanding the often unpredictable or vague information dependencies between teams was essential. This highlighted the existence of dependencies in large, specialised teams, making inter-team dependency another key characteristic.

Furthermore, Larson (2022) argued that companies with cross-functional and overlapping teams needed flexible functional roles assigned to members of multiple teams. This reflected the team structure of cross-functional teams, constituting a fourth important characteristic.

Salinas et al. (2020) established the fifth requirement, "testing methods with customers", and its two associated characteristics. They demonstrated that many companies employed redesigns with prototyping (characteristic 1) and user tests for usability evaluation (characteristic 2).

Furthermore, El Nemar et al. (2022) described how companies utilised social media as a means for customers to offer ideas without direct integration into the NPD process. Consequently, social media emerged as another relevant characteristic for testing methods with customers.

The sixth requirement, customer centricity, encompassed several characteristics. The first pertained to corporate culture, as evidenced by Habel et al. (2020), who demonstrated that a company was perceived as customer-centric only if its entire operation reflected a customer-focused culture.

A second characteristic related to corporate strategy. Colleoni et al. (2021) characterised customer centricity as placing customers at the centre of the organisational process.

The third characteristic, customer co-creation, stemmed from El Nemar et al. (2022), who showed that customer involvement throughout the entire NPD process was of paramount importance to companies.

Kristensson (2019) highlighted that customer prioritised outcomes over technology; for instance, they valued the benefits of good health rather than simply the technology used to monitor it. Organisations needed to understand this mindset when developing digital services, ensuring technology served to improve the customer's situation. Thus, customer value emerged as a crucial consideration in the digital age, achievable through technologies and associated digital services. Consequently, "customer value" was established as the seventh requirement, with "digital services" as its first characteristic.

Abdu Raffi and Chaldun (2022) emphasised that products needed to possess specific characteristics that fulfilled customer needs to ensure effective product use. Therefore, "product characteristics" became the second characteristic for delivering customer value.

Furthermore, Basaran and Ventura (2022) illustrated how providers like Spotify and Netflix leveraged data from their subscription platforms to offer personalised content. Such possibilities in the digital age facilitated a more personalised product experience. Consequently, "personalisation" was identified as another vital characteristic for providing customer value.

4.1.2 Key Papers of the Problems for the Awareness Phase

This section identified key research papers that facilitated problem identification within the awareness phase of the DSR process. For each requirement, at least one problem drawn from the literature is presented. An overview of these requirements was provided in the preliminary empirical coding tree (Table 4.3). Each theoretical problem was then considered in relation to the interviews conducted during the awareness phase. When a theoretical problem found no direct application within these initial interviews, further exploration was undertaken during the second interview phase in the suggestion phase of the DSR process (see section 5.1.2).

Table 4.2: Key papers of the problems, applied in the interviews of the awareness phase of DSR

Requirement	Problem from theory	Application in interviews
Agile process frameworks	Lean startup only created incremental value (Felin et al., 2020).	No direct application was possible. The topic was taken up again in the interviews during the suggestion phase of DSR.
Project management	To support the development of new products, companies often used digital product lifecycle management systems (Schweitzer et al., 2019). However, product lifecycles were becoming increasingly compressed due to the competitive market and the rapid evolution of technology and customer demands (Dogan & Cebeci, 2021).	No lifecycle models were used (Interviewee 2, TB 49, and Interviewee 3, TB 53). Instead, attention was paid to the technical lifecycle (Interviewee 2, TB 50). The problem here was that many people have a say, such as the strategy department (Interviewee 2, TB 36) or management (Interviewee 3, TB 54), to evaluate whether to invest in a new digital product development or not.
Project framework conditions	The NPD team relied on an integrated approach, enabling them to revisit any phase based on the results and feedback gathered throughout the NPD process. However, a key problem emerged: team members lacked clarity on how and when to transition between the required stages (Dogan & Cebeci, 2021).	No direct application was possible. The topic was taken up again in the interviews during the suggestion phase of DSR.
New product development methods	Due to various factors such as the unpredictability of customer demand, organisations needed to integrate new approaches such as agile product development (Palsodkar et al., 2023). However, research into the combination of hybrid models, such as stage-gate and agile methods, indicated that agile methodologies can negatively impact time-to-market due to the incorporation of early and frequent user feedback (Bianchi et al., 2020).	Interviews indicated that the agile product development approach is already being strengthened in all companies (Interviewee 1, TB 62, Interviewee 2, TB 70, and Interviewee 3, TB 75). However, agile process methods such as scrum were mainly used in the development phase (Interviewee 1, TB 3). Regarding the pre-development phases, one interviewee indicated that a sequential approach was initially employed. This entailed managerial approval of a business case (Interviewee 3, TB 83) before transitioning to agile and lean methodologies (Interviewee 3, TB 75). This highlighted the apparent importance of the hybrid development approach. Consequently, the problem identified by Bianchi et al. (2020) was further emphasised in the suggestion phase of DSR.
New product development methods	In large companies, the entire design thinking process in terms of user-centred process was rarely used due to the hierarchical and waterfall-orientated structure. Instead, only the last three phases ideate, prototype and test are used (Kwon et al., 2021).	No full process was used regarding established user-centred process methods (Interviewee 1, TB 88, and Interviewee 2, TB 90). With direct reference to design thinking, it was mentioned that design thinking was not used in the development phase (Interviewee 2, TB 90) and that the idea behind design thinking was only applied with internal stakeholders and not directly with customers (Interviewee 3, TB 93).
Cross-functional interaction	Too much communication across different areas of knowledge in cross-functional teams worsened team results (Larson et al., 2023).	It could be interpreted from the interviews that different teams in a cross-functional setting were dependent on each other (Interviewee 1, TB 118, and Interviewee 2, TB 119) and that communication played thereby a very important role in enabling them to work together towards the same end goal (Interviewee 1, TB 123, and Interviewee 2, TB 124). As communication itself

		could therefore be categorised as relevant, the communication aspect in cross-functional teams was further considered in the interviews of the suggestion phase of DSR.
Testing methods with customers	In terms of the process for new product development, modern companies were increasingly focusing on value co-creation through social media (Zhang et al., 2020). However, very little information was available on the value co-creation research about the customer co-creation experience value enabled by social media (Zhang et al., 2023).	Social media was not used in any media company to increase value co-creation in relation to new product development of digital products (Interviewee 1, TB 176, Interviewee 2, TB 177, and Interviewee 3, TB 178-179).
Customer centricity	Customers only perceived companies as customer-centred if a particular company was customer-centred both at the overall company level and at the level of the salesperson (Habel et al., 2020).	Interviewees considered Swiss media companies to be customer-centric (Interviewee 2, TB 194, and Interviewee 3, TB 202 and TB 215), but that there was still great potential for further development in this area (Interviewee 2, TB 197, and Interviewee 3, TB 203). For example, not all company processes were yet customer-centric (Interviewee 2, TB 198), which was therefore consistent with Habel et al. (2020).
Customer centricity	User-centred design neglected the social dimension of technology, meaning that users were involved in the design process but were not actively involved in the technical solution developed (Catarci et al., 2020).	There was no indication in any of the interviews that user-centred thinking was considered for technical product development. Rather, it was mentioned that customers were involved in the idea generation phase (Interviewee 1, TB 222, and Interviewee 2, TB 225) and in the new conceptualisation of video formats (Interviewee 2, TB 224). To take a closer look at how roles were allocated in the cross-functional teams that work directly with customers, this topic was discussed further in the suggestion phase of DSR. This aimed to clarify which individuals engage with customers and the purpose of that engagement.
Customer value	It became apparent that the field of new service development had not truly matured within the scientific community. Consequently, the existing body of research failed to adequately guide managers on how best to manage the new service development process. One contributing factor could be the over-reliance of previous research on the methods, concepts, and frameworks established for new product development (Biemans et al., 2016).	Regarding services in a general context, it was found that the differentiation between service and product was not clearly distinguishable in the environment of digital products (Interviewee 2, TB 236, and Interviewee 3, TB 242). For one Interviewee, services were related to people, for example in the case of a personal consultation (Interviewee 3, TB 241). For this reason, the topic was taken up again in the suggestion phase of DSR, where the focus was specifically placed on digital services in the Swiss media industry. However, it was stated that services were included in the same development process as the NPD process for digital products (Interviewee 2, TB 238, and Interviewee 3, TB 244). This was the case, for example, because digital services were an integral part of the digital product (Interviewee 2, TB 239).

Table 4.2 presented ten problems from the literature that held particular relevance to this study. Of these, eight were addressed within the interviews conducted during the awareness phase. Four of these eight problems were earmarked for further analysis in the suggestion phase interviews, along with the two problems from the literature that had not yet been identified. This resulted in a total of six problems requiring further investigation in the suggestion phase of DSR in section 5.1.2: Firstly, deeper integration of lean startup principles within the NPD process was necessary. Secondly, the composition of teams throughout the NPD process required re-evaluation and optimisation. Thirdly, a more in-depth examination of the hybrid approach to NPD, specifically concerning the interplay between agile and waterfall methodologies was necessitated. Fourthly, an enhanced focus on communication, including leadership styles, and the optimal configuration of cross-functional teams was crucial. Fifthly, a clearly defined role focused on customer collaboration throughout the NPD process needed to be established. Sixthly, further exploration of digital services was essential. This included examining their integration within product development and identifying the main service elements in the Swiss media companies.

The four theoretical problems that found direct application within the awareness phase interviews were: lifecycles, user-centred process methods, customer-centred corporate culture, and social media as test method. The interviews revealed that no formal lifecycle model was employed; instead, the media companies prioritised the technical lifecycles of their digital products. Regarding user-centred process methods, interviewees explained that these were not adopted in their entirety, but rather, specific elements or aspects were utilised. On the topic of customer-centred corporate culture, it was evident that a customer focus was highly valued, yet there remained significant potential for further development. Finally, the interviews highlighted that social media platforms were not currently being employed for testing purposes within these Swiss media companies.

4.1.3 Preliminary Empirical Coding Tree of the Empirical Artefact

This section presents the preliminary empirical coding tree of the empirical artefact derived from the awareness phase interviews.

Table 4.3: Preliminary empirical coding tree of the empirical artefact

Empirical Coding Tree of the Awareness-Phase in DSR		
Line filled in red = Characteristic from the literature that was not mentioned in the interviews of the awareness phase. Line filled in blue = Characteristics identified in interviews of the awareness phase but were absent from the theoretical coding tree, necessitating comparison with literature. Green font colour = Characteristic from the interviews in the awareness phase that had a different name than in the literature		
Requirements	Characteristics from Theory	Characteristics from awareness phase interviews
Agile process frameworks (Ikonne, 2021)	Scrum (Marion et al., 2021)	<u>Scrum</u> Interview 1: TB 1-3 Interview 3: TB 4-5
	SAFe (Liu et al., 2020)	<u>SAFe</u> Interview 2: TB 8-11 Interview 3: TB 12-17
	Kanban (Jana & Pal, 2020)	<u>Kanban</u> Interview 1: TB 18 Interview 3: TB 19
	Lean startup (Zorzetti et al., 2022)	<u>Build-measure-learn feedback loop</u> Interview 1: TB 21 Interview 3: TB 22-24
Project framework conditions (Kiselev et al., 2020)	Governance (Kiselev et al., 2020)	<u>Governance</u> Interview 1: TB 34-35 Interview 2: TB 36-38
	Lifecycle management (Houston & Kennedy, 2020)	<u>Lifecycle management</u> Interview 2: TB 49-52 Interview 3: TB 53-54
	Quality management (Abdullah et al., 2021)	Not mentioned
New product development methods (Khannan et al., 2021)	Hybrid development (agile + waterfall) (Bianchi et al., 2020)	Not mentioned
	Agile development (Bianchi et al., 2020)	<u>Agile development</u> Interview 1: TB 62-70

		Interview 2: TB 71-74 Interview 3: TB 75
	Waterfall development (Bianchi et al., 2020)	<u>Waterfall development</u> Interview 3: TB 82-83
	User-centred process methods (Kim et al., 2022)	<u>User-centred process methods</u> Interview 1: TB 88-89 Interview 2: TB 90-92 Interview 3: TB 93
Cross-functional interaction (Ahmed et al., 2021)	Functional roles (Larson, 2022)	Not mentioned
	Team efficiency (Zalpuri & Hamlin, 2020)	Not mentioned
	Dependency between teams (Alhammadi & Bashir, 2021)	<u>Dependencies between teams</u> Interview 1: TB 118 Interview 2: TB 119
	Team structure (Larson, 2022)	<u>Team structure</u> Interview 1: TB 123 Interview 2: TB 124
Testing methods with customers (Salinas et al., 2020)	Surveys (Li & Zhang, 2021)	<u>Surveys</u> Interview 1: TB 136-138 Interview 2: TB 139 Interview 3: TB 140-143
	Group work (Buzhinskaya et al., 2022) and (Humani et al., 2020)	<u>Group work</u> Interview 1: TB 147-148 Interview 2: TB 149 Interview 3: TB 150
	Prototyping (Salinas et al., 2020)	<u>Prototyping</u> Interview 1: TB 153-154 Interview 2: TB 155 Interview 3: TB 156-159
	AB-testing (Sońta-Drączkowska & Mrożewski, 2020)	<u>AB-Testing</u> Interview 1: TB 161 Interview 3: TB 162
	Usability evaluation method (Salinas et al., 2020)	<u>Usability-Test</u> Interview 1: TB 165

		Interview 2: TB 166 Interview 3: TB 167-168
	Testing with internal stakeholders (Alrabaiah & Medina-Medina, 2021)	<u>Testing with Internal stakeholders</u> Interview 1: TB 172 Interview 3: TB 173
	Social media (El Nemar et al., 2022)	<u>Social media</u> Interview 1: TB 176 Interview 2: TB 177 Interview 3: TB 178-179
Customer centricity (Habel et al., 2020)	Corporate culture (Habel et al., 2020)	<u>Corporate culture</u> Interview 1: TB 192-193 Interview 2: TB 194-201 Interview 3: TB 202-205
	Customer centred corporate strategy (Colleoni et al., 2021)	<u>Corporate strategy</u> Interview 2: TB 215 Interview 3: TB 216
	Customer co-creation (El Nemar et al., 2022)	<u>Customer co-creation</u> Interview 1: TB 222 Interview 2: TB 223-226 Interview 3: TB 227-228
Customer value (Kristensson, 2019)	Digital services (Kristensson, 2019)	<u>Digital services</u> Interview 2: TB 236-240 Interview 3: TB 241-244
	Product characteristics (Abdu Raffi & Chaldun, 2022)	<u>Product characteristics</u> Interview 2: TB 249-251
	Personalisation (Basaran & Ventura, 2022)	<u>Personalisation</u> Interview 2: TB 253

Table 4.3 presented the preliminary empirical coding tree derived from the awareness phase in DSR. As previously outlined in section 3.5.2.2, this preliminary empirical coding tree was based on the theoretical coding tree depicted in Table 4.1. This entailed identifying theoretical requirements and characteristics from the literature and subsequently comparing them with the findings from the first interview phase in the awareness phase of the DSR process. Corresponding interview text blocks (TB) were provided for each characteristic in the thematic analysis, with a comprehensive overview of these text blocks available in Appendix 1.3.1.

The preliminary empirical coding tree in Table 4.3 demonstrated that almost all theoretical characteristics were reflected in the first interview phase. The exceptions were the characteristics of quality management, hybrid development, functional roles, and team efficiency, which were not mentioned. These were highlighted in red in Table 4.3 and earmarked for further exploration in the second interview phase in the suggestion phase of DSR.

While the characteristic “lean startup” from the theoretical coding tree was not explicitly referenced as such within the interviews, its fundamental activity – the build-measure-learn feedback loop (Ries, 2011) – was discussed. Consequently, this characteristic was renamed within the preliminary empirical coding tree, as indicated by the green font colour in Table 4.3.

Furthermore, the awareness phase interviews yielded new characteristics not initially identified in the literature. These were highlighted in blue in Table 4.3 and encompassed: surveys, group work, AB-testing, and testing with internal stakeholders. Subsequent literature searches were conducted to explore these new characteristics

Regarding surveys, a well-established product development tool is “Quality Function Deployment”, which aims to enhance customer satisfaction by incorporating the “voice of the customer” throughout the product development cycle. For instance, customer surveys are employed to translate customer requirements into design requirements (Li & Zhang, 2021).

In terms of group work, research indicated that participation in customer workshops is crucial for generating product requirements and developing concepts related to software products (Buzhinskaya et al., 2022). Additionally, Humani et al. (2020) highlighted the use of customer brainstorming within design sprints to address critical problems. However, it is important to note that contrasting perspectives on design sprints emerged from the interviews. One interviewee stated that design sprints were not utilised (Interviewee 1, 06.01.2023, TB 89), while another indicated that they were employed only in situations of significant uncertainty (Interviewee 2, 12.01.2023, TB 92).

Concerning AB-testing, a study by Sońta-Drączkowska and Mrożewski (2020), focusing on NPD practices, revealed that AB-testing is frequently employed as a test method during the product implementation phase.

Finally, in a survey of experts involved in mobile application development, 66.7% of respondents reported that their test teams utilised test plans and action lists during functional testing (Alrabaiah & Medina-Medina, 2021). This suggested a prevalence of dedicated internal test teams within companies.

4.2 Cross-Company Analysis of the Awareness Phase

This section presents a cross-company analysis of the awareness phase, in which three interviews were compared to elicit initial findings on the empirical NPD process. These findings were then compared with the theoretical artefact (described in section 2.7).

4.2.1 Generic Insight on the New Product Development Process

In large new product development projects for digital products, such as website development, the interview findings indicate that significant interdependencies existed between different teams, including marketing and advertising (Interviewee 1, 06.01.2023, TB 123). One interviewee suggested that such interdependencies necessitate centralised project management, with weekly meetings and a steering committee to ensure effective coordination (Interviewee 1, 06.01.2023, TB 35).

Interestingly, one media organisation previously relied on large waterfall projects for new product development, aiming for a “big bang” market launch. However, this organisation

acknowledged that such an approach proved ineffective in the contemporary technology-driven environment (Interviewee 3, 16.01.2023, TB 82).

When discussing new product development for digital products, two primary product types were identified: applications (apps) and websites. These were perceived as having distinct focuses: Websites were seen as primarily content-driven (Interviewee 2, 12.01.2023, TB 250), while apps were considered to have a broader focus encompassing content, technology, and functionality (Interviewee 2, 12.01.2023, TB 251). Within the app category, a further distinction was made between mobile apps and web apps. Web apps were perceived to offer an advantage in terms of user testing. This was attributed to the fact that mobile apps require a publication process via an app store, which can introduce delays (Interviewee 3, 16.01.2023, TB 22). Furthermore, prior to developing or updating an app, an investment request was necessary. This triggered a strategy process to assess whether the app aligned with the value proposition for the intended target audience(s) (Interviewee 2, 12.01.2023, TB 36). For example, two distinct apps might be created to cater to different target groups. This strategy process also evaluated whether an existing app that required further development, should be discontinued, or whether a new app was needed. When further development was deemed necessary (involving renewal or expansion), decisions were required regarding the specific focus of this development: content, technology, or functionality (Interviewee 2, 12.01.2023, TB 38).

Furthermore, within the context of app development, the term “service” was perceived as ambiguous due to a lack of clear definition. For instance, a newsletter was considered a product element rather than a digital service (Interviewee 3, 16.01.2023, TB 242).

“Or if you have a subscription model, for example, then you also have a customer service, for example, where the customer is specially served. So, for me, these are services. But, as I said, I associate service very strongly with people who provide some kind of advice, support, or something along those lines. This means that such a service is less digitally scalable” (Interviewee 3, 16.01.2023, TB 241).

Conversely, in the second company, push notifications were regarded as a digital service (Interviewee 2, 12.01.2023, TB 238). It was highlighted that the development of digital services should occur in parallel with the development of the

app itself (Interviewee 2, 12.01.2023, TB 239). However, prioritisation of service features was deemed crucial, considering factors such as customer demand, development costs, and strategic alignment (Interviewee 3, 16.01.2023, TB 244), while also considering the potential impact on other digital services (Interviewee 2, 12.01.2023, TB 240).

4.2.2 Lifecycle Models as an Overarching NPD Structure

In contrast to the theoretical artefact presented in this study (see Figure 2.29), the media companies did not employ a specific model (Interviewee 2, 12.01.2023, TB 49) or framework (Interviewee 3, 16.01.2023, TB 53) for managing product lifecycles. However, when a digital product reached a point where its technical lifecycle became a concern, decisions were needed regarding its continued support and lifespan (Interviewee 2, 12.01.2023, TB 50). Therefore, if a digital product reached the end of its lifecycle, the appropriate course of action, potentially involving significant changes, was determined in consultation with management (Interviewee 3, 16.01.2023, TB 54). For example, in the case of a hypothetical app reaching the end of its technological lifecycle, it was suggested that a complete redevelopment would be preferable to attempting a major overhaul of the existing app (Interviewee 2, 12.01.2023, TB 52). In some circumstances, an app might be entirely withdrawn from the market due to reaching the end of its technological lifespan or if maintenance costs exceeded revenue generation (Interviewee 2, 12.01.2023, TB 51).

Although the NPD phases were not explicitly based on a recognised lifecycle model, it was evident that similar phases existed across all three media organisations for the development of new digital products. These phases exhibited similarities to the application lifecycle management (ALM) model depicted in Figure 2.18.

Initially, there was an idea phase, variously termed “ideas backlog” (Interviewee 1, 06.01.2023, TB 64), “ideation for initiatives” (Interviewee 2, 12.01.2023, TB 73), or “elaboration of a business case through idea generation” (Interviewee 3, 16.01.2023, TB 75). This initial phase aligned with the first phase of the overarching structure in the theoretical artefact (Figure 2.18), which stipulated the creation of a business case before commencing the development process (Chappell, 2010).

Following the initial idea phase, all interviews demonstrated a stage where ideas underwent further detailed assessment before progressing to implementation. In one media company, these processes were termed the “discovery” and “delivery” phases (Interviewee 1, 06.01.2023, TB 63).

“The discovery phase is about developing the idea further and turning it into a concept or a possible product or feature. It is also about testing it in all possible ways, for example with user tests” (Interviewee 1, 06.01.2023, TB 65).

“The delivery phase is about how something can be implemented. The delivery phase is not just about programming, but about conceptualising the idea in more detail, working it out to find out how something can be implemented, where the design and user flows also play a role” (Interviewee 1, 06.01.2023, TB 66).

Within the delivery phase, the agile process framework “scrum” was employed, with teams developing the final product in sprints of two to three weeks (Interviewee 1, 06.01.2023, TB 2). Another media company conducted ideation during this phase, including customer surveys regarding product ideas (Interviewee 2, 12.01.2023, TB 72). Like the discovery phase, a point was reached where an idea was deemed sufficiently developed for implementation. These refined ideas were then incorporated into the “big room planning”, akin to agile sprint planning (Interviewee 2, 12.01.2023, TB 74). The third media company utilised a process linked to an annual Objectives and Key Results (OKR) meeting, where company-wide priorities were established. This annual meeting was followed by four further quarterly meetings (Interviewee 3, 16.01.2023, TB 13). Product teams then broke down these quarterly goals (epic level) into sprints and user stories (Interviewee 3, 16.01.2023, TB 14). This approach of holding quarterly meetings followed by sprint-based work mirrored the procedures in the other two media companies, where sprints were employed after big room planning or within the delivery phase.

The overarching phase model of the system presented in Figure 2.18, based on application lifecycle management (ALM), exhibited similarities to the NPD processes reported within the three media companies. In the proposed system, once a business case was developed, the concept was passed to project portfolio management and integrated into the development

building blocks in iterative cycles encompassing requirements, design, and testing (Chappell, 2010). This occurred before the digital product was fully developed and underwent live testing.

4.2.3 Customer Co-Creation in the Media Companies

Although the media companies perceived themselves as customer-centric (Interviewee 2, 12.01.2023, TB 215, and Interviewee 3, 16.01.2023, TB 202), they acknowledged that further efforts were needed to enhance customer-centricity (Interviewee 2, 12.01.2023, TB 197, and Interviewee 3, 16.01.2023, TB 203). For instance, it was noted that not all business processes were yet fully customer-centric (Interviewee 2, 12.01.2023, TB 198).

Despite variations in how the three media companies involved customers in the new product development process, a common theme emerged: customers could potentially be integrated at every NPD stage. Customer involvement frequently occurred at the outset of a new product development project, with two media companies utilising market research for this purpose (Interviewee 2, 12.01.2023, TB 199, and Interviewee 3, 16.01.2023, TB 204). However, one media company emphasised customer integration most strongly during the detailed ideation phase (Interviewee 1, 06.01.2023, TB 222).

Customers were also involved during the development phase, although this was often targeted and specific, occurring only after a precise product vision was already established (Interviewee 2, 12.01.2023, TB 225). Notably, one of the three media companies invited customers to a dedicated lab for on-site workshops (Interviewee 1, 06.01.2023, TB 148), a practice not yet adopted by the other two companies (Interviewee 2, 12.01.2023, TB 149, and Interviewee 3, 16.01.2023, TB 150).

Interestingly, none of the media companies utilised social media as a tool for gathering customer input. Two primary reasons were identified for this: Firstly, it was simply not something that had been given serious consideration (Interviewee 2, 12.01.2023, TB 177). Secondly, concerns were raised about representativeness (Interviewee 1, 06.01.2023, TB 176), as the social media audience might have different needs compared to existing customers (Interviewee 3, 16.01.2023, TB 179), or the companies' social media channels might be too niche to reach the relevant target group (Interviewee 2, 12.01.2023, TB 177).

This consistent finding led to two conclusions: Firstly, it challenged the assertion by Zhang et al. (2020) that modern companies prioritise value co-creation through social media. This is because using social media to gather customer insights for NPD in the Swiss media industry may not capture the full spectrum of customer needs, given that social media audiences can represent a niche audience. Secondly, this study offers new insights into research on value co-creation in relation to social media, as suggested by Zhang et al. (2023). Specifically, it suggests that social media is not considered a representative method in the Swiss media industry and therefore does not facilitate value co-creation.

To establish a direct relationship with the customer co-creation process depicted in the theoretical artefact in Figure 2.20, the individual process phases were compared, drawing upon the data gathered from the interviews. This comparison is presented in the following four sections: 4.2.3.1, 4.2.3.2, 4.2.3.3, and 4.2.3.4.

4.2.3.1 Understand and Describe the Context of Use

During the strategy process, consideration was given to the relevant target groups and corresponding offers (Interviewee 2, 12.01.2023, TB 37). Furthermore, the development of new apps, as digital products, was consistently grounded in customer needs (Interviewee 1, 06.01.2023, TB 192). These statements supported the notion that the first phase of the customer co-creation process in the theoretical artefact closely resembled the procedures reported within the media companies.

4.2.3.2 Specification of the Usage Requirements

In the pre-implementation phase, collaboration extended beyond the product teams to include other team constellations, such as user experience teams, business project managers, and business owners. This collaborative effort aimed to reconcile user and business requirements (Interviewee 2, 12.01.2023, TB 124), aligning with the “specify requirements” stage within the second phase of the customer co-creation process depicted in the theoretical artefact in Figure 2.20.

4.2.3.3 Ideate

The specific approach of design thinking (DT), or any other user-centred approach that delineates “ideate” as a distinct phase, was not implemented in its entirety within any of the media companies. Instead, their approaches were inspired by these methodologies

(Interviewee 1, 06.01.2023, TB 88), implemented primarily by the user experience team (Interviewee 2, 12.01.2023, TB 90), or conducted with internal stakeholders rather than directly with customers (Interviewee 3, 16.01.2023, TB 93).

Therefore, while ideation was employed, it did not strictly adhere to the construct presented in the theoretical artefact in Figure 2.20.

4.2.3.4 Prototype and Test of Prototype

Prototypes were utilised in various contexts within the media companies. These included AB testing (Interviewee 1, 06.01.2023, TB 161), assessing project feasibility (Interviewee 2, 12.01.2023, TB 155), and validating product content with users (Interviewee 3, 16.01.2023, TB 158).

One media company aimed to launch a minimal viable product (MVP) as rapidly as possible, focusing on validating the most critical initial assumptions (Interviewee 3, 16.01.2023, TB 24). This approach mirrored the process outlined in the theoretical artefact, where tested prototypes are designed to answer specific questions (Hasso Plattner Institute of Design at Stanford University, 2010). Validating key assumptions could therefore be seen as analogous to seeking answers to those questions.

Furthermore, one media company described using an iterative measure-learn cycle for prototypes. This involved extracting insights from the testing of prototypes and incorporating modifications into new iterations for further testing (Interviewee 3, 16.01.2023, TB 23). This iterative process aligned with the “customise prototypes” stage within the theoretical artefact depicted in Figure 2.20.

4.2.4 Agile Frameworks

To gain an initial understanding of agile approaches within the media companies, the three interviewees were asked about their use of agile methodologies. This indicated that all three companies incorporated agile aspects into their development processes.

“So, let’s say we want to make a new website. Then the development itself is agile and step by step and it is always evaluated whether something needs to be adapted. So, we are very flexible on a small scale” (Interviewee 1, 06.01.2023, TB 69).

Regarding the integration of agile approaches, scaling emerged as a significant factor.

“This is because teams alone are not enough, as there are many requirements that we must consider. There is not just one app, but there is a need to do X in one app and Y in another. The same goes for the website” (Interviewee 2, 12.01.2023, TB 71).

Additionally, the lean startup approach was highlighted as an important integration, enabling rapid market entry and initial feature validation (Interviewee 3, 16.01.2023, TB 22).

Furthermore, within the media companies, three different agile frameworks were employed in the development process: Scaled Agile Framework (SAFe), scrum, and kanban.

“SAFe had a lot of points in favour of managing the requirements, scaling, deadlines, etc. However, it is not a question of introducing SAFe as a model 100 per cent and with the exact naming” (Interviewee 2, 12.01.2023, TB 9).

Scrum was employed using two- or three-week sprints (Interviewee 1, 06.01.2023, TB 2).

However, it is important to note that, as was the case with SAFe, scrum was not implemented exactly as prescribed in theory (Interviewee 3, 16.01.2023, TB 5).

“There is also pseudo-scrum. Companies that say they use scrum and have the ceremonies like dailies, sprints, and sprint planning, but they don’t use the core principles of the scrum process, like collecting feedback quickly or reacting quickly to user feedback” (Interviewee 3, 16.01.2023, TB 5).

The third agile framework, kanban, was utilised less intensively than scrum (Interviewee 1, 06.01.2023, TB 18). It was primarily employed for products where precise planning was challenging due to a high incidence of operational issues (Interviewee 3, 16.01.2023, TB 19).

“So, for example, on one day we have problem X, on another day problem Y, which must be tackled. So, with certain teams or with certain topics that are more operational in nature, we tend to go with kanban” (Interviewee 3, 16.01.2023, TB 19).

4.2.5 Conclusion of the Cross-company Analysis

This section describes the problems identified in the awareness phase and the associated requirements. It addressed the three core perspectives of this study: the NPD process, customer co-creation, and cross-functional teams.

4.2.5.1 NPD Process

Within the domain of the NPD process, the interviews revealed that the Swiss media companies lacked a clearly defined overarching structure with underlying process elements for the development of new digital products. Even when agile product development was employed, the NPD process still lacked a holistic structure. For instance, while scrum might be used during the development phase, no defined process for iterative and/or incremental steps was employed in the pre-development phase. Consequently, three key requirements for the NPD process emerged from the first interview phase in the awareness phase: agile process frameworks, project framework conditions, and new product development methods.

4.2.5.2 Customer Co-Creation

Although customers were involved in the NPD process for digital products within the Swiss media companies, this involvement was not consistent across all areas of the companies and was primarily focused on testing. Co-creation between the companies and their customers was limited. This finding indicated that there was significant potential for enhancing customer centricity within these organisations. Consequently, three key requirements related to customer co-creation were derived from the first interview phase in the awareness phase: testing methods with customers, customer centricity; and customer value.

4.2.5.3 Cross-Functional Teams

The interviews with the Swiss media companies revealed significant interdependencies between various teams from different disciplines involved in the NPD process. Consequently, the interviewees deemed team synchronisation and centralised project management to be essential to optimise efficiency and maintain a clear structure. This highlighted a crucial requirement identified from the awareness phase interviews: cross-functional interaction.

5 Suggestion Phase

This chapter addresses the results of the second interview phase conducted during the suggestion phase in the DSR process. These results informed the suggestion of variants for the empirical artefact of this study, culminating in the selection of one variant for the development of the empirical artefact in this study in chapter 6.

In the suggestion phase two additional Swiss media companies, representing two further interviews, were selected in the second interview phase. As in the awareness phase, decision-makers in the NPD process were selected as interview partners. While the awareness phase in chapter 4 focused on problem definition and the associated research problem, the suggestion phase aimed to generate variant suggestions for the empirical artefact. This was achieved by drawing upon data from both the awareness and suggestion phase interviews and therefore the first and the second interview phases, covering a total of five Swiss media companies.

Specifically, this involved further elaborating upon the characteristics identified in the preliminary empirical coding tree (in section 4.1.3) and incorporating characteristics from the theoretical coding tree (in Table 4.1) that had not yet been addressed. The most prominent characteristics, along with the findings from the awareness phase, formed the basis for developing concrete variant suggestions for the empirical artefact of this study.

5.1.1 Empirical Coding Tree of the Empirical Artefact

This section presents the empirical coding tree (in Table 5.1) of the empirical artefact derived from the two interviews conducted in the second interview phase during the suggestion phase in the DSR process. The empirical coding tree in Table 5.1 is based on the preliminary empirical coding tree in the awareness phase of DSR in Table 4.3. It highlights the most prominent characteristics, which were deemed relevant as suggestions for the development of an empirical artefact.

Table 5.1: Empirical coding tree of the empirical artefact

Empirical Coding Tree for Suggestion-Phase in DSR		
Green filled line = Emphasised characteristics in the interviews of the suggestion phase		
Blue filled line = New characteristic from the interviews in the suggestion phase, which were added by literature research		
Requirements	Characteristics from Theory	Emphasised characteristics of suggestion phase interviews
Agile process frameworks (Ikkone, 2021)	Scrum (Marion et al., 2021)	<u>Scrum</u> Interviewee 5: TB 7
	SAFe (Liu et al., 2020)	<u>SAFe</u> -
	Kanban (Jana & Pal, 2020)	<u>Kanban</u> Interviewee 5: TB 20
	Lean startup (Zorzetti et al., 2022)	<u>Build-Measure-Learn cycle</u> Interviewee 4: TB 25 Interviewee 5: TB 26-28
Project framework conditions (Kiselev et al., 2020)	Quality management (Abdullah et al., 2021)	<u>Quality management</u> Interviewee 4: TB 29-30 Interviewee 5: 31-33
	Governance (Kiselev et al., 2020)	<u>Governance</u> Interviewee 4: TB 39-47 Interviewee 5: TB 48
	Lifecycle management (Houston & Kennedy, 2020)	<u>Lifecycle management</u> -
New product development methods (Khannan et al., 2021)	Hybrid development (agile + waterfall) (Bianchi et al., 2020)	<u>Hybrid development (agile + waterfall)</u> Interviewee 4: TB 55-57 Interviewee 5: TB 58-61
	Agile development (Bianchi et al., 2020)	<u>Agile development</u> Interviewee 4: TB 76-78 Interviewee 5: TB 79-81
	Waterfall development (Bianchi et al., 2020)	<u>Waterfall development</u> Interviewee 4: TB 84-85 Interviewee 5: TB 86-87
	User-centred process methods (Kim et al., 2022)	<u>User-centred process methods</u> Interviewee 4: TB 94 Interviewee 5: TB 95-97

Cross-functional interaction (Ahmed et al., 2021)	Functional roles (Larson, 2022)	<u>Team roles</u> Interviewee 4: TB 98-101 Interviewee 5: TB 102-108
	Team efficiency (Zalpuri & Hamlin, 2020)	<u>Efficiency</u> Interviewee 4: TB 109-111 Interviewee 5: TB 112-117
	Dependency between teams (Alhammadi & Bashir, 2021)	<u>Dependencies between teams</u> Interviewee 4: TB 120-121 Interviewee 5: TB 122
	Team structure (Larson, 2022)	<u>Team structure</u> Interviewee 4: TB 125-128 Interviewee 5: TB 129-134
Testing methods with customers (Salinas et al., 2020)	Smoke test (Reshma et al., 2022)	<u>Smoke test</u> Interviewee 5: TB 135
	Surveys (Li & Zhang, 2021)	<u>Surveys</u> Interviewee 4: TB 144 Interviewee 5: TB 145-146
	Group work (Buzhinskaya et al., 2022) and (Humani et al., 2020)	<u>Brainstorming</u> Interviewee 4: TB 151-152
	Prototyping (Salinas et al., 2020)	<u>Prototyping</u> Interviewee 5: TB 160
	AB-testing (Sońta-Drączkowska & Mrożewski, 2020)	<u>AB-Testing</u> Interviewee 5: TB 163-164
	Usability evaluation method (Salinas et al., 2020)	<u>Usability test</u> Interviewee 4: TB 169-170 Interviewee 5: TB 171
	Testing with Internal stakeholders (Alrabaiah & Medina-Medina, 2021)	<u>Testing with Internal stakeholders</u> Interviewee 4: 174-175
	Social media (El Nemar et al., 2022)	<u>Social media</u> -
Customer centricity (Habel et al., 2020)	Market intelligence (Sihvonen et al., 2021)	<u>Market intelligence</u> Interviewee 4: TB 180-186 Interviewee 5: TB 187-191
	Corporate culture (Habel et al., 2020)c	<u>Corporate culture</u> Interviewee 4: TB 206-208 Interviewee 5: TB 209-214

	Customer centred corporate strategy (Colleoni et al., 2021)	<u>Corporate strategy</u> Interviewee 4: TB 217 Interviewee 5: TB 218-221
	Customer co-creation (El Namar et al., 2022)	<u>Customer co-creation</u> Interviewee 4: TB 229-232 Interviewee 5: TB 233-235
Customer value (Kristensson, 2019)	Digital services (Kristensson, 2019)	<u>Digital services</u> Interviewee 4: TB 245-246 Interviewee 5: TB 247-248
	Product characteristics (Abdu Raffi & Chaldun, 2022)	<u>Product characteristics</u> Interviewee 5: TB 252
	Personalisation (Basaran & Ventura, 2022)	<u>Personalisation</u> Interviewee: 5 TB 255-258

Table 5.1 presents the empirical coding tree of the empirical artefact derived from the second interview phase. The characteristics that featured most prominently across both interviews are highlighted in green. These prominent characteristics were considered particularly important for informing the suggested variants of the empirical artefact in section 5.2. The table also indicates the locations of the corresponding text blocks (TB) within the Appendix 1.3.1.

The characteristics “SAFe”, “lifecycle management”, and “social media” did not re-emerge during the suggestion phase interviews. However, two new characteristics, “smoke test” and “market intelligence”, were identified and are highlighted in blue. Further analysis of the literature was conducted to explore these new characteristics.

Regarding smoke tests, research indicated that they assist development teams in confirming successful deployment (Reshma et al., 2022). Therefore, the use of smoke tests is recognised in the literature as a valuable testing method for software applications and, by extension, digital products.

Furthermore, a study analysing 12 exploratory NPD projects found that in-house exploration projects are often guided by the company’s understanding of unmet market needs and significantly influenced by market intelligence throughout the project lifecycle (Sihvonen et al., 2021). This finding therefore supported the relevance of the “market intelligence” characteristic identified in the interviews.

5.1.2 Key Papers Covering the Problems of the Awareness Phase Applied in the Suggestion Phase

This section presents the key papers relevant to the suggestion phase that were not fully applicable within the awareness phase in section 4.1.2.

Table 5.2: Key papers of the problems of the awareness phase, applied in the suggestion phase

Requirement	Problem from theory	Application in interviews
Agile process frameworks	Lean startup only created incremental value (Felin et al., 2020).	The study by Felin et al. (2020) was confirmed in an interview in the suggestion phase. It became apparent that employing a rapid feedback cycle for transformative or disruptive projects was not considered beneficial. This was attributed to the fact that customers often do not recognise their potential need for such products, with reference made to companies like Tesla and Apple, known for their disruptive offerings (Interviewee 5, TB 25).
Project framework conditions	The NPD team relied on an integrated approach, enabling them to revisit any phase based on the results and feedback gathered throughout the NPD process. However, a key problem emerged: team members lacked clarity on how and when to transition between the required stages (Dogan & Cebeci, 2021).	To address the problem of Dogan and Cebeci (2021), one interviewee mentioned utilising milestones (Interviewee 4, TB 29) and emphasised the importance of having the right people in place for quality management. This ensured clarity on when to iterate within the process (Interviewee 4, TB 30). In this context, the “right people” referred to the product team (Interviewee 4, TB 128).
New product development methods	Due to various factors, such as the unpredictability of customer demand, organisations needed to integrate new approaches such as agile product development (Palsodkar et al., 2023). However, research into the combination of hybrid models, such as stage-gate and agile methods, indicated that agile methodologies can negatively impact time-to-market due to the incorporation of early and frequent user feedback (Bianchi et al., 2020).	Regarding hybrid NPD models, one interviewee highlighted their crucial importance for complex and large-scale projects (Interviewee 4, TB 55). Another interviewee emphasised the need to avoid assigning individuals to both agile and waterfall-driven approaches simultaneously, as this could negatively impact the agile approach (Interviewee 5, TB 60). Finally, despite concerns that agile approaches might negatively affect time-to-market due to frequent user feedback Bianchi et al. (2020), it was clearly asserted that frequent involvement of external users in the NPD process is essential to mitigate the risk of product failure in the market (Interviewee 4, TB 230).
Cross-functional interaction	Too much communication across different areas of knowledge in cross-functional teams worsened team results (Larson et al., 2023).	Transparent and open communication was identified as fundamental for ensuring that all individuals involved in an NPD project understand their roles and responsibilities (Interviewee 4, TB 45). Indeed, one interviewee cited insufficient communication as one of the biggest risks for cross-functional teams. It was argued that poor communication can lead to confusion regarding responsibilities, tasks, and decision-making authority (Interviewee 4, TB 99), and could even result in the dissemination of inaccurate information, such as a premature product launch date being announced to the press (Interviewee 4, TB 43). These arguments strongly favoured over-communication rather than under-communication, thus contradicting the assertion of Larson et al. (2023).
Customer centricity	User-centred design neglected the social dimension of technology, meaning that users were involved in the design process but were not actively involved in	A counterargument to the problem identified by Catarci et al. (2020) emerged: while customers are involved in the design process, they are not involved in technical solution development. This distinction stems from the developers’ focus on development tasks

	the technical solution developed (Catarci et al., 2020).	rather than customer interaction. Within the Swiss media industry, customer interaction is typically managed collaboratively by the customer team and the product owner (Interviewee 4, TB 101). Furthermore, in a cross-functional setting, the prevailing attitude should be one of individual responsibility and expertise. It was emphasised that cross-functional team members should not dictate tasks or responsibilities to colleagues from other areas of expertise (Interviewee 5, TB 104). Specifically, regarding technical developments, this implies that individuals with technological expertise are integrated into the NPD process. To avoid unproductive interference, any customer involvement in this area would necessitate those customers possessing a high level of technical understanding. Additionally, time and budget constraints often preclude extensive testing (Interviewee 4, TB 208).
Customer value	It became apparent that the field of new service development had not truly matured within the scientific community. Consequently, the existing body of research failed to adequately guide managers on how best to manage the new service development process. One contributing factor could be the over-reliance of previous research on the methods, concepts, and frameworks established for new product development (Biemans et al., 2016).	A key observation from the suggestion phase was that Swiss media companies primarily develop services that are either integrated within a product or product-related, rather than offering standalone services. For instance, interviewees cited editorial newsletters (Interviewee 5, TB 248) and streaming services (Interviewee 4, TB 246) – specifically subscription-based services like Netflix (Interviewee 4, TB 185) or video-on-demand services (Interviewee 4, TB 181) – as major service elements within the media industry. This finding could explain the observation by Biemans et al., (2016) that, in previous studies, the new service development process often occurs in conjunction with the new product development process.

Table 5.2 presents the application of findings from the second interview phase in the suggestion phase of the DSR process to the outstanding problems identified in the literature review. Together with the first interview phase in the awareness phase in Table 4.2, all theoretical problems were addressed, contributing new knowledge to the existing body of literature.

5.1.3 Combination of Requirements for Variant Suggestions

To ensure consistency between the theoretical and empirical artefacts, a consistent structure was maintained across both. This structure comprised four key elements: an overarching NPD framework, an NPD process, a customer co-creation process, and a structure for cross-functional teams.

Based on this structure, the foundation for variant suggestions was established using the requirements identified in the empirical coding tree in Table 5.1. Accordingly, the requirements from the first interview phase in the awareness phase of the DSR process and the second interview phase in the suggestion phase were combined in Table 5.1 to obtain a comprehensive view of all five Swiss media companies for the first step in suggesting variants in sections 5.1.3.1, 5.1.3.2, 5.1.3.3, and 5.1.3.4. These initial variant suggestions, informed by the requirements, were then further refined in section 5.2 by incorporating the characteristics of all five interviews identified in the empirical coding tree of the suggestion phase in Table 5.1, leading to the formulation of complete variant suggestions.

5.1.3.1 Requirements for the Overarching NPD Structure

Given the absence of an overarching NPD structure based on lifecycles within the Swiss media companies (Interviewee 2, 12.01.2023, TB 49, and interviewee 3, 16.01.2023, TB 53), coupled with the evident presence of an underlying structure, two variant suggestions for an overarching NPD structure were formulated based on the requirements identified in Table 5.1.

The first variant suggestion centred on the “agile process frameworks” requirement, which was merged with the “new product development methods” requirement. This emphasised a fundamentally agile structure (Interviewee 1, 06.01.2023, TB 62, interviewee 2, 12.01.2023, TB 9, interviewee 3, 16.01.2023, TB 75, interviewee 4, 15.01.2024, TB 77, and interviewee 5, 26.01.2024, TB 7).

The second variant suggestion incorporated an additional requirement – “project framework conditions” – alongside the two requirements from the first variant. This placed the focus on a hybrid model (Interviewee 4, 15.01.2024, TB 55), where agile methods were integrated with waterfall-oriented approaches.

5.1.3.2 Requirements for the NPD Process

Because the NPD process observed across the five interviews in five different Swiss media companies was highly similar, and even identical in some instances, only one concrete variant suggestion was proposed for this element. All five companies employed a preliminary NPD phase, for example, the idea generation and business case creation (Interviewee 3, 16.01.2023, TB 75); a middle NPD phase focused on solution conceptualisation, for example, the discovery phase (Interviewee 5, 26.01.2024, TB 160); and a final NPD phase dedicated to technical solution development, for example, the delivery phase (Interviewee 1, 06.01.2023, TB 66).

This variant suggestion incorporated a combination of all NPD-related requirements identified in Table 5.1: agile process frameworks, project framework conditions, new product development methods, cross-functional interaction, and testing methods with customers.

5.1.3.3 Requirements for the Customer Co-Created Process

Three distinct variant suggestions for the customer co-creation process emerged from the five interviews.

The first variant was based on the following requirements: new product development methods, testing methods with customers, and customer centricity. This variant focused not on the full integration of customers throughout the process, but rather on validating assumptions with customer input (Interviewee 4, 15.01.2024, TB 231).

The second variant proposed closer customer integration within the NPD process. This involved combining the following requirements: agile process frameworks, new product development methods, cross-functional interaction, testing methods with customers, customer centricity, and customer value. This variant emphasised a stronger customer co-creation role, with customers potentially involved in activities such as prototype creation

and testing (Interviewee 2, 12.01.2023, TB 155) or testing of features derived from prototypes (Interviewee 5, 26.01.2024, TB 160).

The third variant expanded upon the second, incorporating the same combination of requirements. However, it placed additional emphasis on integrating the build-measure-learn cycle into the NPD process to facilitate rapid feedback from customers (Interviewee 3, 16.01.2023, TB 23, interviewee 4, 15.01.2024, TB 208, and interviewee 5, 26.01.2024, TB 26, and 235).

5.1.3.4 Requirements for the Structure of Cross-Functional Teams

Two variant suggestions for structuring cross-functional teams emerged from the five interviews. Both primarily related to the “cross-functional interaction” requirement, although the “NPD framework conditions” requirement was also relevant.

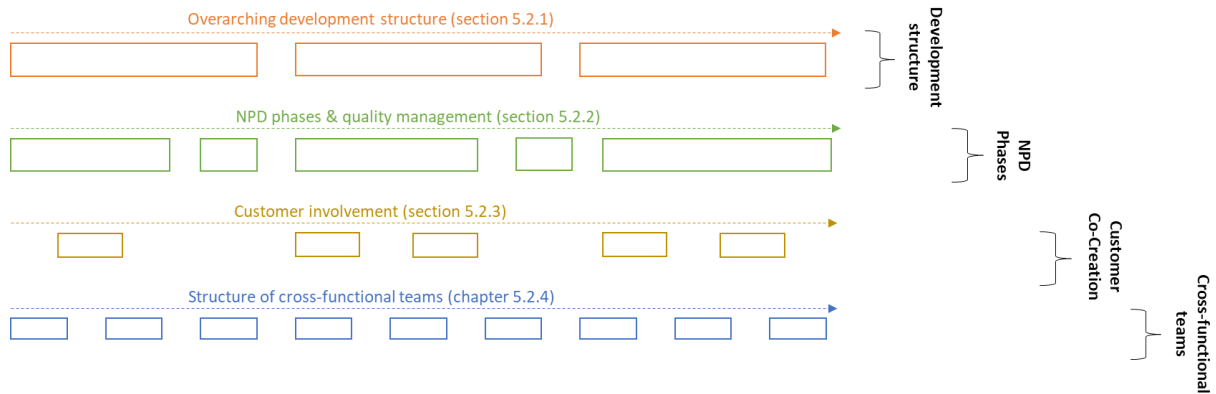
The first variant emphasised the deployment of project management as the central coordinating authority (Interviewee 1, 06.01.2023, TB 35).

The second variant focused on an NPD core team (Interviewee 4, 15.01.2024, TB 126, and interviewee 5, 26.01.2024, TB 114), which collaborates with other functional roles (Interviewee 1, 06.01.2023, TB 123).

5.2 Cross-Company Analysis for Variant Suggestions of the Empirical Artefact

This section presents various variant suggestions that can be used to develop an empirical artefact for the Swiss media industry in section 6.2. A cross-company analysis, encompassing five Swiss media companies, was conducted. This analysis incorporated five interviews from two interview phases: the awareness phase and the suggestion phase of the DSR process, aligning with the iterative nature of DSR. Particular emphasis was placed on the outcomes of the suggestion phase, as certain characteristics in Table 5.1 were explored in greater detail and depth, serving to either verify or challenge the findings from the awareness phase in chapter 4.

Figure 5.1: Components of the empirical artefact



As explained in section 5.1.3, the structure of the empirical artefact in Figure 5.1 mirrors that of the theoretical artefact in Figure 2.29. Both artefacts are organised around an overarching structure, the NPD phases, and the customer co-creation process. Finally, the structure of cross-functional teams is addressed, with functional roles assigned to the individual process steps within the NPD process in Figure 5.1.

The subsequent four sections, 5.2.1, 5.2.2, 5.2.3, and 5.2.4, which focus on suggesting variants for the empirical artefact of this study, are grounded in the requirements identified in section 5.1.3 and their associated characteristics in Table 5.1. As explained in section 3.5.2.3.3, a thematic analysis was conducted, guided by the codebook structure outlined by Richards and Hemphill (2018). The codebook, which contains the text blocks (TB) relevant for citing the five interviews, can be found in Appendix 1.3.1.

5.2.1 Variants for the Overarching NPD Development Structure

This section presents variant suggestions of the empirical artefact for an overarching NPD development structure, as depicted in Figure 5.2.

“Ultimately, there is no right and wrong. The important thing is to decide on a process and then implement it. Every company has a different organisation chart. Ultimately, you must find the one that suits you and try to define the processes accordingly. However, the problem is that many companies do not define these processes” (Interviewee 5, 26.01.2024, TB 48).

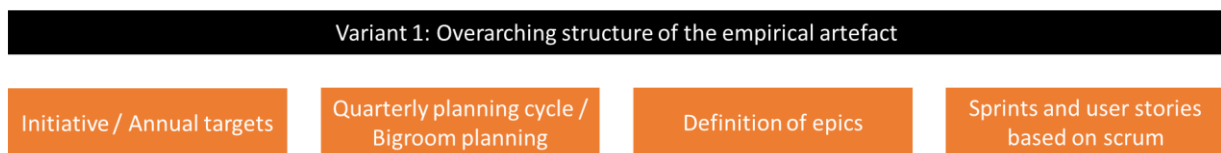
Figure 5.2: Overarching development structure of the empirical artefact



The suggested variants are based on selected characteristics derived from the overarching requirements detailed in section 5.1.3.1 and presented in the empirical coding tree in Table 5.1. Characteristics exhibiting suitable patterns across all interviews during the thematic analysis (see Appendix 1.3.1) were considered. This approach prioritises the development of high-quality variants over a large quantity. The cross-company analysis below, therefore, focuses on variants reflecting these prominent patterns.

The interviews yielded two distinct suggestions for the overarching development structure.

Figure 5.3: First variant of the overarching structure of the empirical artefact



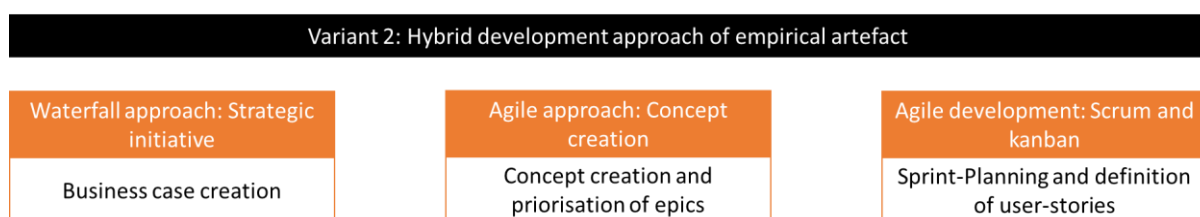
The first variant of the overarching development structure was based on the scaled agile framework (SAFe) and scrum (see Figure 5.3)

One media company described an initial “initiative” phase, followed by a “big room planning” session where tasks were defined and planned in a manner akin to sprint planning (Interviewee 2, 12.01.2023, TB 9). This structure bore strong similarities to the approach of another Swiss media company, which involved setting annual priorities at both the company and product area levels. In alignment with these annual targets, product-specific priorities were determined quarterly. Fundamental topics (epics) were then identified and broken down into user stories and sprints, mirroring the scrum framework (Interviewee 3, 16.01.2023, TB 14).

This analogy to sprints was also evident in another Swiss media company, where technical development was conducted using a scrum approach with two- to three-week sprints (Interviewee 1, 06.01.2023, TB 2). Similarly, another interviewee described a two-week sprint approach based on scrum (Interviewee 5, 26.01.2024, TB 7) and the utilisation of epics (Interviewee 5, 26.01.2024, TB 79).

However, SAFe as a framework was not mentioned during the second interview phase. Moreover, one interviewee acknowledged that they did not apply the SAFe structure in its entirety (Interviewee 2, 12.01.2023, TB 9), while another company only implemented specific aspects of SAFe, such as a quarterly planning cycle (Interviewee 3, 16.01.2023, TB 12).

Figure 5.4: Second variant of the overarching structure of the empirical artefact



The second variant, depicted in Figure 5.4, represents a hybrid approach. This was based on the clear assertion in the second interview phase that a hybrid structure is essential for managing large and complex projects (Interviewee 4, 15.01.2024, TB 55).

The first phase of this hybrid approach focused on a waterfall-oriented process. This emphasis stemmed from several observations: the strategy department's involvement in deciding whether a new digital product was necessary (Interviewee 2, 12.01.2023, TB 38); the consistent need for funding (Interviewee 2, 12.01.2023, TB 36); the influence of management in driving initiatives, sometimes overriding customer needs (Interviewee 5, 26.01.2024, TB 220); and the role of top management in risk assessment (Interviewee 4, 15.01.2024, TB 29).

This overarching waterfall-oriented phase aligned with the observation that management ultimately decided whether a business case could proceed (Interviewee 3, 16.01.2023, TB 83). This finding was corroborated by an interviewee in the second interview phase, which stated that management was invariably involved in large NPD projects due to the significant financial investment required (Interviewee 4, 15.01.2024, TB 40). In essence, before an NPD project for a digital product could advance, it required both funding and a robust business case.

The second phase focused on an agile approach, with concepts developed using agile techniques. This stemmed from the assertion that the stage following business case approval should be agile and lean (Interviewee 3, 16.01.2023, TB 75). It was further argued that an

agile approach facilitates incremental progress, ultimately enhancing NPD performance (Interviewee 4, 15.01.2024, TB 78).

Furthermore, adherence to agile principles was indicated (Interviewee 1, 06.01.2023, TB 62), with previously approved ideas elaborated into more detailed concepts (Interviewee 1, 06.01.2023, TB 65). This suggested that concept creation was indeed conducted in an agile manner. Within these concepts, major topics were defined as “epics” (Interviewee 3, 16.01.2023, TB 12, and interviewee 5, 26.01.2024, TB 79).

However, the ability to scale agile working practices was deemed crucial due to the potential for numerous requirements (Interviewee 2, 12.01.2023, TB 71). Therefore, prioritisation of epics was considered essential (Interviewee 3, 16.01.2023, TB 13, and 14).

The third phase concerned agile development, employing scrum as the agile process framework.

“So, let’s say we want to make a new website. Then the development itself is agile and step by step and it is always evaluated whether something needs to be adapted. So, we are very flexible on a small scale” (Interviewee 1, 06.01.2023, TB 69).

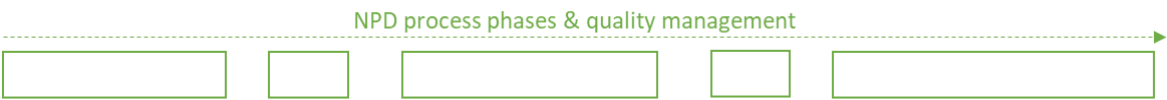
In this regard, it was asserted that, in the current landscape, companies widely recognise the value of scrum. This was attributed to its facilitation of iterative improvements and rapid validation (Interviewee 4, 15.01.2024, TB 77). Thereby, the use of scrum was confirmed across several Swiss media companies (Interviewee 1, 06.01.2023, TB 1, interviewee 3, 16.01.2023, TB 4, and interviewee 5, 26.01.2024, TB 7).

Furthermore, several interviewees indicated working with sprints (Interviewee 1, 06.01.2023, TB 2, interviewee 2, 12.01.2023, TB 9, interviewee 3, 16.01.2023, TB 4, and Interviewee 5, 26.01.2024, TB 80), user stories (Interviewee 3, 16.01.2023, TB 14), or sub-tickets (Interviewee 5, 26.01.2024, TB 79). The utilisation of kanban was also noted (Interviewee 1, 06.01.2023, TB 18, interviewee 3, 16.01.2023, TB 19, and interviewee 5, 26.01.2024, TB 20).

5.2.2 Variant for the NPD Process Phases

This section details the suggested variants for the empirical artefact, mapped to the NPD process phases as illustrated in Figure 5.5.

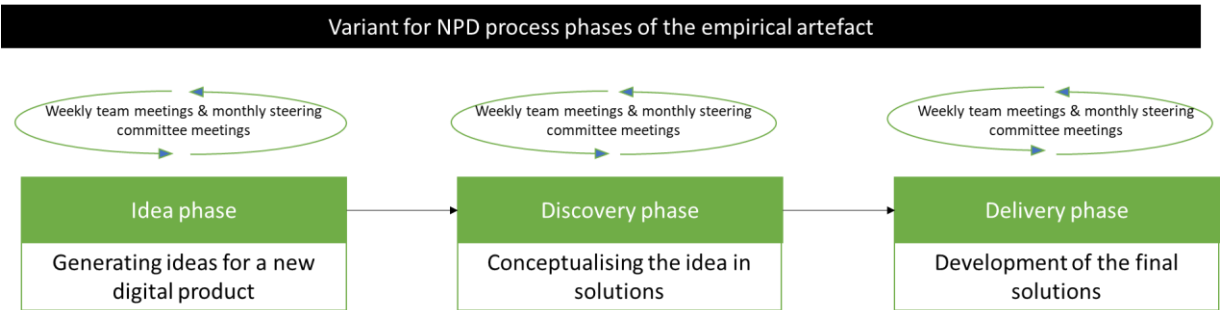
Figure 5.5: NPD phase structure of the empirical artefact



As depicted in Figure 5.5, two key components identified from the interviews were integrated into the NPD phases: NPD process phases and quality management.

The suggested variant is based on selected characteristics derived from the overarching requirements detailed in section 5.1.3.2 and presented in the empirical coding tree in Table 5.1. Characteristics exhibiting suitable patterns across all interviews during the thematic analysis (see Appendix 1.3.1) were considered. This approach prioritises the development of high-quality variants over a large quantity. The cross-company analysis below, therefore, focuses on one variant reflecting these prominent patterns.

Figure 5.6: Variant of the NPD process phases of the empirical artefact



As illustrated in Figure 5.6, only one variant suggestion for the NPD phases emerged from the interviews. This was due to the observed similarity of the NPD process phases and associated quality management approaches across the interviewed media companies.

In this context, this variant suggested prioritising product development as the central process. Other related projects should then be aligned with the product development structure to optimise resource allocation (Interviewee 5, 26.01.2024, TB 61).

The structure of the NPD process, comprising three distinct phases, was already apparent in the awareness phase in section 4.2.2. These phases were: the idea phase, the idea feedback

and evaluation phase, and the development phase (Interviewee 1, 06.01.2023, TB 63, interviewee 2, 12.01.2023, TB 72, 73, and 74, and interviewee 3, 16.01.2023, TB 13, 14, 15, 16, and 75).

Furthermore, a similar structure was observed in interview 1 and interview 5, where the second and third phases were termed the “discovery phase” and “delivery phase”, respectively (Interviewee 1, 06.01.2023, TB 63, and interviewee 5, 26.01.2024, TB 106, and 160). Due to this correspondence, the phases in Figure 5.6 are labelled accordingly.

Regarding quality management, it was stated that management requires milestones to maintain awareness of project progress (Interviewee 4, 15.01.2024, TB 29). This was typically achieved by steering committees (Interviewee 1, 06.01.2023, TB 35, and interviewee 5, 26.01.2024, TB 116), with meetings held monthly (Interviewee 5, 26.01.2024, TB 134). In addition, weekly meetings were conducted with the teams involved in the NPD project (Interviewee 1, 06.01.2023, TB 35, and interviewee 5, 26.01.2024, TB 115).

5.2.3 Variants for Customer Co-Created NPD Processes

This section details the suggested variants for the empirical artefact within the customer co-created NPD process, as depicted in Figure 5.7.

“The less you incorporate external people or an external test user group, the more likely your product is to fail. This is because you may be launching the product you thought people wanted and needed, but they don’t because you were wrong” (Interviewee 4, 15.01.2024, TB 230).

Figure 5.7: Customer co-creation structure of the empirical artefact



As depicted in Figure 5.7, the customer co-creation approach involved generating variant suggestions from the interviews, focusing on customer involvement within the overall NPD process.

The suggested variants are based on selected characteristics derived from the overarching requirements detailed in section 5.1.3.3 and presented in the empirical coding tree in Table 5.1. Characteristics exhibiting suitable patterns across all interviews during the thematic

analysis (see Appendix 1.3.1) were considered. This approach prioritises the development of high-quality variants over a large quantity. The cross-company analysis below, therefore, focuses on variants reflecting these prominent patterns.

“For large new product developments, I would say yes, user-centred thinking is used. For smaller functions, user-centred thinking is not necessarily used, although we now have tools there as well. We have built up a small team, a user group, which can be approached” (Interviewee 2, 12.01.2023, TB 196).

With respect to the quote above, the empirical artefact of this study is focusing on large NPD projects. Smaller-scale functions are considered to be “feature developments”. These feature developments are nonetheless treated as integral components of the NPD process, as detailed in Figure 5.10.

Figure 5.8: First variant of the customer co-created process of the empirical artefact

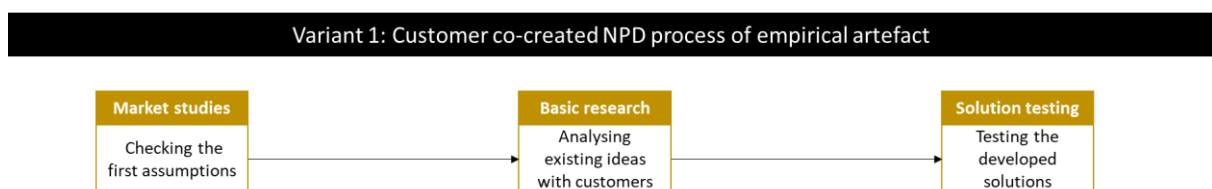


Figure 5.8 presents the first variant suggestion for a customer co-created NPD process within the empirical artefact.

The initial step in this process involves conducting market studies. This stems from the assertion during the second interview phase that research is essential for Swiss media companies, and that market studies can be used to validate initial assumptions (Interviewee 4, 15.01.2024, TB 94). This statement reinforces an observation from the first interview phase:

“If you have an idea, you first do a market study and see if there really is an opportunity” (Interviewee 3, 16.01.2023, TB 205).

The second step involves conducting basic research, as highlighted in two interviews from the first interview phase.

“Before implementation, it is more in the context of researching the basic needs of the customers and more the focus on scientific studies” (Interviewee 2, 12.01.2023, TB 199).

In this context, basic research is identified as the first step, where customers are actively involved in the process during the discovery phase (Interviewee 1, 06.01.2023, TB 222). This is corroborated by an interview from the second interview phase, which states that for large projects, the discovery phase (or ideation phase) includes validation to ensure the project is on the right track. This validation is conducted either through external customers or external research services (Interviewee 4, 15.01.2024, TB 94).

Nevertheless, an interviewee in the second interview phase revealed that inviting customers to workshops at the media company during the discovery phase was rare (Interviewee 4, 15.01.2024, TB 152). This corroborated a finding from the first interview phase (Interviewee 2, 12.01.2023, TB 149, and Interviewee 3, 16.01.2023, TB 150). The reasons cited were the high cost and significant time investment required for this approach during the ideation phase (Interviewee 4, 15.01.2024, TB 152). However, when customers were involved, the focus was not on generating new solutions, but rather on challenging existing ones (Interviewee 1, 06.01.2023, TB 148).

The third step involves testing the developed solutions with external individuals, such as potential customers or users. This was evident in both interviews of the second interview phase, which indicated that most external testing occurs during the development phase (Interviewee 5, 26.01.2024, TB 235) and that co-creation with external individuals is essential in this phase (Interviewee 4, 15.01.2024, TB 94). This aligns with an observation from the first interview phase:

“During the development of the current app there was a great exchange with the customers and many studies were carried out” (Interviewee 2, 12.01.2023, TB 166).

Figure 5.9: Second variant of the customer co-created process of the empirical artefact

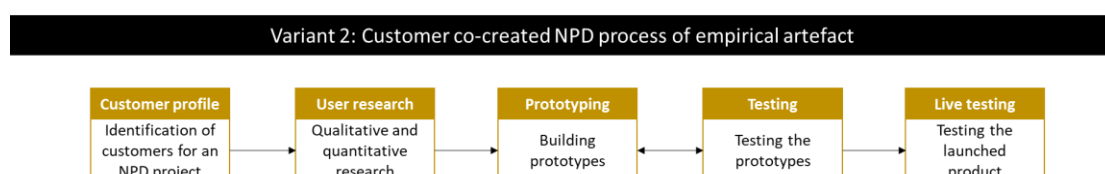


Figure 5.9 presents the second variant suggestion for the customer co-created NPD process within the empirical artefact.

The initial step in this process was to identify the customer profile. This emphasis arose from the second interview phase, where it was explicitly stated that understanding the target customer for a new product is crucial (Interviewee 5, 26.01.2024, TB 97). Qualitative approaches were employed to uncover customer needs and problems (Interviewee 5, 26.01.2024, TB 212). This aligned with observations from the first interview phase, where personas were created based on existing users and their needs, or by working with user groups from “fög” (research center for the public sphere and society at the University of Zurich) that represent the Swiss population (Interviewee 1, 06.01.2023, TB 193).

The second process step focused on conducting both qualitative and quantitative research. This was based on the explanation that qualitative and quantitative market studies were carried out during the discovery phase (Interviewee 1, 06.01.2023, TB 138). This research approach aligned with an interviewee in the second interview phase, where it was explained that qualitative interviews were conducted with UX researchers and quantitative analyses with data analysts (Interviewee 5, 26.01.2024, TB 105). A major topic explored through this research was personalisation, facilitated by new technologies such as artificial intelligence (Interviewee 5, 26.01.2024, TB 258) or linked to digital services (Interviewee 2, 12.01.2023, TB 253).

Furthermore, the need to involve users in the NPD process as early as possible was reinforced by the following quote in an interview in the second interview phase:

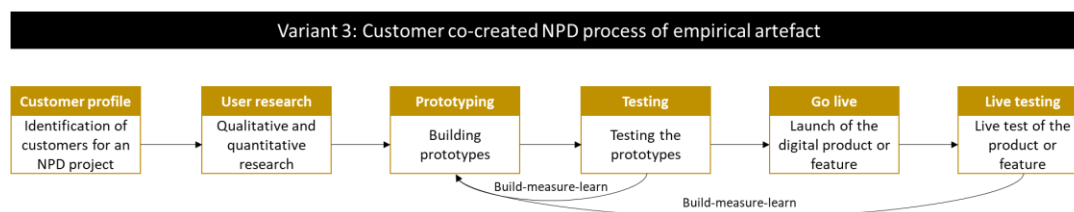
“Involving customers early allows you to minimise the process of building something that no one needs” (Interviewee 4, 15.01.2024, TB 232).

The third and fourth process steps are intrinsically linked. Prototypes are designed first and then subjected to user testing. This aligns with the observation that all interviewees in the first interview phase mentioned the creation of prototypes. For example, prototypes were created during the discovery phase (or ideation phase) to assess project feasibility (Interviewee 2, 12.01.2023, TB 155). Thereby, various prototype formats were employed, including paper-based, clickable, image-based, programmed, and live-implemented prototypes (Interviewee 1, 06.01.2023, TB 154).

Another interviewee in the first interview phase described a process of iterative prototype testing, where findings from testing informed the development of new prototype iterations (Interviewee 3, 16.01.2023, TB 23). This iterative approach was validated by an interviewee in the second interview phase, which explained that user research generated insights that were then incorporated into prototypes for new product features and subsequently tested (Interviewee 5, 26.01.2024, TB 160).

The final phase focused on testing launched products. It was explained in the first interview phase that live product testing was conducted to assess its impact on conversion rates (Interviewee 3, 16.01.2023, TB 227). This was supported by the observation in the second interview phase that new product launches were closely monitored to determine whether traffic, conversion, and re-engagement goals were met (Interviewee 5, 26.01.2024, TB 210).

Figure 5.10: Third variant of the customer co-created process of the empirical artefact



The third variant suggestion, illustrated in Figure 5.10, builds upon the foundation of the second variant (Figure 5.9) by incorporating the build-measure-learn cycle. This inclusion stems from observations in the first interview phase that findings from live products feed back into the idea phase (Interviewee 1, 06.01.2023, TB 21). Other approaches mentioned included rapidly bringing new features or minimal viable products (MVPs) to market for testing (Interviewee 3, 16.01.2023, TB 22, and 24) and using prototypes to implement the build-measure-learn cycle to assess the suitability of new solutions (Interviewee 3, 16.01.2023, TB 23).

This importance of market entry, followed by live testing (Interviewee 5, 26.01.2024, TB 28) and the use of rapid feedback testing (Interviewee 5, 26.01.2024, TB 26, and 235) were reinforced in the second interview phase. Thereby, it was emphasised that this rapid feedback testing is required in every project (Interviewee 4, 15.01.2024, TB 25), ultimately leading to the build-measure-learn cycle.

Furthermore, it was highlighted a nuanced perspective on rapid product launches. While acknowledging the potential of a swift MVP approach for smaller products, one interviewee also emphasised the importance of early and continuous validation for large, complex projects. This validation, potentially achieved through research services, helps minimise the risk of substantial rework later in the development process (Interviewee 4, 15.01.2024, TB 94).

5.2.4 Variants for Cross-Functional Team Structure

This section addressed the constellation of cross-functional teams, as illustrated in Figure 5.11.

“So cross functionals teams means that you have a team that’s made of different departments” (Interviewee 4, 15.01.2024, TB 125).

Figure 5.11: Cross-functional team structure of the empirical artefact



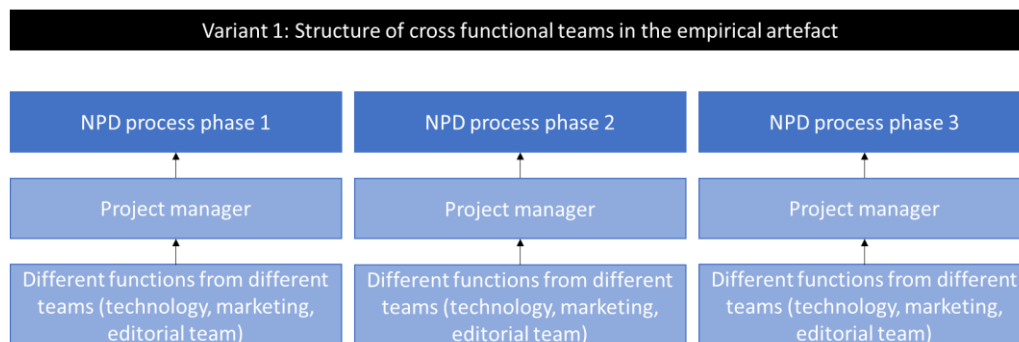
The suggested variants are based on selected characteristics derived from the overarching requirements detailed in section 5.1.3.4 and presented in the empirical coding tree in Table 5.1. Characteristics exhibiting suitable patterns across all interviews during the thematic analysis (see Appendix 1.3.1) were considered. This approach prioritises the development of high-quality variants over a large quantity. The cross-company analysis below, therefore, focuses on variants reflecting these prominent patterns.

The interviewees revealed two distinct variants for structuring cross-functional teams. The first variant, depicted in Figure 5.12, involves assembling all teams and functions individually for each NPD project. The second variant, shown in Figure 5.13, features a core team augmented by individuals from different teams and functions who contribute to specific parts of the NPD process.

Regardless of the chosen variant, it was emphasised that well-defined project governance is essential to provide clear guidance and orientation for all involved (Interviewee 4, 15.01.2024, TB 46, and 47). The steering committee, positioned outside the cross-functional team and comprising management-level roles, typically includes functions such as “Editor-in-

Chief”, “Chief Commercial Officer”, and “Chief Technology Officer” (Interviewee 5, 26.01.2024, TB 134).

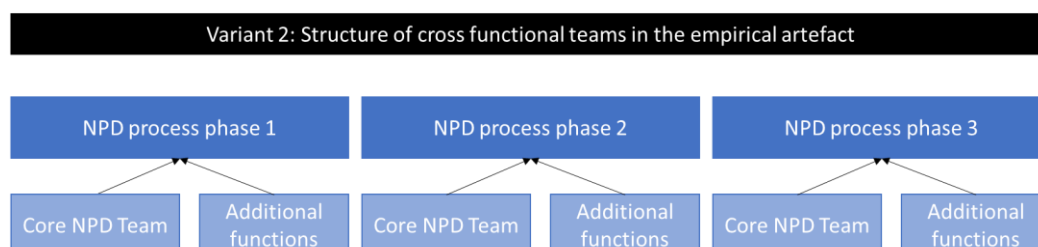
Figure 5.12: First variant of cross-functional team structure in the empirical artefact



As depicted in Figure 5.12, team members from different cross-functional teams were deployed individually throughout all phases of the new product development process. This stemmed from the explanation that teams could not be completely independent and that certain functions could be utilised across multiple digital products (Interviewee 2, 12.01.2023, TB 119). This finding was confirmed by an interviewee in the second interview phase, which described different cross-functional team members working on several projects (Interviewee 5, 26.01.2024, TB 122).

However, it was also mentioned that a dedicated project manager was necessary for large NPD projects (Interviewee 1, 06.01.2023, TB 35, and 123), implying the need for overarching project management. Crucially, it was deemed important that cross-functional teams included members with expertise in technology, marketing, and editorial, as products were typically defined by both their platform and content in the Swiss media industry (Interviewee 5, 26.01.2024, TB 134).

Figure 5.13: Second variant of cross-functional team structure in the empirical artefact



As depicted in Figure 5.13, in this variant a dedicated core team is responsible for managing the NPD process. This core team comprises individuals with various business-driven job

titles, including: business owner, user experience manager, business project manager (Interviewee 2, 12.01.2023, TB 124), editorial team member (Interviewee 4, 15.01.2024, TB 127), designer, data analyst, user experience researcher (Interviewee 5, 26.01.2024, TB 130), head of product, and someone closely connected to the end customer (Interviewee 4, 15.01.2024, TB 126).

Regarding the responsibility in communicating to the end customer, this could be either the product owner or a member of the customer team working in the business-to-customer (B2C) domain (Interviewee 4, 15.01.2024, TB 101). This B2C function typically resides within the marketing department (Interviewee 4, 15.01.2024, TB 127).

In addition to these business-driven roles, the core team also includes individuals with IT-focused roles (Interviewee 5, 26.01.2024, TB 129), such as product owner, developer (Interviewee 4, 15.01.2024, TB 126), and test manager (Interviewee 5, 26.01.2024, TB 133).

This core team must coordinate with other teams that influence the project but are not directly involved in its development. This includes, for instance, the advertising team, which is responsible for creating and placing campaigns (Interviewee 1, 06.01.2023, TB 123) to promote the new digital product.

Finally, in the next DSR phase – the development phase discussed in chapter 6 – all suggested variants from the DSR suggestion phase are consolidated into a single variant and developed into an empirical artefact.

6 Development Phase

This chapter covers the development phase of the DSR process, focusing on the development of this study's empirical artefact. One of the variants suggested in the suggestion phase (sections 5.2.1 to 5.2.4) was selected and developed into the empirical artefact (Figure 6.5).

This chapter is divided into three sections. First, a suggested variant of the suggestion phase in DSR from chapter 5 is selected, following a comparison with existing literature. Based on this selection, the empirical artefact is then developed and described. Finally, this chapter concludes by identifying emerging topics observed within the empirical artefact, which in turn highlight further research gaps.

6.1 Selection of Variant for the Empirical Artefact

This section details the initial step within the development phase in DSR, where one variant was selected for key elements of the empirical artefact: the overarching development structure, the NPD process phases, the customer co-created NPD process, and the structure for cross-functional teams. Variant selection involved a comparative analysis of variant's characteristics against established literature. This approach ensured that the final selection was grounded in robust theoretical justification.

6.1.1 Variant Selection for the Overarching NPD Development

Structure

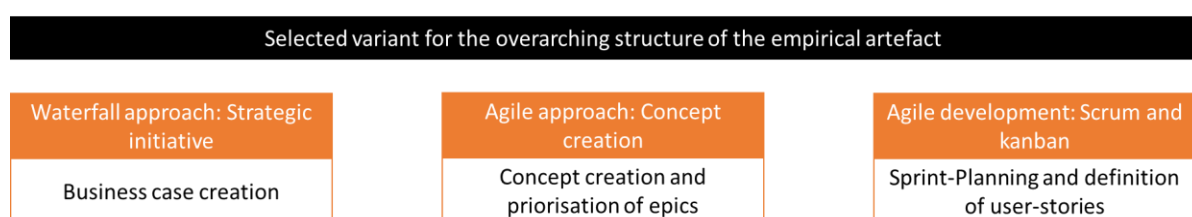
Kwon et al. (2021) suggests that large companies often favour waterfall-oriented methods, where problems are predefined by management rather than identified through customer-centric approaches like design thinking. This observation aligns with interview findings from the second interview phase, which indicated that the issue of problem definition stemmed from management, not customers (Interviewee 5, 26.01.2024, TB 220).

All interviews indicated the prevalence of agile working practices (Interviewee 1, 06.01.2023, TB 62, interviewee 2, 12.01.2023, TB 71, interviewee 3, 16.01.2023, TB 74, interviewee 4, 15.01.2024, TB 77, and interviewee 5, 26.01.2024, TB 80). However, it was acknowledged that a hybrid NPD approach is necessary for large and complex projects (Interviewee 4,

15.01.2024, TB 55). Given the focus of this study on large and complex NPD processes, this necessitates the integration of both agile and waterfall-oriented processes.

Importantly, it was highlighted that agile and waterfall-oriented process models should not be applied simultaneously by the same individual within the same process step, as this can lead to inefficiencies (Interviewee 5, 26.01.2024, TB 60). This aligns with the analysis by Bianchi et al. (2020), which found that while combining agile and waterfall-driven processes can yield positive results, waterfall-oriented processes can also hinder the overall hybrid process.

Figure 6.1: Selected variant for the overarching structure of the empirical artefact



Consequently, the second variant presented in 5.2.1 (Figure 6.1) was selected as the most suitable overarching structure for the empirical artefact. This selection was based on its integration of both agile and waterfall elements, with the waterfall-oriented approach employed only at the outset, followed by a transition to an agile setting.

6.1.2 Variant Selection for the NPD Process Phases

As previously explained in section 5.2.2, only one variant could be suggested for the NPD process. This was likely due to the emergence of a similar, or even identical, structure across the interviews conducted in five different Swiss media companies.

Figure 6.2: Selected variant for the NPD process phases of the empirical artefact

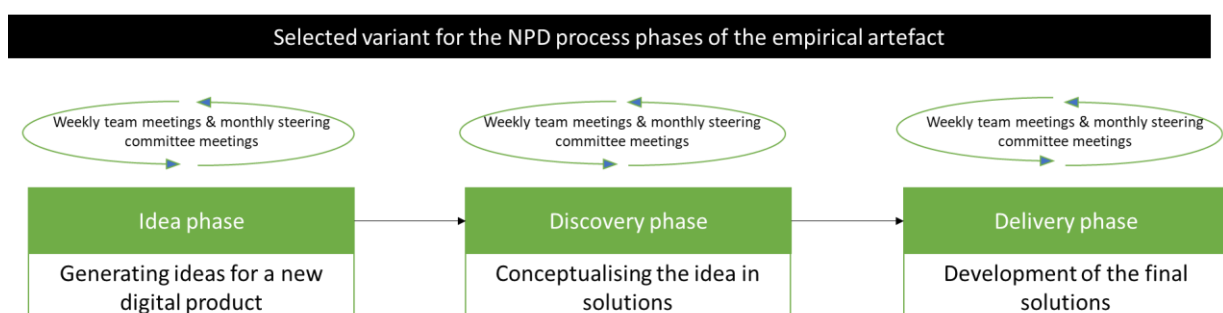


Figure 6.2 presents the selected variant for the NPD process, which progressed through three distinct phases. Firstly, the idea phase involved generating an initial idea. This idea was

then passed to the discovery phase, where it was conceptualised, and potential solutions were explored. Finally, the conceptualised solutions were passed to the development phase for implementation. This approach mirrors Cooper's (2019) classic five-stage process. Both the empirical artefact and Cooper's (2019) model begin with idea generation, followed by development, and culminating in product launch. A key difference, however, lies in the timing of idea generation. In the empirical artefact, ideas are generated as part of developing the business case (see Figure 6.1), whereas in Cooper's (2019) model, the business case is developed after the initial idea generation phase.

6.1.3 Variant Selection for the Customer Co-Created NPD Process

A salient point emerged across the interviews, namely that customer-centric thinking could be foregrounded in two ways: by prioritising customer needs (Interviewee 1, 06.01.2023, TB 192, interviewee 2, 12.01.2023, TB 195, interviewee 4, 15.01.2024, TB 206, and interviewee 5, 26.01.2024, TB 211, and 212) or by focusing on the user (Interviewee 3, 16.01.2023, TB 202). However, only the second variant (see Figure 5.9) and third variant (see Figure 5.10) captured this central focus holistically. In these variants, the customer profile was first identified, establishing the customer's identity (Interviewee 5, 26.01.2024, TB 97), their desired problem resolutions (Interviewee 5, 26.01.2024, TB 211), and the solutions that could be effectively applied (Interviewee 1, 06.01.2023, TB 192).

Analysis of the literature supports the selection of the third variant in section 5.2.3, which incorporates the build-measure-learn cycle. This choice is deemed appropriate due to the strong similarity observed between this variant, in conjunction with the overarching structure in Figure 6.1 and the NPD process phases in Figure 6.2, and the generic structure of spiral product development. Spiral product development follows a sequential process: initial planning; followed by concept development; system-level design definition; iterative cycles of design, build, and test; and finally, production (Ulrich et al., 2019). This aligns closely with the chosen variant, as demonstrated by the following parallels: planning in spiral development corresponds to both the business case creation within the overarching structure and the generation of ideas within the NPD process phases; concept development aligns with the concept creation stage in the overarching structure and the conceptualisation of ideas into solutions within the NPD process phases; system-level design mirrors the definition and prioritisation of epics in the overarching structure; the iterative design-build-

test cycle is reflected in the build-measure-learn cycle of the customer co-created NPD process; finally, production is represented by the agile process development framework, incorporating scrum and kanban, within the overarching structure. This detailed mapping of corresponding elements highlights the appropriateness of selecting the third variant, as it effectively integrates the principles of spiral product development within the framework presented.

Figure 6.3: Selected variant of customer co-created NPD process of the empirical artefact

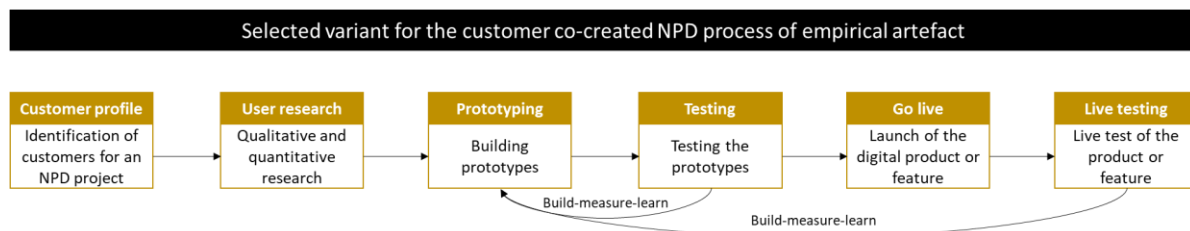


Figure 6.3 illustrates the selected variant for the customer co-created NPD process within the empirical artefact. This variant comprised six process steps, integrating the build-measure-learn cycle for both prototyping and product testing within the live environment.

6.1.4 Variant Selection for the Cross-Functional Team Structure

The first conclusion drawn from the literature and interviews was that project managers coordinated small core teams. This finding indicated that specific functional competences could be utilised, and the size of cross-functional teams could be kept small, ultimately influencing the success of NPD activities (Shurrab et al., 2022). This analysis closely resembled the first variant in section 5.2.4, where a project manager also coordinated individual functional roles throughout the entire NPD process.

However, a notable difference emerged in the composition of cross-functional teams. One interviewee stated that marketing, technology, and editing must be integrated (Interviewee 5, 26.01.2024, TB 134). This differed from Shurrab et al. (2022), who identified finance and sales, rather than an editorial team, as crucial components. This discrepancy could be attributed to the media industry's strong emphasis on the editorial team, which is responsible for content creation (Interviewee 4, 15.01.2024, TB 127), and a media company's focus on quality journalism (Interviewee 5, 26.01.2024, TB 219).

Although the finance and sales teams were not explicitly mentioned in the interviews, their functions remained relevant through the involvement of management (Interviewee 3,

16.01.2023, TB 54, and 83, and Interviewee 4, 15.01.2024, TB 40, and 41) or the strategy team (Interviewee 2, 12.01.2023, TB 36) in financial matters. Notably, these functions were incorporated within the waterfall-oriented structure for the go/no-go decision of a business case, as depicted in Figure 6.1.

Figure 6.4: Selected variant of cross-functional team structure of the empirical artefact

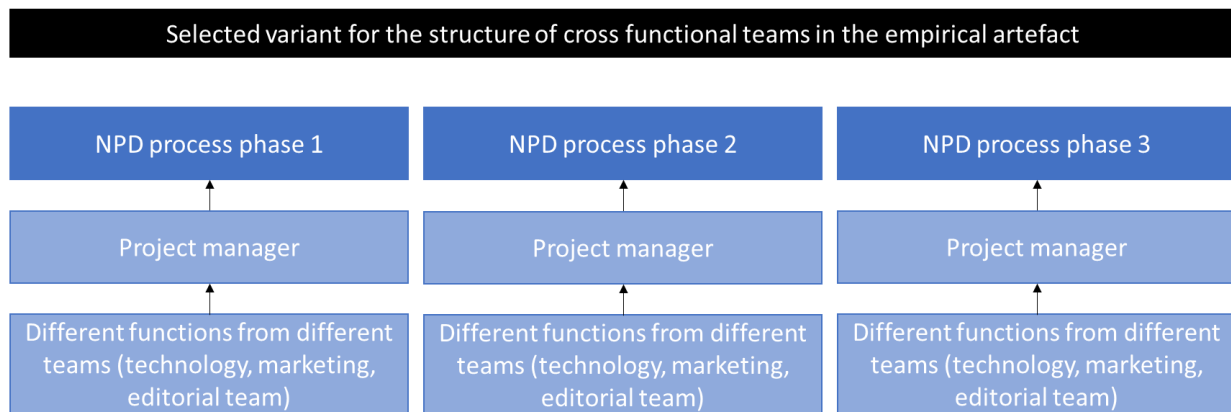


Figure 6.4 illustrates the selected variant for the structure of cross-functional teams, which employed a project manager to coordinate these teams throughout the NPD process. However, further clarification is needed from the third interview phase in the feedback and evaluation phase in terms of the DSR process, specifically whether the roles of product owner (Interviewee 4, 15.01.2024, TB 127, and interviewee 5, 26.01.2024, TB 130, and 131) or product manager (Interviewee 4, 15.01.2024, TB 126, and interviewee 5, 26.01.2024, TB 103, and 115) within Swiss media companies are synonymous with that of a project manager. Finally, section 6.2 delineates the specific functional roles within a cross-functional team and their corresponding process steps within the empirical artefact.

6.2 Development and Description of the Empirical Artefact

This section presents the empirical artefact, which comprised a synthesis of the selected variant from sections 6.1.1, 6.1.2, 6.1.3, and 6.1.4. Additionally, the cross-functional roles were assigned to their corresponding process elements.

Figure 6.5: Empirical artefact of this study

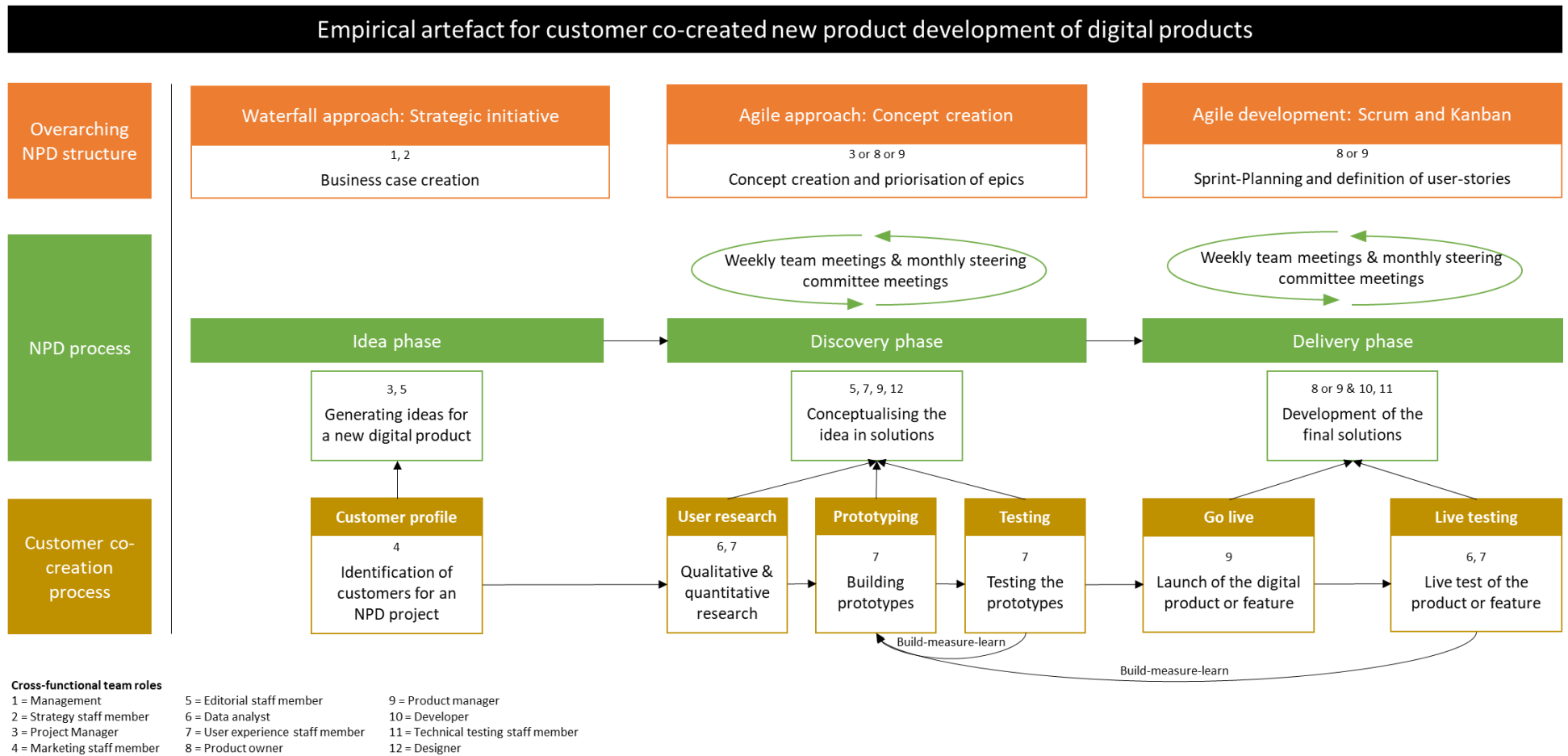


Figure 6.5 presents the empirical artefact of this study, derived from interviews conducted across five different Swiss media companies. It illustrates three distinct areas: the overarching NPD structure, the NPD process within the media industry, and the customer co-created process embedded within the NPD process.

The first overarching structural element involved the creation of a waterfall-driven strategic initiative. This entailed the development of a business case, which was either approved or rejected upon completion. The decision regarding the acceptance of the business case rested with management (Interviewee 3, 16.01.2023, TB 54, and 83, interviewee 4, 15.01.2024, TB 40, and 41) and the strategy team (Interviewee 2, 12.01.2023, TB 36).

The creation of a business case necessitated the initial collection of ideas for the new digital product. This idea phase, therefore, constituted the first NPD process within the strategic initiative of the overarching structure. The generation of these initial ideas required the functional roles of a project manager (Interviewee 1, 06.01.2023, TB 35, and 70, and interviewee 2, 12.01.2023, TB 124) and an editorial team member (Interviewee 5, 26.01.2024, TB 209). Furthermore, from the customer perspective, the customer profile, encompassing their problems, needs, and segment-specific criteria, had to be identified. Analysis indicated that this identification necessitated the functional role of marketing (Interviewee 4, 15.01.2024, TB 101, and 127).

As the business case required prior approval, weekly team meetings and monthly steering committees were not yet feasible. These steering committees, and their associated cross-functional teams, were established only after the approval of the business case.

The second overarching structural element introduced the agile way of working. Its purpose was to create a concept for the new digital product. The most important topics within the concept were defined and prioritised in a roadmap, with these key topics referred to as epics. This task was undertaken by the project manager (Interviewee 1, 06.01.2023, TB 123), or the product owner (Interviewee 4, 15.01.2024, TB 127), or the product manager (Interviewee 5, 26.01.2024, TB 103, and 134).

Accordingly, the project manager, product owner, or product manager led the NPD project and reported to the steering committee. Reports were presented to board members (Interviewee 4, 15.01.2024, TB 39), who constituted the steering committee. This committee

included functions such as the “Chief Commercial Officer”, the “Editor-in-Chief”, and the “Chief Technology Officer” (Interviewee 5, 26.01.2024, TB 134). In addition to the monthly dialogue with the steering committee, weekly cross-functional team meetings were held (Interviewee 1, 06.01.2023, TB 35, and interviewee 5, 26.01.2024, TB 115). Both the monthly steering committee meetings and the weekly team meetings aimed to ensure high quality within the NPD process and to discuss new progress.

Concept creation within the overarching structure encompassed the discovery phase as part of the NPD process. This phase involved further refining the ideas from the business case and transforming them into potential solutions using ideation approaches. This required the functional roles of product manager, UX team members (Interviewee 5, 26.01.2024, TB 106), team members from the editorial department (Interviewee 1, 06.01.2023, TB 66, and interviewee 4, 15.01.2024, TB 127), and designers (Interviewee 4, 15.01.2024, TB 130, and interviewee 5, 26.01.2024, TB 126).

As depicted in Figure 6.5, the discovery phase contained three customer co-created process elements. The first step involved conducting qualitative and quantitative research to develop the ideas. This necessitated the functional roles of data analysts and UX team members (Interviewee 5, 26.01.2024, TB 105). The resulting ideas were then translated into prototypes and tested with potential users or customers using the build-measure-learn approach, achieved through rapid feedback cycles. Creating prototypes and employing the build-measure-learn approach required the functional roles of user experience team members (Interviewee 2, 12.01.2023, TB 124, and interviewee 3, 16.01.2023, TB 157). Based on the test results, new prototypes were created iteratively until the final prototypes were obtained, which were then passed on to technical development.

The third overarching structural element introduced agile development, based on the use of scrum and the kanban board. This involved planning sprints and writing user stories that were used and prioritised for the individual sprints – in other words, incremental technical development cycles. The product owner (Interviewee 4, 15.01.2024, TB 127) or the product manager (Interviewee 5, 26.01.2024, TB 108) was held responsibility for this planning and prioritisation.

This overarching structural element encompassed the delivery phase as part of the NPD process. This was where the final solutions, derived from the discovery phase, underwent

technical development. Members of the scrum team were assigned to this phase (Interviewee 2, 12.01.2023, TB 124). The scrum team included the cross-functional roles of developer (Interviewee 4, 15.01.2024, TB 126, and 127, and interviewee 5, 26.01.2024, TB 116) and product owner (Interviewee 4, 15.01.2024, TB 126, and 127), or product manager (Interviewee 4, 15.01.2024, TB 130, and interviewee 5, 26.01.2024, TB 108). Additionally, technical testing teams could be included as part of the delivery phase if the product was tested based on predefined acceptance criteria (Interviewee 5, 26.01.2024, TB 116, and 133).

As in the discovery phase, weekly team meetings were held with the cross-functional teams, along with monthly meetings with the steering committee. When the launch of the new product or individual new features was planned, the product manager assumed the cross-functional role for the launch (Interviewee 5, 26.01.2024, TB 116). Subsequently, the new product or the new features were tested in the live environment with customers or users (Interviewee 1, 06.01.2023, TB 21). As it was assumed that live testing could be conducted through qualitative or quantitative testing, data analysts (Interviewee 5, 26.01.2024, TB 105) and UX team members (Interviewee 3, 16.01.2023, TB 142 and 168, and interviewee 5, 26.01.2024, TB 105) were required.

Mirroring the discovery phase, the build-measure-learn cycle (Interviewee 5, 26.01.2024, TB 235) was employed in the delivery phase. The aim here was to ensure that new results from the live environment were incorporated into further development (Interviewee 5, 26.01.2024, TB 28).

6.3 Emerging Topics

During the analysis of the first and second interview phases, emerging topics that held partial relevance to the research were identified, prompting further literature review in chapter 2. These topics included, for example: “six sigma”, and “service design tools”. This analysis of emerging topics facilitated the expansion of the literature and the identification of further subjects for the third interview phase.

This process also revealed additional research gaps, complementing those identified in section 2.6. As some of these research gaps extended beyond the scope of this research, they are documented in section 9.4.3 as potential avenues for future research.

6.3.1 Emerging Topics Based on the Interview Data

In the first step, the identified topics were categorised to get an overview, as can be seen in Figure 6.6. This resulted in several questions, which were compared with the literature in the second step in section 6.3.2 to identify further research gaps.

Figure 6.6: Emerging topics based on the data from the first and second interview phases

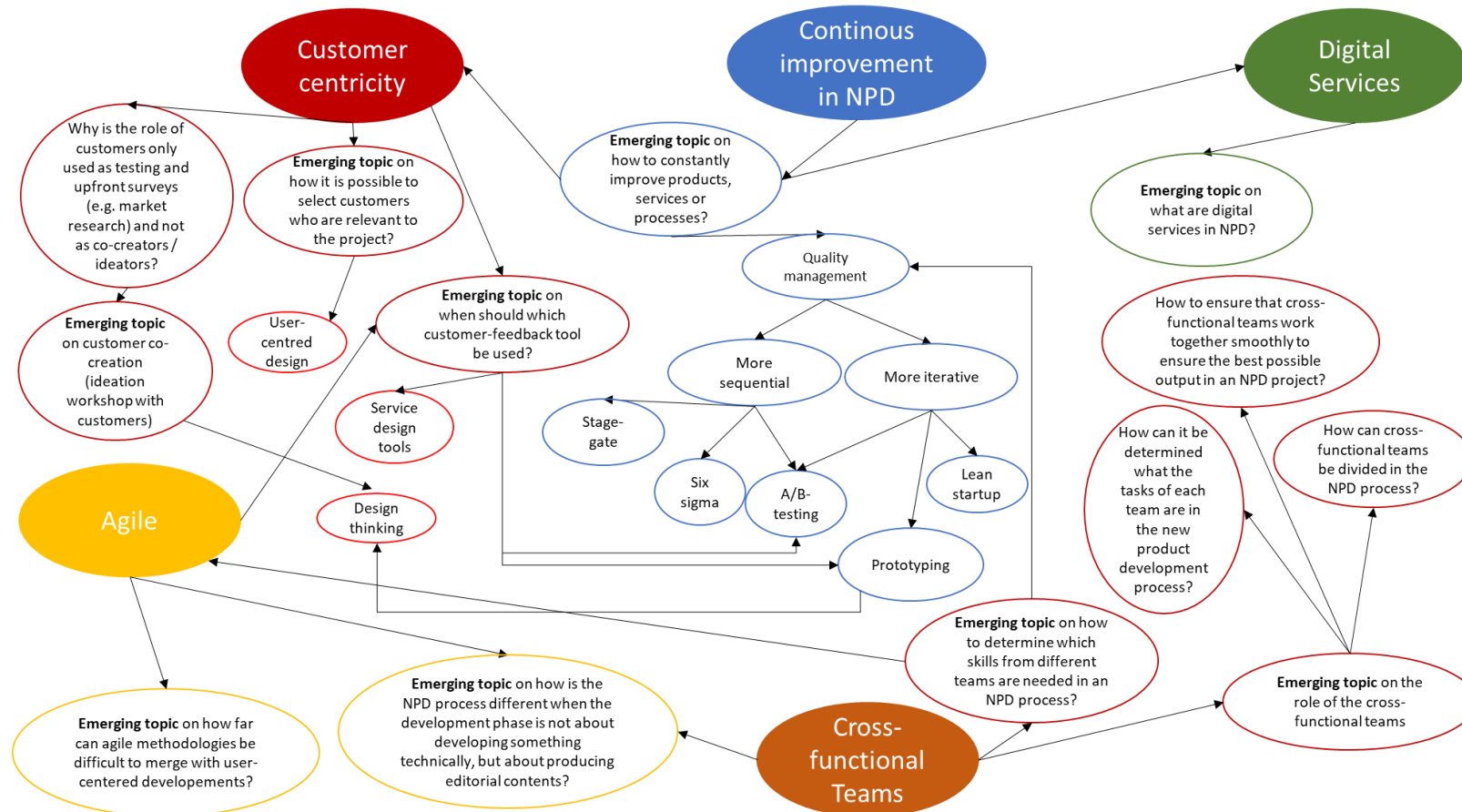


Figure 6.6 presents five categories identified as emerging topics in the data analysis: customer centricity, continuous improvement in NPD, digital services, agile, and cross-functional teams. These categories were derived by re-analysing the two interview phases in the awareness and suggestion phases in the DSR process of this study to identify factors indicative of emerging topics relevant for further research gaps. These factors included discrepancies between interview participants on customer centricity and digital services, the emergence of new topics such as agile and continuous improvement in NPD, and the identification of topics like cross-functional teams that were mentioned in a minor way but deemed central to this study.

6.3.2 Research Gaps that Correspond to the Emerging Topics

This section identifies research gaps from the literature associated with the emerging topics identified in the data from first two interview phases, as depicted in Figure 6.6.

Table 6.1: Research gaps corresponding to the emerging topics

Author and year	Research gap	Emerging topic category	Belonging to the emerging topic in Figure 6.6
(Morgan et al., 2019)	To optimise information analysis in new product development, future studies should investigate the influence of varying customer types (e.g., strong/weak users) and the number of customers involved in the process.	Customer centricity	Emerging topic: how it is possible to select customers who are relevant to the project?
(Morgan et al., 2019)	Future research should explore the relationship between the duration of customer involvement in NPD and the overall time required to complete the NPD process, with the aim of understanding whether extended customer engagement can expedite NPD.	Continuous improvement in NPD	Emerging topic: how to constantly improve processes?
(Helmer et al., 2021)	The innovation process for digital services remains an area ripe for further investigation.	Digital services	Emerging topic: what are digital services in NPD?
(Sjödín et al., 2020)	Further investigation is needed into the evolving dynamics of value co-creation in knowledge-intensive digital services and digital servitisation as it matures.	Digital services	Emerging topic: what are digital services in NPD?
(Zorzetti et al., 2021)	A mature model combining agile, user-centred design, and lean startup principles should be developed to investigate how these elements can synergistically enhance the NPD process.	Agile	Emerging topic: how far can agile methodologies be difficult to merge with user-centred developments?
(Shania et al., 2023)	Further research is needed to identify and address the challenges arising from	Agile	Emerging topic: how far can agile

	the integration of agile practices and user-centred design, with the aim of developing more effective strategies for combining these approaches.		methodologies be difficult to merge with user-centred developments?
(Hund, 2023)	Future research into digital transformation should consider the dynamic interplay between social and technical identities.	Cross-functional teams	Emerging topic: how is the NPD process different when the development phase is not about developing something technically, but about producing editorial content?

As shown in Table 6.1, a total of seven research gaps emerged from the analysis of the identified topics. These research gaps were incorporated into this study. However, some could not be directly addressed due to the need for further analytical methods, as explained in section 9.4.3. Consequently, these were designated as topics for future research.

7 Feedback and Evaluation Phase

This chapter evaluates the empirical artefact based on feedback from the third interview phase. This evaluation refines the empirical artefact and contributes to the development of a design-oriented framework for this study.

To achieve this, a within-company analysis was first conducted (see Appendix 1.2), gathering feedback on the empirical artefact from individual interviewees in section 7.1. Based on the resulting emerging patterns, a cross-company analysis was then conducted to examine these patterns in greater depth in section 7.2.

These results were highly relevant to the evaluation of the empirical artefact in section 7.3, based on the identified requirements and characteristics in section 7.2. This evaluation clarified why these individual requirements and characteristics were necessary to refine the empirical artefact, which forms the basis of this study's design-oriented framework.

The design-oriented framework, therefore, represented a further development of the empirical artefact (Figure 6.5). This incorporated insights from the third interview phase, which empirically evaluated the empirical artefact in section 7.3.1. The extended and new requirements and characteristics identified through the cross-company analysis in section 7.2 were then evaluated against existing literature in section 7.3.2 to confirm their relevance.

To ensure the design-oriented framework's development aligned with established theory in section 7.4, the identified requirements and characteristics were compared against the theoretical artefact presented in Figure 2.29. This involved utilising some of its elements and enriching them with insights from additional, current literature.

The choice of design science research (DSR) was crucial for this research step, as the study's research questions in Table 7.1 centred on how to improve NPD. To explore this "how", the inductive-deductive data analysis approach adopted in this study (see section 3.4.1), undertaken within the iterative process of DSR, has been fundamental to developing both the theoretical artefact in Figure 2.29 and the empirical artefact in Figure 6.5. In this respect, the in-depth analysis of the third interview phase helped refine and validate the design-

oriented framework in Figure 7.12. This ensured its practical relevance and efficiency in addressing the identified challenges in NPD within the Swiss media industry.

The multi-phase qualitative research design in this research step was crucial, as the research questions explored the complexity and challenges of NPD within organisational contexts. Accordingly, five Swiss media companies were selected as the focus to identify similarities and dissimilarities in both the NPD process and its application across the Swiss media landscape. The aim of the third interview phase in the feedback and evaluation phase of DSR was thus to gain insights into the following research questions:

Table 7.1: Overview of the research questions (as presented in section 1.4.2)

Research topics	Research Questions
NPD process	How can current agile and waterfall processes in NPD be united to ensure a good basis for collaboration between cross-functional teams, to integrate customers into the process and to act efficiently from the idea to the launch of the new digital product while reacting quickly to changes?
Customer co-creation	How can the customer co-creation approach be integrated into a hybrid NPD process based on cross-functional teams so that customers are involved in the entire process in the best possible way?
Cross-functional teams	How can optimal collaboration in cross-functional teams be ensured over the entire NPD process to constantly involve the customer and work efficiently at the same time?

Table 7.1 shows the three research questions (based on section 1.4.2) that were used for the cross-company analysis as a central, overarching foundation for integrating the identified patterns of similarities and dissimilarities. Accordingly, the patterns could be classified according to the following three perspectives: “NPD process”, “customer co-creation”, and “cross-functional teams”.

As described in section 3.5.2.4, the data analysis was conducted in a two-step qualitative analysis. This means that, based on the codes from the within-company analysis, new primary codes and subcodes were developed for the cross-company analysis. These new codes emerged from identified patterns of similarities and differences. The codebook, which was based on Mackieson et al. (2019), can be found in Appendix 1.3.4.

7.1 Feedback on Empirical Artefact

Hevner & Chatterjee (2010) describe the DSR process as involving iterations and feedback. This section identifies the feedback on the empirical artefact based on the within-company analysis presented in Appendix 1.2. This feedback reveals emerging patterns that are crucial for the cross-company analysis in section 7.2. By incorporating these diverse perspectives,

the cross-company analysis can identify significant similarities and differences between companies. This analysis helps to evaluate the empirical artefact based on the identified requirements and characteristics of the third interview phase and comparing it with theory in section 7.3. Ultimately, this process helps to refine the empirical artefact, contributing to the development of a design-oriented framework for this study by challenging the concept of customer co-created NPD involving cross-functional teams and its influence on the Swiss media industry.

7.1.1 Feedback on New Product Development Process

This section presents the key feedback on the empirical artefacts identified for the NPD process as part of the within-company analysis in Appendix 1.2. On this basis, emerging patterns are identified, which are analysed in more depth in a cross-company analysis in section 7.2.

7.1.1.1 Feedback from the Within-company Analysis

This section demonstrates the feedback on the empirical artefact for NPD processes based on Appendices 1.2.1.2.2, 1.2.1.2.3, 1.2.2.2.2, 1.2.2.2.3, 1.2.3.2.2, 1.2.3.2.3, 1.2.4.2.1, 1.2.5.2.2, and 1.2.5.2.4. In this context, Table 7.2 shows the text blocks (TB) of the thematic analysis based on Richards and Hemphill (2018) in Appendix 1.3.2.

Table 7.2: Feedback from the within-company analysis in Appendix 1.2 on NPD process for the empirical artefact

Companies	Feedback for the empirical artefact
1, 3, and 5	Emphasise a stronger focus on rapid and iterative development opportunities through agility (Interviewee 6, 22.04.2024, TB 20, interviewee 8, 03.05.2024, TB 47, and interviewee 10, 10.05.2024, TB 34).
1, 2, 3, 4, and 5	Strengthen control mechanisms for go/no-go decisions, with a clear distinction between technology and business considerations (Interviewee 6, 22.04.2024, TB 22, and 36, interviewee 7, 03.05.2024, TB 38, interviewee 8, 03.05.2024, TB 39, interviewee 9, 10.05.2024, TB 40, 41, and 42, and interviewee 10, 10.05.2024, TB 43, and 44).
1, and 4	Checking the technical feasibility of a new digital product before commencing the NPD process (Interviewee 6, 22.04.2024, TB 146, and 199, and interviewee 9, 10.05.2024, TB 163).
1, 2, 4, and 5	Integration of technical aspects and lifecycle into the governance process at an early stage (Interviewee 6, 22.04.2024, TB 157, 158 and 290, interviewee 7, 03.05.2024, TB 297, interviewee 9, 10.05.2024, TB 136, and interviewee 10, 10.05.2024, TB 321).
1, 4, and 5	Integration of overarching NPD structure for operations and guidance (Interviewee 6, 22.04.2024, TB 153, interviewee 9, 10.05.2024, TB 138, and interviewee 10, 10.05.2024, TB 139).
3, and 5	The MVP approach is generally lacking, particularly for products that are not business-critical (Interviewee 8, 03.05.2024, TB 9, and 10, and interviewee 10, 10.05.2024, TB 49).

Table 7.2 shows six distinct types of feedback for the empirical artefact relating to the NPD process. This allows an initial exploration of emerging patterns in section 7.1.1.2, which will be further analysed and expanded upon in the cross-company analysis in sections 7.2.2, and 7.2.4 for the evaluation of the empirical artefact.

7.1.1.2 Emerging Patterns on New Product Development Process

Table 7.2 highlights the main areas for improvement in the NPD process in the empirical artefact, focusing on agility, governance, and technical considerations.

Firstly, there is a clear need for faster and more iterative development (companies 1, 3, and 5), which allows for quicker responses to market changes and customer feedback.

Secondly, there is also a need for stronger control mechanisms, especially for go/no-go decisions, with a clear distinction between technological and business factors (companies ss 1, 2, 3, 4, and 5). This points to the need for stricter evaluation throughout the NPD process to ensure alignment between technical feasibility and business viability.

Thirdly, technical aspects are given a strong weighting. Companies 1, and 4 emphasise the importance of testing technical feasibility early on, before the NPD process is fully underway. Furthermore, it is considered crucial to integrate technical aspects and lifecycle considerations into the governance process from the very beginning (companies 1, 2, 4, and 5). This highlights the need for a more holistic approach, where technological considerations are integrated into strategic decision-making.

Fourthly, the need for an overarching NPD structure to operate and provide guidance is highlighted (companies 1, 4, and 5). This suggests a desire for a more standardised and structured approach to NPD that provides development teams with a clear overarching NPD structure and processes phases.

Finally, interestingly, there is also feedback on the use of minimum viable products (MVPs) in the empirical artefact. Companies 3 and 5 indicate a lack of MVP development, particularly for non-business critical products.

7.1.2 Feedback on Customer Co-Creation

This section presents the core feedback on the empirical artefact identified for customer co-creation in the within-company analysis in Appendix 1.2. Based on this, emerging patterns are identified, which will be explored in greater depth through a cross-company analysis in section 7.2.

7.1.2.1 Feedback from the Within-company Analysis

This section demonstrates the feedback on the empirical artefact for customer co-creation based on Appendices 1.2.1.2.1, 1.2.2.2.1, 1.2.3.2.1, 1.2.4.2.1, and 1.2.5.2.1. In this context, Table 7.3 shows the text blocks (TB) of the thematic analysis based on Richards and Hemphill (2018) in Appendix 1.3.2.

Table 7.3: Feedback from the within-company analysis in Appendix 1.2 on customer co-creation for the empirical artefact

Companies	Feedback for the empirical artefact
1, and 4	The customer co-creation approach must also be more strongly integrated into the business case creation (Interviewee 6, 22.04.2024, TB 7, interviewee 9, 10.05.2024, TB 73).
2	Seek a balance between direct and indirect customer involvement, but avoid excessive reliance on direct interaction, as it can be time-consuming (Interviewee 7, 03.05.2024, TB 85).
2, and 3	Beta versions must be integrated in the NPD process (Interviewee 7, 03.05.2024, TB 53, interviewee 8, 03.05.2024, TB 117).
3, 4, and 5	Technical prototypes are missing in the NPD process (Interviewee 8, 03.05.2024, TB 57, interviewee 9, 10.05.2024, TB 61, and interviewee 10, 10.05.2024, TB 64)
3	Selection of a team person who is responsible for the customer communication (Interviewee 8, 03.05.2024, TB 89).
5	Integration of governance structures to manage a customer co-creation approach (Interviewee 10, 10.05.2024, TB 311).

Table 7.3 shows six distinct types of feedback for the empirical artefact relating to customer co-creation. This allows an initial exploration of emerging patterns in section 7.1.2.2, which will be further analysed and expanded upon in the cross-company analysis in section 7.2.1 for the evaluation of the empirical artefact.

7.1.2.2 Emerging Patterns on Customer Co-Creation

Table 7.3 demonstrates a clear shift towards a more collaborative and customer-centred development approach. This is reflected in the repeated emphasis on deep customer integration throughout the process, from the creation of the business case (companies 1 and 4) to feedback on prototype solutions and live testing. However, it is not just about constant direct interaction; company 2 shows that a balance between direct and indirect methods is required to efficiently gather different insights.

To enable meaningful interaction with the customer, tangible tools are crucial. Companies 2 and 3 emphasise the importance of beta versions for customer testing, while companies 3, 4, and 5 demonstrate that technical prototypes enable practical customer feedback on software designs. Notably, both these elements are missing from the empirical artefact. Company 3 also highlights the need for structured communication by assigning a dedicated team member to manage customer interactions and ensure the organised collection of feedback. Finally, company 5 points to the need for formal governance structures to manage the customer co-creation process, ensuring effective communication, decision making and recognition of customer input.

In essence, successful customer co-creation requires not just participation, but well-managed, structured involvement throughout the NPD process.

7.1.3 Feedback on Cross-Functional Teams

This section presents the core feedback on the empirical artefact identified for cross-functional teams in the within-company analysis in Appendix 1.2. Based on this, emerging patterns are identified, which will be explored in greater depth through a cross-company analysis in section 7.2.

7.1.3.1 Feedback from the Within-company Analysis

This section demonstrates the feedback on the empirical artefact for cross-functional teams based on Appendices 1.2.1.2.4, 1.2.2.2.4, 1.2.3.2.2, 1.2.4.2.2, and 1.2.5.2.3. In this context, Table 7.4 shows the text blocks (TB) of the thematic analysis based on Richards and Hemphill (2018) in Appendix 1.3.2.

Table 7.4: Feedback from the within-company analysis in Appendix 1.2 on cross-functional teams for the empirical artefact

Companies	Feedback for the empirical artefact
1, and 2	Focusing on involving technical experts in the NPD process at an early stage (Interviewee 6, 22.04.2024, TB 199, and interviewee 7, 03.05.2024, TB 161, 220, and 221).
1, 3, 4, and 5	Focusing on a core team to enable autonomy (Interviewee 6, 22.04.2024, TB 169, interviewee 8, 03.05.2024, TB 183, Interviewee 9, 10.05.2024, TB 317, and interviewee 10, 10.05.2024, TB 192).
1, 2, 3, and 4	Investigate the optimal roles and responsibilities of product managers, product owners, and project managers (Interviewee 6, 22.04.2024, TB 258, interviewee 7, 03.05.2024, TB 266, and 267, interviewee 8, 03.05.2024, TB 156, 182, 184, 270, and 273, and interviewee 9, 10.05.2024, TB 276).
2, 3, 4, and 5	Emphasise the importance of technical roles (Interviewee 7, 03.05.2024, TB 219, interviewee 8, 03.05.2024, TB 223, and 316, interviewee 9, 10.05.2024, TB 164, 187, and 230, and Interviewee 10, 10.05.2024, TB 233).

4	A DevOps team is missing (Interviewee 9, 10.05.2024, TB 229).

Table 7.4 presents five distinct types of feedback for the empirical artefact relating to cross-functional teams. This allows an initial exploration of emerging patterns in section 7.1.3.2, which will be further analysed and expanded upon in the cross-company analysis in section 7.2.3 for the evaluation of the empirical artefact.

7.1.3.2 Emerging Patterns on Cross-Functional Teams

Table 7.4 highlights the critical role of technical expertise and clearly defined roles within the NPD process. A recurring theme is the need for early involvement of technical experts (companies 1 and 2) to ensure that technical feasibility and limitations are considered from the outset.

Firstly, the importance of a core team with autonomy is also emphasised (companies 1, 3, 4, and 5). This suggests a need for smaller, self-managing teams that can work efficiently and make decisions quickly, thereby fostering a sense of ownership and accountability.

Secondly, whilst emphasising technical expertise, the feedback also calls for clarity in roles and responsibilities. Companies 1, 2, 3, and 4 highlight the need to examine the optimal roles of product managers, product owners and project managers. This suggests potential ambiguity or overlap in responsibilities.

Thirdly, the emphasis on technical roles is further reinforced in companies 2, 3, 4, and 5. This highlights the need for specialised technical skills within the NPD process and potentially points to a current gap in technical skills, such as IT architects.

Finally, company 4 points to a specific gap in the current line-up: the lack of a DevOps team. This points to the need to bridge the gap between development and operations.

7.2 Cross-Company Analysis

The aim of the cross-company analysis in the following section was to identify patterns, themes, and contrasts across the individual Swiss media companies. Unlike section 7.1, in which each Swiss media company was analysed individually, the cross-company analysis aimed to provide a deeper understanding of all Swiss media companies collectively. This involved exploring the emerging patterns in section 7.1 in greater depth. The cross-company

analysis identified important building blocks that informed the discussion in chapter 8 and crystallised the key findings of this research. Accordingly, this section focusses on the empirical, cross-company findings from the third interview phase of this study.

Building on the primary codes and subcodes from the within-company analyses in Appendices 1.2.1.2 to 1.2.5.2, new primary codes and subcodes were formed for the cross-company analysis, reflecting emergent cross-company patterns. The codebook is provided in Appendix 1.3.4.

7.2.1 Customer Centricity as the First Cross-company Topic

In this section, the primary codes and the associated subcodes of the cross-company topic “customer centricity” are analysed and interpreted. A total of 5 primary codes and 11 subcodes were created to analyse patterns off customer centricity. The codebook for the analysis can be found in Appendix 1.3.4 and is based on the approach of Mackieson et al. (2019). The text blocks (TB) of the quotations from the transcribed interviews can be found in the codebook, which is based on the approach of Richards and Hemphill (2018), in Appendix 1.3.2.

Table 7.5: Codes used for the cross-company analysis – Customer centricity

Primary code	Subcode
COMMON_PRACTICES_CUSTOMER_CENTRICITY	USER_FEEDBACK_COLLECTION
COMMON_PRACTICES_CUSTOMER_CENTRICITY	USER-CENTRIC_DESIGN_APPROACH
COMMON_PRACTICES_CUSTOMER_CENTRICITY	USER_NEEDS_AND_PROBLEM_IDENTIFICATION
IMPLEMENTATION_VARIATIONS_CUSTOMER_INVOLVEMENT	METHODS_OF_CUSTOMER_ENGAGEMENT
CUSTOMER_IMPACT_ON_NPD	IMPACT_ON_PRODUCT_SUCCESS
CUSTOMER_IMPACT_ON_NPD	CUSTOMER_NEEDS_AND_PROBLEM_IDENTIFICATION
CHALLENGES_AND_BARRIERS_CUSTOMER_CO_CREATION	ORGANISATIONAL_AND_CULTURAL_RESISTANCE
CHALLENGES_AND_BARRIERS_CUSTOMER_CO_CREATION	RESOURCE_TIME_AND_FINANCIAL_CONSTRAINTS
CHALLENGES_AND_BARRIERS_CUSTOMER_CO_CREATION	CUSTOMER_CAPABILITIES_AND_EXPECTATIONS
CULTURAL_TRANSFORMATION	CONTENT_DRIVEN_PRODUCT_DEVELOPMENT
CULTURAL_TRANSFORMATION	JOURNALIST_CENTRIC_CULTURE

Table 7.5 shows the five primary codes and the eleven subcodes used for the cross-company analysis to analyse and interpret customer centricity in the Swiss media industry.

A consistent theme that could be observed in the companies is that customers were involved in the various phases of the NPD, which consequently indicated a customer-centred

approach. Company 1, for example, illustrated the use of prototypes for collecting feedback, analysing anonymous usage data, and working with customer interviews (Interviewee 6, 22.04.2024, TB 66). A similar approach was identified in the second company, in which user feedback was also used. Therein it was also described that beta versions were used to gain user feedback before the market launch of a new digital product (Interviewee 7, 03.05.2024, TB 53) and user testing for the newsletter was used to improve the newsletter (Interviewee 7, 03.05.2024, TB 68). Beta versions and customer feedback were also used in the third company, although it was mentioned that the tests of the beta versions were not only carried out by customers but also by family and friends because many of the employees in the company were also customers of the product. Thereby, it was mentioned that beta versions were relevant to recognise real problems that would otherwise not emerge (Interviewee 8, 03.05.2024, TB 59). Customer feedback was obtained when existing hypotheses were to be tested for their suitability (Interviewee 8, 03.05.2024, TB 87) and for user testing, methods such as customer surveys or prototypes were used (Interviewee 8, 03.05.2024, TB 70). Finally, the fifth company also pointed out that customer surveys were used to put the customer at the centre (Interviewee 10, 10.05.2024, TB 74). Apart from the fourth company, it was also possible to identify that every company tried to work with a user-centred design approach in the NPD process (Interviewee 6, 22.04.2024, TB 109, interviewee 7, 03.05.2024, TB 112, interviewee 8, 03.05.2024, TB 114, and interviewee 10, 10.05.2024, TB 74). The fourth company described that there was no specific user-centred process in the NPD process (Interviewee 9, 10.05.2024, TB 72) but that it would have helped to implement one (Interviewee 9, 10.05.2024, TB 119).

Nevertheless, the analysis of the five companies showed that customers were involved in the NPD process in different ways, revealing a broad spectrum of customer-centred approaches. In companies 1 and 5 it was pointed out that customer co-creation was not yet used or was used too little (Interviewee 6, 22.04.2024, TB 79, and interviewee 10, 10.05.2024, TB 97). In contrast, company 3 demonstrated an attempt to integrate customers directly into the NPD process through workshops (Interviewee 8, 03.05.2024, TB 87), indicating a move towards customer co-creation.

Even if the importance of identifying customer needs and problems during new product development was widely acknowledged (Interviewee 7, 03.05.2024, TB 2, interviewee 8,

03.05.2024, TB 87, and interviewee 9, 10.05.2024, TB 73), there were still contradictions. Company 2 highlighted the resource-intensive nature of exploring customer needs early in the NPD process (Interviewee 7, 03.05.2024, TB 211), indicating a more traditional and indirect approach to integrating customers throughout the NPD process, where customers were mainly involved selectively (Interviewee 7, 03.05.2024, TB 113) in the later stages of NPD through testing, as for example through live testing for further product development (Interviewee 7, 03.05.2024, TB 56). Similarly, company 4 described selective customer involvement in the NPD process (Interviewee 9, 10.05.2024, TB 72). Thereby, customer needs only had to be recorded for products that were not yet known on the market (Interviewee 9, 10.05.2024, TB 73). However, if the product was already in use at other media companies, it was not tested again as it was assumed that there was no risk that customers would not like it (Interviewee 9, 10.05.2024, TB 121).

Furthermore, the companies clearly demonstrated agreement that customer involvement in the NPD process led to success. For example, company 2 described how customer involvement drove smaller innovations, increased profitability, and prevented reliance on pure gut feeling in NPD (Interviewee 7, 03.05.2024, TB 86, and 210). This suggested that actively engaging customers in the development process could lead to more successful and profitable new products. As a result, it was of great relevance in company 3 that a person within the company who knew how to handle and categorise customer feedback was always involved in the NPD process (Interviewee 8, 03.05.2024, TB 299). In company 5, it was considered that the digital product would have failed if it had not been developed in a user-centred way (Interviewee 10, 10.05.2024, TB 123). Similarly, it was mentioned in companies 2 and 4 that the first step in NPD was to consider whether customers wanted a new digital product at all and to focus on customer needs accordingly (Interviewee 7, 03.05.2024, TB 210, and interviewee 9, 10.05.2024, TB 3). Company 3 described that the little things made the difference for the users of a digital product. This means that the user-friendliness and therefore the quality of the digital product was more important than creating fancy new functions (Interviewee 8, 03.05.2024, TB 307). It was also explained in company 2 that user-centred working could solve a major problem within cross-functional teams. Specifically, the collaboration between IT departments and business-driven departments frequently resulted in communication breakdowns. A user-centred approach, it was suggested, could resolve

these misunderstandings as all parties would be referencing the same customer-provided insights (Interviewee 7, 03.05.2024, TB 306).

In addition, various reasons were mentioned as to why the introduction and execution of customer co-creation in the individual Swiss media companies was characterised by difficulties and barriers. This aspect was central to finding out why the customer co-creation approach in the Swiss media industry was not yet as advanced as it could have been. One central aspect related to corporate cultural and organisational resistance: In company 1, it was mentioned in this regard that no procedural basis for customer co-creation was available in the company (Interviewee 6, 22.04.2024, TB 78). Accordingly, it would have been a completely new situation and change to the existing process for the first company, because to develop representative new digital products, several customers would have had to develop the new digital product jointly with the product team (Interviewee 6, 22.04.2024, TB 75). A very similar picture was reflected in companies 2 and 5, in which it was described that due to the current mindset, the Swiss media industry did not yet fundamentally understand how to develop in a customer-centred way (Interviewee 7, 03.05.2024, TB 306, and interviewee 10, 10.05.2024, TB 311). Furthermore, time and financial constraints were described, which prevented customer co-creation in Swiss media companies. In companies 1 and 5, the question was posed as to whether customers, if they contributed to the development of the digital product, should also be compensated like regular employees and that an additional budget would therefore be required (Interviewee 6, 22.04.2024, TB 76, and interviewee 10, 10.05.2024, TB 311). Additionally, concerns were raised in company 1 about whether customers would realistically have the time to be fully engaged in the NPD process (Interviewee 6, 22.04.2024, TB 81). Time was also mentioned in company 2 as a central parameter that would have hindered customer co-creation:

“... active involvement in the entire new product development process is extremely time-consuming” (Interviewee 7, 03.05.2024, TB 85).

Regarding time, company 5 explained that customer co-creation aimed to speed up the NPD process while fully involving the customer. However, it also acknowledged that introducing customer co-creation could initially slow down the process due to increased iterations. This slowdown was anticipated to be temporary, with the process becoming more streamlined in the long term (Interviewee 10, 10.05.2024, TB 311). Finally, it was argued that the media

product in its current form no longer met the needs of the younger generation (Interviewee 7, 03.05.2024, TB 291). However, at the same time it was claimed that customers could not be expected to develop new solutions (Interviewee 8, 03.05.2024, TB 89, and interviewee 10, 10.05.2024, TB 98, and 102) and that it was not always necessary to implement everything customers said (Interviewee 8, 03.05.2024, TB 90), as customers could not predict the future of journalism (Interviewee 7, 03.05.2024, TB 84). Customers were not product managers (Interviewee 8, 03.05.2024, TB 89, and interviewee 10, 10.05.2024, TB 207), and their indicated preferences often did not match their actual behaviour when using the product (Interviewee 9, 10.05.2024, TB 95). Instead, the focus needed to be on enabling customers to share their problems and wishes, and to provide feedback on developed solutions as part of the customer co-creation approach (Interviewee 8, 03.05.2024, TB 89, and interviewee 10, 10.05.2024, TB 98, and 102). This emphasised the importance of actively soliciting and incorporating customer input throughout the development process.

The final pattern identified for the NPD process was cultural transformation. Content was clearly a core element in NPD (Interviewee 7, 03.05.2024, 127, and interviewee 8, 03.05.2024, TB 252), but this presented a challenge. It was noted that journalists were not user-centred and still focused on output rather than outcome. This highlighted a need to more actively drive a shift in mindset (Interviewee 7, 03.05.2024, 127, 304 and 305). It was also highlighted that the Swiss media industry should have changed its attitude towards journalists because the external perception of media companies was still too strongly centred on journalism and journalists were more relevant internally to media companies than customers (Interviewee 9, 10.05.2024, TB 309, and interviewee 10, 10.05.2024, TB 288, and 320). Accordingly, it was also clearly explained that the media industry must change, which meant driving innovation and becoming more disruptive (Interviewee 8, 03.05.2024, TB 185, and interviewee 10, 10.05.2024, TB 312, 313, 319, 320, and 321). This suggested that a successful NPD process requires not only changes in procedures but also a fundamental shift in the organisational culture and mindset.

In conclusion, while the interviewees revealed that customer centricity was important in NPD, the actual implementation of customer co-creation remained very limited. Despite various efforts to gather customer feedback using different methods, a truly collaborative approach where customers were involved in the entire NPD process was not fully present.

Reasons for not implementing customer co-creation were mainly due to organisational resistance, resource constraints and a perceived mismatch between customer input and the realities of NPD. Thus, this reveals a significant gap between the theoretical understanding of customer co-creation and its practical application in the Swiss media industry.

Accordingly, the findings have highlighted the need for a more nuanced approach to customer engagement to reconcile the value of customer insights with the challenging realities of NPD in Swiss media organisations and the evolving Swiss media landscape.

Finally, the cross-company analysis of five companies in the Swiss media industry yielded four key results, which formed the basis for the discussion of customer co-creation in this research in chapter 8.

Firstly, it was explained that customers could not develop solutions themselves. However, the customer co-creation approach aimed to involve customers in the solution finding process, without them directly defining the final solution. This meant that customers would, for example, provide opinions and feedback, and participate in brainstorming sessions to contribute to the process. Therefore, it could be concluded that the Swiss media industry needs a deeper understanding of the solution finding process, as established in this study through the development of a design-oriented framework in section 7.4. This result was discussed in section 8.1.

Secondly, ambiguity arose regarding whether individual customers should be involved throughout the entire NPD process for customer co-creation, considering that customers are not product managers. Therefore, future research should investigate which customers to involve and when (more detailed analyses in section 9.4.3). It appeared illogical for a single customer to share their needs, identify ideas for implementation, and then provide feedback on the prototype, as this provides only a single perspective and may not satisfy a market comprised of diverse customers. Instead, iterations with different customers are necessary. For example, customer A could disclose their needs and problems, customer B could then echo or challenge those needs (iteration 1), these findings could be used to find an initial solution (iteration 2), and this solution-finding process could be repeated with customers C, D, E, etc. (iterations 3, 4, etc.) until a solid, testable solution emerges. This result was discussed in section 8.1.

Thirdly, the product manager would have to be present as a central anchor point in the NPD process, because he or she would have had to drive the product strategy and vision and link this with the customer insights throughout the entire NPD process to achieve the clear separation between customers and product managers. This clear involvement of the product manager is further addressed in section 7.2.3 and taken into account in the development of the design-oriented framework in section 7.4.3. This result was discussed in section 8.1.

Fourthly, the cultural transformation within the Swiss media industry made it clear that a cultural shift towards a user-centred approach was crucial for successful product development. However, the focus needed to shift from output to outcome, and customer needs had to take precedence over the internal perception of the role of journalists. This result was discussed in section 8.1.

To conclude with the resulting requirements and characteristics, Table 7.6 shows which requirements and characteristics are relevant for the empirical artefact based on the cross-company analysis around customer centricity.

Table 7.6: Resulting requirements and characteristics for customer centricity in the empirical artefact of the third interview phase

Resulting requirements	Resulting characteristics
Customer centricity	Cultural transformation
Customer centricity	Customer co-creation
Testing methods with customers	Surveys
Testing methods with customers	Brainstorming
Testing methods with customers	Prototyping
Testing methods with customers	Family and Friends
Testing methods with customers	Beta version
Testing methods with customers	Surveys
NPD methods	User-centred process methods

Table 7.6 presents three requirements and nine characteristics pertinent to the empirical artefact. These were identified through cross-company analysis within the area of the customer centricity. These factors are subsequently employed in the artefact's evaluation, detailed in section 7.3.

7.2.2 Agile Adoption as the Second Cross-company Topic

In this section, the primary codes and the associated subcodes of the cross-company topic "agile adoption" are analysed and interpreted. A total of 1 primary code and 5 subcodes were created to analyse patterns for the agile adoption. The codebook for the analysis can

be found in Appendix 1.3.4 and is based on the approach of Mackieson et al. (2019). The text blocks (TB) of the quotations from the transcribed interviews can be found in the codebook, which is based on the approach of Richards and Hemphill (2018), in Appendix 1.3.2.

Table 7.7: Codes used for the cross-company analysis – Agile adoption

Primary code	Subcode
AGILE_FRAMEWORKS_AND_ADOPTION	USE_OF_AGILE_PROCESS_FRAMEWORKS
AGILE_FRAMEWORKS_AND_ADOPTION	BENEFITS_ADVANTAGES_OF_AGILE
AGILE_FRAMEWORKS_AND_ADOPTION	CHALLENGES_OF_AGILE
AGILE_FRAMEWORKS_AND_ADOPTION	HYBRID_DEVELOPMENT_IN_NPD
AGILE_FRAMEWORKS_AND_ADOPTION	IMPACT_OF_AGILE_ON_NPD

Table 7.7 shows the one primary code and the five subcodes used for the cross-company analysis to analyse and interpret agile adoption in the Swiss media industry.

In all companies, it was possible to determine that agile principles are applied. It was specified that all five media companies worked based on the agile process framework “scrum” (Interviewee 6, 22.04.2024, TB 241, interviewee 7, 03.05.2024, TB 247, interviewee 8, 03.05.2024, TB 24, interviewee 9, 10.05.2024, TB 30, and interviewee 10, 10.05.2024, TB 32). Nonetheless, companies 3 and 4 also demonstrated that scrum was not practised according to theory in the Swiss media industry.

“In reality, and this is actually contrary to scrum theory, is that the product manager, and not the scrum master, gets the impediments out of the way”

(Interviewee 8, 03.05.2024, TB 25).

Furthermore, with reference to the application of scrum in practice, the goal in the Swiss media industry should have been to define and validate hypotheses and make quick adjustments based on customer feedback, not just to follow the scrum ceremonies. However, this was rarely done in the Swiss media industry, which meant that real iterations were not used to quickly measure whether the hypotheses were correct or whether the defined roadmap should have been adjusted (Interviewee 9, 10.05.2024, TB 29). The scaled agile framework (SAFe) was also mentioned, although opinions on this in companies 3 and 4 differed. In company 4 it was explained that a better structure was available due to the reference to SAFe and that it was thus possible to work at programme level for product management and at quarterly level on programme increments (Interviewee 9, 10.05.2024, TB 30). Conversely, company 3 described that SAFe in practice led to a loss of spontaneity

and that SAFe could only be used for targeted new product developments such as a new smartphone application (Interviewee 8, 03.05.2024, TB 28).

Moreover, common positive arguments in favour of the use of agile practices were found in the media companies. Firstly, companies 1 and 2 described how agility offered an advantage in terms of flexibility. In company 1 it was emphasised that by following sprints in agile processes, a specific launch date could be announced (Interviewee 6, 22.04.2024, TB 20). In company 2, it was emphasised that scrum offered a great deal of flexibility when planning the sprint (Interviewee 7, 03.05.2024, TB 23). Secondly, companies 1 and 2 discussed the improved team dynamics and productivity that could be achieved using agile practices. Company 1 described that the quality of the teams increased because working with agile processes was fun, as something was always delivered (Interviewee 6, 22.04.2024, TB 21). In company 2, it was emphasised that it was more productive to have a specific team that focused on the backlog (Interviewee 7, 03.05.2024, TB 23). Thirdly, companies 2 and 5 described how those agile practices contributed to risk minimisation and value maximisation. In both companies 1 and 5, it was explained that risk was minimised (Interviewee 6, 22.04.2024, TB 295) because scrum was used to break projects down into individual packages and this provided a high level of transparency (Interviewee 10, 10.05.2024, TB 32). Value maximisation was achieved through the iterative process of testing, learning, failing, and repeating inherent in the scrum framework. This cyclical approach facilitated extensive learning and development (Interviewee 10, 10.05.2024, TB 34). Thereby, developers could use their time efficiently to provide the greatest possible benefit for customers (Interviewee 10, 10.05.2024, TB 35).

Similarly, the interviewees also revealed common drawbacks associated with agile practices, particularly when implementing scrum. The Swiss media companies 1, 2, 3, and 4 specifically illustrated the difficulties encountered with long-term planning and scope management within the scrum framework. The Swiss media companies 1 and 4 indicated that scrum did not offer a solution for long-term planning. They noted that long-term strategic thinking required a broader timeframe than a single sprint (Interviewee 6, 22.04.2024, TB 22, and interviewee 9, 10.05.2024, TB 31). Furthermore, scrum's structure hindered spontaneous adjustments within a sprint, such as securing additional budget for extra resources (Interviewee 7, 03.05.2024, TB 154). A fully populated backlog in scrum was also cited as a

constraint on flexibility (Interviewee 8, 03.05.2024, TB 27, and interviewee 9, 10.05.2024, TB 31).

The Swiss media companies 1 and 3 also highlighted further drawbacks associated with agile practices, specifically concerning responsibilities. In the Swiss media company 1, the introduction of control gates within the NPD process sparked criticism. It was argued that these control gates diminished the sense of individual responsibility among team members (Interviewee 6, 22.04.2024, TB 36). This concern regarding individual responsibility may explain why, in company 4, a dedicated quality assurance team was employed to conduct functional testing within the scrum framework (Interviewee 9, 10.05.2024, TB 189).

Company 3 revealed a desire for greater proactivity from the technical teams, a characteristic that was seemingly discouraged by the scrum approach (Interviewee 8, 03.05.2024, TB 308).

Additionally, the analysis focused on a crucial aspect: the utilisation of a hybrid NPD process structure. Companies 1, 2, 3, and 4 demonstrated that the initial step in the NPD process consistently involved the development of a business case (Interviewee 6, 22.04.2024, TB 7, interviewee 7, 03.05.2024, TB 15, interviewee 8, 03.05.2024, TB 11, and interviewee 9, 10.05.2024, TB 18). This business case was based on a waterfall-oriented process (Interviewee 7, 03.05.2024, TB 15, and interviewee 9, 10.05.2024, TB 18), which focussed on financing (Interviewee 6, 22.04.2024, TB 7, interviewee 7, 03.05.2024, TB 15, and interviewee 8, 03.05.2024, TB 11) and defined the greatest risks and assumptions (Interviewee 9, 10.05.2024, TB 48). However, once the business case was approved, it was important to switch to the agile, customer-centred (Interviewee 7, 03.05.2024, TB 15), and lean process mode (Interviewee 9, 10.05.2024, TB 41). This finding indicated the initial adoption of a waterfall-oriented approach in the NPD process, followed by a transition to an agile, lean, and customer-centric methodology.

Ultimately, the analysis identified various impacts of agile practices on NPD. Statements from companies 1, 3, and 5 highlighted the challenges associated with estimation and scaling within NPD when employing agile practices. Company 1 illustrated the difficulties in accurately estimating the long-term scope and investment required for a new, large-scale product (Interviewee 6, 22.04.2024, TB 6, and 22). Furthermore, it demonstrated the complexities of scaling a large new product effectively, especially when multiple teams were

involved in the development process (Interviewee 6, 22.04.2024, TB 37). Consequently, it was concluded that scrum did not provide a universal solution. Instead, the analysis emphasised the critical importance of continuous collaboration and meticulous attention to detail throughout the entire NPD process and that effective product management was deemed essential to prioritise tasks, manage scale at a conceptual level, and maintain focus on the highest-priority items at any given time (Interviewee 6, 22.04.2024, TB 242, and 243, interviewee 8, 03.05.2024, TB 26, and interviewee 10, 10.05.2024, TB 33).

In conclusion, the cross-company analysis revealed that all companies utilised agile practices, though not always in strict adherence to theoretical principles. The scrum framework was particularly prevalent. Agile practices demonstrably offered numerous advantages, including increased flexibility, improved team dynamics, value maximisation, risk minimisation, and enhanced productivity. However, disadvantages were also apparent, notably challenges related to managing scope changes, long-term planning, and defining responsibilities within agile teams.

Beyond illustrating the positive and negative aspects of agile practices, which contributes valuable insights to existing literature, the analysis also described the application of hybrid process structures. This analysis observed the presence of waterfall-oriented processes for the initial business case development at the outset of an NPD project, followed by a transition to agile processes for the subsequent realisation of that business case. This finding holds particular significance as it demonstrates the practical utilisation of hybrid process models within this context. Furthermore, it suggests that while such models are employed in practice, a formally established model with a foundation of this specific process may currently be absent within the Swiss media industry.

Finally, the cross-company analysis of five companies in the Swiss media industry yielded four key results, which formed the basis for the discussion of agile adoption in this research in chapter 8.

Firstly, scrum implementation in the Swiss media industry often deviated from the theoretical ideals, with product managers taking over the responsibilities of scrum masters and an emphasis on ceremony rather than iterative learning. This result was discussed in section 8.2.

Secondly, contrasting views on SAFe illustrated the complexities of scaling agile, with some appreciating the structure while others find it restrictive. This result was discussed in section 8.2.

Thirdly, while agile practices offered advantages such as flexibility and improved team dynamics, they also presented a challenge, particularly in long-term planning and scope management. This result was discussed in section 8.2.

Fourthly, the widespread use of hybrid process structures that combined waterfall and agile approaches suggested that hybrid-oriented approaches could reflect the future of NPD processes in the Swiss media industry. This result was discussed in section 8.2.

To conclude with the resulting requirements and characteristics, Table 7.8 shows which requirements and characteristics are relevant for the empirical artefact through the cross-company analysis around agile adoption.

Table 7.8: Resulting requirements and characteristics for agile adoption in the empirical artefact of the third interview phase

Resulting requirements	Resulting characteristics
Agile process frameworks	
Agile process frameworks	Scrum
NPD methods	Hybrid development
NPD methods	Agile development
NPD methods	Waterfall development

Table 7.8 presents two requirements and five characteristics pertinent to the empirical artefact. These were identified through cross-company analysis within the area of agile adoption. These factors are subsequently employed in the artefact's evaluation, detailed in section 7.3.

7.2.3 Team Structure as the Third Cross-company Topic

In this section, the primary codes and the associated subcodes of the cross-company topic "team structure" are analysed and interpreted. A total of 4 primary code and 15 subcodes were created to analyse patterns for the team structure. The codebook for the analysis can be found in Appendix 1.3.4 and is based on the approach of Mackieson et al. (2019). The text blocks (TB) of the quotations from the transcribed interviews can be found in the codebook, which is based on the approach of Richards and Hemphill (2018), in Appendix 1.3.2.

Table 7.9: Codes used for the cross-company analysis – Team structure

Primary code	Subcode
SPECIALISED_IT_ROLES	TECH_LEAD
SPECIALISED_IT_ROLES	IT_ARCHITECTS
SPECIALISED_IT_ROLES	DEVOPS_TEAM
SPECIALISED_IT_ROLES	OUTSOURCING
NPD_ROLES_AND_GOVERNANCE	BASIC_ROLES_NPD_TEAM
NPD_ROLES_AND_GOVERNANCE	PM_ROLES
NPD_ROLES_AND_GOVERNANCE	SIMILAR_ROLE_OF_PM_AND_PO
NPD_ROLES_AND_GOVERNANCE	STEERING_BOARD
NPD_ROLES_AND_GOVERNANCE	RESPONSIBLE_ROLE_FOR_CUSTOMER_INTERACTION
CROSS_FUNCTIONAL_TEAM_STRUCTURE	TEAM_PURPOSE_AND_CONTEXT
CROSS_FUNCTIONAL_TEAM_STRUCTURE	TEAM_DYNAMICS
CORE_TEAMS_AND_PROJECT_MANAGER	USE_OF_CORE_TEAMS
CORE_TEAMS_AND_PROJECT_MANAGER	UNCLEAR_COORDINATING_ROLE
CORE_TEAMS_AND_PROJECT_MANAGER	LEADERSHIP_OF_CORE_TEAM
CORE_TEAMS_AND_PROJECT_MANAGER	USE_OF_PROJECT_MANAGER

Table 7.9 shows the four primary codes and the fifteen subcodes used for the cross-company analysis to analyse and interpret the team structure in the NPD process in the Swiss media industry.

The first key pattern observed was the pivotal role of the product manager in the NPD process across all companies. The product manager invariably functioned as the project lead, assuming responsibility for the entire NPD process and defining both the scope and rationale of the development (Interviewee 6, 22.04.2024, TB 166, and 282, interviewee 7, 03.05.2024, TB 283, and interviewee 8, 03.05.2024, TB 25).

“With digital products, it’s very clear who has to take the lead, which is the product manager” (Interviewee 6, 22.04.2024, TB 281).

Likewise, the product manager was responsible for the vision and strategy of the product (Interviewee 9, 10.05.2024, TB 278, and interviewee 10, 10.05.2024, TB 280). Furthermore, while other essential roles within the NPD team were identified, these varied across the companies examined. These included UX specialists and UX researchers (Interviewee 6, 22.04.2024, TB 171, 208, and 237, interviewee 7, 03.05.2024, TB 177, and 178, interviewee 8, 03.05.2024, TB 70, and interviewee 9, 10.05.2024, TB 187) technology specialists such as developers (Interviewee 6, 22.04.2024, TB 237, interviewee 7, 03.05.2024, TB 177, interviewee 8, 03.05.2024, TB 148, and 202, and interviewee 9, 10.05.2024, TB 187, and 230), and a product owner (Interviewee 9, 10.05.2024, TB 189, and 277, and interviewee 10, 10.05.2024, TB 235). It was also explained that editors were required for journalistically

relevant products (Interviewee 6, 22.04.2024, TB 237, interviewee 7, 03.05.2024, TB 180, and interviewee 10, 10.05.2024, TB 288) and that marketing specialists were also involved when it came to campaign purposes (Interviewee 6, 22.04.2024, TB 237, and interviewee 7, 03.05.2024, TB 181). In addition, four companies referred to the fact that data was used (Interviewee 6, 22.04.2024, TB 67, interviewee 7, 03.05.2024, TB 178, and interviewee 8, 03.05.2024, TB 16), and that as a result, employees in the data area were deployed in the NPD process (Interviewee 6, 22.04.2024, TB 67, and interviewee 7, 03.05.2024, TB 178). Employees with data expertise were involved in the NPD process, for instance, during the initial stages to establish key performance indicators (KPIs) (Interviewee 7, 03.05.2024, TB 178). It was also mentioned in three companies that designers were involved in the NPD process (Interviewee 6, 22.04.2024, TB 209, interviewee 8, 03.05.2024, TB 148, and 202, and interviewee 9, 10.05.2024, TB 62). Nevertheless, one point on which companies 1, 2 and 3 did not agree was which role was responsible for the exchange with customers. This could be either the product manager or a UX researcher (Interviewee 6, 22.04.2024, TB 208, interviewee 7, 03.05.2024, TB 178, and interviewee 8, 03.05.2024, TB 25). It could therefore be suggested that an NPD team comprises product managers, UX specialists, technology specialists, and, depending on the nature of the product and organisation, potentially also product owners, editors, marketing specialists, data specialists, and designers.

Another common finding was that, except for company 5, the roles of product manager and product owner were often combined (Interviewee 6, 22.04.2024, TB 258, interviewee 7, 03.05.2024, TB 266, interviewee 8, 03.05.2024, TB 270, and interviewee 9, 10.05.2024, TB 276). Company 4 offered a potential explanation for why merging the roles might not always be feasible, and why this merger of roles in company 5 was not mentioned. In this regard, it was suggested that combining the roles was only suitable for smaller products with a more manageable scope (Interviewee 9, 10.05.2024, TB 276).

Beyond the role of developers in the technical building of digital products (Interviewee 9, 10.05.2024, TB 187, and 230, and interviewee 10, 10.05.2024, TB 233), another pattern emerged regarding team composition within the NPD process: the presence of specialised technical roles. Specifically, “tech leads” were utilised in companies 1, 3, and 4 (Interviewee 6, 22.04.2024, TB 218, interviewee 8, 03.05.2024, TB 223, and interviewee 9, 10.05.2024, TB 187). Thereby, it was described that the tech leads had a very high level of knowledge in the

tech area but also had to take on the role as manager (Interviewee 8, 03.05.2024, TB 302). Furthermore, the utilisation of IT architects was reported across all companies (Interviewee 6, 22.04.2024, TB 218, interviewee 7, 03.05.2024, TB 222, interviewee 8, 03.05.2024, TB 223, interviewee 9, 10.05.2024, TB 229, and interviewee 10, 10.05.2024, TB 233). In this regard, the growing importance of IT architects was highlighted (Interviewee 7, 03.05.2024, TB 219) and attributed to their responsibility for identifying technical solutions, evaluating proposals from other technical specialists, and establishing a technical roadmap for developers (Interviewee 8, 03.05.2024, TB 224, 226, and 227, and interviewee 10, 10.05.2024, TB 233). However, the role of the IT architect varied across the companies. In companies 1 and 3, the tech lead assumed the responsibilities of the IT architect (Interviewee 6, 22.04.2024, TB 218, and interviewee 8, 03.05.2024, TB 223). Conversely, in companies 4 and 5, IT architects were not directly embedded within the NPD team but rather belonged to the general IT department (Interviewee 9, 10.05.2024, TB 231, and interviewee 10, 10.05.2024, TB 232). Notably, company 5 outsourced all technical roles for the NPD process due to their inability to occupy these positions year-round (Interviewee 10, 10.05.2024, TB 234, and 235). Finally, a DevOps team was mentioned in two companies, although in company 3, its involvement was limited to IT infrastructure support (Interviewee 8, 03.05.2024, TB 228, and interviewee 9, 10.05.2024, TB 229).

While companies 2, 3, and 4 utilised a steering committee for the NPD process (Interviewee 7, 03.05.2024, TB 284, interviewee 8, 03.05.2024, TB 286, and interviewee 9, 10.05.2024, TB 287), comprising key stakeholders and executive board members (Interviewee 7, 03.05.2024, TB 284, and interviewee 9, 10.05.2024, TB 287), company 4 highlighted a lack of systematic organisation within these committees, resulting in inconsistent membership (Interviewee 9, 10.05.2024, TB 287). Consequently, company 4 proposed the establishment of a product advisory board to ensure consistent participation, including representation from the editorial department (Interviewee 9, 10.05.2024, TB 303).

Furthermore, in all five companies it was pointed out that cross-functional teams were deployed (Interviewee 6, 22.04.2024, TB 209, interviewee 7, 03.05.2024, TB 172, interviewee 8, 03.05.2024, TB 183, interviewee 9, 10.05.2024, TB 188, and interviewee 10, 10.05.2024, TB 195). It was emphasised that these teams should operate with agility, lean principles, and autonomy to break down silos, pursue a shared objective, maintain a strong

user focus, foster diverse perspectives, and include developers as integral members to prevent isolation (Interviewee 7, 03.05.2024, TB 173, and 314, interviewee 8, 03.05.2024, TB 185, 186, and 315, interviewee 9, 10.05.2024, TB 190, 191, 206, and 317, and interviewee 10, 10.05.2024, TB 195). While both companies 2 and 4 employed cross-functional teams, they differed in their views on team reorganisation: company 2 allowed for restructuring every 3 to 6 months (Interviewee 7, 03.05.2024, TB 176), whereas company 4 prioritised stability and consistent team composition for greater efficiency (Interviewee 9, 10.05.2024, TB 190).

Furthermore, cross-functional teams were primarily deployed for developing individual features or smaller products (Interviewee 7, 03.05.2024, TB 175, interviewee 8, 03.05.2024, TB 186, interviewee 9, 10.05.2024, TB 188, and 190, and interviewee 10, 10.05.2024, TB 195), as this structure was deemed particularly effective for innovative, future-oriented, fast-paced, and disruptive projects (Interviewee 7, 03.05.2024, TB 174, interviewee 8, 03.05.2024, TB 185, interviewee 9, 10.05.2024, TB 317, and interviewee 10, 10.05.2024, TB 195). However, a key distinction emerged regarding the application of cross-functional teams: companies 3 and 5 employed them for non-business-critical products to minimise risk (Interviewee 8, 03.05.2024, TB 183, and interviewee 10, 10.05.2024, TB 195), while companies 2 and 4 considered them crucial for developing features or components of core (business-critical) products, aiming for end-to-end development (Interviewee 7, 03.05.2024, TB 173, 174, and 175, and interviewee 9, 10.05.2024, TB 190, and 317). Lastly, companies 3 and 4 agreed that cross-functional teams were not affected when interacting with customers throughout the NPD process (Interviewee 8, 03.05.2024, TB 214, and interviewee 9, 10.05.2024, TB 215).

In addition to the cross-functional teams, it was also confirmed in all companies that a core team was used in the NPD process. In company 2, the core expertise had to be present within the cross-functional teams (Interviewee 7, 03.05.2024, TB 172). In company 4, a cross-functional team had to remain in the same team constellation, which also included the developers, so that a close-knit team could work together for a long time (Interviewee 9, 10.05.2024, TB 190, and 191). Accordingly, it could be interpreted from these two explanations that the companies in companies 2 and 4 worked with core teams consisting of cross-functional compositions. Conversely, companies 1 and 5 demonstrated that core

teams were only suitable when it came to the NPD of large and strategically relevant products (Interviewee 6, 22.04.2024, TB 169, and interviewee 10, 10.05.2024, TB 193, 194, and 195). Companies 4 and 5 also emphasised that a core team had to be a team that focused specifically on only one new product (Interviewee 9, 10.05.2024, TB 190, and interviewee 10, 10.05.2024, TB 192).

Furthermore, companies 1, 2, 3, and 5 described the need for overarching leadership in a core team (Interviewee 6, 22.04.2024, TB 168, interviewee 7, 03.05.2024, TB 261, interviewee 8, 03.05.2024, TB 182, and interviewee 10, 10.05.2024, TB 195, and 196). The necessity for overarching leadership within a core team was primarily attributed to coordination needs, although opinions diverged on the specific role best suited for this responsibility. In company 1, this coordinative leadership function was carried out by the product manager (Interviewee 6, 22.04.2024, TB 168), in company 3 by the project manager (Interviewee 8, 03.05.2024, TB 269), and in company 5 by the product owner (Interviewee 10, 10.05.2024, TB 280).

Furthermore, companies 1 and 3 highlighted that large NPD projects often employed a (technical) project manager in addition to the product manager (Interviewee 6, 22.04.2024, TB 257, and interviewee 8, 03.05.2024, TB 269). However, opinions varied on the importance of a project manager for NPD projects. Company 2 asserted that a project leader was no longer necessary (Interviewee 7, 03.05.2024, TB 267). Conversely, company 3 emphasised the crucial, albeit non-content-related, role of a project leader for business-critical products, highlighting responsibilities such as escalation management, risk assessment, timeline adherence, and performance management (Interviewee 8, 03.05.2024, TB 156, 184, 185, 186, 205, 248, 273, and 275).

In conclusion, the five companies revealed the central and leading role of the product manager in the NPD process. While team composition varied, certain roles, such as UX specialists and developers, were consistently identified as crucial. The analysis also demonstrated the necessity of a core team and the effectiveness of autonomous, agile, and lean cross-functional teams. However, differing perspectives emerged regarding the core team leader's role and the application of cross-functional teams for core product development versus smaller, non-business-critical projects. Discrepancies were also noted regarding customer interaction responsibility and the feasibility of merging product manager

and product owner roles. Furthermore, the growing importance of specialised technical roles, including IT architects and technical leaders, was highlighted, although the Swiss media industry appeared to be in a nascent stage regarding their integration.

Finally, the cross-company analysis of five companies in the Swiss media industry yielded five key results, which formed the basis for the discussion of the team structure in this research in chapter 8.

Firstly, the product manager consistently played a central leadership role in the NPD process, was responsible for overall project management and defined the scope. However, the supporting roles varied from company to company, which raised questions about the optimal team composition and the influence of the product type and organisational context on the definition of roles. A potential solution, explored in the development of the design-oriented framework detailed in section 7.4.3, will be discussed further in section 8.3.

Secondly, while the necessity of core teams and cross-functional teams was generally acknowledged, there were differing views regarding their structure and application. There were discrepancies regarding the role of the core team leader, the suitability of cross-functional teams for core product development, and the frequency of team restructuring. This highlighted the need for further research into the factors influencing team configuration and leadership within NPD. A potential solution, explored in the development of the design-oriented framework detailed in section 7.4.3, will be discussed further in section 8.3.

Thirdly, the analysis revealed inconsistencies in the assignment of responsibility for customer interaction, with both product managers and UX researchers taking on this role in various companies. This ambiguity calls for further research into how customer interaction is managed and its impact on product development outcomes. A potential solution, explored in the development of the design-oriented framework detailed in section 7.4.3, will be discussed further in section 8.1.

Fourthly, the conflation of the roles of product managers and product owners was common but not universally accepted, with feasibility linked to product scope and complexity. This finding prompts a discussion of the conditions under which the conflation of these roles is beneficial, as well as the potential implications for role clarity and workload. One possible

approach to this, which was examined in the development of the design-oriented framework in section 7.4.3, will be discussed further in section 8.3.

Fifthly, the analysis highlighted the growing importance of specialised technical roles, such as IT architects and tech leads. Given the observed overlap of these roles within the Swiss media industry, they were combined in the design-oriented framework of this study.

However, the theoretical distinctions between these roles will be further elaborated upon in section 8.3.

To conclude with the resulting requirements and characteristics, Table 7.10 shows which requirements and characteristics are relevant for the empirical artefact through the cross-company analysis around team structure.

Table 7.10: Resulting requirements and characteristics for team structure in the empirical artefact of the third interview phase

Resulting requirements	Resulting characteristics
Cross-functional teams	Team roles
Cross-functional teams	Team dynamics
Cross-functional teams	Core team
Cross-functional teams	Steering committee

Table 7.10 presents one requirement and four characteristics pertinent to the empirical artefact. These were identified through cross-company analysis within the area of team structure. These factors are subsequently employed in the artefact's evaluation, detailed in section 7.3.

7.2.4 Elements and Focus Areas of the New Product Development

Process as the Fourth Cross-company Topic

In this section, the primary codes and the associated subcodes of the cross-company topic “elements and focus areas of the NPD process” are analysed and interpreted. A total of 5 primary code and 17 subcodes were created to analyse patterns for the elements and focus areas of the NPD process. The codebook for the analysis can be found in Appendix 1.3.4 and is based on the approach of Mackieson et al. (2019). The text blocks (TB) of the quotations from the transcribed interviews can be found in the codebook, which is based on the approach of Richards and Hemphill (2018), in Appendix 1.3.2.

Table 7.11: Codes used for the cross-company analysis – Elements and focus areas of the NPD process

Primary code	Subcode
FOCUS_ON_TECHNOLOGY	IMPORTANCE_OF_TECHNOLOGY_IN_NPD
FOCUS_ON_TECHNOLOGY	EARLY_INTEGRATION_AND_TECHNICAL_SUSTAINABILITY
FOCUS_ON_TECHNOLOGY	TECHNOLOGY_AS_ENABLER
FOCUS_ON_TECHNOLOGY	ARTIFICIAL_INTELLIGENCE
FOCUS_ON_TECHNOLOGY	PROBLEMS_TECHNICAL_STAFF_FINDING
FOCUS_ON_TECHNOLOGY	WISH_BETTER_COOPERATION_BUSINESS_AND_TECH
PROTOTYPE_AND_POC_FOR_SOFTWARE_DESIGN	USE_FOR_SOFTWARE_DESIGN
PROTOTYPE_AND_POC_FOR_SOFTWARE_DESIGN	CHALLENGES_FOR_SOFTWARE_DESIGN
PROTOTYPE_AND_POC_FOR_SOFTWARE_DESIGN	POC_VS_PROTOTYPE
CONTROL_GATES_IN_NPD_PROCESS	NO_SYSTEMATICALLY_USE
CONTROL_GATES_IN_NPD_PROCESS	ONLY_SITUATIONALLY_USE
IMPLEMENTATION_AND_USE_OF_OVERARCHING_FRAMEWORKS	REASONS_FOR_USING
IMPLEMENTATION_AND_USE_OF_OVERARCHING_FRAMEWORKS	FOCUS_AREAS
IMPLEMENTATION_AND_USE_OF_OVERARCHING_FRAMEWORKS	CHALLENGES_OF_USE
RAPID_FEEDBACK_CYCLES_AND_MVP	USE_AND_WISH_OF_USING_RAPID_FEEDBACK_CYCLES
RAPID_FEEDBACK_CYCLES_AND_MVP	CHALLENGES_USING_RAPID_FEEDBACK_CYCLES
RAPID_FEEDBACK_CYCLES_AND_MVP	CHALLENGES_AND_LIMITATIONS_MVP

Table 7.11 shows the five primary codes and the seventeen subcodes used for the cross-company analysis to analyse and interpret elements and focus areas of the NPD process in the Swiss media industry.

A primary pattern identified related to the use of technology. In all companies, it was indicated that prioritising technology was of great importance in NPD (Interviewee 6, 22.04.2024, TB 146, 157, 158, and 199, interviewee 7, 03.05.2024, TB 162, interviewee 8, 03.05.2024, TB 155, interviewee 9, 10.05.2024, TB 150, and interviewee 10, 10.05.2024, TB 151). In this context, a key technology that was focussed on was the use of artificial intelligence (Interviewee 8, 03.05.2024, TB 183, Interviewee 9, 10.05.2024, TB 163, and interviewee 10, 10.05.2024, TB 321). However, there were differing opinions as to when the focus was placed on technology in the NPD process. In the first company, technology was prioritised from the outset of the NPD process to assess its long-term sustainability, specifically, to evaluate its durability and potential for use across multiple products (Interviewee 6, 22.04.2024, TB 159, TB 218, and 290). Conversely, in company 4, the technology was not initially prioritised in the NPD process. Instead, it was first evaluated to determine whether it was an established or new technology. For established technologies,

the focus shifted to the technology later in the NPD process, when the problems it could solve were already known (Interviewee 9, 10.05.2024, TB 164, and 165). However, in three companies, the consensus was that the technology served to solve the underlying problem and was therefore not considered a driver for NPD (Interviewee 6, 22.04.2024, TB 160, interviewee 9, 10.05.2024, TB 150, and interviewee 10, 10.05.2024, TB 321). The final pattern relating to technology emerged as a problem area. Difficulties were reported in the collaboration between technology and business units during the NPD process. This was attributed to developers feeling unable to contribute to business-critical topics, despite being expected to co-create new products alongside the business units (Interviewee 6, 22.04.2024, TB 217, and 199, and interviewee 7, 03.05.2024, TB 264, and 306). In this context, it was mentioned that it was very difficult for the Swiss media industry to find good technical talent (Interviewee 8, 03.05.2024, TB 155, and 302, interviewee 9, 10.05.2024, TB 309), which led to a situation where business-relevant roles ended up taking on the technical role even though they did not have the necessary technical expertise (Interviewee 8, 03.05.2024, TB 224, and 308).

Another pattern identified was that (technical) prototypes were used to create software designs (Interviewee 7, 03.05.2024, TB 54, and 55, interviewee 8, 03.05.2024, TB 57, and 58 interviewee 9, 10.05.2024, TB 61, and 63, and interviewee 10, 10.05.2024, TB 64).

Nevertheless, it was mentioned in several companies that although the quality of the software designs was not compromised with prototypes (Interviewee 7, 03.05.2024, TB 55, and interviewee 9, 10.05.2024, TB 61), it had to be considered that this did not yet result in a final software concept. This was because working with prototypes invariably necessitated subsequent improvements to the software design (Interviewee 6, 22.04.2024, TB 51, interviewee 7, 03.05.2024, TB 55, interviewee 8, 03.05.2024, TB 149, and interviewee 9, 10.05.2024, TB 63). Furthermore, a distinction was drawn between technical prototypes and proof of concepts (PoCs) for technical products. The key differentiator was that PoCs were employed when questions arose regarding the performance, applicability, and cost of a technical solution (Interviewee 8, 03.05.2024, TB 148, interviewee 9, 10.05.2024, TB 42, and interviewee 10, 10.05.2024, TB 151). Prototypes were considered particularly helpful when it came to analysing clicks on the prototypes (Interviewee 6, 22.04.2024, TB 7, and interviewee 9, 10.05.2024, TB 62), which ultimately indicated the technical usability.

Furthermore, there was evidence that no media company used a systematic approach for the use of quality control gates in the NPD process, although this was considered important (Interviewee 6, 22.04.2024, TB 289, interviewee 7, 03.05.2024, TB 38, interviewee 8, 03.05.2024, TB 39, interviewee 9, 10.05.2024, TB 41, and interviewee 10, 10.05.2024, TB 44). Instead, situational approaches were described, such as incorporating a gate at the beginning of the NPD process to approve the business case or to facilitate initial technical assessments (Interviewee 6, 22.04.2024, TB 218, and interviewee 9, 10.05.2024, TB 40).

“The problem is that we are not that brave. At least the control gate, that is, at the beginning of the business case, where we decide whether we want to implement this business or not, based on user insights, would be hugely relevant” (Interviewee 6, 22.04.2024, TB 289).

It was also noted in company 2 that gates were primarily used on a situational basis, when significant changes were involved, marking the transition from one NPD phase to the next (Interviewee 7, 03.05.2024, TB 38). Another key point was the importance of separating gates for technical and business-related topics, ensuring that only individuals with relevant expertise participated in the gate review meetings (Interviewee 9, 10.05.2024, TB 42, and interviewee 10, 10.05.2024, TB 43).

Moreover, it was found that no company referred to an overarching lifecycle-based framework for the NPD process. Either only an implicit, in other words unwritten, process was carried out (Interviewee 6, 22.04.2024, TB 125, and interviewee 9, 10.05.2024, TB 135), or a project management framework was used for large and relevant products with a new technological foundation (Interviewee 8, 03.05.2024, TB 129). Nevertheless, the use of an overarching framework for the NPD process was considered important in all companies. The reasons given for this varied. Company 1 felt an overarching framework would have necessitated a reassessment of the financial investment and organisational structure within the NPD project (Interviewee 6, 22.04.2024, TB 301). Companies 2, 3, and 5 believed it would have simplified the work to have providing an overarching process to follow, thereby adding structure to the NPD process (Interviewee 7, 03.05.2024, TB 128, interviewee 8, 03.05.2024, TB 300, and interviewee 10, 10.05.2024, TB 139, and 140). It was also suggested that a framework would have enabled a focus on the entire technical lifecycle of a new digital product, including its eventual end-of-life (Interviewee 6, 22.04.2024, TB 158, and

interviewee 9, 10.05.2024, TB 136). Finally, the importance of considering a product's operation and maintenance to control costs and ensure effective benefits for users, was highlighted (Interviewee 6, 22.04.2024, TB 153, and interviewee 9, 10.05.2024, TB 138).

Despite the view being expressed that an overarching framework would have been very beneficial for the NPD process (Interviewee 7, 03.05.2024, TB 297, interviewee 9, 10.05.2024, TB 134, and interviewee 10, 10.05.2024, TB 139), challenges were also identified. Companies 1 and 2 reported that the strategy department was not directly integrated into the NPD process and therefore worked with a process that was separate from it (Interviewee 6, 22.04.2024, TB 239, and 240, and interviewee 7, 03.05.2024, TB 126, and 292). This meant that while working with the same overarching framework across the entire organisation was desirable, it was not considered feasible (Interviewee 7, 03.05.2024, 297). Furthermore, it was noted that in companies 2, 3, and 5, it was challenging to adhere strictly to a theoretical model. In practice, an overarching framework was required that offered the flexibility to adapt processes to the specific NPD project (Interviewee 7, 03.05.2024, 297, interviewee 8, 03.05.2024, TB 17, and interviewee 10, 10.05.2024, TB 141).

Another pattern detected related to the use of rapid feedback cycles and most viable products (MVPs). Although it was explained that rapid feedback cycles were used in the NPD process, for example in the ideation phase of new digital products (Interviewee 6, 22.04.2024, TB 52, interviewee 7, 03.05.2024, TB 55, interviewee 9, 10.05.2024, TB 41, and 48, and interviewee 10, 10.05.2024, TB 49), or that there was a desire to use them more (Interviewee 6, 22.04.2024, TB 46, and 50, and interviewee 7, 03.05.2024, 53), problems were also highlighted, which was why the actual introduction had stumbled. One problem identified included the fear of reputational damage when working with rapid feedback cycles (Interviewee 6, 22.04.2024, TB 50). Another problem was that in the Swiss media industry, specifically within technical development in the NPD process, agile principles were not implemented effectively to enable rapid feedback cycles with customers (Interviewee 9, 10.05.2024, TB 29).

It was also shown that MVPs were used (Interviewee 8, 03.05.2024, TB 10, and interviewee 10, 10.05.2024, TB 49). However, several observations were made regarding MVPs. Firstly, it was suggested that they were only suitable when the NPD did not exclusively involve business-critical functions. This was because, when such business-critical functions were

involved, a complete product had to be developed, rather than just an MVP (Interviewee 8, 03.05.2024, TB 9, and 10). Secondly, it was noted that, in reality, MVPs often deviated from the true principle of an MVP, as they were often far more extensive than “minimal” (Interviewee 8, 03.05.2024, TB 117). Thirdly, the importance of avoiding excessive quality control gates in the NPD process for MVPs was highlighted. This was because such gates could delay development. However, market testing of the live MVP was considered the crucial quality control gate (Interviewee 10, 10.05.2024, TB 45, and 49). Finally, it was suggested that if a full customer co-creation approach had been integrated into the NPD process, an MVP would become unnecessary, as all necessary customer information would have already been gathered (Interviewee 10, 10.05.2024, TB 100).

In conclusion, the cross-company analysis of elements and focus areas within the NPD process reveals a paradoxical relationship between technology and NPD in Swiss media organisations. While technology is widely acknowledged as essential, the focus on technology in the NPD process varied and the disconnect between business and technology departments hindered effective collaboration and innovation. Furthermore, it was mentioned that technical prototypes could be used to create software designs without compromising quality. However, it was also noted that prototypes could not be used to create a final software design, as they invariably require subsequent adjustments. Furthermore, the lack of a standardised process for quality control assessment in these media companies was criticised, posing a risk to the introduction of new digital products. In addition, it was established that an overarching structure for the NPD process is needed, one which considers the entire technical lifecycle, including operation and maintenance. However, it was also emphasised that such a model must be adaptable in practice and not just theoretically sound. Moreover, although MVPs were used in the NPD of digital products, it was suggested that they would be unnecessary if a customer co-creation approach were fully adopted, as all customer information would already be integrated.

Finally, the cross-company analysis of five companies in the Swiss media industry yielded four key results, which formed the basis for the discussion of agile adoption in this research in chapter 8.

Firstly, a paradoxical relationship between technology and the NPD process in Swiss media companies was revealed. While technology was generally seen as essential, its integration

was uneven and fraught with challenges. The timing of its prioritisation varied from company to company, and in some instances, technology was not seen as a key enabler of NPD. This result was discussed in section 8.4.

Secondly, a significant disconnect between the business and technology departments was identified, hindering effective collaboration and innovation. This was exacerbated by difficulties in attracting and retaining technical talent, leading to business-focused employees taking on technical tasks despite lacking the necessary expertise. This result was discussed in section 8.3.

Thirdly, the lack of standardised processes for quality control stages posed a risk to the successful introduction of new digital products. Although control stages were employed, their application was often situational and lacked consistency across the companies. This result was discussed in section 8.4.

Fourthly, despite recognising the benefits of an overarching NPD framework, none of the companies employed one. This highlighted a disconnect between the perceived need for structure and the practical challenges of implementing a framework that could meet the diverse needs and strategic objectives of each organisation. This result was discussed in section 8.4.

To conclude with the resulting requirements and characteristics, Table 7.12 shows which requirements and characteristics are relevant for the empirical artefact through the cross-company analysis around elements and focus areas of the NPD process.

Table 7.12: Resulting requirements and characteristics for elements and focus areas of the NPD process in the empirical artefact of the third interview phase

Resulting requirements	Resulting characteristics
Agile process frameworks	Rapid feedback cycle
Project framework conditions	Quality control gates
Project framework conditions	Overarching NPD Framework
Project framework conditions	Technical lifecycle management
NPD methods	Focus on technology
NPD methods	Most viable product
Testing methods with customers	Technical prototypes

Table 7.12 presents four requirements and seven characteristics pertinent to the empirical artefact. These were identified through cross-company analysis within the area of team structure. These factors are subsequently employed in the artefact's evaluation, detailed in section 7.3.

7.2.5 Conclusion of the Cross-company-Analysis

In conclusion, the cross-company analysis has provided important insights into NPD processes in Swiss media companies, emphasising a sector undergoing significant change but facing various challenges in its approach to NPD. The analysis has shown that Swiss media companies understand the concept of customer centricity but struggle to fully implement customer co-creation. Agile practices are widely adopted, but their implementation does not always match the theoretical principles, resulting in inconsistencies and limitations in their effectiveness. Likewise, team structures are evolving, with product managers playing a central role, but there is a lack of clarity and standardisation regarding other roles and responsibilities within NPD teams.

The analysis also pointed to a complex relationship between technology and NPD, with technology seen as crucial but its integration often hampered by organisational and collaborative issues. The lack of standardised overarching structures, the limited and situational application of quality control points, and the continued pursuit of reconciling co-creation with customers with the use of MVPs indicate another mismatch between theoretical understanding and practical reality within NPD processes.

The cross-company analysis provides a narrative of Swiss media companies that are aware of the necessity for innovation and customer-centric approaches but have difficulty fully implementing these concepts into their NPD processes. The results of this analysis highlight the urgent need for a more sophisticated, structured and integrated approach to NPD that effectively merges customer insights, agile methodologies, cross-functional teams, and technological advances within a robust and standardised overarching process framework.

Finally, the cross-company analysis identified key requirements and characteristics central to the empirical artefact. These are used to evaluate the artefact (see Figure 6.5) in the next section 7.3, enabling a refinement that ultimately leads to this study's design-oriented framework.

7.3 Evaluation of the Empirical Artefact

This section evaluates the requirements and characteristics of the empirical artefact, as identified in Table 5.1. It begins with an empirical evaluation based on the requirements and characteristics identified in the cross-company analysis of the third interview phase in

section 7.2. This is followed by a theoretical evaluation of the extended and new requirements and characteristics identified through the empirical evaluation. The section concludes by identifying the requirements and characteristics relevant to refining the empirical artefact, which forms the basis for the development of the design-oriented framework of this study.

7.3.1 Empirical Evaluation of the Empirical Artefact

This section evaluates the empirical artefact (Figure 6.5) against the requirements and characteristics (detailed in Table 5.1) that informed its development. This evaluation drew upon the cross-company analysis of the third interview phase, as discussed in section 7.2.

Table 7.13: Evaluation of requirements and characteristics of the empirical artefact

Requirement in development phase	Associated characteristic in development phase	Evaluation of empirical artefact	Justification
Agile process frameworks (Ikonne, 2021)		Confirmation	In all interviews, the use of agile process frameworks was mentioned (see section 7.2.2) and could be confirmed.
Agile process frameworks	Scrum (Marion et al., 2021)	Extension	In the Swiss media industry, the implementation of scrum frequently deviated from the theoretical ideals in practice (see section 7.2.2). This necessitated the implementation of an extended view of scrum.
Agile process frameworks	SAFe (Liu et al., 2020)	Mixed patterns and reduction	Opinions on SAFe were divided. Some interviewees perceived it as providing better structure, while others believe it leads to a loss of spontaneity (see section 7.2.2). Because scrum was the fundamental agile process framework, SAFe was therefore considered in reduced form.
Agile process frameworks	Kanban (Jana & Pal, 2020)	Reduction	Kanban was not mentioned in more detail in section 7.2, which is why Kanban was not considered further.
Agile process frameworks	Build-measure-learn cycle (lean startup) (Zorzetti et al., 2022)	Extension	The characteristic “build-measure-learn cycle” was extended to “rapid feedback cycle” because the focus in the interviews in section 7.2.4 was on the overall method of rapid feedback cycles, wherein the build-measure-learn cycle was one possible procedure.
Project framework conditions (Kiselev et al., 2020)		Confirmation	The project framework conditions remained relevant in all interviews (see section 7.2.4) and could be confirmed.
Project framework conditions	Quality management (Abdullah et al., 2021)	Extension	The quality management remained highly relevant in all interviews. However, as quality control gates were specifically addressed (see section 7.2.4), this characteristic necessitated the extension to “quality control gates”.
Project framework conditions	Governance (Kiselev et al., 2020)	Extension	As demonstrated in section 7.2.4, focusing solely on “governance” was insufficient. Instead, an overarching NPD framework was required, with governance as one component, similar to the dimensions of governance within ALM proposed by (Chappell, 2010). Therefore, the characteristic necessitated the extension to “overarching NPD framework”.
Project framework conditions	Lifecycle management (Houston & Kennedy, 2020)	Extension	The characteristic “lifecycle management” necessitated the extension to “technical lifecycle management” because the importance of the technical lifecycle was highly emphasised in the interviews (see section 7.2.4).

NPD methods (Khannan et al., 2021)		Confirmation	NPD methods were still considered important in all interviews (see section 7.2.1, and 7.2.2) and could be confirmed.
NPD methods	Hybrid development (agile + waterfall) (Bianchi et al., 2020)	Confirmation	Hybrid methods were used in almost all interviews and were considered important (see section 7.2.2) and could be confirmed.
NPD methods	Agile development (Bianchi et al., 2020)	Confirmation	Agility was still considered important in all interviews (see section 7.2.2) and could be confirmed.
NPD methods	Waterfall development (Bianchi et al., 2020)	Confirmation	Waterfall-oriented process elements were mainly used for the release of business cases (see section 7.2.2) and could be confirmed.
NPD methods	User-centred process methods (Kim et al., 2022)	Confirmation	It was stated that either attempts had already been made to work with user-centred processes or that an established process would be relevant for the NPD process in the future (see section 7.2.1). Therefore, the characteristic “user-centred process methods” could be confirmed.
NPD methods	Focus on technology	Extension	The interviewees highlighted the use and focus of technology in the NPD process (see section 7.2.4). This perspective, however, is already implemented in the theoretical artefact (Figure 2.29) of this study. Therefore, it is not novel in theory but rather represents an extended focus on technology within the NPD of the empirical artefact.
NPD methods	Most viable product	Extension	In some interviews, the development of minimum viable products (MVPs) was discussed (see section 7.2.4). This perspective, however, is already implemented in the theoretical artefact (Figure 2.29) of this study. Therefore, it is not novel in theory but rather represents an extended focus on MVPs within the NPD of the empirical artefact.
Cross-functional interaction (Ahmed et al., 2021)		Extension	In the interviews, cross-functional interaction was mentioned, but the focus was on cross-functional teams (see section 7.2.3), which is why the requirement “cross-functional interaction” necessitated the extension to “cross-functional teams”.
Cross-functional interaction	Team roles (functional roles) (Larson, 2022)	Confirmation	Team roles were a central theme in the five interviews (see section 7.2.3), which is why this characteristic could be confirmed.
Cross-functional interaction	Team efficiency (Zalpuri & Hamlin, 2020)	Extension	The efficiency within a cross-functional team and the dependency on other teams was still emphasised (see section 7.2.3), which is why these characteristics remained crucial. However, the focus was increasingly on the overall team dynamics and not just on efficiency or dependency (see section 7.2.3), which is why the characteristics
Cross-functional interaction	Dependency between teams		

	(Alhammedi & Bashir, 2021)		“team efficiency” and “dependencies between teams” necessitated the extension to “team dynamics”.
Cross-functional interaction	Team structure (Larson, 2022)	Extension	The team structure remained important, but the focus shifted to core teams and non-core teams (see section 7.2.3), which is why the characteristic “team structure” necessitated the extension to “core team”.
Cross-functional interaction	Steering committee	Extension	The importance of a steering committee was highlighted in section 7.2.3. This perspective, however, is already implemented in the empirical artefact (Figure 6.5) of this study. Therefore, it is not a novel finding, but rather an extended focus point to be integrated as a characteristic.
Testing methods with customers (Salinas et al., 2020)		Confirmation	Testing methods with customers were still mentioned in the interviews (see section 7.2.1), which is why this requirement could be confirmed.
Testing methods with customers	Smoke test (Reshma et al., 2022)	Reduction	Smoke tests were not mentioned in the interviews in section 7.2, which is why this characteristic was reduced.
Testing methods with customers	Surveys (Li & Zhang, 2021)	Confirmation	In total, six core methods were discussed as testing methods with customers, one of which was surveys with customers (see section 7.2.1). Therefore, this characteristic could be confirmed.
Testing methods with customers	Group work (brainstorming) (Buzhinskaya et al., 2022) and (Humani et al., 2020)	Confirmation	In the interviews it was mentioned that it would be necessary to involve customers so that they could express their problems and wishes (see section 7.2.1). To get customers even more involved, brainstorming was therefore confirmed as a testing method.
Testing methods with customers	Prototyping (Salinas et al., 2020)	Extension	Overall, six core methods were identified as testing methods with customers, one of which was prototyping (see section 7.2.1). Therefore, this characteristic could be confirmed. However, this characteristic needed to be extended to include “(technical) prototyping” because technical prototypes were considered another useful testing method for software designs in several interviews (see section 7.2.4).
Testing methods with customers	AB-testing (Sońta-Drączkowska & Mrożewski, 2020)	Reduction	A/B-testing was not analysed in detail in the interviews in section 7.2, which is why this characteristic was removed.
Testing methods with customers	Usability test (Usability evaluation method) (Salinas et al., 2020)	Reduction	Usability tests were seen as a part of prototyping (see section 7.2.4). Therefore, this characteristic could be reduced.

Testing methods with customers	Testing with Internal stakeholders (Alrabaiah & Medina-Medina, 2021)	Extension	A total of six core methods were discussed as testing methods with customers, one of which was testing with family and friends, which also included employees because they also used the digital products privately (see section 7.2.1). The characteristic “testing with internal stakeholders” necessitated therefore the extension to “family and friends”.
Testing methods with customers	Social media (El Namar et al., 2022)	Reduction	Social media was not analysed in detail in the interviews in section 7.2, which is why this characteristic was reduced.
Testing methods with customers	Beta version	New theory	A new theory has been added, which relates to the use of beta versions mentioned in several interviews (see section 7.2.1). This perspective was neither present in the theoretical artefact (Figure 2.29) nor in the empirical artefact (Figure 6.5)
Customer centricity		Confirmation	Customer centricity as a requirement was a central aspect in all interviews (see section 7.2.1). Therefore, this requirement could be confirmed.
Customer centricity	Market intelligence (Sihvonen et al., 2021)	Reduction	In the interviews in section 7.2, market intelligence was no longer specifically addressed, which is why this characteristic was reduced.
Customer centricity	Corporate culture (Habel et al., 2020)	Extension	In the interviews, the corporate culture or corporate strategy was discussed, but the focus was on cultural transformation (see section 7.2.1). Therefore, this characteristic was combined and extended to “cultural transformation”.
Customer centricity	Corporate strategy (customer centred corporate strategy) (Colleoni et al., 2021)		
Customer centricity	Customer co-creation (El Namar et al., 2022)	Confirmation	Customer co-creation remained a central point in all interviews (see section 7.2.1), which is why this characteristic could be confirmed.
Customer value (Kristensson, 2019)		Reduction	Customer value was not described as a single, discrete characteristic, but rather as part of a generic customer focus, such as recognising customer needs and problems (see section 7.2.1). Therefore, this requirement was reduced.
Customer value	Digital services (Kristensson, 2019)	Reduction	Digital services were not further addressed in the interviews in section 7.2, which is why this characteristic was reduced.
Customer value	Product characteristics (Abdu Raffi & Chaldun, 2022)	Reduction	Product characteristics were not further addressed in the interviews in section 7.2, which is why this characteristic was reduced.
Customer value	Personalisation (Basaran & Ventura, 2022)	Reduction	Personalisation was not further addressed in the interviews in section 7.2, which is why this characteristic was reduced.

Table 7.13 presents an evaluation of the requirements and characteristics found in the empirical artefact. This evaluation stemmed from a comparison between the empirical coding tree in Table 5.1 (used for the empirical artefact's development) and the requirements and characteristics identified in the cross-company analysis of the third interview phase in section 7.2.

This analysis confirmed all requirements except “cross-functional interaction”, which was extended to “cross-functional team” and “customer value”, which was reduced.

Furthermore, while 8 characteristics were confirmed, 10 were reduced, 13 were extended, and 1 new characteristic (as a new theory) emerged. The confirmed requirements and characteristics were initially identified theoretically in Table 4.1 and require therefore no further theoretical evaluation. However, the extended and new characteristics in Table 7.13 are further compared and evaluated against existing literature in the next section (7.3.2).

7.3.2 Theoretical Evaluation of the Empirical Artefact

In this section, the extended requirement and the new and extended characteristics in the Table 7.13, identified empirically in the cross-company analysis of the third interview phase in section 7.2, were evaluated against the existing literature (period from 2020-2024).

An extended characteristic regarding the characteristic “scrum” in the cross-company analysis in section 7.2.2 suggests replacing the scrum master with a product manager to handle impediment removal (see section 7.2.2). This departure from traditional scrum theory, is supported by Cooper and Fürst (2024) who argue that highly experienced teams no longer require the coaching function of a scrum master. This evaluation, therefore, aligns with their theoretical perspective. Moreover, in addition to the agile scrum framework, quality control gates are considered essential in hybrid process structures (Křivánková & Remta, 2023). Therefore, the literature supports the inclusion of “quality control gates” as an extended characteristic crucial for the empirical artefact with the focus on a hybrid NPD structure. This necessitates refining the connection within the empirical artefact between the scrum master's role in inexperienced teams and the use of quality control gates in the NPD process.

The empirical evaluation of extending the “build-measure-learn cycle” to “rapid feedback cycle” is consistent with the findings of Qiu et al. (2024). Their study demonstrates that rapid

feedback cycles enable selected key users to access early product versions, quickly familiarise themselves with new features, and provide timely feedback. This, in turn, allows for the swift identification and rectification of problems. This approach has interesting connections to the evaluation of the extended characteristic “family and friends” and the new characteristic “beta version” in Table 7.13. This is because a beta version, informed by initial prototype testing, facilitates further iterative development through user feedback and evaluation (Resnick et al., 2022), thus connecting with the rapid feedback cycle approach. Regarding selected key users, the literature indicates that many user tests are conducted with colleagues or family members (Parmentier et al., 2021), suggesting that family and friend members (or colleagues) could be integrated as test subjects. The combined approach of “rapid feedback cycle”, “family and friends”, and “beta version” is therefore a central and fundamental approach for refining the empirical artefact.

Furthermore, Mora et al. (2022) emphasise the importance of comprehensive project management processes to ensure controlled project execution through to completion. This reflects the extended characteristic of an “overarching NPD framework”, which guides the individual phases of the full NPD project. Additionally, Mora et al. (2022) underscore the critical role of operations and maintenance in sustaining a system throughout its lifespan. This aligns with the findings from the cross-company analysis (section 7.2.4), which identified the need for a technical lifecycle model focused on these aspects. Therefore, the extended characteristics “overarching NPD framework” and “technical lifecycle management” are deemed essential for the success of the empirical artefact, which requires further refinement.

The concept of a “focus on technology” as an extended characteristic finds theoretical support in the work of Sly and Crowne (2023). They highlight the crucial role of technological development as the initial step in new product design. Sly and Crowne (2023) argue that inadequate application of systems engineering and systems thinking principles in this early stage can result in technologies that misdiagnose the problem or impede project advancement. Therefore, the empirical artefact should more strongly emphasise the integration of technology at the beginning of the NPD process. Furthermore, Cai et al. (2023) confirms the importance of technical prototypes for developers. They enable hypothesis testing, interaction triggering, and sharing of insights, establishing them as a standard design

tool for problem solving. Therefore, this theoretical evaluation supports the use of “technical prototyping” as an extended characteristic. Consequently, incorporating technical prototypes is crucial for refining the empirical artefact.

Moreover, the evaluation of “most viable products” (MVPs) as a relevant extended characteristic for the empirical artefact can be supported by York (2020), who posits that MVPs are centred on customer interaction. This fosters the development of potentially releasable product increments (Cano et al., 2021). To further align with the empirical results presented in the cross-company analysis in section 7.2.4, it is necessary to focus on the MVP approach specifically for non-business-critical products. This perspective is highlighted by Felin et al. (2020), who argue that the lean startup methodology, entailing MVP as a key tenet (Ries, 2011), primarily generates incremental value rather than radical innovation. Therefore, the empirical artefact should be refined to incorporate the MVP approach specifically for non-business-critical product development.

The importance of “cross-functional teams” as an extended requirement and “team dynamics” as an extended characteristic in Table 7.13 is supported by Attah et al. (2024). Their research emphasises that cross-functional teams and their dynamics are fundamental to both efficiency and innovation, enabling the breakdown of silos, improved communication, and better collaboration between departments. This, therefore, provides a theoretical foundation for evaluating “cross-functional teams” as an extended requirement, and “team dynamics” as an extended characteristic.

Furthermore, the study by Salvato and Laplume (2020), which emphasises a core team for consistent action throughout the NPD process, underscores the importance of “core teams” as a central characteristic in theory. Therefore, the empirical artefact of this study should further strengthen its focus on the central characteristic of “core teams”.

In addition, the study by Amiraslani (2021) highlights the necessity of a steering committee for large-scale projects. Furthermore, the cross-company analysis (section 7.2.3) indicates that these steering committees typically consist of top management, corroborating the roles identified by Roscoe et al. (2023). This, therefore, provides a theoretical foundation for evaluating “steering committee” as an extended characteristic.

Finally, editorial offices are structurally ill-equipped to adapt to dynamic change (Hogh-Janovsky & Meier, 2021). To manage this transformation, media companies have been forced to prioritise the customer. This shift has been crucial due to the drastic changes in consumer behaviour and has necessitated a targeted approach to customer segmentation (Lopes da Costa et al., 2022). This evaluation theoretically confirms the extended characteristic of “cultural transformation” within the Swiss media industry, as the cross-company analysis in section 7.2.1 demonstrated that journalists do not yet possess the required level of customer centricity. Furthermore, Albannai et al. (2024) emphasised the central role digital leaders must play in this transformation. This aligns with the cross-company analysis in section 7.2.3, which describes the product manager fulfilling this leadership role in the development of new digital products. Therefore, the empirical artefact must adapt to counteract this cultural transformation.

Based on this theoretical evaluation of the extended and new requirements and characteristics in Table 7.13, the next section (7.3.3) will identify those central to refining the empirical artefact. This refinement contributes to the development of the study’s design-oriented framework (section 7.4).

7.3.3 Requirements and Characteristics for the Refined Empirical Artefact

To refine the empirical artefact and create the design-oriented framework of this study, the requirements and characteristics evaluated in sections 7.3.1 and 7.3.2 through cross-company analysis of the third interview phase and literature review are formed into an empirical coding tree.

Table 7.14: Empirical coding tree of the feedback and evaluation phase in DSR for the development of a design-oriented framework

Requirement in the feedback and evaluation phase of DSR	Associated characteristic in the feedback and evaluation phase of DSR
Agile process frameworks (Ikonne, 2021)	Scrum (Cooper & Fürst, 2024)
	Rapid feedback cycle (Qiu et al., 2024)
Project framework conditions (Kiselev et al., 2020)	Quality control gates (Křivánková & Remta, 2023)
	Overarching NPD Framework (Mora et al., 2022)
	Technical lifecycle management (Mora et al., 2022)

NPD methods (Khannan et al., 2021)	Hybrid development (Bianchi et al., 2020)
	Agile development (Bianchi et al., 2020)
	Waterfall development (Bianchi et al., 2020)
	User-centred process methods (Kim et al., 2022)
	Focus on technology Sly and Crowne (2023)
	Most viable product (Felin et al., 2020).
Cross-functional teams (Attah et al., 2024)	Team roles (Larson, 2022)
	Team dynamics (Attah et al., 2024)
	Core team (Salvato & Laplume, 2020)
	Steering committee (Roscoe et al., 2023) and (Amiraslani, 2021)
Testing methods with customers (Salinas et al., 2020)	Surveys (Li & Zhang, 2021)
	Brainstorming (Buzhinskaya et al., 2022) and (Humani et al., 2020)
	(Technical) prototyping (Salinas et al., 2020) and (Cai et al., 2023)
	Family and friends (Parmentier et al., 2021)
	Beta version (Resnick et al., 2022)
Customer centricity (Habel et al., 2020)	Cultural transformation (Albannai et al., 2024) and (Lopes da Costa et al., 2022)
	Customer co-creation (El Nemar et al., 2022)

Table 7.14 presents all the requirements and characteristics identified through the evaluation of the empirical artefact. These will refine the empirical artefact shown in Figure 6.5, thus forming the design-oriented framework of this study in the next section (7.4).

7.4 Refinement of the Empirical Artefact: Developing the Design-Oriented Framework

In this section, the refined empirical artefact (design-oriented framework of this study) is developed based on the empirical coding tree in Table 7.14. To integrate empirical findings with existing knowledge, the design-oriented framework was further developed by incorporating current literature (published since 2020) and aspects of the theoretical artefact described in section 2.7.

7.4.1 Overarching NPD Structure

This section refers to the development of the overarching NPD structure for the design-oriented framework. Table 7.15 contains the relevant requirements and characteristics, which are derived from the overview of all requirements and characteristics for the design-oriented framework listed in Table 7.14.

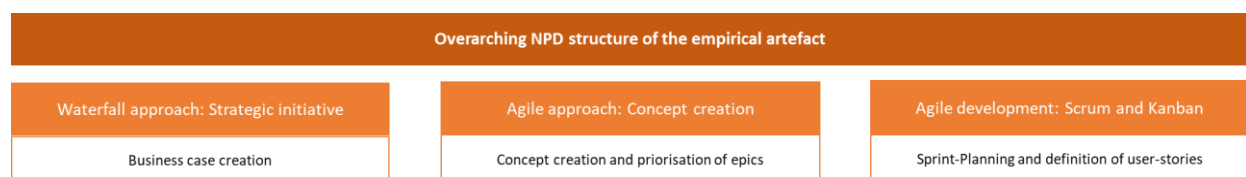
Table 7.15: Requirements and characteristics for the overarching NPD structure for the design-oriented framework

Requirements	Associated characteristics
Project framework conditions	
Project framework conditions	Overarching NPD Framework
Project framework conditions	Technical lifecycle management
NPD methods	
NPD methods	Hybrid development
NPD methods	Agile development
NPD methods	Waterfall development

Table 7.15 shows the two requirements and five characteristics that were relevant for the development of an overarching NPD structure in the design-oriented framework for the Swiss media industry.

Derived from the empirical artefact in Figure 6.5, it was possible to identify that an overarching NPD structure already existed, but that it did not include all the requirements of the newly researched requirements and characteristics in Table 7.15.

Figure 7.1: Overarching NPD structure of the empirical artefact



In Figure 7.1, an extract was taken from the empirical artefact in Figure 6.5, which showed the overarching NPD structure. From this, it was apparent that in the first step of the empirical artefact, new digital products were developed using a waterfall-oriented followed by an agile-oriented approach. This basis helped to expand the overarching NPD structure because the cross-company analysis in section 7.2.2 emphasised that a hybrid process structure, that is, the blending of the waterfall principle and agile processes, was highly relevant. During the cross-company analysis of the third interview phase (see section 7.2.2), it was noted that the initial creation of a business case always followed a waterfall approach. This involved

defining the most significant risks and assumptions, after which the process ideally should have transitioned to a more agile, lean, and customer-centric mode.

This observation revealed an interesting parallel with the overall structure of the theoretical artefact discussed in section 2.7.2. In that instance, an initial business case was also developed, suggesting that the application lifecycle management (ALM) framework, employed for a comprehensive NPD structure, could indeed hold promise in practical applications.

However, the cross-company analysis of the feedback and evaluation phase in section 7.2.4 identified further key points of considerable relevance to the Swiss media industry regarding the use of an overarching NPD structure. This analysis revealed that, firstly, such a structure must guarantee process-oriented support. Secondly, it must focus on operation and maintenance. Thirdly, it must incorporate the technical lifecycle. Finally, financial considerations must be included. To integrate these four key points into the overarching NPD structure of the design-oriented framework, several different approaches were subsequently developed.

Figure 7.2: Overarching NPD structure of the theoretical artefact

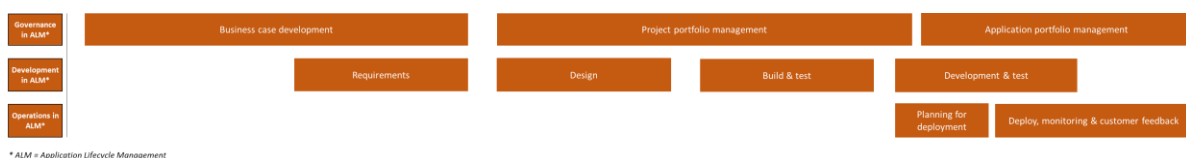


Figure 7.2 presented an extract from the theoretical artefact depicted in Figure 2.29, illustrating the overarching NPD structure based on ALM. This extract demonstrated that process-oriented support and an additional focus on the operations and maintenance perspective were already incorporated. Therefore, the first two key points identified in the cross-company analysis, relating to the creation of an overarching NPD structure for the design-oriented framework, were addressed by the theoretical artefact. Consequently, the overarching NPD structure from the theoretical artefact was reused for the design-oriented framework, as shown in Figure 7.4.

With the help of current studies, the above-described key points three and four from the cross-company analysis for the development of an overarching NPD structure could be examined in more detail. In doing so, Markard (2020) highlighted a central aspect that

earlier studies have focused too heavily on the early phases of technology development. In this respect, however, the utilisation of technological innovation systems (TIS) also addressed the core components of products already launched in the market. This, in turn, was of central importance to the sustainability of a product.

Figure 7.3: Four phases of TIS lifecycle

	Formative phase	Growth phase	Mature phase	Decline phase
Size & actor base	Sales close to zero; little growth; small number of actors; high degree of vertical integration; low entry/exit rates	Sales are moderate at first but grow rapidly; medium to large number of actors in different roles; specific associations & intermediaries emerge; high entry rates; strong competition and struggles over standards	Sales are high; low growth; medium to large number of actors; high degree of specialization; low entry/exit rates; potentially dominant players; little conflict	Sales below maximum and declining; high exit rates; intermediaries lose influence; increasing conflict
Institutional structure & networks	Low structuration; high degree of uncertainty; cognitive institutions central; loose networks, incomplete value chains	Increasing structure; markets take shape; technology-specific institutions emerge; increasing formalization; collaboration in networks	High degree of structuration; uncertainty low; established markets, value chains & networks	Structural destabilization; norms/designs questioned; struggles over institutions; networks break up
Technology performance & variation	Performance parameters unclear; performance low compared to exist. Technology; high degree of variation	Performance parameters clear; performance increasing; variation decreasing; potential emergence of dominant design	Performance increasing; potential branching of technology to new application contexts	Performance parameters potentially questioned
Context & TIS-context relationship	TIS depends on context and adapts to it; first ties emerge	Ties to context multiply and formalize; TIS has increasing impact on context; potential conflicts arise; co-dependence	High number of close ties; interaction of TIS and context; co-dependence	Ties break up; dependent context structures decline as well

Source: derived from Markard (2020)

Figure 7.3 presented the four phases of the TIS lifecycle from the study by Markard (2020). It describes that there are four phases: firstly, the formative phase; secondly, the growth phase; thirdly, the mature phase; and fourthly, the decline phase. Consequently, these four phases were of great importance for the overarching NPD structure of the design-oriented framework. They addressed not only the initial development but also the technical and economic lifecycle of a new digital product. This could also be used to determine when the digital product should be withdrawn from the market, ultimately making a technical lifecycle apparent in the overarching NPD structure of the design-oriented framework.

In this context, the fourth key point from the cross-company analysis, concerning the development of an overarching NPD structure, could also be addressed. The study by Kozma et al. (2021) emphasised that it is of fundamental importance to use investment management for the entire lifecycle. Therefore, it was crucial for the design-oriented framework of this study that the overarching NPD structure demonstrated that financing must be managed across the entire TIS lifecycle.

Figure 7.4: Overarching NPD structure of the design-oriented framework

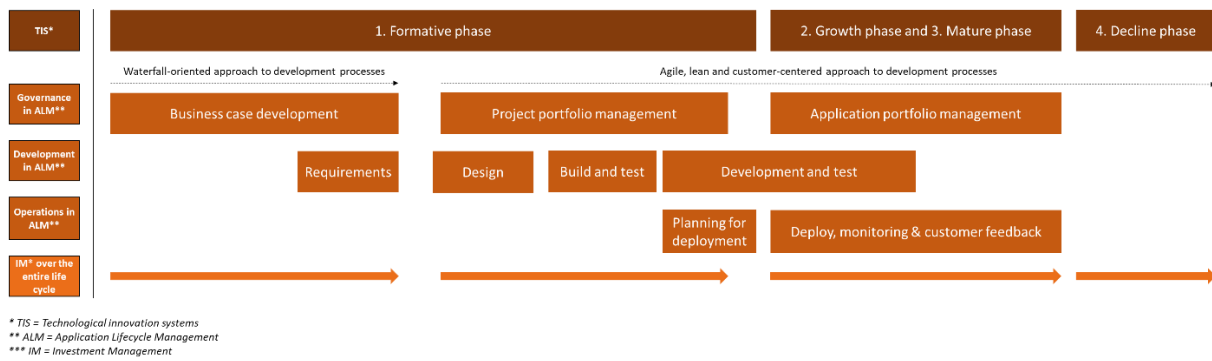


Figure 7.4 shows the completed overarching NPD structure for the design-oriented framework. Thereby, four different perspectives were combined: the empirical artefact, the theoretical artefact, new findings from the cross-company analysis of the feedback and evaluation phase, and findings from additional current literature. Accordingly, the hybrid process structure from the empirical artefact (see Figure 7.1) was embedded, which was also accompanied by the finding concerning the integration of a hybrid process in the cross-company analysis of the feedback and evaluation phase in section 7.2.2. To accomplish this, a dashed arrow was used in Figure 7.4 to illustrate that a waterfall-oriented approach needs to be taken during the business case and that an agile, lean and customer-centred approach should be used as soon as the business case has been approved. The integration of the overarching NPD structure from the theoretical artefact (see Figure 7.2) ensured that the definition of clear process phases within an NPD project were integrated into the overarching NPD structure of the design-oriented framework, so that support for the NPD process could take place. This provided guidance and embedded the focus on the operations and maintenance perspective, which were both important findings from the cross-company analysis of the feedback and evaluation phase in DSR in section 7.2.4. With the help of additional current literature, the integration of a technical lifecycle and the focus on financing within the overarching NPD structure for the design-oriented framework could be addressed. Both focus points were described in the cross-company analysis in section 7.2.4 as imperative for an overarching NPD structure. The integration of the TIS lifecycle, based on the study by Markard (2020), into the overarching NPD structure of the design-oriented framework incorporated the sustainable focus on the technical and economic lifecycle. The visualisation that investment management must be in place throughout the entire lifecycle,

as described in the study by Kozma et al. (2021), addressed the need for financing to be fully evaluated.

Finally, all the requirements and characteristics outlined in Table 7.15, which incorporated the findings from the cross-company analysis (sections 7.2.2 and 7.2.4) regarding the overarching NPD structure, were integrated into the overarching NPD structure of the design-oriented framework, illustrated in Figure 7.4.

7.4.2 Customer Co-Created New Product Development Process

This section refers to the development of the customer co-created NPD process for the design-oriented framework, which is orientated towards the overarching structure in Figure 7.4. In this respect, Table 7.16 contains the relevant requirements and characteristics, which are derived from the overview of all requirements and characteristics for the design-oriented framework listed in Table 7.14.

Table 7.16: Requirements and characteristics for the customer co-created NPD process of the design-oriented framework

Requirements	Associated characteristics
Agile process frameworks	
Agile process frameworks	Scrum
Agile process frameworks	Rapid feedback cycle
Project framework conditions	
Project framework conditions	Quality control gates
NPD methods	
NPD methods	User-centred process methods
NPD methods	Focus on technology
NPD methods	Most viable product
Testing methods with customers	
Testing methods with customers	Surveys
Testing methods with customers	Brainstorming
Testing methods with customers	(Technical) prototyping
Testing methods with customers	Beta version
Customer centricity	
Customer centricity	Customer co-creation
Customer centricity	Cultural transformation

Table 7.16 shows the five requirements and thirteen characteristics that were relevant for the development of a customer co-created NPD process in the design-oriented framework for the Swiss media industry.

From the empirical artefact in Figure 6.5, it could be deduced that a customer co-created NPD process was already in place.

Figure 7.5: NPD process and customer co-creation process of the empirical artefact

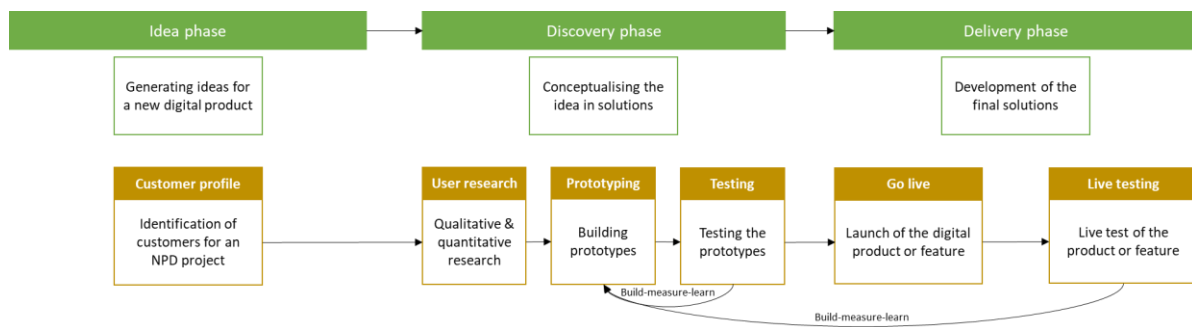


Figure 7.5 presents an extract from the empirical artefact depicted in Figure 6.5, which illustrated the NPD process (in green) and the customer co-creation process (in yellow). It is crucial to note that the process highlighted in yellow in Figure 7.5 was labelled as “customer co-creation process” due to the study’s focus on this concept. The development of the empirical artefact aimed to demonstrate a practical example of such a process within the Swiss media industry. However, this process did not fully embody the theoretical nature of customer co-creation, as it only included indirect customer involvement. As shown in Table 7.16, both “customer co-creation” and “user-centred process methods” were identified as characteristics. Consequently, the design-oriented framework adopted a modified approach to customer co-creation, utilising user-centred process methods to address the specific challenges faced by the Swiss media industry. This will be explored in further detail later in this section.

The NPD process illustrated in Figure 7.5 lacked integrated quality control gates. Consequently, there was no differentiation between technical and business-driven quality control gates, as emphasised in the cross-company analysis in the third interview phase in section 7.2.4. Additionally, the NPD process depicted in Figure 7.5 lacked two characteristics from the “NPD methods” requirement in Table 7.16, which were: “focus on technology”, and “most viable product”. This absence suggests that the NPD process in the design-oriented framework needed expansion and could not be retained as it was in the empirical artefact in Figure 7.5.

Furthermore, the overarching structure of the empirical artefact in Figure 7.1 revealed the inclusion of the scrum approach for agile technical development. While this initially suggested the reuse of “scrum” as a characteristic in Table 7.16, it became necessary to incorporate it within the NPD process itself.

Figure 7.6: First version of the customer co-created NPD process in the design-oriented framework

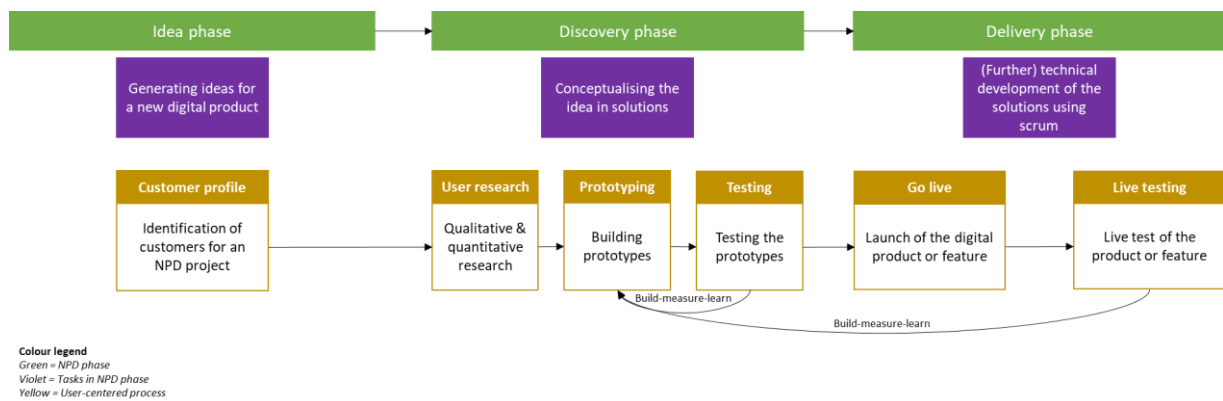


Figure 7.6 shows the first version of the customer co-created NPD process in the design-oriented framework, in which scrum was integrated as an agile process framework for the technical development of solutions. This can be seen in Figure 7.6 in violet (task in NPD phase) in the delivery phase.

The empirical artefact in Figure 7.5 already incorporated a user-centred approach within its customer co-creation process. This facilitated its reuse in the design-oriented framework, aligning with the “user-centred process methods” characteristic in Table 7.16. Furthermore, the evident build-measure-learn cycle in Figure 7.5 indicated that this component, alongside the “rapid feedback cycle” characteristic in Table 7.16, could also be reused.

However, the “testing methods with customers” requirement in Table 7.16 lacked certain characteristics, namely: “beta version”, “(technical) prototyping”, and a strong focus on “brainstorming”. Consequently, it became clear that these three characteristics would need to be integrated as the development of the design-oriented framework progressed.

Similarly, the cross-company analysis in section 7.2.1 revealed that Swiss media companies had not fully adopted the customer co-creation approach due to its potential impact on finances and development speed. To mitigate these concerns, the design-oriented framework incorporated a blend of traditional indirect customer involvement with active, direct customer engagement methods. An initial comparison with the theoretical artefact in Figure 2.29 revealed a preliminary approach that adapted to this customer co-creation model.

Figure 7.7: NPD process and customer co-creation process of the theoretical artefact

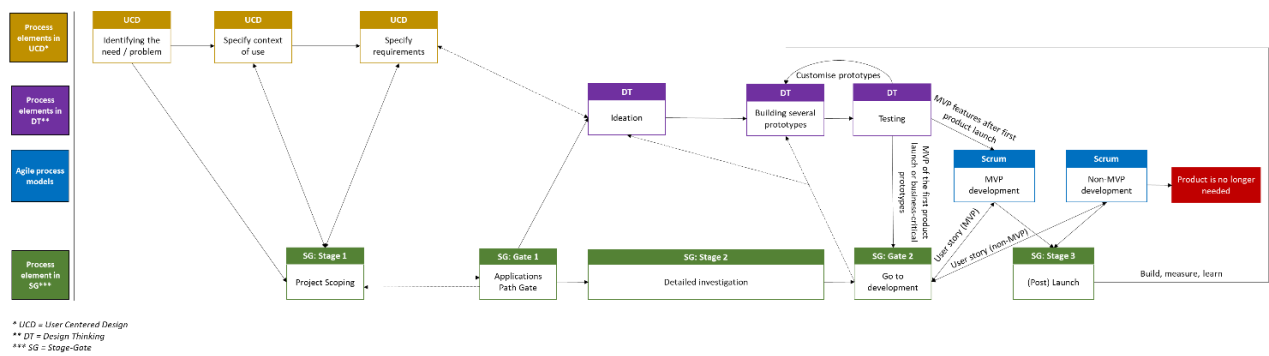


Figure 7.7 shows an extract from the theoretical artefact in Figure 2.29, which illustrated the NPD process and the customer co-creation process.

The cross-company analysis in sections 7.2.1 and 7.2.4 underscored two critical factors for Swiss media companies within the NPD process: identifying customer needs and problems, and maintaining a focus on technology. Understanding the target audience was paramount for the characteristic “customer co-creation”, while the emphasis on technology aligned with the “focus on technology” characteristic highlighted in Table 7.16.

Furthermore, by strengthening this focus on customer co-creation and technology, the “cultural transformation” characteristic in Table 7.16 could also be addressed. The cross-company analysis in section 7.2.1 identified a prevailing issue within the Swiss media industry: content and the role of journalists were still prioritised over the customer. This business model was deemed unsustainable and lacked long-term innovation potential.

The coronavirus pandemic exacerbated this issue, dramatically impacting the global media industry. Increased internet usage significantly affected traditional media like television and newspapers, leading to a sharper decline in advertising revenue (Gkanas & Antonopoulou, 2021). To navigate this digital transformation, media companies needed to prioritise the customer. This shift was crucial due to the drastic changes in consumer behaviour, necessitating a targeted approach to customer segmentation (Lopes da Costa et al., 2022).

Therefore, it became evident that the Swiss media industry required an internal cultural transformation focused on developing new products centred on digital transformation. This shift required prioritising customer needs over the traditional focus on editorial teams within the design-oriented framework.

Accordingly, it was relevant to incorporate the user-centred design (UCD) process, as defined by the European Committee for Standardization (2019) and illustrated in the theoretical artefact in Figure 7.7, into the design-oriented framework. This integration aimed to identify customer needs and problems, define the target group, and specify requirements. Specifying requirements encompasses technical, business, and customer-relevant requirements, demonstrating a focus on technology at the outset of the NPD process. Consequently, the “customer profile” stage in the initial version of the NPD process in Figure 7.6 was replaced by the three UCD phases from Figure 7.7, while the remaining elements of the customer co-creation process from the empirical artefact in Figure 7.5 were retained.

Given that scrum was identified as an agile process framework in both the theoretical artefact in Figure 7.7 and the initial version of the design-oriented framework in Figure 7.6, it was essential to incorporate an initial development step focused on technical development using scrum within the design-oriented framework.

Accordingly, the characteristics “user-centred process methods”, “focus on technology”, “cultural transformation”, and “scrum” from Table 7.16 could be transferred from the theoretical artefact to the design-oriented framework.

Figure 7.8: Second version with user-centred design and scrum of the customer co-created NPD process in the design-oriented framework

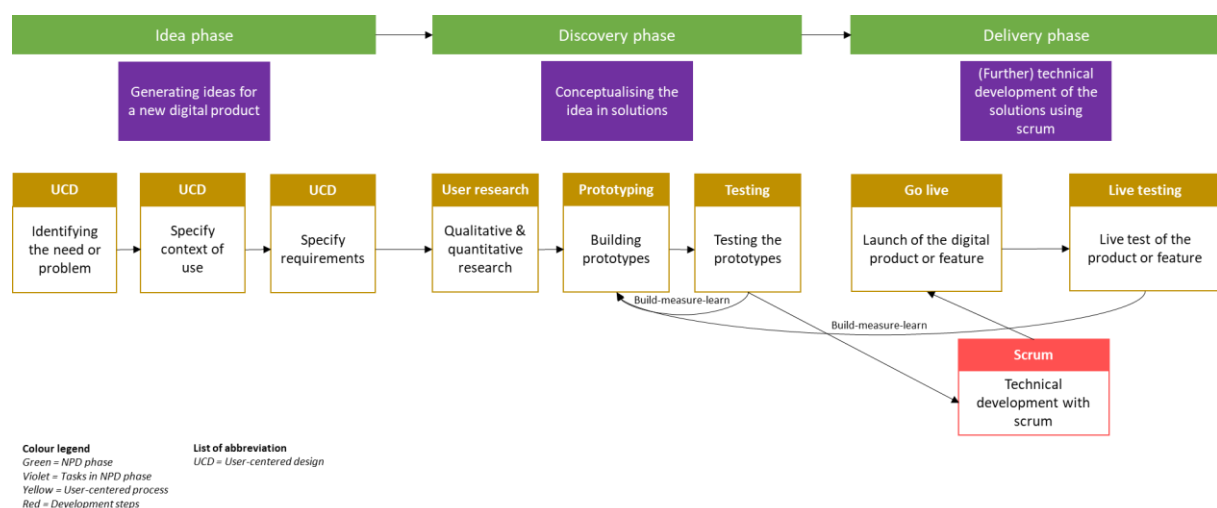


Figure 7.8 presents the second version of the customer co-created NPD process within the design-oriented framework. This version builds upon the first iteration shown in Figure 7.6, incorporating three elements of the user-centred process from UCD (as seen in the theoretical artefact in Figure 7.7) into the “idea phase”. This is represented in yellow (user-

centred process) with the abbreviation “UCD” in Figure 7.8. Likewise, the first development step was inserted into the design-oriented framework. This can be seen in red with the title “scrum” in Figure 7.8.

Furthermore, a parallel emerged between the theoretical artefact in Figure 7.7 and the empirical artefact in Figure 7.5. In the design thinking (DT) process depicted in Figure 7.7, prototypes were customised by revising them with new findings. Similarly, in the empirical artefact in Figure 7.5, prototypes were adapted using the “build-measure-learn” rapid feedback cycle. Thus, the empirical artefact followed the same logic as the theoretical artefact, incorporating a quality control gate for business-driven topics through iterative prototyping.

The “detailed investigation” stage in the theoretical artefact in Figure 7.7 specifically addressed the refinement of technical details. This further supported the separation of quality control gates for business and technology topics, a characteristic identified in the cross-company analysis of the third interview phase in section 7.2.4. Additionally, this analysis highlighted the suitability of technical prototypes for developing adaptable software designs without compromising quality.

Therefore, to combine technical investigations, such as the creation of technical prototypes, into a single NPD process step, it was essential to conduct these activities during the technical investigation stage.

Furthermore, the cross-company analysis in section 7.2.4 advocated for a systematic approach to quality control gates throughout the NPD process. The theoretical artefact in Figure 7.7 provided precisely that, ensuring not only the project scope of the business case in the “project scoping” stage and its acceptance in the “applications path gate”, but also re-examining both business-created prototypes and technical details in the “go to development” gate. A final decision on feature or product launch readiness occurred in the “(post) launch” stage. Consequently, it was possible to fully incorporate the stage-gate approach based on Cooper (2017), as depicted in the theoretical artefact in Figure 7.7, into the design-oriented framework.

Moreover, the cross-company analysis in section 7.2.4 revealed another crucial quality control gate: live product testing in the market. This aligned with the build-measure-learn

cycle in the empirical artefact in Figure 7.5, where an arrow labelled “build-measure-learn” connected live testing to “building prototypes”, signifying that live products were tested and further developed with new findings based on new prototypes. As described by Sońta-Drączkowska & Mrożewski (2020), this could be achieved through AB-testing, a method often employed in the implementation phase. Thus, AB-testing could be used to redeploy live products for further development and subsequent implementation.

Finally, the characteristics “rapid feedback cycle”, “quality control gates”, and “(technical) prototyping” from Table 7.16 were incorporated into the design-oriented framework.

Figure 7.9: Third version with quality control gates, (technical) prototyping and development steps of the customer co-created NPD process in the design-oriented framework

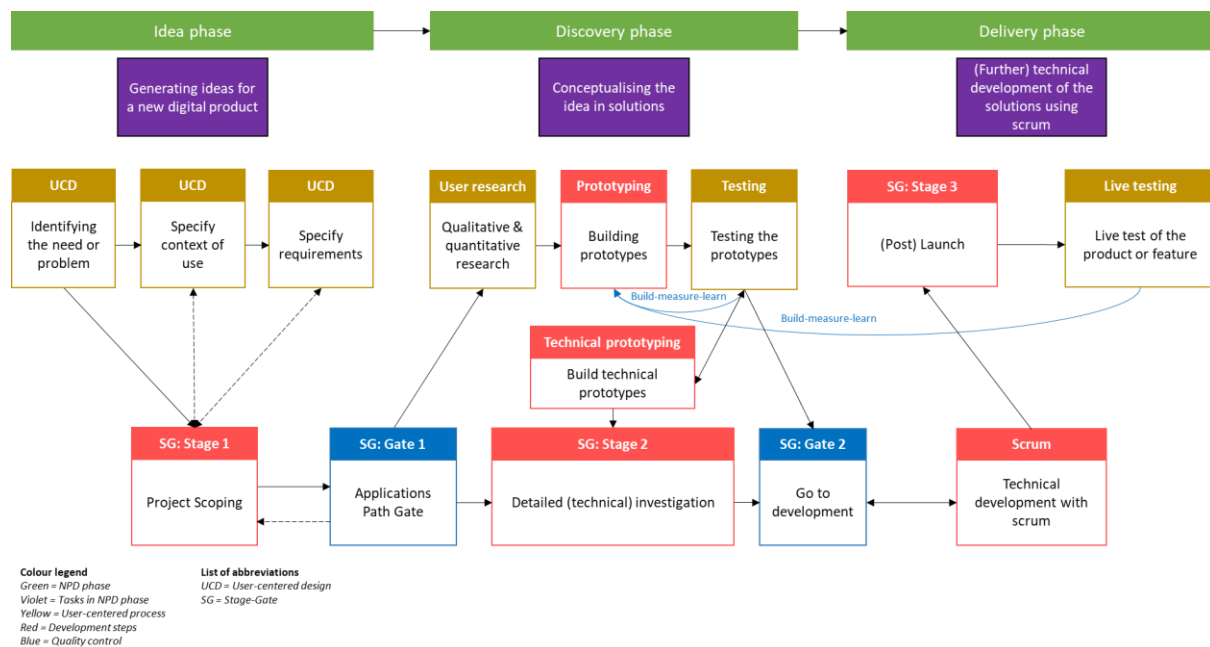


Figure 7.9 shows the third version of the NPD process in the design-oriented framework, in which further development steps and quality control gates based on the stage-gate process from the theoretical artefact in Figure 7.7 have been incorporated. This can be seen in Figure 7.9 in red (development steps), with the title “stage” as well as “build technical prototypes”, and in blue (quality control) with the title “gate” or “build-measure-learn”. As in the theoretical artefact in Figure 7.7, a two-headed arrow was inserted in Figure 7.9 between the gate 2 “go to development” and the development step “scrum”, because, as described in section 2.7.8, iterations could occur between these two NPD process elements.

In section 7.2.1, the characteristic “brainstorming” from Table 7.16 was considered to aid the solution process. However, it was explicitly stated that while customers could not

develop solutions themselves, their problems and needs required closer attention. These empirical results allowed for a connection to the “define” phase of the design thinking (DT) process (detailed in section 2.5.2.2), where brainstorming sessions with customers using “how might we...?” questions can help capture specific problem subsets (Hasso Plattner Institute of Design at Stanford University, 2010). Such direct customer interactions are crucial for gathering insights to identify problems, generate value propositions, and ultimately create MVPs (York, 2020).

The importance of focusing on MVPs was explicitly included as a characteristic from the cross-company analysis of the third interview phase in section 7.2.4. Alonso et al. (2021) provided a key finding, which was that visual prototyping practices, such as sketching wireframes or creating paper prototypes, were frequently used for MVP ideation. This was highly relevant for the NPD process in the design-oriented framework, as it indicated that visual prototypes could be used to create MVPs after the “define” phase.

Furthermore, Alonso et al. (2021) also highlighted that validation with end users occurred before public MVP release. This finding was valuable for the design-oriented framework’s NPD process, as the cross-company analysis of the third interview phase in section 7.2.1 established the use of beta versions with end users (or family and friends) before final product launch.

To achieve this, employing the build-measure-learn cycle for beta testing with end users is crucial. As Cook et al. (2023) explained, this iterative process facilitates validated learning by enabling the collection of user feedback, the measurement of key metrics, and the continuous refinement of the product based on these insights.

However, to ensure the development of business-critical functions, which the cross-company analysis of the third interview phase in section 7.2.4 identified as unsuitable for development using MVPs, it was crucial to retain the “user research” step in Figure 7.9. This allows for preliminary qualitative and quantitative research to analyse business-critical functions in greater detail.

Moreover, customer co-creation could be further enhanced by combining direct customer involvement methods (brainstorming, visual prototype testing) with indirect methods (qualitative and quantitative research, live product/feature testing). This mixed-methods

approach was supported by the cross-company analysis in section 7.2.1, which demonstrated the necessity of integrating both direct and indirect customer involvement for effective co-creation in NPD.

Finally, the characteristics “brainstorming”, “most viable product”, “surveys”, “beta version”, “customer co-creation”, and “digital transformation” shown in Table 7.16 could be incorporated into the design-oriented framework.

Figure 7.10: Fourth version of the customer co-created NPD process in the design-oriented framework

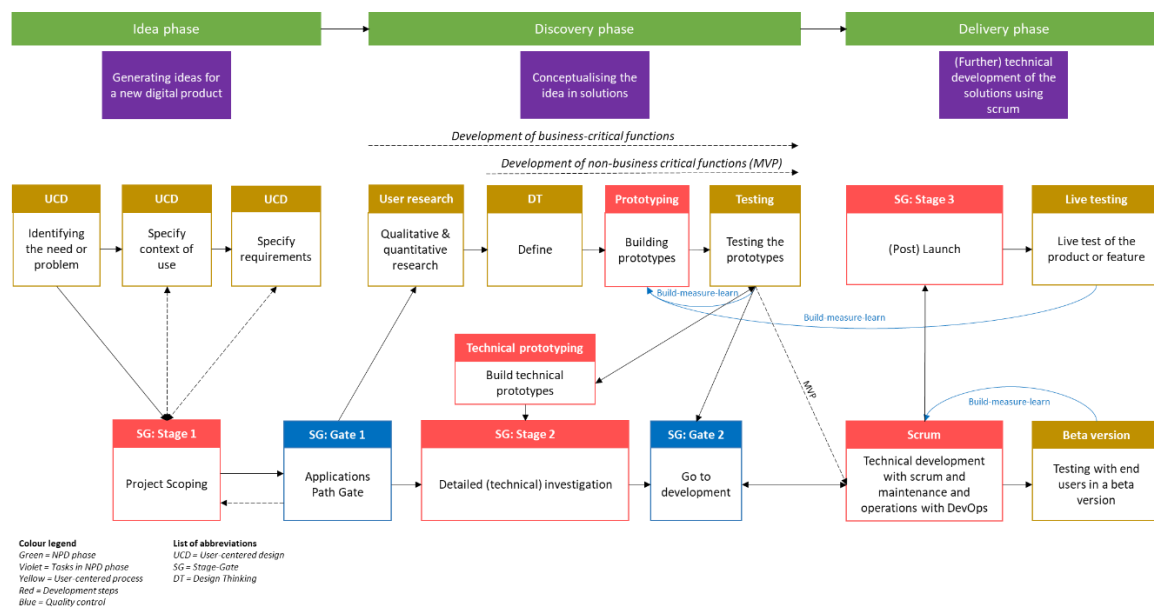


Figure 7.10 illustrates the fourth iteration of the customer co-created NPD process in the design-oriented framework and highlighted the remaining characteristics from Table 7.16. In this version, the “brainstorming” characteristic was highlighted with DT to encourage creative solutions and innovative ideas together with customers (shown in the yellow box labelled “DT”), the “beta version” characteristic was embedded to gather early user feedback (shown in the yellow box labelled “beta version”), and illustrated that qualitative and quantitative user research (shown in the yellow box labelled “user research”) must be carried out for business-critical products in addition to the steps for purely non-business-critical MVP functions to obtain an accurate target image from the customers of the solution to be developed.

Consequently, the “user research” step addressed the “surveys” characteristic, while the focus on MVPs incorporated the “most viable product” characteristic from Table 7.16 into the design-oriented framework’s customer co-created NPD process. By combining direct and

indirect customer involvement methods, the “customer co-creation” characteristic from Table 7.16 was also more firmly embedded. Thus, Figure 7.10 encompasses all the requirements and characteristics outlined in Table 7.16.

7.4.3 Cross-Functional Team Structure

This section details the development of the cross-functional team structure within the design-oriented framework. The integration of cross-functional roles is based on the overarching NPD structure of the design-oriented framework illustrated in Figure 7.4, and on the final version of the customer co-created NPD process depicted in Figure 7.10. In this respect, Table 7.17 contains the relevant requirements and characteristics, which are derived from the overview of all requirements and characteristics for the design-oriented framework listed in Table 7.14.

Table 7.17: Requirements and characteristics for the cross-functional team structure of the design-oriented framework

Requirements	Associated characteristics
Agile process frameworks	
Agile process frameworks	Scrum
Testing methods with customers	
Testing methods with customers	Family and friends
Cross-functional teams	
Cross-functional teams	Team roles
Cross-functional teams	Team dynamics
Cross-functional teams	Core team
Cross-functional teams	Steering committee

Table 7.17 shows three requirements and six characteristics that were relevant for the development of a cross-functional team structure in the NPD process in the Swiss media industry.

The cross-company analysis of the third interview phase in section 7.2.3 identified a core team for NPD in the Swiss media industry with a cross-functional composition. The most frequently mentioned roles were those of: product manager, user experience (UX) staff member, developers, tech leads or IT architects, designers, and, for journalistically relevant products, an editorial staff member.

In addition, the cross-company analysis of the third interview phase in section 7.2.3 described further roles that were not integrated into the core team but were utilised during the NPD process. These included a data team member and marketing staff member.

The cross-company analysis of the third interview phase in section 7.2.3 clearly showed that the product manager assumed the role of leader in the NPD process, mirroring the “business owner” role in the theoretical artefact presented in Figure 2.29. Almost all these roles were also listed in this theoretical artefact and the empirical artefact in Figure 6.5. The IT architect (or tech lead) was the sole exception, absent from the empirical artefact despite being clearly identified as a core team role – and an elementary one at that – in the analysis of the third interview phase in section 7.2.3. Consequently, the IT architect (or tech lead) was included as a core NPD team role in the design-oriented framework.

Another interesting finding that emerged in the cross-company analysis in section 7.2.3 was that friends and family members tested the beta versions. This suggests they should be included in the NPD team within the design-oriented framework, reflecting the characteristic of “family and friends”.

Furthermore, the theoretical artefact in Figure 2.29 and the empirical artefact in Figure 6.5 revealed additional team roles. A test manager (technical staff member/quality assurance team member) was listed in both artefacts, highlighting its significance in theory and the empirical findings from the second interview phase. Consequently, this role was incorporated into the design-oriented framework.

The cross-company analysis of the third interview phase in section 7.2.3 also highlighted the presence of a steering committee in the NPD process (characteristic “steering committee”), typically composed of executive board members or key stakeholders. This aligned with both the theoretical artefact in Figure 2.29 (senior/c-level executive) and the empirical artefact in Figure 6.5 (management). As the empirical artefact indicated the occurrence of monthly steering committee meetings and weekly team meetings, this practice was adopted for the design-oriented framework.

While both the theoretical artefact in Figure 2.29 and the empirical artefact in Figure 6.5 depicted a product owner in the NPD process, the cross-company analysis in section 7.2.3 revealed a lack of clear distinction between the product owner and product manager roles. These roles appeared to be used synonymously. This finding, coupled with the observation from section 7.2.2 that the product manager, rather than the scrum master, addressed

impediments, indicated a departure from theoretical scrum practices (characteristic “scrum”).

Furthermore, the analysis in section 7.2.3 noted that DevOps teams were engaged solely for IT infrastructure matters, contrasting with their broader role in the theoretical artefact in Figure 2.29. Similarly, the theoretical artefact did not include a project manager in the NPD process. However, the analysis in section 7.2.3 uncovered differing views on the necessity of a project manager in NPD.

To ascertain the relevance of roles like product owner, scrum master, DevOps team, and project manager for the design-oriented framework, a comparison with existing literature was undertaken.

The study by Cooper and Fürst (2024), which explored some of the aspects previously discussed, differentiated between a project leader and a project manager. Drawing on Collazo (2022), they characterised the project manager’s role as rather authoritarian, focused on issuing instructions to team members and relying on operational activities for problem-solving. Conversely, a project leader concentrated on motivating the team, employing people-oriented skills to achieve project goals, and acting strategically (Cooper & Fürst, 2024).

The cross-company analysis in section 7.2.3 revealed that the product manager frequently assumed the leading role, suggesting an alignment with the functions of a strategic project leader. This aligns with the “business owner” role in the theoretical artefact in Figure 2.29, as Scaled Agile Inc. (2023b) described the business owner as a superordinate role that could be fulfilled by a product manager.

Regarding the question of a shared role between product owner and product manager, addressed in the cross-company analysis in section 7.2.3, Collazo (2022) posited that the project manager occupied an operational role. Conversely, Cooper and Fürst (2024) observed that the product owner role was often fulfilled by a senior person, frequently a product manager. Therefore, it was deemed important for the design-oriented framework to establish an additional product manager role, encompassing the responsibilities of the project manager and embodying the agile operational principle of the product owner role.

About the scrum master, Cooper and Fürst (2024) indicated that this role proved beneficial for inexperienced teams requiring coaching, but its necessity diminished as teams gained experience. This observation aligns with the cross-company analysis in section 7.2.2, which described the product manager (effectively functioning as the scrum master) removing impediments, suggesting the involvement of highly experienced teams.

Furthermore, the introduction of DevOps teams has become crucial for companies, as without them traditional software development processes often lead to protracted software delivery delays. DevOps teams yield significant improvements, including increased process efficiency and automation, enhanced collaboration, and greater team effectiveness. This results in a faster time to market, ultimately leading to higher customer satisfaction and improved software quality (Díaz et al., 2021).

Additionally, Yadav et al. (2020) highlighted how DevOps practices contribute to a reduction in repetitive testing cycles and streamline technology upgrades within software development, further shortening project lead times.

To work effectively with DevOps teams, Lopez-Fernandez et al. (2022) found that establishing horizontal DevOps teams as a central operational model proved beneficial. These teams, while not directly embedded within the NPD core team, function as a DevOps centre of excellence or chapters, possessing a diverse range of DevOps skills. This horizontal structure fosters closer collaboration with product teams, enabling these specialised DevOps teams to provide a broader array of services and ultimately enhance software delivery performance.

Accordingly, it became evident that utilising horizontal DevOps teams as an NPD service provider plays a central role in developing new digital products. Consequently, horizontal DevOps teams were included in the design-oriented framework.

Another aspect added to the empirical artefact in Figure 6.5 was the inclusion of a “strategy staff member”. The cross-company analysis of the third interview phase in section 7.2.4 revealed that, like the DevOps team, the strategy department operated in isolation from the NPD process, despite its central importance within the Swiss media industry. Consequently, the role of “strategy staff member” was incorporated into the NPD process as an NPD service provider.

These results allowed for the identification of the roles in the NPD process that could be embedded within the core team, separated from the core team, or excluded entirely from the design-oriented framework. Consequently, references could be made to the characteristics of “scrum”, “family and friends”, “team roles”, “core team”, and “steering committee” in Table 7.17.

Regarding the “team dynamics” characteristic in Table 7.17, the cross-company analysis of the third interview phase in section 7.2.3 presented an ambiguity: whether the product manager or UX staff member should be responsible for interacting with customers. Cooper and Fürst (2024) suggested that allowing a product owner (referred to in the design-oriented framework as “product manager [operational project manager]”) to interact with customers could be detrimental, as the product owner might assume they know customer needs even when this is not the case. Therefore, it was deemed important for the design-oriented framework that a UX staff member within the core NPD team manage customer communication. For this reason, it seemed prudent to avoid assigning customer interaction responsibilities to the product manager (operational project manager) in the design-oriented framework, as this could potentially lead to misinterpretations of customer needs and hinder the development of successful products.

Another point concerning “team dynamics” stemmed from the difficulty of collaboration between technology and business departments in the NPD process, as described in section 7.2.4. Although the intention was for developers to act as co-creators with the business, they did not feel empowered to contribute to business-critical issues. This problem was addressed in the design-oriented framework by combining technical and business-specific roles within the cross-functional core team, ensuring everyone worked towards the same objectives – an approach highlighted as an important criterion in section 7.2.3.

Additionally, the analysis in section 7.2.3 revealed that the dynamics within cross-functional teams throughout the NPD process remained unaffected by the inclusion of customers. This finding indicated that to further enhance the effectiveness of customer co-creation, formally integrating the customer (or user) as a core team member within the design-oriented framework was essential. To this end, Cajander et al. (2022) revealed that UX personnel were using “users” instead of “customers” for tests on the product itself, for example,

through user testing. Consequently, users were involved in this study for live tests. This also applied to beta versions.

Table 7.18: Cross-functional roles in the design-oriented framework

Core cross-functional core team	Other cross-functional roles	Roles outside of NPD
Product manager (strategic project leader)	Data team member	Horizontal DevOps team
Product manager (operational project manager)	Marketing staff member	Strategy staff member
User experience staff member (customer representative)	Friends and family members	
Developer (frontend / backend)	Technical testing staff member	
Tech lead or IT architect	Executive board members and important NPD stakeholders	
Designer	Scrum master	
Editorial staff member		
Customer / user		

Table 7.18 shows the roles that were embedded in the design-oriented framework. A total of 16 different cross-functional roles were shown, eight of which belonged to the core team and six of which were integrated outside the core team. Two roles were identified as not directly involved in the NPD process but rather considered NPD service providers.

Figure 7.11: Final version of the customer co-created NPD process in the design-oriented framework

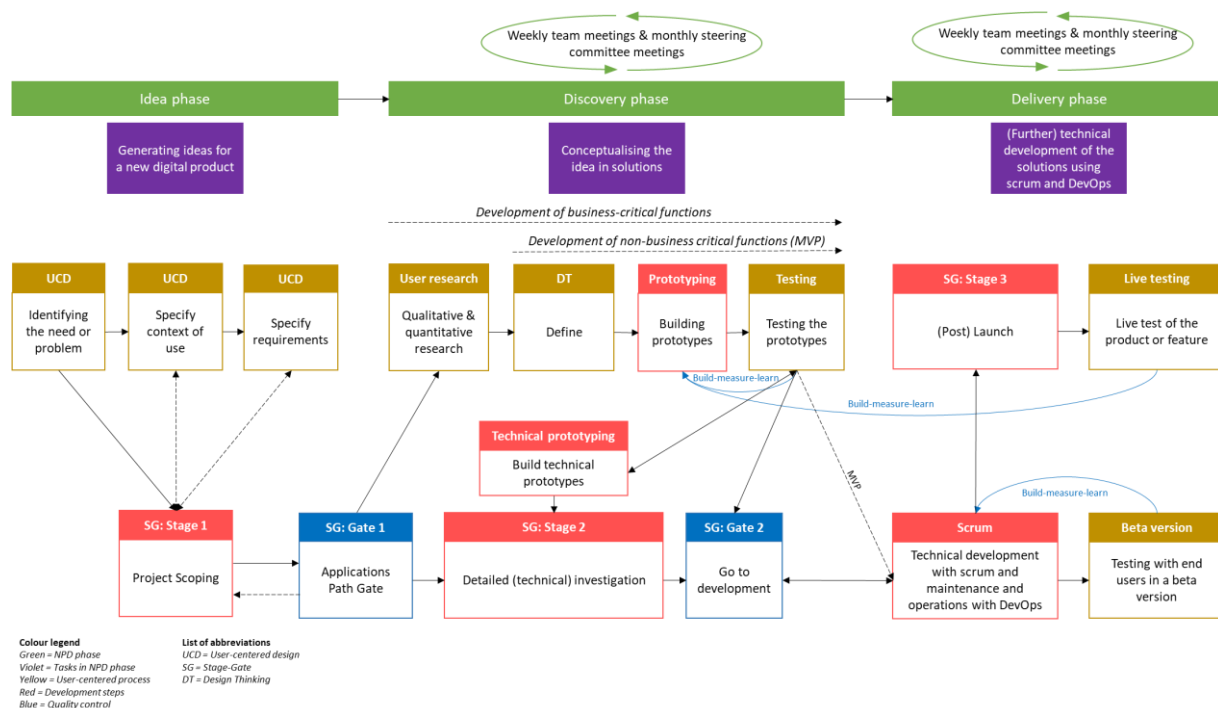


Figure 7.11 presents the final iteration of the customer co-created NPD process for the design-oriented framework, building upon the version established in Figure 7.10. In this regard, Figure 7.11 illustrates the integration of DevOps within the tasks of the “delivery

phase” (in violet) and the “scrum” development step (in red). It also depicts the embedding of weekly team meetings and monthly steering committee meetings (in green) across the NPD phases. The visualisation of the weekly team meetings and monthly steering committee meetings was adopted from the empirical artefact presented in Figure 6.5.

7.4.4 Composition and Description of the Design-Oriented Framework

Figure 7.12: Design-oriented framework of this study

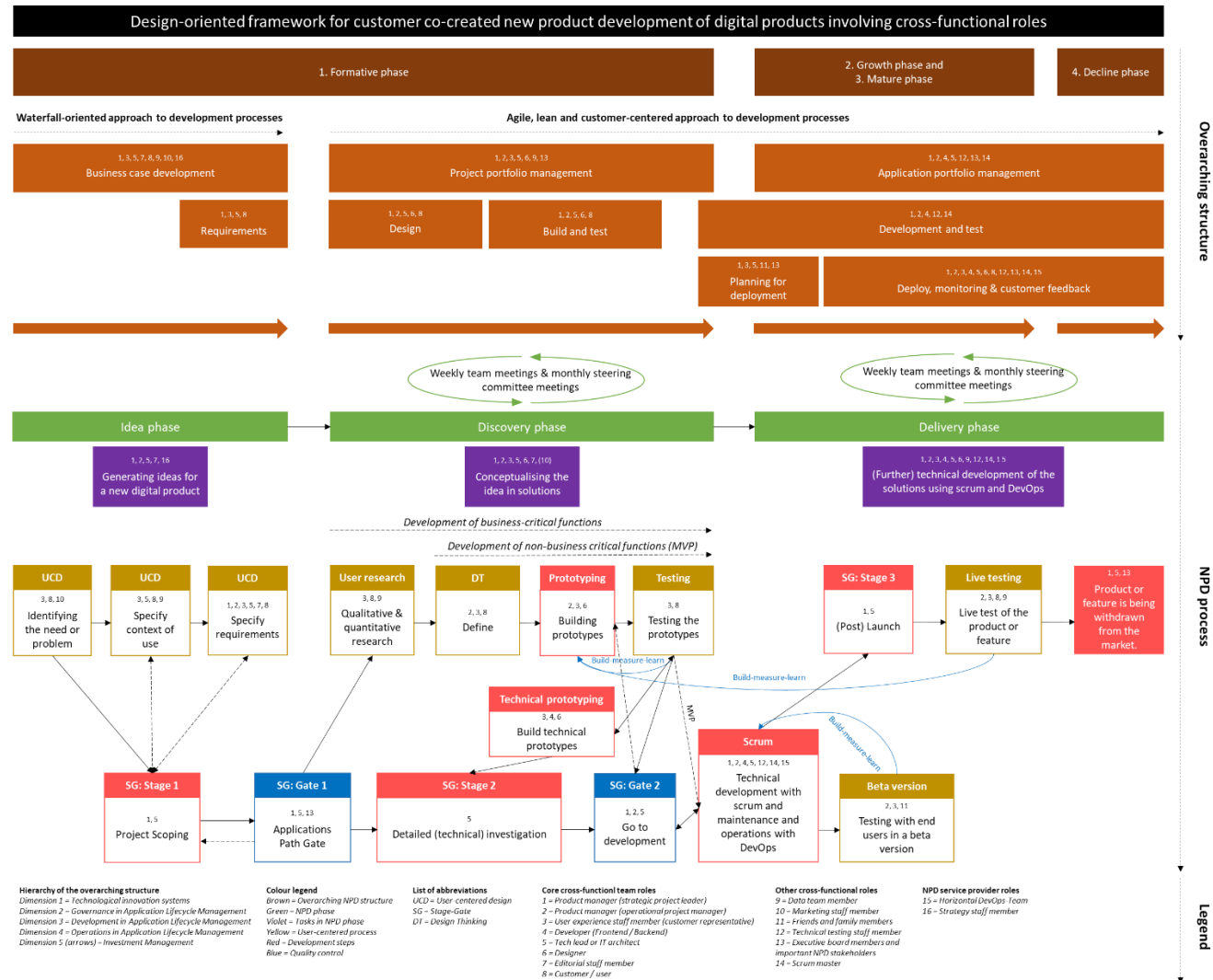


Figure 7.12 presents the design-oriented framework of this study. This framework was constructed by combining elements of the theoretical artefact in Figure 2.29 and the empirical artefact in Figure 6.5, along with new findings from the cross-company analysis of the feedback and evaluation phase in section 7.2, supported by current literature in sections 7.4.1, 7.4.2, and 7.4.3.

7.4.4.1.1 Structure and Roles within the Design-Oriented Framework

As the theoretical artefact in section 2.7.8 and the empirical artefact in section 6.2 have been previously described in detail, the NPD process within the design-oriented framework in Figure 7.12 is presented below in summary form, broken down by individual NPD process phases. For more precise and detailed process descriptions, refer to sections 2.7.8 and 6.2.

Section 7.4.3 outlined the cross-functional roles envisioned for the design-oriented framework. These roles largely align with those observed in the empirical artefact in Figure 6.5 and the theoretical artefact in Figure 2.29, but with some key differences.

Unlike the empirical and theoretical artefacts, the design-oriented framework does not include a separate product owner role. Instead, a product manager, fulfilling the operational project manager role, will be utilised, as described in section 7.4.3. This role was titled as “product manager (operational project manager)” in the design-oriented framework in Figure 7.12.

Additionally, while the theoretical artefact included a business owner and various architect roles, these functions are consolidated within the design-oriented framework (Figure 7.12). As described in section 7.4.3, the product manager will assume the responsibilities of a strategic project leader. This role is titled “product manager (strategic project leader)” in the design-oriented framework in Figure 7.12. Furthermore, to provide overarching responsibility in the technical area, the “tech lead or IT architect” role was incorporated into the design-oriented framework in Figure 7.12.

Finally, to enhance customer co-creation, the customer or user is embedded as a separate role in the design-oriented framework in Figure 7.12. As detailed in section 7.4.3, users are employed when tests involve the product itself. Within the design-oriented framework, this involves testing beta versions and live testing of the product.

7.4.4.1.2 Process Description of the Design-Oriented Framework

Within the overarching structure of the design-oriented framework depicted in Figure 7.12, the process will commence with the formative phase of the technical lifecycle. This phase, the first within the technical innovation system (TIS) (further description in section 7.4.1), will encompass the entire conception, ideation, and development of the initial version of the new digital product.

As with the remaining three TIS phases, continuous investment management will be conducted throughout the formative phase, ensuring that expenditure remains under control. This is visually represented in Figure 7.12 by the brown arrows.

Within the formative phase, the overarching structure will be mapped by the application lifecycle management (ALM) framework. This will highlight the governance, development, and operations dimensions for upcoming new product developments.

The governance dimension will commence with “business case development”, which will be supported by “requirements” within the development dimension (further details are available in section 2.7.8). These dimensions will be crucial in illustrating the underlying first phase of the NPD process: the “idea phase”.

As shown in Figure 7.12, various roles will be involved in the idea phase, which will ensure that a business case can be developed. The roles will be distributed as follows: the product manager, who will be the strategic project manager in the NPD process; the product manager, who will take on the operational side of the product and project management; the tech lead or IT architect, who will be responsible for the technical management; an editorial staff member, if the digital product is strongly content related; a data team member, who will be able to explain quantitative test insights for the problem specification; a strategy staff member, who will act as a service provider in determining the strategic value and sales purposes of the new product for the media company; a marketing staff member, who will provide insights into customers from old campaigns; the customers, who will express their needs and problems; and a UX staff member, who will be responsible for interacting with customers. Further details about the cross-functional team setup were described in section 7.4.3.

The idea phase in Figure 7.12 will be about developing a business case for the new product to be developed. A more detailed description of the “idea phase” can be found in section 6.2. In the idea phase three UCD phases will be implemented, which together will aim to identify customer needs, crystallise customer problems, learn how the product will be used, and define customer, business and technical requirements (more on this in section 2.7.8).

All the information collected in the UCD phases will be compiled and analysed by the “project scoping” (more on this in section 2.7.8), so that a final business case can be created with all the information needed. To present a release process for the business case, the “applications path gate” (for more details, see section 2.7.8) will be used to decide whether the business case can be financed. This will be done in collaboration with the executive board members, who will make a waterfall-driven decision.

If the business case is approved, the next NPD phase in Figure 7.12, the “discovery phase”, will be worked on, in which an agile, lean and customer-centred approach will be followed. The aim will be to develop the idea from the business case in more detail and ultimately to find possible solutions for it. A more detailed description of the “discovery phase” can be found in section 6.2. As an overarching ALM process structure, “project portfolio management” will be initiated at the governance dimension, accompanied by “design” and “build and test” at the development dimension (more on this in section 2.7.8).

In the discovery phase in Figure 7.12, work will continue with almost the same roles as in the idea phase. In addition, the designer who will be responsible for the interface design and the developers who will be responsible for developing the technical prototype(s) will join the team. However, the strategy staff member is no longer needed because she or he was only relevant for the strategic and sales orientation at the overall corporate level of the new product and will not continue to accompany the NPD process unless further corporate strategy issues arise. Therefore, this role was also referred to as a service provider. The marketing staff member will only be needed in this phase if a campaign for the new digital product is required, as was made clear in the cross-company analysis in section 7.2.3. Further details about the cross-functional team setup were described in section 7.4.3.

In the discovery phase in Figure 7.12, the technical solution-finding process will be separated from the business-driven solution-finding process, which was a strong need in the cross-company analysis in section 7.2.4, to also initiate different quality control gates.

Accordingly, in the process step “detailed (technical) investigation”, a detailed technical development approach of technical solution variants with corresponding technologies will be defined (more on this in section 2.7.8), in which technical prototypes will also be created. The use of technical prototypes was advocated in the cross-company analysis in section 7.2.4 to obtain software designs without compromising quality later in the development process. These technical prototypes will be tested with customers to obtain initial software drafts, which can then be further refined during the detailed investigation phase without any loss of quality.

On the business side, the minimum viable product (MVP) approach will be employed for non-business-critical products or features. This means the process will swiftly progress to the “define” stage (further elaborated upon in section 7.4.2), where workshops will be conducted with customers, and prototypes subsequently developed based on the findings. These prototypes will then undergo testing with customers using the build-measure-learn cycle resulting in the digital product being adapted according to the new insights gained. All of this will occur within a rapid feedback iteration, ensuring prototypes are finalised as quickly as possible.

However, for business-critical products or features, additional qualitative and quantitative research will be undertaken before the “define” stage. This will enable detailed exploration of customer problems and needs, which can then be addressed in the customer workshops during the “define” stage. This approach will naturally require more time than the MVP approach, as the objective is not solely a rapid market launch, but the development of high-quality products or features that truly meet customer needs. The inadvisability of using an MVP approach for business-critical features was also confirmed in section 2.7.5 by the study conducted by Felin et al. (2020).

Since weekly team meetings and monthly steering committee meetings will take place, the technical side will need to be informed about progress on the business side (and vice versa). Therefore, the solution approaches on both the technical and business sides will be checked in the gate 2 “go to development” (more on this in section 2.7.8) for completeness and validity before they can be passed on to development. Only MVPs will not have to pass this check as they can be handed over with user stories directly to development so that a faster go-to-market can be achieved. Conversely, if it is determined that prototypes of business-

critical functions (and therefore not MVP-related) require reworking, the process will iterate back to the “building prototypes” stage. This is indicated in Figure 7.12 by a dashed arrow leading from gate 2 (“go to development”) back to “building prototypes”.

With the continuation in the process for technical development, titled “development” in Figure 7.12, the transition to the delivery phase will be made. A more detailed description of the “delivery phase” can be found in section 6.2. The overarching structure built on the delivery phase in Figure 7.12 will be based on the second technical lifecycle of TIS, the “growth phase” (more on this in section 7.4.2). This will go hand in hand with launching a product on the market and boosting new sales accordingly. The overarching structure based on ALM will be set up as the with application portfolio management at the governance dimension, development and test at the development dimension, and planning for deployment as well as deploy, monitoring and customer feedback at the operations dimension. A more comprehensive description of the perspective within these dimensions of ALM is available in section 2.7.8.

In the “delivery phase” of the NPD phase, as illustrated in Figure 7.12, the solutions will undergo (further) technical development and subsequent refinement. This will be based on the scrum and DevOps approach. Compared to the discovery phase, the delivery phase will necessitate additional cross-functional roles. This will include front-end and back-end developers for technical development, friends and family members for beta version testing, dedicated technical testing staff for assessing technical solutions, a scrum master to coach within the scrum framework, and a horizontal DevOps team responsible for maintaining and operating the digital product. The editorial staff member will no longer be required, as their involvement is not essential for technical development or testing of the launched version. Further details regarding the cross-functional team setup are outlined in section 7.4.3.

As soon as the roadmap has been approved in gate 2 “go to development”, the NPD process in the design-oriented framework in Figure 7.12 will proceed to the technical development in the development step “scrum”. For this purpose, the same traditional scrum approach from the description of the theoretical artefact in section 2.7.8 is embedded in the design-oriented framework in Figure 7.12. This traditional scrum approach will be used because the cross-company analysis in section 7.2.2 showed that only sub-elements, such as the scrum

ceremonies, were used in the Swiss media industry. However, interview evidence in section 7.2.2 indicated that the traditional use of scrum would be desired in the future.

In the development step “scrum” in the design-oriented framework in Figure 7.12, a product backlog will first be created and then user stories will be developed, which will be prioritised in the product backlog, as described in section 2.7.8. However, if it is determined in gate 2 “go to development” that the user stories are not yet ready for technical development, they must be revised before they can be passed on to technical development (in the development step “scrum”). As with the theoretical artefact in Figure 2.29, an iteration between gate 2 “go to development” and the development step “scrum” will occur in the design-oriented framework in Figure 7.12. This is because it was described in the theoretical artefact in section 2.7.8 that user stories can be fed back by the development team if there are ambiguities on the business side. Likewise, the scrum ceremonies, which were explained in detail in the theoretical artefact in section 2.7.8, namely sprint plannings, retrospective meetings and daily meetings, will also be included in the development step “scrum”.

As soon as the MVP or business-critical functions have been developed, they will be tested using a beta version involving family and friends, applying the build-measure-learn cycle. In this regard, it is important, as described in the theoretical artefact in section 2.7.8, that a launch date will be announced and approved by the steering committee. Once the relevant changes, derived from the test results and documented in new user stories, have been implemented during the “scrum” development step, the MVP or business-critical functions will be launched. The product or feature launched on the market will then undergo live testing. As described in section 7.4.2, A/B testing will be a suitable method for this purpose. The build-measure-learn cycle will be employed to facilitate rapid adjustments, with new prototypes created in the development step “building prototypes” and subsequently developed, adhering to the MVP process structure to ensure a swift go-to-market.

The third phase of the technical lifecycle within the TIS, the “mature phase”, will be initiated once the complete product, or a specific feature thereof, has been established in the market for a significant period and is generating the highest turnover.

Finally, the TIS’s fourth and final “decline phase” begins when turnover decreases. At this point, the product or feature must be withdrawn or replaced, triggering the final development phase in Figure 7.12, which illustrates its removal from the market.

8 Discussion

This chapter discusses the cross-company analysis results from the third interview phase, previously identified in sections 7.2.1 to 7.2.4. These results are organised into four thematic blocks: customer co-creation; agile adoption in the NPD process; team structures within the NPD process; and key elements in the NPD process. Each thematic block also addresses and closes the research gaps identified in sections 2.6 and 6.3.2.

8.1 Customer Co-Creation: Implications for Innovation

This study has provided valuable insights into the complexities of customer co-creation in the Swiss media industry. The results highlight critical areas where current practices deviate from ideal strategies, leading to challenges in the development of successful new digital products. The concept of customer co-creation was only used to a limited extent in the Swiss media industry. The most prevalent arguments made by interviewees against its use were based on a perceived mismatch between customer input and the realities of NPD, resource constraints, and organisational resistance.

8.1.1 Closing Key Research Gaps in Customer Co-Creation

This study addresses three important research gaps (sections 2.6, and 6.3.2) in the existing literature on customer co-creation.

This research addresses a key challenge identified by Kwon et al. (2021): integrating user-centred design into the waterfall-dominated NPD processes of large (media) companies. This study's design-oriented framework in Figure 7.12 introduces a novel hybrid approach that combines the structured waterfall methodology with the flexibility of agile practices (section 7.4.2), ensuring user needs remain central throughout the entire development process. This approach offers Swiss media companies a way to balance the need for structured planning and rapid adaptation to user feedback, ultimately leading to more successful and user-centric digital products. Specifically, the design-oriented framework employs a waterfall approach for developing the business case (section 7.4.1), which then passes through a quality gate to initiate the agile, lean, and customer-centric NPD process (section 7.4.2).

In addition this research provides a robust examination of customer co-creation in NPD, directly addressing two critical research gaps identified by Morgan et al. (2019).

Firstly, through meticulous micro-level analysis of five Swiss media companies, this study identifies the barriers to effective customer engagement in the NPD process, and how to balance the trade-offs between collaboration and efficiency. The findings demonstrate that maximising efficiency requires both direct and indirect approaches to customer involvement (see section 7.2.1). Furthermore, effective collaboration necessitates clearly defined roles and responsibilities for customer interaction. As illustrated in section 7.4.3, this study shows how assigning this responsibility to a UX team member can alleviate the burden on the product manager. This approach offers Swiss media industries valuable insights for optimising customer co-creation by identifying barriers to engagement and streamlining workflows through direct and indirect customer involvement, including assigning UX responsibility for efficient collaboration.

Secondly, to understand how long customers should be involved in NPD and how to potentially speed up the NPD process through customer involvement, this study directly examines the research of Morgan et al. (2019). Empirical findings presented in section 7.2.1 unequivocally demonstrate that customer involvement is essential throughout the entire NPD process. Furthermore, extended customer participation, as exemplified by the build-measure-learn cycle and the use of prototypes (described in section 7.4.2), can accelerate NPD. This is because continuous feedback allows companies to identify and implement necessary adjustments, ensuring an optimal product reaches the market. Likewise, this study reveals in the empirical findings (section 7.2.4) that for non-business-critical products or features, minimum viable products (MVPs) should be used to gather rapid customer feedback and accelerate market entry. Thereby, leveraging MVPs can further speed up NPD through rapid customer feedback. These insights demonstrate to Swiss media companies that the approaches outlined in section 7.4.2, specifically MVPs and the build-measure-learn cycle, offer effective strategies to accelerate NPD through rapid customer feedback.

8.1.2 Discussion of Findings in Customer Co-Creation

This research examined the role of customers in NPD in the Swiss media industry. Analysis of the data revealed a misunderstanding regarding the involvement of customers. While the value of customer insights was recognised, there was an unrealistic expectation regarding the ability of customers to develop complete solutions on their own. This misunderstanding

suggests that there is a need to re-evaluate how customer contributions are integrated into NPD processes.

“One problem with a complete customer co-creation approach could be that customers are not good at finding solutions. On the other hand, they know best what their problems are” (Interviewee 10, 10.05.2024, TB 102).

This tension is further explored by the recent research by Dean et al. (2024), which differentiates between involving customers in problem-solving and decision-making. Applying this framework to the context of the Swiss media industry suggests a need for a more nuanced approach to customer co-creation, involving customers in activities aligned with their strengths and the specific phase of the NPD process. This could include utilising customer expertise in needs identification, initial solution ideation and prototype evaluation (decision making), while cross-functional teams remain responsible for solution development and refinement (problem solving).

The study by Melander (2020) on the voice of the customer (VoC) provides a further valuable perspective on how to effectively gather and integrate customer insights. This research draws on the findings of Melander (2020) to highlight the potential of VoC to capture a holistic understanding of customer needs and preferences, informing both product development and marketing initiatives within the Swiss media landscape, thus fostering cross-functional collaboration between departments. VoC, therefore, emerges as a potential tool to bridge the gap between customer input and the development of digital products.

Furthermore, this research examines the potential for collaborative NPD within the Swiss media industry.

“We should consider how we in the Swiss media industry can work together rather than against each other as media companies. In other words, as partner co-creation. This is because the competition is not in Switzerland. This means that all of us media companies in Switzerland could, at best, carry out a joint ideation process where all the advantages are disclosed, and

we consider what could be done together” (Interviewee 6, 22.04.2024, TB 318).

This perspective underscores the potential for cross-industry collaboration in NPD. By sharing insights and resources, Swiss media companies could potentially leverage VoC to identify shared challenges and co-create solutions that strengthen their competitive position in the global market.

This study therefore provides a nuanced understanding of customer co-creation in NPD in the Swiss media industry. It highlights the need for a strategic approach to customer engagement, where diverse methodologies like VoC are employed to gather and integrate customer insights and cross-functional teams collaborate to leverage those insights effectively.

In addition, this research explored resource constraints as a barrier to customer co-creation in NPD within the Swiss media industry. The study has identified three key aspects of resource constraints: time commitment for internal teams, time commitment for customers, and financial implications of customer compensation. Each of these aspects presents unique challenges and necessitates careful consideration to effectively integrate customer co-creation into the NPD process within the Swiss media industry.

The time required for effective customer co-creation emerged as a significant concern. This finding aligns with existing literature, from Perna et al. (2022), which emphasises the intensive effort required for successful customer collaboration. However, this research also revealed ambiguity regarding who within cross-functional teams should be responsible for customer interaction. Given the demanding role of product managers in NPD, dedicating time for extensive customer interaction could be challenging.

This ambiguity highlights the potential value of including UX professionals, as described in the development of the design-oriented framework (section 7.4.3), in customer co-creation activities. Their expertise in user research and interaction design equips them to effectively facilitate co-creation sessions, collect customer feedback, and translate insights into actionable product enhancements. This focused involvement could potentially reduce the

time required by product managers and enable them to focus on other important aspects of their role.

However, there is a difference between users, who use a product, and customers, who pay for a product (Lee, 2012). In this regard, Cajander et al. (2022) caution against the role of UX professionals in customer co-creation. Their research distinguishes between customer-centred and user-centred approaches and suggests that an exclusively customer-centred approach could hinder the direct involvement of users and potentially compromise the prioritisation of important user research. This highlights the need for UX professionals to balance the needs of customers with the input of users, acting as facilitators between these potentially conflicting perspectives.

This research therefore suggests that allocating co-creation tasks to a member of the UX team could optimise resource allocation within cross-functional teams. This approach could ensure that customer insights are effectively gathered and integrated into the NPD process, while considering the time constraints of both product managers and customers. By strategically leveraging the expertise of UX professionals, Swiss media companies could potentially overcome resource constraints and maximise the value of customer co-creation in digital product development.

In addition, this study also examined the challenges of customer co-created NPD, focusing on the time required of customers. The results indicated that expectations of continuous involvement throughout the entire NPD process may be too high. This suggests the need for a more dynamic approach, involving different customer groups at different stages, depending on their expertise and availability.

This dynamic approach is supported by De Jong et al. (2024), who emphasise the potential of working with “lead users” in product development. Lead users can provide valuable insights into future trends with their forward-looking needs, and together they can develop solutions that give companies a competitive advantage. This concept could be particularly relevant for the Swiss media industry, where rapid technological advances and changing consumer preferences require continuous innovation.

To optimise the involvement of the main users, this research builds on the findings of Mandolfo et al. (2020), which emphasise the importance of considering customers' personality traits in customer co-creation activities. For example, individuals with high levels of "mavenism" – those with extensive knowledge of the market – might be particularly valuable in the ideation phase, while those with high levels of "quality consciousness" could be crucial for testing and refining prototypes. This insight offers a valuable perspective for strategically selecting and engaging customers based on their individual characteristics and the specific demands of the NPD process.

Furthermore, Mandolfo et al. (2020) highlight the difference between high-touch and high-tech products. For high-tech products, such as new digital media platforms, it is crucial to minimise external barriers to participation. This could include providing clear instructions, providing real-time support, and using simplified interfaces to make it easier for customers to participate, even for those with limited technical knowledge. Conversely, for high-touch products, such as personalised content recommendations in the context of Swiss media organisations, companies can leverage customers' intrinsic motivation for control and self-expression to encourage deeper engagement.

By integrating these findings, Swiss media companies could potentially overcome the challenges of customer engagement and maximise the value of co-creation. This could include the strategic selection and integration of different lead users, taking into account their personality traits and the specific nature of the media product to be developed. This differentiated approach could be particularly valuable in the dynamic Swiss media landscape, where continuous upheaval and the demand for innovative products require a flexible and responsive approach to customer co-creation. This approach, which aligns with the identified research gap of Morgan et al. (2019) in section 6.3.2, could be further explored in future research and is discussed in more detail in section 9.4.3.

Moreover, this research also identified financial constraints as a potential barrier to customer co-creation in the Swiss media industry. Compensating customers for their time and input using traditional methods could necessitate a larger budget, potentially limiting the feasibility of customer co-creation initiatives.

However, the study by Lyu et al. (2022) offers an alternative perspective. Their study shows that the collaborative nature of co-creation fosters a sense of ownership and shared success, leading to joint value co-creation. This shared experience can be a strong driver of customer loyalty, suggesting that actively involving customers in NPD could foster a strong sense of community and investment in the company's success. This implies that non-monetary benefits, such as exclusive access to premium content, could be an effective incentive for customer co-creation.

Furthermore, this research draws on the work of Hwang and Choi (2020) to explore the potential of gamification in addressing financial constraints. Hwang and Choi (2020) illustrate how Starbucks successfully engaged and increased customer loyalty through gamified loyalty programmes. This example suggests that incorporating game-like elements such as points, badges, and leader boards into customer co-creation initiatives could boost customer participation and engagement. Non-monetary rewards and feedback mechanisms built into the gamified system could further incentivise participation without incurring significant financial costs.

This study therefore suggests that Swiss media companies could consider a range of non-monetary benefits to incentivise customer co-creation. These could include providing exclusive access to premium content, early access to new features, invitations to exclusive events, and public recognition of customer contributions. Furthermore, customising these benefits to different customer segments or personality types, as suggested by Mandolfo et al. (2020), could maximise their effectiveness. For example, customers with a high level of "mavenism" could be motivated by the opportunity to share their expertise, while customers with a strong "quality consciousness" could appreciate early access to new offerings for testing and feedback.

Finally, this research identified organisational resistance as a significant barrier to the adoption of customer co-creation in the Swiss media industry. Two key factors contributing to this resistance emerged: the prioritisation of journalists' roles over customer needs, and a prevailing Swiss media industry culture that has not fully embraced customer centricity.

The continued emphasis on the role of journalists is in line with the findings of Udris et al. (2024), which confirm the continued value of high journalistic standards. However, their

study also shows a decline in public interest and trust in Swiss news media, coupled with a low willingness to pay for online news. This points to a difficult financial position for the Swiss media industry, necessitating research into new business models and disruptive approaches to ensure long-term sustainability.

This need for innovation is further emphasised by Murschetz (2024), who argues that traditional media business models are increasingly becoming redundant. He emphasises the need for hybrid models that incorporate various revenue streams and break away from dependence on single revenue sources. This view is supported by de-Lima-Santos et al. (2022), who observed a similar trend among Brazilian news organisations and emphasised the growing importance of technology-driven, innovative business models for the future of news.

Interestingly, de-Lima-Santos et al. (2022) also underscore the increasing significance of technical staff within news organisations, a finding mirrored in this research in section 7.2.3. This highlights the potential for cross-functional collaboration between editorial and technical departments in developing and implementing innovative solutions.

This research therefore suggests that overcoming organisational resistance to customer co-creation requires a change in mindset in the Swiss media industry. This change involves recognising the value of customer insights in developing digital products that resonate with the target audience, potentially unlocking new revenue streams and ensuring long-term sustainability. By embracing customer co-creation and using technology, Swiss media companies could potentially navigate the evolving digital landscape and adapt to the changing needs and expectations of their audiences.

In addition, this study also analysed that insufficient customer centricity within the culture of Swiss media companies is another key factor leading to operational resistance. To foster a stronger customer centricity in the culture of Swiss media companies, this study draws on Madhani (2021), who highlights the role of compensation and reward systems (both financial and non-financial) in promoting customer-centric thinking and behaviour. Madhani (2021) argues that such systems can encourage employees to prioritise customers and contribute to increased customer retention, customer lifetime value, and enhanced enterprise value.

This perspective is consistent with the findings of Tuominen et al. (2023), who show the positive influence of customer orientation on innovation and business growth. However, Madhani (2021) emphasises the importance of clearly defined goals and values that put the customer at the centre of all decision-making processes, further indicating that key performance indicators should be defined based on metrics such as customer satisfaction, customer equity, customer retention, customer lifetime value, share of wallet, and enterprise value. This suggests that Swiss media companies should establish key performance indicators based on metrics such as customer satisfaction, customer retention, and customer lifetime value to foster a customer-centric culture.

Furthermore, Feige (2024) argues that fostering a customer-centric culture requires empowering employees and supporting teams to achieve success. Feige (2024) suggests starting with small pilot projects that embody a customer-centric approach. These pilots can build trust and demonstrate the value of customer-centric practices, thereby encouraging broader adoption across the organisation.

This strategy is also supported by observations from this research:

“You can create subcultures. This means that you have a cross-functional team that is already working with new methods such as user-centred process foundations and celebrating success with them. Such success stories in subcultures can then spread throughout the company” (Interviewee 7, 03.05.2024, TB 296).

This suggests that pilot projects can effectively initiate a cultural shift towards greater customer centricity within Swiss media companies.

This study highlights potential avenues for Swiss media organisations to overcome organisational resistance and foster a customer-centric culture. This discussion suggests that aligning compensation and reward systems, empowering employees, and implementing pilot projects could play a role in this process. Further research could examine the effectiveness of these strategies in increasing customer satisfaction and business success in the Swiss media landscape. This future research approach is discussed in more detail in section 9.4.3.

8.2 Agile Adoption and its Impact on NPD

This study has yielded important insights into the introduction of agile methodologies within the NPD process. An analysis of the implementation revealed several approaches and shortcomings, highlighting four key areas of interest. Firstly, this study found that the agile framework “scrum” was not applied in accordance with its theoretical principles. Secondly, differing perspectives emerged regarding the implementation of the scaled agile framework (SAFe). Thirdly, the analysis identified distinct advantages and disadvantages associated with specific agile practices. Finally, the findings underscore the necessity of adopting a hybrid approach, combining elements of waterfall and agile methodologies, to optimise future NPD processes.

8.2.1 Closing Key Research Gaps in Agile NPD

This study addresses four important research gaps (sections 2.6, and 6.3.2) in the existing literature on agile NPD.

This study addresses Cooper’s (2019) call for novel approaches to product innovation by developing a design-oriented framework, for integrating customer co-creation into the NPD process. It integrates design thinking and user-centred design principles for a more holistic approach to customer co-created NPD (see section 7.4.2). Additionally, it refines agile methodologies by identifying key deviations from theory (see sections 2.7.4, 2.7.5, and 7.4.2) and highlighting the specific advantages and challenges of these methods in the context of Swiss media companies (see section 7.2.2). This framework enables media companies to manage the complexity of NPD of digital products, increase the success of innovation by developing products that are needed on the market, and strategically manage resource scarcity by showing which cross-functional roles are used within the NPD process.

Building on Bianchi et al. (2020), this research provides a refined hybrid NPD model that seamlessly integrates user-centred approaches and enables Swiss media companies to develop products that are precisely aligned with market demand. By integrating stage-gate and agile methodologies into a structured yet flexible framework, this model balances planning and control with adaptability. Crucially, this research advances Bianchi et al. (2020) in terms of a combined approach of agile and stage gate by explicitly integrating user-centred approaches, including design thinking, user-centred design, the build-measure-learn

cycle and testing through beta versions. This ensures that customer needs are at the centre of the entire NPD process, increasing the likelihood of developing successful products. Empirical evidence from five Swiss media companies illustrates the challenges and opportunities of this integrated approach in sections 7.2.1., 7.2.2, and 7.2.4. The design-oriented framework, illustrated in Figure 7.12, presents the Swiss media industry with an approach for successfully combining stage-gate, agile methods and customer-centric processes in the NPD process.

Furthermore, this research directly addresses the research gap identified by Shania et al. (2023), who highlighted the need for research exploring the challenges of comprehensively integrating agile practices and user-centred design into NPD. Based on a detailed analysis of five companies within the media industry, this study identifies one key challenge associated with combining these two paradigms (section 7.2.2). The most significant challenge identified is the limited customer feedback obtained during the work with the agile framework scrum within the technical development phase. This contradicts the principle of customer co-creation throughout the entire NPD process. To address this, this study proposes a design-oriented framework (Figure 7.12) which involves developing prototypes that undergo rigorous customer testing and must pass a quality gate before being passed to the technical development with scrum. All technically developed solutions are then integrated into a beta version for further customer feedback via the build-measure-learn cycle, ensuring continuous customer input throughout technical development. This approach enables the Swiss media industry to prioritise customer focus, even if direct customer feedback is not consistently obtained during the scrum process itself.

Finally, this research addresses the need identified by Zorzetti et al. (2021) for a mature model that effectively combines agile, user-centred design and lean startup principles in product development. This study presents a design-oriented framework (Figure 7.12) that achieves this integration by incorporating agile methods, user-centred design principles, the build-measure-learn cycle, and minimum viable product (MVP) development. Analysis of five companies in sections 7.2.1., 7.2.2, and 7.2.4 illustrates how this combined approach can lead to more effective and efficient NPD processes and demonstrates the synergetic benefits of these principles in driving innovation. The design-oriented framework in Figure 7.12, with the integrated build-measure-learn cycle and the focus on MVP for non-business-critical

products in a hybrid NPD process, enables the Swiss media industry to develop products quickly, while holistically integrating the needs of the customer.

8.2.2 Discussion of Findings in Agile Adoption

This study examined the introduction of agile practices, in particular elements of the scrum framework, into the NPD processes of five Swiss media companies. Although all companies introduced agile practices, their implementation often deviated from the theoretical ideals. Product managers often took responsibility for removing obstacles, a task typically assigned to scrum masters in traditional scrum.

This observation could be interpreted in the light of Cooper and Fürst (2024), who suggest that the need for a dedicated scrum master decreases as teams become more experienced. This perspective informed the development of the design-oriented framework (section 7.4.3), which suggests a flexible approach to scrum master involvement based on team maturity. However, it also raises the question of whether this assumption holds in the context of these Swiss media companies and whether the lack of a dedicated scrum master might be affecting their ability to fully adopt agile principles. An alternative interpretation could be a fundamental misunderstanding of the scrum master role within Swiss media companies. This echoes the “resource constraints” discussion in section 8.1.2, where perceived limitations impact effective implementation.

This study suggests that scrum masters should adopt a coaching role, echoing the findings of Cooper and Fürst (2024). Therefore, this approach is particularly valuable for immature NPD teams in Swiss media companies. By integrating scrum masters, cross-functional teams within large organisations can benefit from coaching, ultimately enhancing team effectiveness (Schwaber & Sutherland, 2020).

Furthermore, this study revealed that a consistent commitment to iterative development and rapid, feedback-driven learning, a core aspect of scrum, was not uniformly recognisable in the five Swiss media companies studied. This finding raises questions regarding the alignment between agile principles and the specific needs and context of Swiss media NPD.

Omonije (2024) emphasises the importance of understanding an organisation’s “why, how and what” for a successful agile implementation. This research raises the question of

whether the observed deviations from agile ideals can be traced back to a lack of clarity regarding the reasons for introducing agility in these Swiss media companies. Do they really prioritise faster time to market, higher customer satisfaction or improved team collaboration? How do these priorities influence the adaptation of agile practices?

This research also reveals a potential area of tension between the structured, iterative approach of agile and the need for creative exploration and experimentation often associated with media production. While Jain and Mitra (2024) claim that agile methods are well suited to dynamic landscapes, as is the case in the Swiss media industry, the results of this study suggest a more nuanced reality. The observed inconsistency in iterative development and feedback integration raises questions regarding the suitability of various agile frameworks or modifications for Swiss media NPD, despite the emphasis on customer feedback by Jain and Mitra (2024).

In this regard, the lack of consistent feedback loops identified in this study challenges the assertion by Omonije (2024) that agility increases customer satisfaction in a “fast-paced environment”. This highlights the need to examine how effectively Swiss media companies collect and incorporate customer feedback and whether the qualitative and subjective nature of feedback in the media industry requires different approaches compared to other sectors. This need for future research is revisited in section 9.4.3 accordingly.

Moreover, this study examined the implementation and impact of the scaled agile framework (SAFe) in Swiss media companies. The results showed different interpretations regarding the influence of SAFe, with some respondents believing that it improves the NPD project structure, while others believed that it limits spontaneity.

These different perspectives can be examined in light of existing research. Putta et al. (2021) found that implementing SAFe can improve transparency, dependency management, and collaboration between agile teams, which supports the positive interpretations observed in this study. However, Putta et al. (2021) also identified challenges to adopting SAFe, including barriers to establishing an agile mindset, organisational politics, and resistance to change. These challenges may contribute to the perception that SAFe suppresses spontaneity, suggesting that successful adoption of SAFe may depend on how effectively organisations address these challenges.

To further explore the implications of SAFe on spontaneity, this research draws on the study of Almeida and Espinheira (2021), who compared various agile frameworks and found that SAFe performed worse than scrum at scale in terms of “flexibility”. This result is consistent with the observations in this study, which highlighted the potential limitations of SAFe in accommodating spontaneity.

However, this research also found that scrum’s flexibility can be limited when the backlog becomes too large, as observed in the second company:

“But if you have scrum teams that provide these 300 test cases and carry out the tests, then the problem is that they become inflexible because they have already planned everything in the sprints and no longer want to change and say that there is no more room for other things in the backlogs” (Interviewee 7, 03.05.2024, TB 27).

This observation suggests that “scrum at scale”, as defined by Sutherland et al. (2022), might offer a more flexible approach compared to traditional scrum.

Interestingly, however, Almeida and Espinheira (2021) also found that SAFe was among the most effective frameworks for customer involvement. This contrasting finding, whereby SAFe can limit spontaneity but facilitate customer involvement, raises important questions for future research, particularly regarding the impact of SAFe on various forms of customer co-creation in NPD. Accordingly, this impetus for future research is included in section 9.4.3.

In addition, this study identified challenges related to long-term scalability and estimation when introducing agile practices in the Swiss media industry. This finding is consistent with Almeida and Bálint (2024), who emphasise the need to adapt agile practices to larger, more complex organisations. They propose a hybrid approach to scaling that combines agile methods with traditional project management methods (PMM) and incorporates elements such as schedule and cost control. This approach is based on three core principles: transparency, inspection, and adaptation.

These principles of hybrid agile scaling were incorporated into the development of the design-oriented framework shown in Figure 7.12. This artefact encompasses cost control and the technical lifecycle and embodies all three core principles. Transparency is achieved through the overarching structure, which provides clear orientation for all stakeholders.

Inspection is facilitated by the stage-gate process, with quality control built into the NPD process. Adaptation is ensured by the build-measure-learn cycle, in which decisions are evaluated based on empirical results rather than subjective judgements.

This design-oriented framework therefore represents a practical application of hybrid agile scaling principles that are specifically tailored to the context of customer co-created NPD in the Swiss media industry. By incorporating transparency, inspection, and adaptation, the design-oriented framework of this study provides a framework for developing digital products that are aligned with market demands and can be iteratively refined based on customer feedback. This approach could potentially address the challenges of scalability and estimation identified in this study, while supporting the integration of customer co-creation with agile NPD processes.

Furthermore, this research has identified a growing trend towards hybrid process structures in the Swiss media industry. However, these structures differ from the previously discussed integration of agile and traditional PMM. Instead, agile and waterfall methods are combined within the NPD process, often starting with a waterfall approach to business case development and then moving on to agile methods for project realisation.

This observation is consistent with the findings of Yahya and Maidin (2022), who analysed hybrid process structures in software projects and found that combining waterfall models with scrum was the most common approach. This is consistent with the patterns observed in this study, where a waterfall approach often precedes the introduction of scrum for technical development in NPD.

Moreover, this research draws on the study of Sreenivasan and Suresh (2024), who highlight the benefits of combining lean startup and design thinking in NPD. They emphasise how this combination can enhance the identification of customer needs, product ranges and risk reduction by combining customer centricity with iterative and data-driven concepts. This perspective provides valuable support for the design-oriented framework shown in Figure 7.12, which integrates elements of lean startup and design thinking to promote customer co-creation in a hybrid NPD structure within the Swiss media industry.

This research therefore highlights the emergence of hybrid process structures as a pragmatic approach to combining traditional and agile practices in the Swiss media landscape. By integrating elements of the waterfall, agile, lean startup, and design thinking approaches, these hybrid approaches could potentially address the specific needs and challenges of NPD of digital products in this dynamic industry.

Furthermore, this research draws on the studies by Nunes et al. (2023) and Cooper and Sommer (2016) to examine the integration of business cases into NPD processes. These studies highlight the relevance of the hybrid stage-gate model, which provided the basis for the development of both the theoretical artefact in Figure 2.29 and the design-oriented framework in Figure 7.12. This suggests that the use of formal plan-based process models, such as the waterfall model, for business case development is consistent with existing theoretical approaches.

In essence, the design-oriented framework shown in Figure 7.12 provides a practical framework for Swiss media companies that want to implement this dynamic and responsive approach to product development. By introducing such hybrid structures, the industry could potentially manage the complexity of the media landscape, drive innovation and adapt to changing market demands.

8.3 Team Structure in Facilitating Customer-Centric NPD

This study identified four key themes within the team structure that warrant further discussion: the central role of the product manager and the variability of supporting roles; differing perspectives on the structure and application of cross-functional teams; the blurring of the roles of product manager and product owner; and the increasing importance of specialised technical roles as well as the difficulty in finding technical talents. Each of these topics is explored in detail, drawing upon existing literature and insights gained from this research. This section also considers some of the challenges identified and a potential solution, which was analysed in the development of the design-oriented framework described in section 7.4.3.

8.3.1 Closing Key Research Gaps in NPD Team Structures

This study addresses two important research gaps (sections 2.6, and 6.3.2) in the existing literature on NPD team structures.

This research contributes significantly to the understanding of cross-functional collaboration in NPD and directly addresses a crucial research gap identified by Ahmed et al. (2021) by analysing the involvement of cross-functional roles in the whole NPD process. Through the in-depth analysis of five Swiss media companies in section 7.2.3, this study provides compelling empirical insights into how cross-functional teams influence NPD success. This research reveals the product manager's leadership role, the critical importance of both technical and business-focused roles within the NPD process, and that steering committees are used in the NPD process. However, it is also demonstrated that agile methods sometimes do not provide clear role definitions (e.g. product manager vs. product owner), that it is not clear who is responsible for communicating with customers and that there are different approaches to the integration of cross-functional teams (e.g. small products vs. large products). Building on these findings, this study presents a design-oriented framework (Figure 7.12), offering new perspectives on cross-functional roles within NPD teams, relevant to both academic research and the Swiss media industry. This research provides other researchers with a deeper understanding of how cross-functional teams are structured and offers a comprehensive overview of the roles involved throughout the entire NPD process. By adapting these roles within the NPD process, the identified challenges can be effectively addressed in the Swiss media companies.

Furthermore, this research addresses a critical challenge highlighted by Hund (2023): the integration of social and technical identities in the digital transformation of Swiss media companies. This study recognises the crucial role of editors and emphasises the need to combine their perspectives with those of technical staff to develop successful digital products (see section 7.2.1, 7.2.3, 7.4.2, and 7.4.3). By advocating for cross-functional collaboration, the design-oriented framework in Figure 7.12 promotes a shared understanding of user needs, technological capabilities, and content requirements, thus facilitating the integration of social and technical identities. This research illuminates the complexities faced by Swiss media companies undergoing digital transformation. It also offers these companies a practical framework for implementing cross-functional teams,

incorporating key personnel from business, editorial, and technology departments, to effectively navigate this transformation.

8.3.2 Discussion of Findings in NPD Team Structures

This study highlights the central leadership role of the product manager in NPD in Swiss media companies. This observation is consistent with Loughlin et al. (2020), who describe the evolving nature of this role from a focus on execution to that of a “mini-CEO” responsible for drawing on diverse knowledge and collaborating with cross-functional teams.

However, a discussion of the universal approach in this study of all essential roles within an NPD process for digital products is difficult and unrealistic given the focus of this study and the need for a separate in-depth analysis on this topic alone. This is because it can be assumed that different expertise is required for the NPD of different software products (such as website versus business information system). This assumption is further supported by the lack of a universal consensus in the existing literature. Nevertheless, this study emphasises the importance of identifying key roles for the NPD of software-based digital products in the media industry. Royal et al. (2020) emphasise the role of the product manager in defining product strategy, executing deliverables and integrating users, companies and technology.

In terms of technology, Hallstedt et al. (2020) highlight the crucial role of empowered individuals with technical expertise (such as developers) in creating digital solutions that address the challenges and opportunities of digitalisation and sustainability. This highlights the need for technical roles in NPD for digital products.

Furthermore, Mtchedlidze (2024) highlights the importance of collaboration between journalists and developers when innovating in the newsroom and emphasises the need for both technological and editorial resources for successful NPD. This is consistent with the findings of this study, which emphasises the importance of strong editorial content for journalistic products.

Finally, Santhosh and De Crescenzo (2023) emphasise the crucial role of customer experience (CX) in co-creation. This suggests that a member from the CX or user experience (UX) domain plays a central role in NPD, especially in the context of co-creating customer experiences.

This study therefore identifies four core roles for customer-co-created NPD in the media industry: the product manager, technical roles (including developers), UX/CX specialists, and an editorial team member. These roles are reflected in the design-oriented framework shown in Figure 7.12, which demonstrates the coherence between the literature and the empirical results of this study.

Furthermore, this research reveals a nuanced approach to cross-functional teams in NPD in the Swiss media industry, reflecting the complexity of product development highlighted by Hull (2024). Cross-functional teams were used in all five companies, although their application varied considerably, reflecting the distinction made by Hull (2024) between “heavyweight” and “lightweight” teams.

In some companies, cross-functional teams were reserved for non-business-critical products, which is consistent with the suggestion in Hull (2024) to use “light” teams for smaller product derivatives. In other companies, however, they were used for business-critical products, which reflects the emphasis in Hull (2024) on “heavy” teams for novel, complex projects.

Moreover, different team formation strategies were observed in this study, with some interviewees favouring frequent reconfiguration and others keeping the membership constant in cross-functional teams. This echoes the findings of Hull (2024) on the importance of both initial collaboration and knowledge retention in product development. Hull (2024) highlights the risks associated with the loss of knowledge when early decision-makers leave protracted projects, emphasising the need for careful consideration of team composition and stability.

This research therefore highlights the need for a contingent approach to the utilisation and composition of cross-functional teams in NPD, as illustrated in the design-oriented framework in Figure 7.12. Based on the insights of Hull (2024), this research suggests that maintaining stable cross-functional teams over time is critical for large-scale NPD projects to prevent the loss of valuable expertise that can occur with frequent team reorganisations.

In addition, this research has found a lack of consensus regarding the roles of product manager and product owner in the Swiss media industry, with the two terms often being used interchangeably. This ambiguity is exemplified by the observation of company 3:

“In our company, it is often the case that the employees affected assign the title to themselves, meaning that some call themselves product managers because it sounds more strategic, and others call themselves product owners because they want to be closer to scrum approach and closer to the developers. However, there is no formal difference between the role of product manager and product owner in our company” (Interviewee 8, 03.05.2024, TB 272).

This observation is further supported by Pattyn (2023), who used the generative AI tool “ChatGPT” to identify synonyms for “product manager” and found “product owner”. This illustrates the difficulty of distinguishing between these roles, as even advanced language models struggle to differentiate them consistently.

With further reference to the theoretical view, in agile software development, operational responsibilities are often assigned to the product owner, wherein Tkalic et al. (2022) argue that a dedicated product manager is needed to oversee the entire product portfolio and provide strategic direction. The same perspective informed the development of the design-oriented framework in Figure 7.12, which differentiates between the operational and strategic activities of a product manager. Since this artifact includes models that go beyond the purely agile framework, the decision was made to omit a separate product owner role, given the potential limitations of this role in broader contexts.

This research therefore highlights the need for clarity around the roles and responsibilities of product managers and product owners in NPD. The design-oriented framework in Figure 7.12 proposes a differentiated approach with two distinct product manager roles, focusing on operational or strategic functions. This nuanced approach, which includes models beyond the purely agile setting, deliberately eschews a distinct product owner role, as it recognises the potential limitations of this role in broader contexts. Further research is needed to explore the effectiveness of this nuanced approach and its ability to foster effective collaboration in different development settings. This impetus for further research is addressed in section 9.4.3.

Furthermore, this study highlights the growing importance of technical functions, such as IT architects or tech leads, in the Swiss media industry. This observation is consistent with

Capgemini Invent (2020), which emphasises the increasing importance of architects, particularly enterprise architects, in modern organisations.

In this regard, Capgemini Invent (2020) highlights the benefits of enterprise architects providing crucial insights and identifying opportunities to refine business models, processes, and technology decisions. This perspective is particularly relevant to the rapidly changing technological landscape of the Swiss media industry, where enterprise architectures need to be adapted to meet evolving business and customer demands.

The increasing importance of architects in the media industry is also confirmed by (Wu, 2024b), who emphasises that media companies must prioritise technology research and development. This highlights a crucial trend in the Swiss media landscape: a shift towards recognising and appreciating the strategic role of technology experts.

However, this study also shows that the Swiss media industry faces challenges in recruiting qualified technical professionals. This difficulty stems from the industry being perceived as an unattractive employment opportunity, resulting in individuals with limited technical expertise often being entrusted with the execution of technical tasks.

To address this challenge, this study draws on Schwartz et al. (2020), who suggest that companies should explore how integrating artificial intelligence (AI) into teams can lead to new ways of working and increase productivity. This approach could potentially reduce the skills gap by augmenting the capabilities of existing employees and enabling them to take on complex tasks.

While this study recognises the potential benefits of AI in addressing the skills gap, it also considers the ethical considerations associated with AI integration in the Swiss media industry. Maintaining human oversight and ensuring responsible and ethical AI use are critical.

However, realising this potential will require a shift in mindset, with Swiss media companies actively investing in the education of their technical talent, as recommended by Liu et al. (2024). This need for investment is further reinforced by the significant barriers to entry in the media industry, including the demand for

skilled technical talent, and the competitive advantage of established companies such as Disney (Liang, 2024).

This study therefore highlights the crucial role of educational institutions in teaching a diverse range of skills to future media professionals (Wu, 2024a). Incorporating interdisciplinary training in areas such as computer technology or data processing alongside traditional journalism classes (Wu, 2024a) could ensure that graduates have the comprehensive skills needed to succeed.

Consequently, this study underscores the need for a multifaceted approach to addressing the challenges of recruiting and developing technical talent in the Swiss media industry. This approach includes recognising the strategic importance of technical functions, investing in training and development, integrating AI strategically and ethically, and fostering collaboration across technical and non-technical departments. This future research initiative is further elaborated in section 9.4.3.

8.4 Key NPD Process Elements

This study yields significant findings concerning key elements of the NPD process within the Swiss media industry, which warrant further detailed discussion. It became evident that whilst a focus on technology is pertinent, its application and prioritisation within the NPD process varies considerably. Similarly, although Swiss media companies strongly favour the use of quality control mechanisms in the NPD process, a standardised and effective method for implementing these is currently lacking. Furthermore, the research did not identify a structured approach to the NPD process within the analysed Swiss media companies. Such a structure, with an overarching framework focused on technical lifecycles within NPD projects, appears to be essential.

8.4.1 Closing Key Research Gaps in NPD Process Elements

This study addresses two important research gaps (sections 2.6, and 6.3.2) in the existing literature on NPD team structures.

This research addresses the challenge posed by Islam and Storer (2020) to find a method that enables rapid adaptation of software designs without sacrificing quality. Empirical

results presented in section 7.2.4 demonstrate the value of technical prototypes for the early validation of software designs. The integrated build-measure-learn cycle facilitates rapid adaptation without compromising quality, ensuring alignment with user needs. This research proposes a novel approach (see section 7.4.2) employing two distinct prototype types, each serving a specific purpose: usability and technology. This approach provides Swiss media companies with a method for decoupling software design from functional requirements of digital products.

Furthermore, this research enriches the understanding of the value co-creation dynamics in digital services and provides detailed insights that need to be explored in more depth, as proposed by Helmer et al. (2021) and Sjödin et al. (2020). Based on in-depth interviews with managers in five Swiss media companies (see Table 5.2), this study examines how companies work with digital services. A key finding shows that media companies primarily develop services that are integrated into products or product-related, rather than stand-alone services. This is consistent with Biemans et al. (2016) observation that new service development often occurs in parallel with new product development. However, it was also shown (see section 4.2.1, and Table 4.2) that Swiss media companies do not have a clear definition of what a digital service should be. This ultimately leads to the need for separate research focussing specifically on the development of digital services in the (Swiss) media industry. This will be further explored in section 9.4.3.

8.4.2 Discussion of Findings in NPD Process Elements

This research shows the significant role of technology in the NPD process within the Swiss media companies studied. This observation is consistent with Jie (2023), who describes the increasing adoption of digital formats by media companies and the emergence of new degree programmes focusing on digital media technologies.

However, this study also shows that the priority given to technology as part of the NPD process varies across Swiss media companies, depending on whether it is a new or established technology. Interestingly, there was a shared perspective that technology is a means to an end, to facilitate problem solving, rather than a driving force behind the development of new digital products.

This view seems to contrast with Sly and Crowne (2023), who emphasise the critical role of technology development as the first step in designing new products. They argue that insufficient application of systems engineering and systems thinking principles in this initial phase can lead to technologies that address the wrong problem or hinder project progress.

While the findings of this study positions technology as a supporting tool rather than a primary driver of NPD, the findings of Sly and Crowne (2023) emphasise the importance of sound systems engineering and thinking in technology development. This suggests that Swiss media companies could benefit from proactively integrating these principles into their NPD processes to minimise risk and ensure the development of technologies that meet user needs and market demands. Further research could explore the specific applications and benefits of systems thinking in the unique context of the Swiss media landscape. This impetus for future research is described in more detail in section 9.4.3.

Furthermore, this research shows that there are no systematic quality control processes in place in the Swiss media organisations analysed, although there is a desire to introduce them. This pursuit of improved quality control is reflected in the design-oriented framework shown in Figure 7.12, which includes a quality gate system and uses the concept of minimum viable products (MVPs) to accelerate the launch of non-business-critical products.

The importance of quality control systems is well established in the literature. Sinha and Behera (2021), for instance, emphasise its role in ensuring the attainment of quality objectives of software products. This highlights the importance of recognising that none of the Swiss media companies analysed have a standardised quality control system embedded in their NPD process.

To address this issue, this study draws on the research of Xu et al. (2023), who describe a model that includes quality gates for software development projects. Their model defines quality gates as decision points at which a solution is evaluated against predefined acceptance criteria. This model also emphasises the importance of appointing a quality gate owner who is responsible for managing the phase and ensuring compliance with the criteria.

While the design-oriented framework in Figure 7.12 also employs a quality gate system embedding quality gate meetings and quality gate owners, the study by Xu et al. (2023)

provides valuable additions, such as the use of a Gantt chart as a supplementary tool for quality control meetings.

Moreover, this research draws parallels between the MVP process depicted in the design-oriented framework and the MLOps cycles presented by Helmer et al. (2024). Both emphasise iterative progression and validation, with Helmer et al. (2024) suggesting structured progression through proof of concept, prototype, MVP and pilot environment.

The MVP process in the design-oriented framework of this study in Figure 7.12 reflects this progression, starting with a “define” phase (proof of concept), followed by iterative prototyping and technical development using scrum, culminating in a beta test (pilot environment). This streamlined approach, with fewer quality control points, emphasises rapid market entry.

By integrating insights of Xu et al. (2023) and Helmer et al. (2024), Swiss media companies could potentially establish robust yet agile quality control systems that support both innovation and efficient product development.

In addition, this research highlights the importance of a clear technical lifecycle in the NPD process within the Swiss media industry. This emphasis is reflected in the overarching structure of the design-oriented framework presented in Figure 7.12.

The importance of the technical lifecycle is supported by Lindström et al. (2024), who emphasise its critical role in decommissioning, continuing, or transitioning products. Their findings underscore the importance of understanding the technical lifecycle to determine a product’s economic value and end of life, especially when considering factors such as residual value, legal restrictions, and supporting frameworks. This finding underscores the relevance of focusing on the technical lifecycle in NPD, as demonstrated in the design-oriented framework of this study.

However, this research also highlights concerns with the overarching structure proposed in the design-oriented framework. These concerns primarily centre on the difficulty of finding a universally applicable model for the entire organisation and the perceived impracticality of purely theoretical models that lack flexibility. Chawla et al. (2023) address this challenge by advocating a focus on product and platform operating models that enable cross-functional

teams to develop and deliver solutions independently. This suggests that the Swiss media industry needs to adopt more flexible and adaptable operating model.

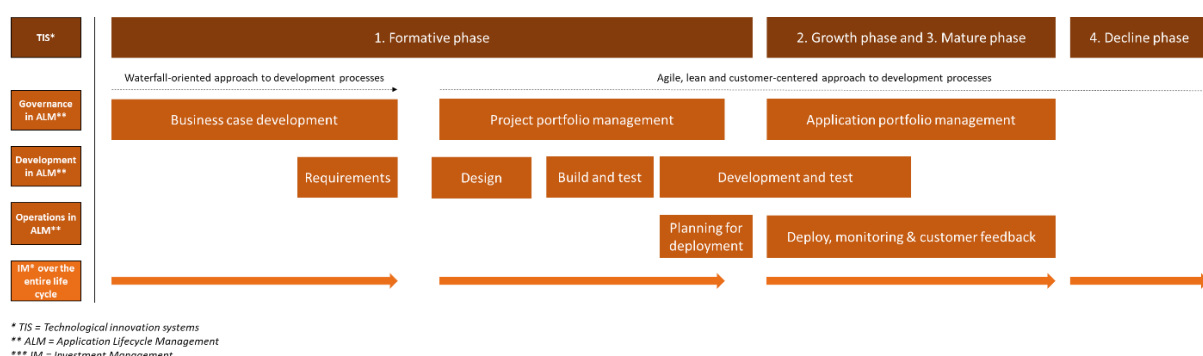
Furthermore, Kandemir and Acur (2022) emphasise the importance of agile decision-making processes that enable companies to respond to changing market demands. This finding is reflected in the design-oriented framework in Figure 7.12, which encompasses iterative cycles of building, measuring and learning, and promotes a dynamic and responsive approach to decision-making based on continuous customer engagement.

This research therefore highlights the need for a balance between structure and flexibility in product development. By integrating a clear technical lifecycle while promoting agile decision-making and iterative learning, the design-oriented framework in this study is designed to provide a framework that supports both effective planning and responsive adaptation to market dynamics. This opens up exciting possibilities for future research, in particular the creation of a holistic operating model for products and platforms in the Swiss media industry, building on the findings of this study and the design-oriented framework. This impetus for future research will be addressed further in section 9.4.3.

8.5 Conclusion

This section addresses key discussion points arising from the preceding sections (8.1, 8.2, 8.3, and 8.4), directly linking these to the design-oriented framework (Figure 7.12) and its implications for management.

Figure 8.1: Excerpt of the overarching NPD structure of the design-oriented framework in Figure 7.12

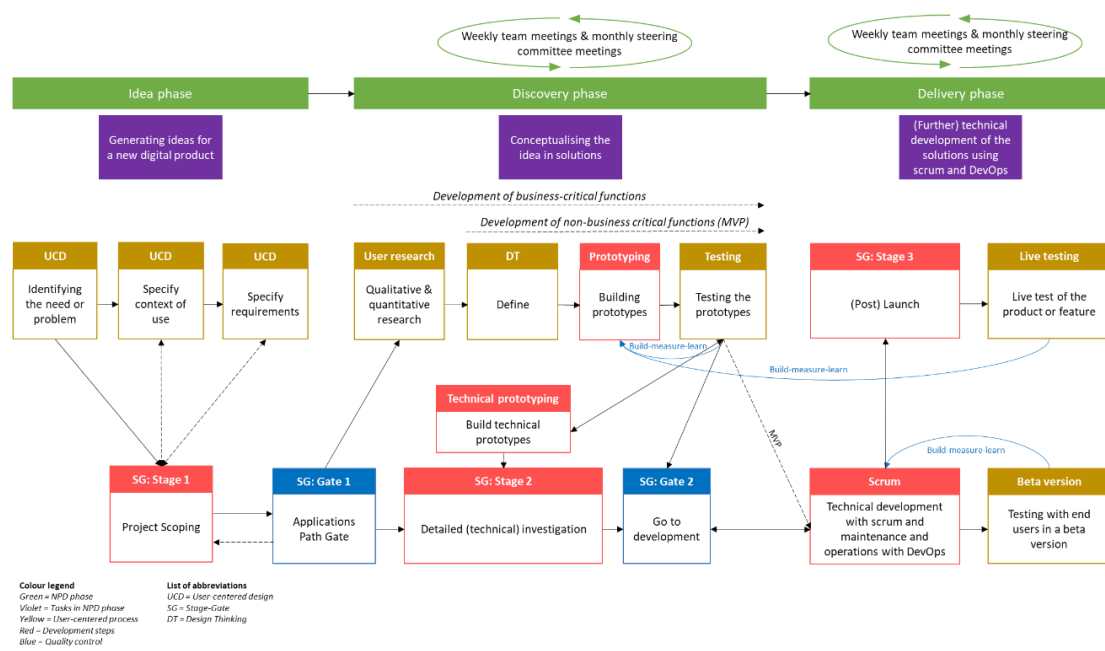


Firstly, the findings in section 7.2.4 reveal a key gap: none of the five Swiss media companies use an overarching NPD structure, despite its clear benefit for managing the technical lifecycle (operations and maintenance) of digital products – a point supported by Lindström

et al. (2024) regarding product decommissioning, continuation, or transition. Therefore, to address the identified NPD gap, management should strongly consider adopting the design-oriented framework's overarching structure (Figure 8.1) for the following compelling reasons:

- **Enhanced digital product lifecycle visibility:** This overarching NPD structure provides a comprehensive view of the entire digital product lifecycle, from formation to decline. This end-to-end visibility clearly identifies where development efforts should be concentrated at each stage.
- **Hybrid approach:** The overarching NPD process demonstrates a flexible model that utilises waterfall for rigorous business case development and sign-off, followed by agile, lean, and customer-centric execution.
- **Clear guidance and structure for NPD stakeholders:** The overarching NPD structure within this framework offers a well-defined structure for all individuals involved in NPD. It clarifies their position within the process and distinguishes between the crucial dimensions of governance, development, and operations, enabling a more coordinated and focused approach to each development step.
- **Proactive cost management:** By embedding a continuous focus on costs throughout the NPD process, this overarching NPD structure allows for consistent monitoring of budget details. This proactive approach ensures financial transparency and enables the steering committee to be informed well in advance of any potential financial constraints, facilitating timely and informed decision-making.

Figure 8.2: Excerpt of the customer co-created NPD process in the design-oriented framework in Figure 7.12



Secondly, regarding the customer co-created NPD process, the Swiss media industry reveals key shortcomings in its adoption. Specifically: customers are not empowered to develop solutions independently and are involved only indirectly (section 7.2.1); Swiss media companies do not sufficiently utilise quality control gates in their NPD processes (section 7.2.4); and there is not always a focus on technology at the outset of the NPD process (section 7.2.4). Consequently, to address these identified shortcomings in the adaptation of a customer co-created NPD process, management should strongly consider adopting the NPD process structure of the design-oriented framework (Figure 8.2) for the following cogent reasons:

- **Untapped potential of collaborative decision-making:** The core imperative is to empower customers in the decision-making process for new digital products (Dean et al., 2024). This requires a holistic adoption of customer co-creation methodologies, spanning both direct engagement (brainstorming) and indirect involvement through iterative feedback loops (testing), structurally embedded within the design-oriented framework (Figure 8.2).
- **Quality-driven evolution:** A fundamental principle must be the rigorous application of quality control checkpoints to attain the quality objectives of digital (software-based) products (Sinha & Behera, 2021). This rigorous application, as outlined in the NPD process within the design-oriented framework (Figure 8.2), ensures not only

robust development but also facilitates essential iterative refinements. Embracing agile methodologies like most viable product (MPV) for non-critical functions and the build-measure-learn cycle (exemplified by beta testing) becomes crucial for dynamically incorporating customer insights.

- **Technology integration from the outset:** Recognising the risk of technologically misdirected solutions if not considered early in NPD (Sly & Crowne, 2023), the design-oriented framework (Figure 8.2) strategically tackles this by differentiating between technical and business-oriented process steps. This deliberate separation ensures focused attention on the technological underpinnings of new digital products from the beginning, facilitating the use of technical prototypes without sacrificing quality to validate fundamental assumptions directly with customers.

Thirdly, drawing on the observations in Table 4.2 regarding the product versus service distinction of the interviewees, and as further illustrated by the disruptive impact of subscription-based competitors like Netflix in Table 5.2, NPD of digital products in the media industry is affected. This aligns with the observation of Biemans et al., (2016) that an over-reliance on new product development frameworks can hinder the maturity of new service development. While the Swiss media industry often integrates digital services as features within existing digital products (such as newsletters), this tendency to treat digital outputs primarily as product augmentations, rather than as potentially transformative stand-alone services, can limit the development of service-led innovation within established NPD processes. This underscores the finding in section 7.2.1, highlighting for the urgent need for Swiss media companies to become more disruptive and innovative. To address this, leveraging the customer co-created NPD process in Figure 8.2 offers a valuable avenue for grounding the development of new digital services in customer needs and market realities. While the current NPD focus on digital product development provides a foundation, further dedicated research in section 9.4.3.4 is warranted to specifically examine and optimise the design-oriented framework of this study for the unique demands of disruptive digital service innovation.

Table 8.1: List of cross-functional roles and team composition in the design-oriented framework in Figure 7.12

Core cross-functional team roles	Other cross-functional roles	NPD service provider roles
Product manager (strategic project leader)	Data team member	Horizontal DevOps team
Product manager (operational project manager)	Marketing staff member	Strategy staff member
User experience staff member (customer representative)	Friends and family members	
Developer (frontend / backend)	Technical testing staff member	
Tech lead or IT architect	Executive board members and important NPD stakeholders	
Designer	Scrum master	
Editorial staff member		
Customer / user		

Fourthly, as highlighted by Ahmed et al. (2021), there is a lack of an approach that integrates cross-functional teams throughout the entire NPD process. This aligns with the analysis in section 7.2.3, which indicates a lack of clear role definition within the NPD process for digital products across the five Swiss media companies in this research. Consequently, management should strongly consider applying

Table 8.1, which uniquely illustrates the cross-functional roles and team structure within the design-oriented framework (Figure 7.12), owing to its overall application of cross-functional roles in NPD. Moreover, this approach is also relevant in practice, as it aligns with three findings identified in sections 7.2.2, and 7.2.3:

- **Customer experience manager for customer interaction:** The analysis in section 7.2.3 demonstrates that there is not a clear role responsible for customer interaction within the NPD process. As can be seen in Table 8.1 and detailed in section 7.4.3, and further supported by Cajander et al. (2022) in section 8.1.2, this research suggests employing a customer or user experience manager to take responsibility for customer interaction. This encourages a thorough understanding of customers and alleviates the workload of the product manager in terms of time constraints.
- **Focus on two product manager roles:** The analysis presented in section 7.2.3 highlights a distinct lack of consensus concerning the roles of product manager, product owner, and project manager. In this context, and building upon Cooper and Fürst (2024), Table 8.1 delineates two potential product manager roles: one operating at a strategic and project leader level, and the other functioning at an operational and project management level. Applying these two distinct product

manager roles can clearly define the respective responsibilities within the NPD process, resolve the confusion surrounding the three roles, and, as demonstrated in section 8.3.2, negate the need for a separate product owner role in NPD frameworks that are not solely agile-driven.

- **Using a scrum master as coach in inexperienced teams:** The analysis in section 7.2.2 indicates that the work of a scrum master could potentially be undertaken by the product manager. However, this study, as illustrated in Table 8.1 and demonstrated in section 7.4.3, and supported by Cooper and Fürst (2024) in section 8.2.2, advocates for the integration of a scrum master in a coaching capacity for inexperienced teams to enhance team effectiveness (Schwaber & Sutherland, 2020).

In conclusion, applying the design-oriented framework of this study (Figure 7.12) offers a strong foundation and structure for developing new digital products in practice. Therefore, organisations seeking to streamline their NPD processes and foster greater collaboration should consider its adoption. Ultimately, this framework offers a pathway towards more effective and customer-centric innovation.

9 Conclusion

The conclusion phase represents the final stage of the DSR process, marking the culmination of the research endeavour. This chapter addresses the research questions, identifies the theoretical contributions, and outlines the implications for management practice. It also critically evaluates the study's quality criteria, acknowledges its limitations, and suggests avenues for future research.

9.1 Answering the Research Questions

This section addresses the research questions of this study. Each of the three questions, which focus on the topics of NPD processes, customer co-creation, and cross-functional teams will be answered in turn.

9.1.1 NPD Process

The first research question about the NPD process aims to answer the following question:

“How can current agile and waterfall processes in NPD be united to ensure a good basis for collaboration between cross-functional teams, to integrate customers into the process and to act efficiently from the idea to the launch of the new digital product while reacting quickly to changes?”

This study proposes a hybrid approach to product development, combining iterative and waterfall processes (sections 7.2.2, 7.4.1, and 8.2).

Initially, a waterfall methodology is employed to develop the business case, with a focus on securing NPD project funding and identifying key risks and assumptions. Once the business case is approved, the process transitions to an agile, customer-centric, and lean approach (sections 7.2.2, 7.4.1, and 8.2).

To ensure new digital products are developed in an agile and customer-centric manner, elements of design thinking and user-centred design are incorporated, guaranteeing full customer involvement throughout the NPD process (sections 7.2.1, 7.4.4, and 8.1). Agile development utilises the scrum framework, combined with DevOps principles for ongoing enhancement (sections 7.2.2, 7.4.2, 7.4.3, and 8.2). Quality control gates are integrated into the NPD process to ensure that all work meets customer, business, and technical

requirements (sections 7.2.4, 7.4.2, and 8.4). This customer-centric and agile NPD process is further enhanced by adopting the minimum viable product (MVP) philosophy. Non-business-critical products and features pass through fewer quality control gates, facilitating a faster go-to-market (sections 7.2.4, 7.4.2, 7.4.4.1.2, and 8.4). This approach aligns with the build-measure-learn cycle, incorporating prototyping, beta testing, and live testing of launched products (sections 7.2.1, 7.4.2, 8.1, and 8.4).

This approach provides a structured foundation while retaining the flexibility to adapt to change and incorporate customer feedback; dividing the NPD process into manageable phases facilitates effective collaboration between cross-functional teams (section 7.4.4.1.2, 8.1, and 8.4).

Launching a new NPD project with a clearly defined business case promotes alignment among stakeholders on project objectives and scope. This initial waterfall-oriented approach for a business case, which prioritises structured planning and financial considerations, transitions into an agile methodology for the subsequent development phases (section 7.2.2, and 8.2). This shift to agile methodologies enables rapid iteration, continuous learning through the build-measure-learn cycle and the integration of customer feedback throughout the entire development lifecycle (sections 7.2.1, 7.4.2, and 8.2)

Finally, the entire NPD process is underpinned by a flexible overarching NPD structure that is crucial for the sustainable development of new digital products. This overarching NPD structure illustrates the technical and economic lifecycle of the product, provides guidance on governance, development, and operations for the development phases for cross-functional teams, and highlights the importance of ongoing investment management (section 7.2.4, 7.4.1, and 8.4).

This hybrid NPD model not only optimises the NPD process but also fosters a collaborative environment. It empowers cross-functional teams to work together seamlessly from ideation to launch, while effectively responding to evolving needs and customer feedback.

9.1.2 Customer Co-Creation

The second research question about customer co-creation aims to answer the following question:

“How can the customer co-creation approach be integrated into a hybrid NPD process based on cross-functional teams so that customers are involved in the entire process in the best possible way?”

This study proposes that product managers should lead a cross-functional core team and be responsible for coordinating teamwork and aligning it with customer insights (sections 7.2.3, 7.4.3, and 8.3). However, direct communication and engagement with customers should be handled by a member of the user experience team within the core team, who possesses the necessary skills and expertise in customer interaction (sections 7.4.3, and 8.1).

Customers play a crucial role in providing feedback and input, but they are not expected to develop solutions independently. Instead, they collaborate with the responsible core team members in regular feedback loops during the entire NPD process. Their involvement should focus on sharing needs and identifying problems, participating in brainstorming session to identify potential solutions, providing feedback on prototypes, and conducting product testing within the build-measure-learn cycle. This approach emphasises a combination of indirect and direct customer involvement (sections 7.2.1, 7.4.2, 7.4.3, and 8.1).

Engaging individual customers throughout the entire NPD process is not efficient, as it provides only a single perspective. Therefore, different types of customers should be integrated into the NPD process. Iterations with diverse customer groups are necessary to gather varied feedback and ensure a solution that satisfies a broader market with diverse needs (sections 7.2.1, and 8.1).

The product manager is critical to realising the product strategy and vision. She or he links customer insights with the NPD process, ensuring that customer needs are aligned with the overall direction of the product (sections 7.2.3, and 8.3). This requires a shift in mindset in the Swiss media industry, prioritising customer needs and shifting the focus from output to outcome. This cultural shift would ensure that the entire media organisation focuses on developing products that genuinely meet customer needs and market demands (sections 7.2.1, 7.4.2, and 8.1).

In essence, this study proposes a customer co-creation approach where a core cross-functional team, led by a product manager and supported by a UX specialist to facilitate customer interaction, coordinates a hybrid NPD process. Customers provide feedback on

their direct and indirect involvement in the NPD process. This feedback is gathered through various methods, including feedback loops for identifying needs and problems, brainstorming sessions, prototype reviews, and product testing, all conducted in close collaboration with the core team. Recognising that diverse customer groups offer unique insights; a variety of customers are involved throughout the NPD process. This necessitates a customer-centric approach where the product manager aligns customer insights with product strategy to deliver market-driven products.

9.1.3 Cross-Functional Teams

The third research question about cross-functional teams aims to answer the following question:

“How can optimal collaboration in cross-functional teams be ensured over the entire NPD process to constantly involve the customer and work efficiently at the same time?”

This study (see sections 7.4.3, and 8.3) suggests that cross-functional teams should be established with a core team that remains consistent throughout the NPD process, so that no expertise is lost during the NPD process and the team members can rely on each other. Good collaboration in cross-functional teams in the Swiss media industry requires a multi-faceted approach throughout the NPD process, while always using user-centred approaches (sections 7.2.1, and 8.1). The digital transformation has made a customer-centric approach essential for media companies. Accordingly, a customer-centric strategy is essential for an NPD team to focus on common goals, driven by information received from customers (section 7.4.2).

Furthermore, adopting agile methodologies can significantly enhance team performance (sections 7.2.1, 7.2.2, 7.4.2, and 8.2). Agile practices promote flexibility, communication, and efficiency, enabling iterative progress and adaptation based on customer feedback. Clearly defined roles and responsibilities are also vital (sections 7.2.1, 7.2.3, 7.4.3, and 8.3). When each team member understands their contribution, they can work more effectively towards shared objectives.

Finally, fostering a culture of collaboration and knowledge sharing encourages open communication and mutual support among team members (sections 7.2.3, 7.4.3, and 8.3). The effective integration of technology and technical employees streamlines processes,

contributes to a reduction in repetitive testing cycles, facilitates communication and enables efficient data analysis for informed decision-making (sections 7.2.3, 7.2.4, 7.4.1, 8.1, 8.2 8.3, and 8.4).

By incorporating these elements, cross-functional teams can navigate the evolving Swiss media landscape, ensuring ongoing customer engagement and efficient NPD.

9.2 Theoretical Contribution

This study redefines the understanding of customer co-created NPD for digital products in the Swiss media landscape. It addresses the complexities of customer co-creations, hybrid NPD structures and the value of cross-functional teams. In this regard, this study has achieved the following: It culminates in a design-oriented framework (Figure 7.12) to guide successful customer co-created NPD of digital products with cross-functional teams.

This section is structured as follows: Firstly, the research aim outlined in section 1.4 is reviewed. Following this, a pilot study was peer-reviewed and published in preparation for this research. Finally, the three main theoretical contributions of this study are presented.

9.2.1 A Review of the Aim of this Research

As demonstrated in section 1.4.1, this research aimed to:

“The aim of this study is to investigate the theoretical construct of how new product development from the organisational perspective can effectively use customer co-creation within the Swiss media industry.”

This aim was successfully realised, and all research objectives (see section 1.4.2) were met. Employing the design science research process facilitated progression through various research phases, culminating in three interview phases across five Swiss media companies. This approach enabled in-depth analysis of NPD processes, with a particular focus on customer co-creation and cross-functional teams. Consequently, this led to the development of a design-oriented framework in Figure 7.12.

9.2.2 Pilot Study of this Research

On 26 May 2023, a peer reviewed conference paper was published as a pilot study by Le Cunff and Schlick (2023), which focused on an NPD system for customer co-creation and the

integration of ALM as an overarching phase system. It addressed the research gap identified by Goyal et al. (2020), illustrating how external knowledge from customers can be used in knowledge creation for the generation of new ideas, thus setting out a process to develop innovative products.

9.2.3 Three Key Contributions to Theory

This research makes three important contributions to theory:

Firstly, updating the work of Bianchi et al. (2020), Cooper (2019), and Kwon et al. (2021), this research has shown that the novel understanding of how hybrid NPD structures can be used with customer co-creation in large, hierarchical organisations goes far beyond a mere synthesis of agile and waterfall methodologies. In setting out this contribution, this research differentiates itself in the following ways:

- **Holistic Framework:** Unlike Cooper (2019), this study emphasises the importance of a holistic, overarching NPD structure based on application lifecycle management. This framework serves as a guide throughout the entire lifecycle of digital products, ensuring alignment across governance, development, and operations.
- **Hybrid approach with customer co-creation:** While Bianchi et al. (2020) explore hybrid models, this study uniquely integrates customer co-creation throughout the entire NPD process, from initial business case to end-of-life. This is achieved by combining established process models like user-centred design, design thinking, lean startup, stage-gate, and scrum.
- **Focus on business and technical elements:** This research explicitly addresses the need to balance both business-driven and technically driven elements within the NPD process, a critical aspect, which was not fully explored by Cooper (2019).
- **Application in large, hierarchical Swiss media organisations:** While Kwon et al. (2021) focused on understanding how large corporations with a waterfall culture define and apply design thinking in a general sense, this study goes further by specifically examining the implementation of a comprehensive hybrid NPD approach that incorporates design thinking alongside other customer-centric practices (user-centred design, and lean startup) within large, hierarchical Swiss media organisations. This provides a more detailed and practical application of how

customer co-creation can be embedded within the NPD process of such organisations.

Secondly, this study makes a theoretical contribution by providing insights into how to effectively overcome barriers to customer co-creation. Existing research, such as El Namar et al. (2022) and Morgan et al. (2019), highlighted two key challenges: motivating customer participation and balancing collaboration with efficiency in NPD. This study builds upon this existing knowledge by:

- **Demonstrating the interplay between challenges:** This research goes beyond simply identifying challenges and demonstrates the interplay between motivation and collaboration in customer co-creation. This study observed that assuming customers cannot develop solutions independently (reducing motivation) can lead to a reliance on indirect customer involvement approaches, rather than combining direct and indirect customer involvement methods (impacting collaboration).
- **Highlighting the role of communication:** This study identifies a lack of clarity regarding the role of communication in customer co-creation and its influence on efficiency. This study proposes a novel approach by assigning responsibility for customer interaction to dedicated user experience or customer experience employees in a cross-functional NPD team, thereby promoting effective integration and alleviating pressure on product managers.
- **Providing context-specific insights on social media:** While Zhang et al. (2020) and Zhang et al. (2023) explore the broader methodological perspective of value co-creation through social media, this study offers a contrasting perspective. This study suggests that using social media for gathering customer feedback in the Swiss media industry for new digital products may be unsuitable due to the non-representative audience it attracts. This highlights the importance of considering context-specific factors when selecting customer feedback methods.

Thirdly, this study makes a theoretical contribution by outlining cross-functional roles and team structures throughout the entire NPD process. This responds to the observation by Ahmed et al. (2021) that there is a lack of existing approaches that actively integrate cross-functional teams throughout the entire NPD process.

- **Proposing a unique approach:** This research offers a detailed design-oriented framework in Figure 7.12 that specifies the necessary cross-functional roles for each stage of the NPD process. It details the composition of a core cross-functional team and identifies further roles to be integrated outside the core team as needed.
- **Demonstrating broader applicability:** While this research focuses on the Swiss media industry, the proposed approach has broader applicability. As Ulrich et al. (2019) argue, cross-functional roles are essential in almost all NPD processes. This study provides a practical example of how such roles can be structured and integrated within a hybrid customer co-created NPD framework for the development of new digital (software-based) products.

Finally, to the best of the author's knowledge, this research is the first of its kind to attempt to develop a customer co-created NPD process involving cross-functional teams for digital products within the design-oriented framework in Figure 7.12. This design-oriented framework builds upon existing research by combining established process models such as user-centred design, design thinking, lean startup, stage-gate, and scrum, and integrating them with an overarching holistic NPD structure based on application lifecycle management while assigning clear roles and responsibilities to cross-functional team members. This approach facilitates direct and indirect customer involvement and promotes effective customer engagement in the NPD process.

9.3 Management Implications

This section provides important insights for managers in the Swiss media industry dealing with the complexity of NPD of digital products.

On 19 October 2023, an online talk was given by the author of this study at the "Garaje Inspiration Fest" on the topic of customer centricity in NPD. It was presented to a large community of product managers and designers on how possible practical approaches can be used to have an NPD process that is fully focused on customers and finally can develop a digital product that matches the demand in the market. Different approaches such as stage-gate for quality control points, application lifecycle management for an overarching NPD structure and the combination of agile and customer-centric processes were presented (Le

Cunff, 2023). This recorded talk can help managers in media companies to gain the basis of customer centricity in NPD processes.

Furthermore, this study reveals a significant discrepancy between the theoretical understanding of customer co-creation and the practical implementation in the five Swiss media companies analysed. Managers often face challenges such as organisational resistance, resource constraints, and perceived discrepancies between customer input and NPD realities (see section 7.2.1). The study also shows that while agile methodologies are widespread in the five Swiss media companies, their implementation often deviates from established principles, leading to inconsistencies and limitations (see section 7.2.2).

The differing roles within cross-functional teams in the Swiss media industry (see section 7.2.3) contribute to a lack of standardised structure for developing new digital products across individual Swiss media companies. Furthermore, the analysis in section 7.2.4 highlighted the importance of an overarching NPD structure, robust quality control gates, and a focus on technology. However, it also concluded that these elements are not yet fully integrated within the Swiss media industry.

To overcome these challenges, the development of a design-oriented framework, described in detail in section 7.4, provides a comprehensive structure for customer co-created NPD of digital products, where cross-functional teams are involved. This design-oriented framework includes an overarching NPD structure, a customer-co-created NPD process, key NPD process elements for business and technically driven development processes, and a cross-functional team structure.

These insights provide actionable ideas for managers to improve their NPD strategies. By actively fostering a customer-centric culture, adopting agile practices, focusing on key cross-functional roles in the NPD process, effectively implementing hybrid practices, and working with an overarching NPD structure and quality control gates, media companies can navigate the evolving media landscape and drive innovation. Building on these findings, specific implications for management are described in the sections below.

9.3.1 Customer Co-Creation in the Swiss Media Industry

This section outlines five specific implications for managers in the Swiss media industry regarding customer co-creation, addressing the challenges detailed in section 9.3.

Firstly, managers should utilise the expertise of customers, specifically when determining requirements, generating initial ideas, and evaluating prototypes (Dean et al., 2024). To this end, it is important that customers are involved not only indirectly but also directly, for example, through workshops with brainstorming sessions in the NPD process (see section 7.4.2).

Secondly, lead users, as customer segments (De Jong et al., 2024), should be involved in the NPD process. The personality traits of customers should also be taken into account when selecting participants (Mandolfo et al., 2020). This ensures that diverse customers with varying knowledge are included (see section 8.1.2).

Thirdly, managers should prioritise non-monetary incentives, such as access to exclusive content or gamified rewards (Hwang & Choi, 2020; Lyu et al., 2022). This helps conserve financial resources when engaging customers in the NPD process (see section 8.1.2).

Fourthly, aligning compensation and reward systems with key performance indicators (KPIs) based on customer-centricity (Madhani, 2021) should be a priority for managers.

Additionally, conducting pilot projects that demonstrate the value of customer co-creation (Feige, 2024) is crucial. These focus points help overcome internal organisational barriers to a customer-centric culture in Swiss media companies (see section 8.1.2).

Fifthly, this study's design-oriented framework (Figure 7.12) integrates user-centred design, design thinking, and lean startup principles (build-measure learn cycle and MVP). Managers are strongly encouraged to explore this framework for customer co-creation, as it offers significant benefits. For instance, combining design thinking and lean startup can enhance customer needs identification and risk mitigation (Sreenivasan and Suresh, 2024).

Furthermore, it enables structured customer involvement throughout the NPD process, an area where current practices within the Swiss media industry vary considerably (see section 7.2.1).

9.3.2 Agile Adoption in the Swiss Media Industry

This section provides three specific implications for managers in the Swiss media industry regarding agile adoption to counteract the challenges highlighted in section 9.3.

Firstly, since scrum masters often do not operate according to scrum theory within the Swiss media industry (see section 7.2.2), managers should ensure that immature teams are supported by a scrum master who can coach and facilitate agile adoption (Cooper & Fürst, 2024). This can improve team effectiveness within large organisations (Schwaber & Sutherland, 2020).

Secondly, given the observation that scrum is not applied in the Swiss media industry as prescribed in theory, and that agile practices negatively impact estimation and scaling (section 7.2.2), managers are advised to explore “scrum at scale” (section 8.2.2). For projects with extensive backlogs, “scrum at scale” offer greater flexibility than traditional scrum (Sutherland et al., 2022). Furthermore, managers should focus on integrating agile methods with project management methods to contribute to improved scaling and estimation (section 8.2.2). In this regard, the inclusion of schedule and cost control is crucial (Almeida and Bálint, 2024), aligning with the design-oriented framework presented in Figure 7.12 of this study.

Thirdly, managers are advised to adopt a hybrid structure within their NPD process, combining waterfall and agile methodologies. This approach is recognised as an effective method for software development projects, integrating waterfall structures with scrum (Yahya & Maidin, 2022). Specifically, as shown through Nunes et al. (2023) and Cooper and Sommer (2016), managers are encouraged to utilise a hybrid stage-gated processes to develop a business case. This is crucial to comprehensively assess financing and evaluate the greatest risks and assumptions (see section 7.2.2). As empirically analysed in section 7.2.2, after approval of the business case, a customer-centric and lean approach is recommended alongside agile.

9.3.3 Cross-Functional Teams

This section outlines two specific implications for managers in the Swiss media industry regarding cross-functional teams, aiming to address the challenges identified in section 9.3.

Firstly, given that the empirical analysis in section 7.2.3 did not clarify which roles should be included in a cross-functional team, managers are advised to prioritise the following key roles: product manager (Royal et al., 2020), technical experts (Hallstedt et al., 2020), user experience or customer experience specialists (Santhosh and De Crescenzo, 2023), and

editorial team members (Mtchedlidze, 2024). To gain a comprehensive understanding of the roles within cross-functional teams at each stage of the NPD process, managers should also consult the design-oriented framework presented in this study (Figure 7.12). This framework provides detailed insights into identified roles beyond the four core roles described.

Secondly, given the lack of clarity within the Swiss media industry regarding customer interaction ownership (see section 7.2.3), it is recommended that managers assign this responsibility to user experience professionals. This approach serves to enhance direct user engagement (Cajander et al., 2022) and alleviate the burden on the product manager (section 8.1.2), who leads the NPD project (section 7.2.3).

9.3.4 Elements and Focus Areas on New Product Development

This section outlines three specific implications for managers in the Swiss media industry, focusing on elements and areas within NPD to address the challenges identified in section 9.3.

Firstly, section 7.2.4 demonstrated the importance of technology in NPD in the Swiss media industry, though it is not currently perceived as a key driver. However, it is recommended that managers prioritise systems engineering and systems thinking from the outset of a project. This ensures the project addresses the correct problem and avoids potential obstacles to progress (Sly and Crowne, 2023).

Secondly, based on the findings in section 7.2.4, managers are strongly encouraged to integrate the overarching NPD structure, as outlined in this study's design-oriented framework (Figure 7.12), into their existing NPD processes. This overarching NPD structure, primarily based on application lifecycle management, facilitates the integration of key factors such as financing, technical lifecycles, and operation and maintenance.

Thirdly, managers are strongly advised to incorporate the quality control gate mechanism, as detailed in this study's design-oriented framework (Figure 7.12), into their NPD process. This is crucial because, despite a desire for such an approach, a systematic methodology is currently lacking within the Swiss media industry (see section 7.2.4). In this regard, to effectively manage and adhere to new product quality criteria, appointing a dedicated quality gate ownership is further recommended (Xu et al., 2023).

9.4 Quality Criteria, Limitations and Future Research

This section addresses three key aspects of this study: a critical assessment of its quality criteria, an acknowledgement of its limitations, and suggestions for future research.

9.4.1 Quality Criteria

This study utilises the framework developed by Mayring (2023) to evaluate the quality of the research and its findings. This framework encompasses six key criteria: rule-governedness, procedural documentation, proximity to the object of study, communicative validation, triangulation, and argumentative interpretation safeguarding.

Furthermore, this study acknowledges the limitations of the traditional paradigm of internal validity, external validity, reliability, and objectivity. In line with Lincoln and Guba (1985), it adopts the alternative criteria of credibility, transferability, dependability, and confirmability. The techniques proposed by Lincoln and Guba (1985), as discussed by Schwandt et al. (2007), will be employed to enhance the likelihood of meeting these criteria.

Therefore, the subsequent sections of this study will employ the quality criteria established by both Mayring (2023) and Lincoln and Guba (1985) to assess the overall quality of this research.

9.4.1.1 Rule-Governedness

This research adheres to clearly defined rules and procedures throughout, enhancing the dependability of the findings. The research strategy aligns with the DSR process (see Figure 3.2), meticulously following all phases: awareness, suggestion, development, feedback and evaluation, and conclusion. This rigorous adherence to established procedures strengthens the credibility of the research by ensuring a systematic and transparent approach. It also provides a clear explanation of when and how DSR cycles are employed within each individual phase of the DSR process (see Figure 3.3).

Furthermore, the data analysis phases, based on Yin (2015), were rigorously executed across all three interview phases (see sections 3.5.2.2, 3.5.2.3, and 3.5.2.4).

9.4.1.2 Procedural Documentation

This study provides a comprehensive and transparent account of the research process, contributing to its dependability and confirmability. The philosophical stances are meticulously laid out (see section 3.1), explaining the interpretive approach and the rationale for prioritising qualitative research methods. This detailed documentation allows for an audit trail, enabling others to trace the research process and contributing to the confirmability of the findings.

The selection of a DSR research strategy (see section 3.2) and the research design based on the multi-phase qualitative research (see section 3.3) are explained in detail, including a clear presentation of the iterative cycles within DSR and their alignment with the three interview phases (see section 3.4).

Furthermore, this study provides comprehensive documentation of the data collection and interview participant selection process in section 3.5.1, following the approach of Mayring (2015). The data analysis process is meticulously documented in section 3.5.2 using the phases of Yin (2015), with corresponding references to the codebooks available in Appendix 1.3. Of particular note are the codebooks from the feedback and evaluation phase in DSR in Appendices 1.3.3 and 1.3.4, which offer precise and rigorous documentation for each individual code.

9.4.1.3 Proximity to the Object of Study

This study demonstrates proximity to the object by focussing on interviews with people who are directly involved in customer co-created NPD in five Swiss media companies (see sections 3.5.1.1.2, 3.5.1.1.3, and 3.5.1.1.4). This enhances the credibility of the research by ensuring that the data collected is rich, nuanced, and grounded in the lived experiences of the participants. The semi-structured interview format (see section 3.5.1.1.3) facilitates open-ended responses and allows participants to share their insights in detail.

All interviewees received the interview questions in advance. Each interviewee was given a detailed explanation of the research aims and assured that they would receive a copy of the published research work. Furthermore, the study adhered to the relevant ethical guidelines and values (see section 3.1.3).

Finally, this study provides rich descriptions of the five Swiss media companies, including their size, revenue figures, and market position (see section 3.5.1.1.2). This detailed contextual information allows readers to assess the potential transferability of the findings to other media organisations or industries.

9.4.1.4 Communicative Validation

Communicative validation was fostered during the feedback and evaluation phase of the DSR process. This involved feedback discussions with participants regarding the empirical artefact (see section 7.1), where they identified missing elements and contributed to its refinement by expressing their needs and perspectives. This process enhances the credibility of the findings by allowing participants to verify the accuracy and interpretation of their experiences. Following publication, participants will be offered a presentation of the research findings to facilitate further discussion and feedback.

9.4.1.5 Triangulation

To increase the credibility of the findings, this study utilises data triangulation by drawing on multiple sources of evidence (see Table 3.12). This triangulation of data strengthens the credibility of the findings by providing a more comprehensive and nuanced understanding of the phenomenon under investigation. These include ten semi-structured interviews with five individuals (see section 3.5.1.4) from five of Switzerland's largest media organisations (see section 3.5.1.1.2) to provide rich first-hand accounts of customer co-creation in NPD, where cross-functional teams are involved. These interviews provide valuable insights into the challenges, successes, and practical realities of implementing customer-centric processes. The study also integrates established theoretical concepts and models from the academic literature on NPD, customer co-creation and cross-functional teams, providing a solid framework for analysing the empirical data. To provide a broader context, the study also incorporates industry reports, a media report and research reports from reputable sources such as Deloitte, and Reuters, which provide insights into industry trends and best practices. By combining these different sources, the study aims to create a more comprehensive and nuanced understanding of new products developed with customers, ensuring that the findings are robust and grounded in both theory and practice.

9.4.1.6 Argumentative Interpretation Safeguarding

The interpretation of the data is carefully grounded in empirical evidence and supported by arguments and conclusions, with direct quotations used throughout the analysis to illustrate key points. This approach contributes to the confirmability of the findings by ensuring that interpretations are rooted in the data and not solely based on the researcher's preconceptions. The study utilises a combined inductive-deductive approach for the data analysis (see section 3.4.1), ensuring that the findings are both rooted in existing theory and emerge from the empirical data. Furthermore, the interpretations of cross-company analysis in section 7.2 of the feedback and evaluation phase in DSR are discussed in chapter 8 and contextualised with reference to the current literature to provide a clear rationale for the conclusions drawn.

9.4.2 Limitations

While this study provides valuable insights into customer co-created NPD processes with cross-functional teams in Swiss media organisations, it has certain limitations.

Firstly, the research was limited to five companies in the Swiss media industry. While this allowed each company to be analysed in depth, it should be noted that the results may not be applicable to small media companies in Switzerland or media companies in other countries.

Secondly, this study is limited by its reliance on qualitative data. Incorporating quantitative data, such as project performance metrics or customer satisfaction surveys, could provide a more comprehensive understanding of NPD outcomes.

Thirdly, this study acknowledges the difficulty of defining a universally applicable set of roles for cross-functional teams involved in the NPD of digital products. This is because these products can vary greatly (from websites and mobile applications to complex customer relationship management systems), and requirements differ across industries. For example, in the media industry, the focus is often on editorial staff. Nevertheless, the design-oriented framework in Figure 7.12 and a literature review provide a unique perspective for future research by presenting a comprehensive cross-functional team constellation that includes roles from strategic and operational product management, user or customer experience department (responsible for customer interaction), technical development

(frontend/backend), IT architecture, design department, editorial department, customer/user, data department, marketing department, and strategy department (including finance). It is also noteworthy that the constellation highlights the involvement of stakeholders such as board members (steering committee), scrum masters, DevOps teams, and even friends and family members. In addition, the discussion in section 8.3 confirmed the core competencies of key roles, including product managers, user experience experts, and technical staff members highlighted the critical importance of cross-functional collaboration for the successful development of new digital products.

Fourthly, although this research provides a valuable framework for new digital product development, it is important to recognise that product development in the media industry encompasses a broader range of products and services. This includes traditional print media, television and radio programmes, as well as innovative content formats that do not necessarily fall into the “digital product” category.

Fifthly, it is important to acknowledge that qualitative research, by its nature, involves subjective interpretation. While this study benefited from the insights of a dedicated researcher, it did not incorporate multiple perspectives on the data analysis.

Sixthly, the Swiss media industry is constantly evolving, influenced by technological advances, changing consumer behaviour, and new business models. Therefore, this study recognises that the analysis of the results was a snapshot in time, based on interviews conducted in 2023 and 2024.

Despite these limitations, this study contributes significantly to the understanding of customer co-created NPD with cross-functional teams in the Swiss media industry. The findings provide valuable insights for academics and practitioners by highlighting key challenges and suggesting actionable recommendations to improve NPD processes. By recognising these limitations and suggesting future research directions in section 9.4.3, this study opens further avenues of investigation and contributes to the continuous advancement of knowledge in this dynamic field.

9.4.3 Recommendations for Future Research

This section outlines thirteen avenues for future research, drawing upon insights gleaned from the limitations of this study in section 9.4.2, and the preceding discussion in chapter 8.

9.4.3.1 Future Research on Customer Co-Creation

This section presents three suggestions for future research around customer co-creation.

Firstly, as described in section 9.4.2, future research could investigate how NPD processes adapt and change over time and include longitudinal studies to track the long-term impact of customer co-creation in the Swiss media industry.

Secondly, as described in section 8.1, future research should develop a typology of lead users in the Swiss media landscape and identify their characteristics, motivations and preferred methods of customer co-creation, building on the work of De Jong et al. (2024) on lead user identification. In addition, it should investigate the optimal level and type of customer co-creation activities for different media products (e.g., high-tech vs. high-touch), drawing on the findings of Mandolfo et al. (2020) on personality traits.

Thirdly, to further explore customer centricity within the culture of Swiss media companies, future research could examine, as described in section 8.1, the effectiveness of aligning employee compensation and reward systems with customer-oriented key performance indicators (based on Madhani [2021]), and the impact of small customer-centric pilot projects (based on Feige [2024]) on larger-scale initiatives with a full customer focus. This research could assess how these strategies affect customer loyalty, business success, and the development of a customer-centred corporate culture within Swiss media companies.

9.4.3.2 Future Research on Agile Methodologies

This section presents two suggestions for future research around agile methodologies.

Firstly, based on Omonije (2024), further research should investigate whether a deeper understanding of the “why, how, and what” in the Swiss media industry can lead to a more effective implementation of agile methods. A more detailed comparison between the principles outlined by Omonije (2024) and the findings of this study will provide a more nuanced understanding of how agile can be effectively tailored to the specific requirements of digital products in the media industry.

Secondly, as discussed in section 8.2, Almeida and Espinheira (2021) show that the scaled agile framework (SAFe) does not emphasise flexibility, which was supported by this study,

which manifested that SAFe does not allow for spontaneity. However, Almeida and Espinheira (2021) also highlighted that SAFe is one of the best frameworks for involving customers. Therefore, future research could explore whether SAFe's emphasis on predefined roles and processes hinders the serendipitous, emergent nature of co-creation activities or whether it provides a necessary framework for effectively integrating customer input at various stages of the NPD process. Exploring this area of tension could provide valuable insights for media organisations seeking to optimise customer co-creation.

9.4.3.3 Future Research on Roles and Skills

This section presents three suggestions for future research around roles and skills in NPD.

Firstly, as described in section 9.4.2, future research could focus solely on cross-functional teams within an NPD process, clarifying the specific roles and tasks of individuals involved. It would also be valuable to analyse the differing roles within the NPD process for various digital products, such as website development, app development, or the development of business management software.

Secondly, this study suggests a consolidated product manager role that encompasses both operational and strategic responsibilities in two roles, as shown in the design-oriented framework in Figure 7.12. As discussed in section 8.3, further research is needed to examine the effectiveness of this approach compared to existing separate roles of product manager and product owner, examining factors such as team performance and product success. This includes research into the specific skills and knowledge required for these consolidated roles.

Thirdly, as described in section 8.3, future research should build on this study by examining the strategic importance of technical roles in Swiss media companies, optimising training programmes for key skills, researching ethical artificial intelligence (AI) integration, and improving collaboration between technical and non-technical teams. This research should use a combination of qualitative and quantitative methods to develop practical recommendations for media companies. For example, in-depth interviews with technical employees could reveal challenges and opportunities related to AI, while surveys could identify broader trends in skills gaps across the industry. By combining these approaches, this future research could provide a more nuanced understanding of the complexities facing

the Swiss media industry and lead to more effective and targeted recommendations for how these Swiss media organisations can recruit technical talent, develop their employees' skills, integrate AI ethically, and foster collaboration across departments.

9.4.3.4 Future Research on Digital Transformation and Innovation in the Swiss Media Industry

This section presents five suggestions for future research around digital transformation and innovation in the Swiss media industry.

Firstly, as described in section 9.4.2, future research could incorporate quantitative data such as project performance metrics or customer satisfaction surveys to provide a more comprehensive understanding of NPD outcomes.

Secondly, this study has highlighted a key trend within the Swiss media industry in section 8.4.1: the development of digital services that are predominantly integrated with existing products. Future research should investigate which digital services could generate new revenue streams and foster disruptive innovation within this sector. Furthermore, it should be established whether the development of such digital services can be incorporated within existing NPD processes, or whether a separate, customer co-created process is required to optimise value creation.

Thirdly, given the potential benefits of systems thinking in NPD in section 8.4 based on Sly and Crowne (2023), future research should investigate the specific applications and challenges of implementing systems thinking principles within Swiss media companies. This could involve case studies of companies that have successfully integrated systems thinking in the beginning of NPD projects, examining their approaches, outcomes, and lessons learned.

Fourthly, as described in section 8.4, this study highlights the limitations of standardised models and suggests a need for the Swiss media industry to prioritise operating models that empower cross-functional teams to develop and deliver solutions independently. Future research should therefore focus on developing a holistic operating model specifically for this industry. This model should embrace decentralisation, prioritise flexibility, and foster collaboration, building upon the findings of this study and incorporating a comparative analysis of successful models from other technologically advanced media industries.

Fifthly, this study culminates in the development of a design-oriented framework in Figure 7.12 that is intended to improve the customer-co-created NPD process in Swiss media companies. To further refine and validate this framework, future research should use an action research design. This includes testing the design-oriented framework within different Swiss media companies, actively engaging cross-functional team members in the process, and iteratively incorporating feedback and new insights. This action research approach allows for a hands-on evaluation and continuous improvement of the artefact, ensuring its relevance and applicability in the dynamic Swiss media landscape.

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1 Appendix

This chapter refers to the appendices of this research.

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1.1 Interview Questions

This section addresses the interview questions in three interview phases.

1.1.1 Awareness Phase

This section shows the interview questions from the first interview phase dedicated to the awareness phase in chapter 4 and cross-company analysis of the suggestion phase in section 5.2.

Interview Questions: NPD Process	
Number	Question
1	In how far you rely on an overarching model for new digital product development that engages the entire lifecycle from business case creation to deactivation?
2	In how far you use agile and thus iterative or rolling processes in the new product development process?
3	In how far you use waterfall processes, i.e. one step must be completed before the next can be tackled, in your new product development process?
4	In how far you think that it makes sense to develop digital services at the same time as the digital product?
5	To what extend do you use the same new product development process for digital services as for the digital product being developed?
Interview Questions: Customer Co-Creation	
6	In how far you involve customers in your new product development process?
7	What is the importance of customer centricity in your company and where is it used?
8	Do you use a process to translate the wishes, needs and hopes of customers and users into product and service solutions (e.g. through user experience)?
9	In how far you use the user-centred paradigms like “design thinking” in your company and specifically for the development of digital goods?
10	How do you survey customers through online and offline channels?
11	Why would you use social media to conduct customer surveys?
12	Could customer interviews on social media replace face-to-face customer interviews in the design thinking process to obtain customer insights for new product development?

1.1.2 Suggestion Phase

This section shows the interview questions from the second interview phase dedicated to the suggestion and development phase in chapters 5 and 6.

Interview Questions: NPD Process	
Number	Question
1	When would you use hybrid process models, e.g. scrum as an agile process and stage-gate as a waterfall process, for the new product development (NPD) process?
2	What do you see as the problem with mixing iterative agile processes with classic project management processes?
3	When does it make sense to review and approve the quality of the work performed during an NPD process?
4	Spotify offers the digital service that allows music to be streamed digitally. In how far you are focusing on the development of digital services?
Interview Questions: Customer Co-Creation	
5	In how far you use fast feedback cycles with customers when it comes to testing a new product or individual features?
6	What do you think about the fact that quick user feedback, as is the case in the lean startup process, is only used if it concerns features that are already known on the market and are not business-critical?
7	What is the difference between the pre-development phase and the development phase in your NPD process of new digital products in terms of customer involvement?
8	In how far you use customer centred and agile frameworks?
Interview Questions: Cross-Functional Teams	
9	How is the composition of the cross-functional teams per NPD phase in your company?
10	Where do you see the biggest challenges for cross-functional teams in terms of collaboration and efficiency in the NPD process?
11	How does the collaboration between cross-functional teams and customers in the NPD process work?

1.1.3 Feedback and Evaluation Phase

This section shows the interview questions from the third interview phase for the feedback and evaluation phase with a focus on the within-company analysis in Appendix 1.2, the cross-company analysis in section 7.2, the evaluation of the empirical artefact in section 7.3, and the development of the design-oriented framework in section 7.4.

Interview Questions: NPD Process	
Number	Question
1	The theoretical artefact is based on a lifecycle model, which provides a structural basis for the NPD process. If an overarching model for project management components of the governance, development and operations perspective is used in your organisation in the future, why would this have an impact on the new product development of digital products?
2	The empirical artefact relies little on the technical development part. For example, that a detailed investigation of the technical basis must take place. How important is it in your company that technical development is at the centre of the entire product development process and that the technical components therefore play a central role?
3	In both artefacts, a business case must first be accepted and then developed in an agile manner. This indicates a hybrid model. In terms of efficiency, how do you rate the use of checkpoints within the NPD process, which analyses whether the work is good enough to pass on to the next process step?
4	What are the key benefits or limitations in practice when using agile process frameworks, including scrum and kanban, for the technical development of a digital product?
5	How do you evaluate the use of prototypes for an MVP and the build-measure-learn cycle for live testing of digital products to create software designs that can be adapted quickly and without compromising quality?
Interview Questions: Customer Co-Creation	
6	In the empirical artefact, the direct and active customer co-creation approach is only used very sparingly from the start of the business case up to and including the further development of the digital product. This means that customers are utilised indirectly by being used as study participants, for evaluating prototypes or for testing final products. If in future customers are directly and actively involved in the concept creation and design process in your company, how does this differ from the current process?
7	To what extent do you think that the use of user-centred process methods such as design thinking or user-centred design as a process-related basis in the NPD process would help your company to maintain a stronger focus on the customer and react quick to changes?
Interview Questions: Cross-Functional Teams	
8	Suppose you are responsible for ensuring that a cross-functional team within the NPD process has a good, efficient and customer-focussed collaboration. Why would you then either create a dedicated core team OR empower a specific role, such as product manager, product owner or project manager, who is responsible for bringing together the required roles for each phase of the process?
9	Where in the NPD process do customers need to be deployed so that efficiency and collaboration in a cross-functional team is not compromised?
10	Why do the roles of a product owner, product manager and project manager differ in your company regarding new product development?
11	The theoretical artefact of this study includes additional technical roles such as system architect, solution architect, and a DevOps team. Why are these or other technical roles also relevant or irrelevant in your organisation's NPD process?
Closing questions	

12	Finally, what aspects do you consider relevant for the future regarding the development of new digital products in the media industry?
13	Who in your organisation could I email important questions to so that I can clarify areas that have not yet been answered?

1.2 Within-Company Analysis of the Third Interview Phase

The third interview phase involved selecting the five largest media companies in Switzerland, so that feedback could be gathered from respondents and the empirical artefact shown in Figure 6.5 evaluated. These included “TX Group”, “Ringier Media Switzerland”, “Schweizer Radio und Fernsehen”, “CH Media”, and “Neue Zürcher Zeitung”. As the topic of this research is very specific and only very few people can provide in-depth insights into the customer co-created new product development process while concentrating on cross-functional teams, one interviewee with the required knowledge was selected for each company (see Table 3.1). This made it possible to conduct very specific and in-depth interviews in the semi-structured interviews. The job titles of the persons were “Chief Product Officer”, “Head of Digital Activities and Business Development”, “Lead Product Manager”, “Chief Product Owner”, and “Chief Product Officer”. The evaluation of the interviews was carried out using DSR as the research strategy (more on this in section 3.2) and multi-phase qualitative research design as the research design (more on this in section 3.3).

The data analysis took place in several steps and is based on the approach of Yin (2015), who suggests several iterations take place in the data analysis process. The detailed process of data analysis can be found in section 3.5.2.4.

1.2.1 First Within-Company Analysis

This section deals with the within-company analysis of the first Swiss media company. The company is described first, followed by the analysis and interpretation of the primary as well as sub-codes and concluded with company-specific insights.

1.2.1.1 Introduction

In the first company, a person with the job title “Chief Product Owner” was interviewed using a semi-structured interview process. The first company involved one of the five largest Swiss media companies, which had its core business mainly in the areas of news, broadcast media, and radio. This Swiss media company recognised the potential benefits of customer co-creation for the development of new products but had several challenges associated with it. While user-centred practices were used, there was hesitation when it came to involving

customers as a fully active part of the NPD process. This was mainly due to a lack of procedural basics, organisational and financial concerns, as well as operational difficulties.

1.2.1.2 Primary and Subcode Analysis

In this section, the primary codes and the associated subcodes of the first company are analysed and interpreted. A total of 14 primary codes and 32 subcodes were created, representing the primary codes and subcodes of the first company. The codebook for the analysis can be found in Appendix 1.3.3.1 and is based on the approach of Mackieson et al. (2019). The text blocks (TB) of the quotations from the transcribed interviews can be found in the codebook, which is based on the approach of Richards and Hemphill (2018), in Appendix 1.3.2.

1.2.1.2.1 Customer Co-Creation Implementation

This section deals with the interpretation of the analysis for the customer co-creation implementation of the first Swiss media company.

Primary code	Subcode
CHALLENGE_IMPLEMENTATION_CUSTOMER_CO_CREATION	UNCERTAINTY_AND_RESISTANCE
CHALLENGE_IMPLEMENTATION_CUSTOMER_CO_CREATION	INTEGRATION_CHALLENGES
CHALLENGE_IMPLEMENTATION_CUSTOMER_CO_CREATION	RESOURCE_IMPLICATIONS
STRATEGIC_CUSTOMER_INTEGRATION	UNIQUE_SELLING_PROPOSITION
STRATEGIC_CUSTOMER_INTEGRATION	CUSTOMER_FEEDBACK_AND_DATA
STRATEGIC_CUSTOMER_INTEGRATION	USER_CENTRED_APPROACH

The table above shows the two primary codes and the six subcodes used to analyse and interpret customer co-creation implementation.

The narrative of the first company revealed a complex landscape around the implementation of customer co-creation. While highlighting potential benefits, significant and numerous concerns were expressed. Five key patterns were identified that need to be addressed: uncharted territory and procedural gaps, organisational and financial considerations, operational challenges, perceived risks and benefits, and existing practices.

Regarding uncharted territory and procedural gaps, it was stated that the first company lacked a procedural basis for utilising customer co-creation (Interviewee 6, 22.04.2024, TB 78). Accordingly, customer co-creation was a situation where a complete rethink would have been necessary:

“That means it would be a complete change and we would have to think about how we deal with it and how we handle this new situation”
(Interviewee 6, 22.04.2024, TB 75).

The lack of experience and the change required to fully integrate customers into the NPD process led to great uncertainty, for which there was still no concrete solution at the time of the interview (Interviewee 6, 22.04.2024, TB 79, and 81).

With reference to organisational and financial considerations, it was stated that not only procedural difficulties, but also organisational and financial challenges would arise resulting from customer co-creation implementation. Accordingly, the first company would initially have needed to actively decide in favour of customer co-creation before proceeding (Interviewee 6, 22.04.2024, TB 82). Consequently, it could be expected that the customer-centred strategy would not rely on the use of customer co-creation at that point. Another organisational point of concern was the financial compensation of customers participating in the NPD process, with uncertainty surrounding whether these customers would need to be paid (Interviewee 6, 22.04.2024, TB 76).

Regarding the operational challenges, it was made clear that it would have been necessary to clarify at operational level how the customer would be integrated into the existing processes, such as the scrum ceremonies (Interviewee 6, 22.04.2024, TB 77). The time component was also raised as a challenge, highlighting the difficulty that customers were not always available (Interviewee 6, 22.04.2024, TB 81). This suggested that the long-term involvement of the customer in the operational and holistic product development process could have been jeopardised due to the time constraints.

With reference to perceived risks and benefits, in addition to the challenges, potential benefits of implementing customer co-creation were also mentioned. It was explained that the customer co-creation approach could be used to recognise whether a potential business case would be of interest to customers at all (Interviewee 6, 22.04.2024, TB 7). Although it was stated that this was not the current practice, it was considered highly relevant for such business cases to be subject to a control gate, where user insights could determine the viability of implementation (Interviewee 6, 22.04.2024, TB 289).

In relation to existing practices, it was outlined that although the first company had not yet fully engaged with the implementation of customer co-creation, the shift towards user-centric processes had been recognised (Interviewee 6, 22.04.2024, TB 66, and 109). In this context, it was described that the indirect involvement of customers was emphasised by collecting user data, carrying out feedback tests with prototypes, and conducting interviews with the help of user experience research (Interviewee 6, 22.04.2024, TB 66, and 109).

To summarise, the first company revealed a complex interplay of challenges, hesitations, and potential benefits in implementing customer co-creation. Even though this company had not yet fully embraced this approach, the narrative indicated a growing recognition of its value and a progressive shift towards user-centric practices. Overcoming the organisational, financial, operational and procedural challenges, and fostering a culture of experimentation and collaboration, were identified as crucial for the successful integration of customer co-creation into the NPD processes of this company. Finally, the strong internal reluctance towards customer co-creation could hinder the ability to innovate and effectively focus on underlying customer needs.

1.2.1.2.2 Agile Development and Scalability

This section deals with the interpretation of the analysis for the agile development and scalability of the first Swiss media company.

Primary code	Subcode
FEASABILITY_ASSESSMENT	TECHNICAL_FEASIBILITY
FEASABILITY_ASSESSMENT	FINANCIAL_VIABILITY
ADVANTAGE_AGILE	SPEED_AND_FLEXIBILITY
ADVANTAGE_AGILE	TEAM_MORALE_AND_PRODUCTIVITY
ADVANTAGE_AGILE	RISK_MITIGATION
LIMITATION_AGILE	LONG_TERM_PLANNING
LIMITATION_AGILE	ESTIMATION_AND_SCOPING
CHALLENGE_SCALABILITY	RESOURCE_ALLOCATION_AND_OVERSIGHT
CHALLENGE_SCALABILITY	COORDINATION_AND_DEPENDENCY_CHALLENGES
CHALLENGE_SCALABILITY	NEED_FOR_SCALABILITY_AND_ALIGNMENT

The table above shows the four primary codes and the ten subcodes used to analyse and interpret agile development and scalability.

The narrative emphasised that the first company favoured agile process frameworks because, for example, agile process frameworks could accelerate development (Interviewee 6, 22.04.2024, TB 20). However, challenges with agility were also noted, primarily related to

balancing the need for long-term planning and scalability (Interviewee 6, 22.04.2024, TB 22, 37, 242, and 301). Many of these challenges were described as specific to large media companies with complex dependencies (Interviewee 6, 22.04.2024, TB 37).

Overall, three advantages and four specific challenges were identified that went hand in hand with agility:

It was explained that agility brought the advantage of responsiveness and speed, as rapid iteration and development cycles were promoted by agile processes allowing the rapid development of products to be tested on the market (Interviewee 6, 22.04.2024, TB 20). This suggested that agile methods enabled a rapid response to changing market requirements. Furthermore, it was identified that agile processes improved team morale because the team delivered something of value (Interviewee 6, 22.04.2024, TB 21). Another advantage that was mentioned was risk minimisation, which was promoted by agile methods (Interviewee 6, 22.04.2024, TB 295). Therefore, it could be assumed that the iterative nature of agile process frameworks would have helped to recognise and eliminate risks at an early stage.

A first major challenge associated with agility was the difficulty in maintaining long-term planning due to the use of short sprints (Interviewee 6, 22.04.2024, TB 22). This exclusive focus on agile process frameworks within NPD could potentially compromise long-term strategic planning and goals. Additionally, scalability posed a challenge, as coordinating several teams within a large organisation was described as complex and could have resulted in conflicts (Interviewee 6, 22.04.2024, TB 37, 242, and 301). The third challenge involved the allocation of resources, as prioritising projects allocating resources across numerous teams was seen as difficult (Interviewee 6, 22.04.2024, TB 243, 289, and 301). This suggested that relying solely on agile processes in large companies, as was the case in the company of the first company with multiple development teams, required integration with other process models to prevent bottlenecks and inefficiencies. Furthermore, the clear definition of control mechanisms within the NPD process presented the last challenge. Such control mechanisms were deemed necessary for large products or features that required go-or-no-go decisions (Interviewee 6, 22.04.2024, TB 22, and 36).

“To estimate the size of something for a long time requires an approach that scales large new features or large new products and allows a go or no-go decision to be made accordingly” (Interviewee 6, 22.04.2024, TB 6).

This suggested that in the first company, the absence of solid control mechanisms alongside agile procedures resulted in challenges with time planning and project scope management.

To address these challenges, the first company specifically emphasised the need for agile flexibility to be balanced with strategic decision-making. As key elements, it was pointed out that the technical feasibility of a new product had to be assessed before the start of the actual NPD (Interviewee 6, 22.04.2024, TB 146, and 199) and that the initial business case had to have been checked for financial viability (Interviewee 6, 22.04.2024, TB 7, and 125) so that it became clear whether it would be strategically, financially, and technically worthwhile to develop a new product at all. During the actual NPD, the first company was experimenting with new approaches, including splitting large teams into smaller teams to improve scaling in agile development (Interviewee 6, 22.04.2024, TB 242).

In conclusion, the first company revealed a difficulty in balancing agility and scalability in NPD. While agile methods were recognised for their advantages, this company faced challenges related to resource allocation, coordinating multiple teams, and long-term planning. To keep up with the fast-paced market requirements and develop innovative digital products, it will remain crucial for this company to find a balance between agility and strategic focus. Accordingly, it can be interpreted that agile practices alone were not sufficient for complex projects, but that a hybrid approach in NPD would have been important to ensure a clear strategic direction, effective project monitoring, and efficient resource allocation.

1.2.1.2.3 Technological, Organisational, and Industry Related Factors in NPD

This section deals with the interpretation of the analysis for the technological, organisational, and industry related factors in NPD of the first Swiss media company.

Primary code	Subcode
ADVANTAGE_OF_ITERATIVE_DEVELOPMENT	CONTINUOUS_FEEDBACK_LOOP
ADVANTAGE_OF_ITERATIVE_DEVELOPMENT	RAPID_ITERATION
ADVANTAGE_OF_ITERATIVE_DEVELOPMENT	CUSTOMER_CENTRIC_DEVELOPMENT
LIMITATION_OF_ITERATIVE_DEVELOPMENT	REPUTATIONAL_RISK
LIMITATION_OF_ITERATIVE_DEVELOPMENT	TECHNICAL_DEBT
TECHNOLOGICAL_CONSIDERATIONS_IN_NPD	EARLY_INTEGRATION_OF_TECHNOLOGY
TECHNOLOGICAL_CONSIDERATIONS_IN_NPD	TECHNICAL_DECISION-MAKING_AND_SUSTAINABILITY
ORGANISATIONAL_STRUCTURE	DECISION_MAKING_MODEL
ORGANISATIONAL_STRUCTURE	DECISION_MAKING_PROCESS
INDUSTRY_COLLABORATION	PARTNER_CO_CREATION

The table above shows the five primary codes and the ten subcodes used to analyse and interpret technological, organisational, and industry related factors in NPD.

The narrative pointed to a complex interplay of organisational, industry-related, and technological factors for the NPD process. Thereby, the first company struggled with the balance between technical feasibility and rapid iteration, while also navigating organisational structures and potential industry collaborations. Four core areas were identified in this regard: technological considerations, organisational structure, industry collaboration, and lifecycle management and governance.

Regarding technological considerations, the first company focused on involving technical experts in the NPD process at an early stage (Interviewee 6, 22.04.2024, TB 199) to define whether the technology used also made sense for future purposes and was sustainable for use on several digital products (Interviewee 6, 22.04.2024, TB 159, and 218). Even though the technology itself was not necessarily considered a driver for a new product (Interviewee 6, 22.04.2024, TB 160), it was explained that the first company needed to focus even more on integrating technological aspects into the governance process and the NPD process as early as possible, and to work with a model that covered the technical lifecycle over the entire life of the digital product (Interviewee 6, 22.04.2024, TB 157, 158 and 290).

About the organisational structure, it was explained that the first company was moving away from developing completely new digital products such as apps from scratch. Instead, they were choosing a fully iterative approach to shorten the development time (Interviewee 6, 22.04.2024, TB 46). This iterative character and the rapid feedback cycle embedded in it were already integrated in the further development of products, as each further development had to go through a new development release process (Interviewee 6, 22.04.2024, TB 13). However, it was acknowledged that the rapid feedback cycle with customers, for example through prototypes, could be improved in the iterative development approach to strengthen the ideation phase with customers. Nevertheless, this approach fuelled fear of suffering reputational damage (Interviewee 6, 22.04.2024, 50, 51, and 52).

“Personally, I would work much more with rapid approaches such as prototyping or the build-measure-learn cycle. Also to get features live quickly. In our company, however, there is a direct fear of reputational

damage. In principle, however, I think it would be very good” (Interviewee 6, 22.04.2024, TB 50).

In this regard, it was indicated that there were different levels in the organisation at governance and management level and that there was a level in between that focused on delivery (Interviewee 6, 22.04.2024, TB 236). However, the challenges that arose with this were that, firstly, the strategic discussions took place outside of this delivery organisation and the product manager was not necessarily involved (Interviewee 6, 22.04.2024, 239, and 240). Secondly, it also appeared to be complex to integrate developers into the strategic decision-making process (Interviewee 6, 22.04.2024, 217). Consequently, it can be assumed that the organisational cross-functional cooperation in this company did not yet function completely procedurally.

Regarding industry collaboration, a future focus was proposed, which referred to partner co-creation with other Swiss media companies, because the actual competition was located abroad (Interviewee 6, 22.04.2024, TB 318). As already indicated in section 1.7.2, it could be assumed that the competition abroad referred to advertising powers such as Google or Facebook (Meta).

About lifecycle management and governance, it was described that the first company lacked an overarching framework for the NPD process, which would have emphasised two specific aspects more strongly. Firstly, it was mentioned that an overarching framework was needed for the operation of the new digital product and secondly, with an overarching framework, the costs and financing would have been explicitly discussed again (Interviewee 6, 22.04.2024, TB 153, and 301).

In conclusion, the first company around technological, organisational, and industry related factors in NPD revealed various issues within the NPD process that were not, or only to a limited extent, harmonised with each other. For instance, technological aspects needed to be more integrated from the beginning of the NPD project, but this was difficult in the current governance structure as the initial strategic discussions took place outside of the NPD process. There was also no overarching framework in place that revisited the investment at the beginning of the project, focussed on the operation of the new product and outlined the technological lifecycle of the product. As a result, it can be interpreted that a more proactive and integrated overarching framework is needed in the first company to

effectively address operational concerns, financial planning, and technological considerations throughout the NPD lifecycle. Even though the company wanted to work more with an iterative development approach, there was a fear of suffering reputational damage when using the rapid feedback cycle. Finally, it was suggested that partner co-creation between the individual Swiss media companies should be sought to combat the competition abroad.

1.2.1.2.4 Roles and Responsibilities in NPD

This section deals with the interpretation of the analysis for the roles and responsibilities in NPD of the first Swiss media company.

Primary code	Subcode
TEAM_STRUCTURE	CORE_TEAM_STRUCTURE
TEAM_STRUCTURE	TEAM_ROLES_AND_RESPONSIBILITIES
PO_RESPONSIBILITIES	COORDINATION_ACROSS_TEAMS
PO_RESPONSIBILITIES	PRODUCT_OPERATIONAL_RESPONSIBILITY
PM_RESPONSIBILITIES	PROJECT_LEADERSHIP
PM_RESPONSIBILITIES	MIXED_ROLES

The table above shows the three primary codes and the six subcodes used to analyse and interpret roles and responsibilities in NPD.

The narrative of the first company described a complex and evolving landscape of responsibilities and roles within the NPD process. There was a tension between hierarchical, traditional structures and more agile, collaborative practices.

The first company was moving away from individual meta-teams, which had only worked together to a limited extent, towards core teams, which were perceived to have fewer frictions and less loss of communication. However, when assembling a core team, initial consideration was given to whether this was worthwhile. A team exceeding 20 people was deemed too large to be effective for collaboration (Interviewee 6, 22.04.2024, TB 167, 197, 198, and 258). Various functions were involved in these core teams, including design members, technical roles and a product manager. The product manager could be used in a leadership function that coordinated the NPD (Interviewee 6, 22.04.2024, TB 168, and 281).

“As soon as it becomes clear that we are developing a new product, the product manager takes the lead” (Interviewee 6, 22.04.2024, TB 256).

There were also purely agile teams that worked based on scrum, in which there were tech leads who focused more on the IT architecture (Interviewee 6, 22.04.2024, TB 218), developers such as backend developers, and a product owner (Interviewee 6, 22.04.2024, TB 217, and 259). All members of the team shared responsibility for the product at an operational level (Interviewee 6, 22.04.2024, 260). In principle, it was relevant that roles from all organisationally superordinate areas were always integrated for the NPD and therefore other roles such as UX people, marketing managers, and editorial staff were also included in the NPD process (Interviewee 6, 22.04.2024, TB 237). When it came to working with the customer, user experience researchers existed in the first company, who conducted interviews or testing and were integrated throughout the NPD process (Interviewee 6, 22.04.2024, TB 170, and 171). Data analysts were also used when it came to working in a data-oriented manner (Interviewee 6, 22.04.2024, TB 67). Due to the structure of different roles and functions within an NPD process, it could therefore be interpreted that the cross-functional cooperation within the NPD process was highly relevant in this company.

The product manager was defined when it came to taking over the management, staffing, and financial responsibility within an NPD process (Interviewee 6, 22.04.2024, TB 166, 257, and 282). In contrast, the product owner could be deployed for several project activities at the same time as the technical lead of the scrum team and was responsible for the operations and maintenance of the digital product (Interviewee 6, 22.04.2024, TB 259, and 260). However, there was disagreement in the first company as to what the actual role of a product manager and a product owner was, as it was stated that the role of the product manager and the product owner could overlap (Interviewee 6, 22.04.2024, TB 258).

In conclusion, the first company demonstrated various roles and functions within an NPD process, with a desire to move towards core teams. The diverse roles from areas like marketing, editorial, product management, and technical development highlighted the importance of cross-functional collaboration. It was deemed crucial for this company to involve all key departments in the NPD process. However, the greatest ambiguity within the organisation lay in the overlapping roles of product manager and the product owner.

1.2.1.3 Company Specific Insights

In the first company, individual company-specific key insights were found, which are structured in this section analogue to the topics in Appendix 1.2.1.2:

1.2.1.3.1 Customer Co-Creation Implementation

The first company already utilised user-centred process elements, including working with user data and obtaining customer feedback. However, the company showed hesitancy and uncertainty towards the implementation of customer co-creation due to a lack of experience and a concrete organisational, and procedural framework.

1.2.1.3.2 Agile Development and Scalability

The first company sought a balance between agile flexibility and strategic decision-making. A pure agile approach did not seem to be the right fit for their NPD process, but a hybrid one would be.

1.2.1.3.3 Technological, Organisational, and Industry Related Factors in NPD

In the first company, it was crucial that technical experts and the choice of target-oriented technology were integrated into the NPD process right from the start. However, the governance structure made it challenging for the relevant NPD stakeholders, such as the product manager, to be involved in preliminary strategic discussions. The fact that initial strategic discussions took place outside of NPD made it difficult to strategically involve developers with technical expertise from the very beginning. It seemed advantageous for the first company to consider using an overarching framework that showed the entire technical lifecycle and integrated the operating perspective of a digital product. In addition, there is future strategic potential in working together with other Swiss media companies to create an alliance to counter the major advertising powers abroad.

1.2.1.3.4 Roles and Responsibilities in NPD

The first company was shifting its team alignment to core teams for NPD. The first company had recognised that cross-functional collaboration was an important driver of NPD. However, there was difficulty in finding an exact role for the product manager or the product owner, as the tasks could overlap.

1.2.2 Second Within-Company Analysis

This section deals with the within-company analysis of the second company. The company is described first, followed by the analysis and interpretation of the primary as well as sub-codes and concluded with company-specific insights.

1.2.2.1 Introduction

In the second company, a person with the job title “Lead Product Manager” was interviewed using a semi-structured interview process. The second company concerned a Swiss media company, one of the five largest in Switzerland, with its largest business area focused on editorial content. The company had a strong focus on indirect customer involvement in NPD but lacked the ability to directly involve customers and focus on future customer needs.

1.2.2.2 Primary and Subcode Analysis

In this section, the primary codes and the associated subcodes of the second company are analysed and interpreted. A total of 9 primary codes and 23 subcodes were created, representing the primary codes and subcodes of the second company. The codebook for the analysis can be found in Appendix 1.3.3.2 and is based on the approach of Mackieson et al. (2019). The text blocks (TB) of the quotations from the transcribed interviews can be found in the codebook, which is based on the approach of Richards and Hemphill (2018), in Appendix 1.3.2.

1.2.2.2.1 Customer Focus

This section deals with the interpretation of the analysis of the customer focus of the second Swiss media company.

Primary code	Subcode
CUSTOMER_INVOLVEMENT	CUSTOMER_INVOLVEMENT_METHODS
CUSTOMER_INVOLVEMENT	CUSTOMER_INVOLVEMENT_BENEFITS
CUSTOMER_INVOLVEMENT	CUSTOMER_INVOLVEMENT_CHALLENGES_AND_LIMITATIONS
CUSTOMER_INVOLVEMENT	CUSTOMER_INVOLVEMENT_NPD_STAGES

The table above shows the one primary code and the four subcodes used to analyse and interpret the customer focus.

The narrative of the second company revealed a customer-oriented approach throughout the entire NPD process, especially through user feedback and testing. However, the active involvement of customers for a targeted customer co-creation approach presented some hurdles, which is why customer involvement had not yet reached its full potential.

A great importance was placed on indirect customer integration through user research and feedback loops in the second company. The company actively obtained feedback from users with the help of qualitative interviews (Interviewee 7, 03.05.2024, TB 2), beta versions

(Interviewee 7, 03.05.2024, TB 53), user tests (Interviewee 7, 03.05.2024, TB 68) and tests with prototypes (Interviewee 7, 03.05.2024, TB 54, 55, and 211). The aim of this indirect involvement was to integrate three different perspectives. Firstly, to determine if the existing customers understood what had changed in the existing digital product, and secondly, if new customers tested the changed features, allowing for a comparison of feedback between new and existing customers (Interviewee 7, 03.05.2024, TB 56). The third perspective was aimed at live tests in which user feedback was collected to continuously develop the product further (Interviewee 7, 03.05.2024, TB 56). Accordingly, customers or users were integrated throughout the entire NPD process. At the beginning, however, it was mainly about identifying customer needs at an early stage (Interviewee 7, 03.05.2024, TB 2, 69 and 210). In the ideation phase, the focus was on testing initial solution drafts with customers (Interviewee 7, 03.05.2024, TB 68). During the actual development, prototypes were then used to obtain feedback on defined solutions (Interviewee 7, 03.05.2024, TB 211). It was made clear that the indirect involvement of customers in the NPD process was indispensable, but that the direct and active customer co-creation approach would have made more sense due to the high time commitment required for small innovations (Interviewee 7, 03.05.2024, TB 85). Accordingly, it could be interpreted that although the second company worked iteratively, the customer co-creation approach was not used for the active involvement of customers in creating solution variants, for example.

Ultimately, the active customer co-creation approach employed by the second company presented several challenges. Notably, customer opinions proved volatile, requiring the company to exercise independent judgement in determining which product ideas to pursue (Interviewee 7, 03.05.2024, TB 55). Similarly, the value of customer co-creation was sometimes limited, as analyses occasionally provided sufficient insight into customer needs (Interviewee 7, 03.05.2024, TB 213). Finally, a key challenge for future-oriented active customer co-creation was identified: the Swiss media industry lacked understanding of the fundamental requirements young people have for news products (Interviewee 7, 03.05.2024, TB 291). Accordingly, it could be assumed that the media industry was not yet sufficiently engaged in future-oriented change. It continued to rely on established practices, even though this could lead to significant problems in the future. This reliance stemmed from a lack of understanding regarding the needs and requirements of the current young generation.

In conclusion, the second company demonstrated a strong customer focus in NPD by encouraging the indirect involvement of customers throughout the NPD process. However, a lack of balance was observed between indirect and direct customer involvement (such as through workshops). Additionally, this company was not proactively addressing the needs of the upcoming young generation. Accordingly, it appeared that the second Swiss media company was hesitant to fully embrace customer co-creation. This hesitancy, within a rapidly changing media landscape and evolving youth needs, suggested a missed opportunity. The company could have leveraged the full potential of customer co-creation and innovation to develop future-oriented digital products and integrate them into their product development strategy.

1.2.2.2.2 Governance and Strategic Alignment

This section deals with the interpretation of the analysis of the governance and strategic alignment of the second Swiss media company.

Primary code	Subcode
PRODUCT_DEVELOPMENT_GOVERNANCE	STEERING_BOARD
PRODUCT_DEVELOPMENT_GOVERNANCE	DECISION_MAKING_PROCESSES
PROCESS_MODEL_ALIGNMENT	PROCESS_MODEL_STANDARDISATION_DESIRE
PROCESS_MODEL_ALIGNMENT	PROCESS_MODEL_DISPARITY

The table above shows the two primary codes and the four subcodes used to analyse and interpret the governance and strategic alignment.

The narrative of the second company revealed a complex governance structure and a lack of standardised processes for NPD. Three areas were highlighted: the hierarchical governance, the issue around build or buy decisions, and the problem for standardised, corporate processes.

With reference to hierarchical governance, it was explained that the second company worked with a hierarchical management structure in which the agile teams reported to a steering committee consisting of the “Chief Technology Officer”, the “Editor-in-Chief”, and the “Chief Commercial Officer” (Interviewee 7, 03.05.2024, TB 284), who made the final decisions (Interviewee 7, 03.05.2024, TB 283). Only when large budget requests arose, was this proposal passed on to the executive board (Interviewee 7, 03.05.2024, TB 284). To prevent a purely top-down structure, the product managers in this company had the option of challenging rejected proposals through the steering committee if they believed that the

proposals were relevant to their users (interviewee 7, 03.05.2024, TB 283). Accordingly, it could be interpreted from these processes that the second company was trying to mitigate the hierarchical barriers.

Regarding the issues around build or buy decisions, the second company was repeatedly faced with the problem of whether, from a technical perspective, a system should be bought externally or developed internally. External solutions were usually considered if they were established systems on the market that would have been far too costly to develop internally (Interviewee 7, 03.05.2024, TB 147).

The media second company lacked an overarching process model for NPD (Interviewee 7, 03.05.2024, TB 297). While such a model was seen as potentially beneficial (Interviewee 7, 03.05.2024, TB 128) for reducing uncertainties in planning and implementation (Interviewee 7, 03.05.2024, TB 297) doubts were raised about its feasibility (Interviewee 7, 03.05.2024, TB 127) due to differing working principles between product management and the strategy department (Interviewee 7, 03.05.2024, TB 292).

“Our strategy department works according to a model that is based on business logic, as is the case in Application Lifecycle Management. Product development, on the other hand, works more according to processes, as is the case in the artefacts below Application Lifecycle Management in the empirical artefact” (Interviewee 7, 03.05.2024, TB 126).

Although the second company utilised control gates, such as customer feedback for quality checks (Interviewee 7, 03.05.2024, TB 38), a holistic approach for integrating these gates within a comprehensive process model was not evident.

In conclusion, the second company attempted to work with a bottom-up structure in the NPD process, even though the NPD process was hierarchically led. Consequently, this showed limitations for a truly innovative and agile environment. Whilst control gates were used and customer feedback was gathered, the holistic framework for integrating these elements into an overarching framework was missing. From this, it could be interpreted that the second company risked inefficiency in its NPD process and faced potential difficulties in effectively scaling innovation efforts.

1.2.2.2.3 Development Perspectives in NPD

This section deals with the interpretation of the analysis of the development perspectives in NPD of the second Swiss media company.

Primary code	Subcode
AGILE_METHODS	HYBRID_DEVELOPMENT_APPROACH
AGILE_METHODS	ADVANTAGE_AGILE_MODELS
AGILE_METHODS	DISADVANTAGE_AGILE_MODELS
USER_CENTRIC_NPD	USER_CENTRIC_NPD_NEEDS_AND_DESIGN
USER_CENTRIC_NPD	USER_CENTRIC_NPD_PROCESS_AND_IMPLEMENTATION
CONTENT_CENTRIC_DEVELOPMENT	CONTENT_AS_CORE
MEDIA_INDUSTRY_TRANSFORMATION_AND_ADAPTATION	SHIFTING_POWER_DYNAMICS_AND_AUDIENCE_EXPECTATIONS

The table above shows the four primary codes and the seven subcodes used to analyse and interpret the development perspectives in NPD.

The narrative of the second company revealed a complex landscape of the company's approach to NPD. It highlighted the transition to agile methods and user-centric processes as well as the challenges regarding organisational culture and thinking in outdated patterns.

The second company was moving towards the active use of the agile process framework "scrum" (Interviewee 7, 03.05.2024, TB 247), because this allowed more flexibility for sprint planning and scrum enables operational agility (Interviewee 7, 03.05.2024, TB 23, and 200). In addition, a hybrid system was also used, which combined a waterfall-driven approach for business case approval with agile approaches during the actual NPD process itself (Interviewee 7, 03.05.2024, TB 15).

Great importance was also attached to user-centred designs during the NPD process (Interviewee 7, 03.05.2024, TB 53, and 112).

"I think that you basically have to have user-centred process principles in the new product development process" (Interviewee 7, 03.05.2024, TB 111).

This was because customer needs formed the crucial foundation for NPD. Without this focus, the second company would have been operating solely on assumptions, typically based on intuition rather than concrete evidence (Interviewee 7, 03.05.2024, TB 210). However, implementing a user-centric process presented challenges. Many Swiss media companies, and their IT departments in particular, had not yet embraced a customer-centric approach

(Interviewee 7, 03.05.2024, TB 306). Another problem was the traditional way of thinking in some media companies. It was described that media companies were extremely focused on content when creating software products (Interviewee 7, 03.05.2024, TB 127), but readers could obtain information from anywhere and from many sources (Interviewee 7, 03.05.2024, TB 304). This meant that users were demanding a unique selling proposition (USP) in terms of content. Consequently, future product co-design would necessitate the integration of customers (Interviewee 7, 03.05.2024, TB 304).

In conclusion, while the second Swiss media company recognised the importance of hybrid NPD processes and user-centred design, it faced significant challenges. These included the media industry's lack of a customer-centric mindset and a traditional focus on content rather than user experience. Consequently, the NPD process appeared to lack a cohesive approach that integrated hybrid development with customer-centred practices. This likely resulted in inefficiencies and uncertainties related to decision-making, iteration points, and customer involvement throughout the NPD process.

1.2.2.2.4 Cross-functional Teams and Roles

This section deals with the interpretation of the analysis of the cross-functional teams and roles of the second Swiss media company.

Primary code	Subcode
CROSS_FUNCTIONAL_TEAM_STRUCTURE_DYNAMIC S_EVOLUTION	EVOLVING_ROLE_OF_IT
CROSS_FUNCTIONAL_TEAM_STRUCTURE_DYNAMIC S_EVOLUTION	TECHNICAL_ROLES_AND_EXPERTISE
CROSS_FUNCTIONAL_TEAM_STRUCTURE_DYNAMIC S_EVOLUTION	CROSS_FUNCTIONAL_TEAM_DYNAMICS
CROSS_FUNCTIONAL_TEAM_STRUCTURE_DYNAMIC S_EVOLUTION	CROSS_FUNCTIONAL_TEAM_ROLES
PRODMAN_PRODOWN_PROJMAN_ROLES	ROLE_MERGING_AND_ELIMINATION
PRODMAN_PRODOWN_PROJMAN_ROLES	NEW_PRODUCT_MANAGEMENT_HIERARCHY
PRODMAN_PRODOWN_PROJMAN_ROLES	ROLE_DEFINITIONS_AND_RESPONSIBILITIES
MEDIA_INDUSTRY_TRANSFORMATION_AND_ADAPT ATION	INTERNAL_CULTURAL_TRANSFORMATION_AND_AGI LE_ADOPTION

The table above shows the three primary codes and the eight subcodes used to analyse and interpret the cross-functional teams and roles.

The narrative of the second company revealed a dynamic landscape of cross-functional roles and teams. The key findings were as follows:

It was described that roles including a UX manager, a product manager, and IT engineers were needed for the core of the team (Interviewee 7, 03.05.2024, TB 172, and 177). When it came to developing a journalistic product, an editor was also needed who was responsible for the content (Interviewee 7, 03.05.2024, TB 180). Other roles in a cross-functional team, but not necessarily part of the core team, included UX researchers, and people with extensive data expertise (Interviewee 7, 03.05.2024, TB 178), as well as people from marketing when launching a new product on the market to set up and manage campaigns (Interviewee 7, 03.05.2024, TB 181). In this context, UX researchers were responsible for basic research, meaning they interacted with customers while those people from the data area defined the key performance indicators (KPIs) (Interviewee 7, 03.05.2024, TB 178). It was highlighted that cross-functional teams were crucial for effective customer collaboration. However, it was also noted that this collaboration could pose challenges for these teams. Thereby, significant resources were required at the outset of an NPD process for comprehensive need-finding (Interviewee 7, 03.05.2024, TB 212). Additionally, it was noted that cross-functional teams typically had two leaders, one for the technical and one for business aspects (Interview 2, 03.05.2024, TB 261).

Furthermore, it was revealed in the second company that the IT department was changing from an operational role to a co-creating role in product development (Interviewee 7, 03.05.2024, TB 161, and 220). This shift was attributed to the changing business model of media companies, in which the technical level was becoming increasingly relevant (Interviewee 7, 03.05.2024, TB 221).

“Technology is a central aspect of our business, because journalism would no longer exist without technology” (Interviewee 7, 03.05.2024, TB 162).

It was also made clear that specific technical roles, such as that of an IT architect, are becoming increasingly important (Interviewee 7, 03.05.2024, TB 219), and that technology teams needed to be more empowered in the future (Interviewee 7, 03.05.2024, TB 305).

It was further explained that product managers, product owners, and project managers existed in the second company (Interviewee 7, 03.05.2024, TB 265). However, project managers were not used for NPD purposes but were only involved in strategic projects related to executive management, such as the remodelling of a

building (Interviewee 7, 03.05.2024, TB 267). Regarding the roles of product manager and product owner, it was emphasised that these two roles should be merged (Interviewee 7, 03.05.2024, TB 266), as the only real difference between them was that the product owner's role was closer in proximity to the developers (Interviewee 7, 03.05.2024, TB 263) and that the product owner was generally responsible for the technical realisation of the product (Interviewee 7, 03.05.2024, TB 265). The product manager, on the other hand, took on the role of project manager (Interviewee 7, 03.05.2024, TB 267) and focused on the business perspective (Interviewee 7, 03.05.2024, TB 263). However, a new hierarchical structure was needed to realise this merger (Interviewee 7, 03.05.2024, TB 245) so that there would be only product managers, who would develop a new product together (Interviewee 7, 03.05.2024, TB 246).

“When merging the role of a product manager and product owner and not having a project manager for digital products, in my opinion, a new hierarchically structure is needed” (Interviewee 7, 03.05.2024, TB 245).

In such a proposed new hierarchical structure, there would be a “Head of Product Management” responsible for the overall product strategy, a lead product manager overseeing an entire product area, and a product manager at operational level managing a specific section within that product area (Interviewee 7, 03.05.2024, TB 245).

Finally, the second company offered valuable insights into the future of the Swiss media industry, emphasising the importance of cross-functional teams. They suggested experimenting with “subcultures” – small, cross-functional teams that pilot new methods, such as user-centred processes. Successful practices from these subcultures could then be adopted across the company (Interviewee 7, 03.05.2024, TB 296). Likewise, the second company highlighted the need for editorial teams to shift their focus from outputs to outcomes and to embrace a customer-centric mindset (Interviewee 7, 03.05.2024, TB 305). Lastly, the relevance of using models that promote agility and provide guidance on forming effective cross-functional teams, was also emphasised (Interviewee 7, 03.05.2024, TB 314).

In conclusion, the second Swiss media company showed a dynamic shift in the composition of cross-functional roles and teams in the NPD process. It was found that there were unclear

boundaries between the product owner and the product manager, and that the IT department was in a new co-creating role, which had the potential to lead to inefficiency and confusion. Establishing true agility and the structured composition of cross-functional teams was interpreted with difficulty because hierarchical management structures were in place and a holistic model showing the agility and composition of cross-functional teams was not available.

1.2.2.3 Company Specific Insights

In the second company, individual company-specific key insights were found, which are structured in this section analogue to the topics in Appendix 1.2.2.2:

1.2.2.3.1 Customer Focus

The second media company primarily focused on indirect customer involvement. However, this approach was not balanced with sufficient direct and active engagement with customers. Furthermore, the company lacked foresight in proactively addressing future user needs. This over-reliance on indirect feedback may have limited its ability to fully understand and respond to evolving customer expectations.

1.2.2.3.2 Governance and Strategic Alignment

Even though the second Swiss media company was bound to a hierarchical structure, it still tried to take a bottom-up approach. Nevertheless, there was a lack of standardised NPD processes, which complicated the overall efforts within an NPD process.

1.2.2.3.3 Development Perspectives in NPD

Agile and user-centric practices were central to the second company, but the full implementation of both practices was blocked by outdated thinking and organisational barriers.

1.2.2.3.4 Cross-functional Teams and Roles

The second company was undergoing a dynamic shift in how it structured its cross-functional teams. IT roles were evolving from purely operational involvement to become co-creators in the NPD process. However, the company was still seeking an optimal model for the future

composition of these teams and recognised a potential for merging the roles of product owner and product manager.

1.2.3 Third Within-Company Analysis

This section deals with the within-company analysis of the third company. The company is described first, followed by the analysis and interpretation of the primary as well as subcodes and concluded with company-specific insights.

1.2.3.1 Introduction

In the third company, a person with the job title “Chief Product Officer” was interviewed using a semi-structured interview process. The third company concerned a Swiss media company, one of the five largest in Switzerland, with its largest business area focused on publishing. The third company recognised the importance of customer feedback, but the involvement of customers appeared to be limited, restricting the full potential for innovative and customer co-created development.

1.2.3.2 Primary and Subcode Analysis

In this section, the primary codes and the associated subcodes of the third company are analysed and interpreted. A total of 6 primary codes and 16 subcodes were created, representing the primary codes and subcodes of the third company. The codebook for the analysis can be found in Appendix 1.3.3.3 and is based on the approach of Mackieson et al. (2019). The text blocks (TB) of the quotations from the transcribed interviews can be found in the codebook, which is based on the approach of Richards and Hemphill (2018), in Appendix 1.3.2.

1.2.3.2.1 Customer-Centric Focus

This section deals with the interpretation of the analysis of the customer-centric focus of the third Swiss media company.

Primary code	Subcode
USER_FEEDBACK_AND_TESTING	USER_NEEDS_AND_EXPECTATIONS
USER_FEEDBACK_AND_TESTING	TESTING_METHODS
USER_FEEDBACK_AND_TESTING	FEEDBACK_COLLECTION_AND_INTERPRETATION
CUSTOMER_INVOLVEMENT_IN_NPD	CUSTOMER_INVOLVEMENT_METHODS
CUSTOMER_INVOLVEMENT_IN_NPD	CUSTOMER_INVOLVEMENT_NPD_STAGES
CUSTOMER_INVOLVEMENT_IN_NPD	CUSTOMER_INVOLVEMENT_BENEFITS_AND_CHALLENGES

The table above shows the two primary codes and the six subcodes used to analyse and interpret the customer-centric focus.

The narrative of the third Swiss media company showed a customer-centric approach in which testing, and user feedback were involved throughout the NPD process. The third company actively sought insights through various methods, including user testing, app reviews, beta releases and direct customer interactions, which indicated a first approach to the application of customer co-creation.

The third company recognised that beta testing was relevant to identify real problems that otherwise could not be identified in controlled environments (Interviewee 8, 03.05.2024, TB 59). Beta rounds were also considered important to test a most viable product (MVP) before going live so that bugs could be minimised (Interviewee 8, 03.05.2024, TB 117). For beta versions, however, not only customers but also family and friends were included as test users. This was since many employees of the third company were often also users of the company products themselves and used these products privately (Interviewee 8, 03.05.2024, TB 59).

Furthermore, the handling of app reviews was also explained. It emerged as relevant that app reviews of users were rarely positive, but that in most cases this negative feedback related to minor things such as the colour being changed. Accordingly, it was mentioned that if nothing was heard from most users, this implied that everything was fine on the new app (Interviewee 8, 03.05.2024, TB 60). For specific user tests, however, other methods were used, including non-technical prototypes, surveys and UX testing (Interviewee 8, 03.05.2024, TB 70).

Technical prototypes were also used in the third company for the proof of concept (PoV). Even though developers who subsequently implemented a technical prototype could confirm that the technical prototype itself worked, it was acknowledged that technical prototypes had faced a fundamental challenge in the past, namely that it did not show the complete technical solution. Rather, shortcuts were designed which could not then be used as the final technical solution (Interviewee 8, 03.05.2024, TB 148). However, this was not seen as problematic, as a technical prototype should help to verify the technical basis so that the technical details could then be addressed (Interviewee 8, 03.05.2024, TB 57).

The third Swiss media company actively sought customer input by actively listening to customers to understand why customers do things (Interviewee 8, 03.05.2024, TB 87). This illustrated a user-centred design approach within their NPD process (Interviewee 8, 03.05.2024, TB 114). A key factor was having someone on the NPD team skilled in interpreting customer feedback (Interviewee 8, 03.05.2024, TB 299). Nevertheless, it was emphasised that customers, while valuable for identifying needs and problems, are not product managers. They could articulate their challenges but not necessarily propose concrete solutions or build products themselves (Interviewee 8, 03.05.2024, TB 89).

“You always need this level of abstraction, which means that even though the customer group says something, it doesn’t mean you have to do it that way” (Interviewee 8, 03.05.2024, TB 90).

Furthermore, the third company pursued the customer co-creation approach by directly involving customers in workshops (Interviewee 8, 03.05.2024, TB 87) four times a year (Interviewee 8, 03.05.2024, TB 88). It was considered relevant that customers had to be involved throughout the entire NPD process (Interviewee 8, 03.05.2024, TB 115) without negatively impacting cross-functional teams (Interviewee 8, 03.05.2024, TB 214). However, this involvement could vary depending on the NPD process phase. For example, it was made clear that it was relevant at the beginning of the NPD process to identify the customer problems (Interviewee 8, 03.05.2024, TB 71) and that in the conceptualisation phase, the hypotheses that arose from the customer problems would be confirmed by customers (Interviewee 8, 03.05.2024, TB 116). However, it was ultimately emphasised that the customer co-creation approach required a clear understanding of achievable outcomes (Interviewee 8, 03.05.2024, TB 91). This was particularly important because diverse users with varying use cases were involved in content-related discussions. Consequently, the media company had to determine the most beneficial content strategy independently (Interviewee 8, 03.05.2024, TB 114).

It can be concluded that although the third company recognised the importance of customer feedback, actively sought customer input, and involved them in workshops, the interpretation of “customer co-creation” could be considered as limited. The statement that “customers are not product managers” and should only express problems, not solutions,

indicates a reluctance to fully utilise the potential of collaborative new product development. Despite acknowledging that customer feedback needed to be interpreted, the final decision-making power appeared to lie with the company itself, which possibly undermined the true spirit of customer co-creation. Overall, the approach of the third company in terms of user research and customer involvement in NPD appeared to be valuable but limited to some extent, possibly restricting the potential for innovative and customer co-created development.

1.2.3.2.2 Agile Development and Collaboration

This section deals with the interpretation of the analysis of the agile development and collaboration of the third Swiss media company.

Primary code	Subcode
AGILE_METHODS_IMPLEMENTATION_AND_CHALLENGES	AGILE_MINDSET_AND_FLEXIBILITY
AGILE_METHODS_IMPLEMENTATION_AND_CHALLENGES	AGILE_IMPLEMENTATION_CHALLENGES
CROSS_FUNCTIONAL_TEAMS	CROSS_FUNCTIONAL_TEAMS_ADVANTAGES
CROSS_FUNCTIONAL_TEAMS	CROSS_FUNCTIONAL_TEAMS_CHALLENGES
TEAM_STRUCTURE_IN_NPD	PM_PO_ROLES_AND_RESPONSIBILITIES
TEAM_STRUCTURE_IN_NPD	TECHNICAL_ROLES_AND_EXPERTISE
TEAM_STRUCTURE_IN_NPD	PROJECT_MANAGEMENT_ROLES_AND_RESPONSIBILITIES

The table above shows the three primary codes and the seven subcodes used to analyse and interpret the agile development and collaboration.

The narrative of the third company showed a great desire for flexibility and agility as well as the advantages of cross-functional teams in the development process. However, limitations and challenges were identified with the implementation of pure agile methodologies. In addition, the collaborative approach was illustrated, in which agile principles were combined with traditional project management and the different activities of product managers, product owners, project managers, and technical employees were examined.

In the third company, it was explained that it was considered important to work with agile processes that allowed a short decision-making period and could therefore act as flexibly as possible (Interviewee 8, 03.05.2024, TB 28). It was also emphasised that the iterative nature of the development process was elementary (Interviewee 8, 03.05.2024, TB 47). However, concerns were raised about rigidly adhering to requirements as initially defined. It was

argued that this approach was problematic because true innovation often lay in the nuanced details, requiring flexibility and adaptation beyond the initial specifications (Interviewee 8, 03.05.2024, TB 26).

In addition, agile process frameworks, specifically including scrum, were seen as central (Interview 3, 03.05.2024, TB 24). In practice, however, the use of scrum also faced criticism. Scrum teams were perceived as being ill-suited for incorporating testing effectively. This was because testing could disrupt the team's flexibility, particularly when the backlog was already filled with other development tasks (Interviewee 8, 03.05.2024, TB 27). It was also noted that, in practice, the company deviated from the theoretical scrum framework. Instead of the scrum master, the product manager often addressed impediments, while the scrum master assumed a more organisational role (Interviewee 8, 03.05.2024, TB 24).

In addition, the scaled agile framework (SAFe) was also criticised:

“I am not an extreme fan of agile methods such as SAFe. SAFe is great in theory, but in practice it takes away the spirit that you actually wanted ...”
(Interviewee 8, 03.05.2024, TB 28).

As such, it was mentioned that SAFe could only be used if the company allowed the rigidity of SAFe and this could work for app development, for example (Interviewee 8, 03.05.2024, TB 28).

It was further explained in the third company that it was very relevant to provide multi-functional roles in a team (Interviewee 8, 03.05.2024, TB 315). This approach provided teams with the autonomy to advance their own agendas and pursue their goals effectively (Interviewee 8, 03.05.2024, TB 183). It was pointed out that in an agile working environment, for example for a new function on the website, it made sense to work in cross-functional teams (Interviewee 8, 03.05.2024, TB 186) to be innovative, fast and disruptive (Interviewee 8, 03.05.2024, TB 185). Nevertheless, it was stated that working in cross-functional teams was also challenging when it came to delivering on a deadline (Interviewee 8, 03.05.2024, TB 204) and telling a team colleague within the cross-functional team that her or his performance was inadequate, due to the close relationship between them (Interviewee 8, 03.05.2024, TB 184).

Furthermore, the third company did not formally distinguish between the titles “product owner” and “product manager” (Interviewee 8, 03.05.2024, TB 270), but rather the employees assigned the titles to themselves (Interviewee 8, 03.05.2024, TB 272). This was because it was considered useless if the product manager only took over the thinking in his role and the product owner had to implement what the product manager had thought (Interviewee 8, 03.05.2024, TB 271). Nevertheless, the product manager was given the responsibility of describing the “what” and “why” of product development, focussing on the needs of the users and defining the product strategy (Interviewee 8, 03.05.2024, TB 25). The product managers in the third company also worked closely with the designers and developers because compromises and negotiation of individual details often had to be made during implementation (Interviewee 8, 03.05.2024, TB 202). However, it was considered crucial that the product managers or product owners were not responsible for the technical solutions because this was not their area of expertise (Interviewee 8, 03.05.2024, TB 308). The technical area of expertise required technical partners who recognised the risks (Interviewee 8, 03.05.2024, TB 225). However, the third company faced a significant challenge in finding suitable candidates with the required technical expertise (Interviewee 8, 03.05.2024, TB 155), especially if roles such as staff engineers or tech leads were needed, which would ultimately have combined management and tech expertise (Interviewee 8, 03.05.2024, TB 302). Furthermore, the ability of the tech team to present multiple solution variants was deemed crucial. This allowed for the selection and implementation of the variant that addressed the most critical requirements, potentially achieving a faster outcome than pursuing a solution that attempted to fulfil all requirements (Interviewee 8, 03.05.2024, TB 225). Accordingly, the third company considered itself insufficiently aligned when it came to technology and considered that the path for senior tech positions needed to be reconsidered (Interviewee 8, 03.05.2024, TB 302).

While the company had previously utilised tech leads instead of system architects (Interviewee 8, 03.05.2024, TB 223) due to concerns about potential isolation and limited technical breadth (Interviewee 8, 03.05.2024, TB 227), they were now reconsidering this approach. They acknowledged the potential value a system architect could bring, despite past experiences:

“One of the main problems I see is that people think far too quickly in terms of solutions and not what problem we actually want to solve. It would be the job of a solution architect to find the right technical solution” (Interviewee 8, 03.05.2024, TB 226).

However, it was emphasised that when engaging a system architect, their responsibilities should encompass the entire system or product. This would prevent unintended dependencies, and workload increases for other tech teams (Interviewee 8, 03.05.2024, TB 316). Furthermore, the use of DevOps teams had been limited, primarily focused on IT infrastructure (Interviewee 8, 03.05.2024, TB 205, 228).

In addition, the third company focussed on the project manager. The project manager was responsible for managing risks, especially for business-critical products, or escalating them to a higher hierarchical function (Interviewee 8, 03.05.2024, TB 185, 186, and 248), adhering to timelines, coordinating, and holding team members accountable (Interviewee 8, 03.05.2024, TB 156, 182, 184 and 273).

In conclusion, the third company revealed a Swiss media company striving for agility and cross-functional collaboration within its NPD process but encountering challenges in effectively implementing agile methodologies. While appreciating the adaptability and iterative nature of agility, the company recognised the limitations of rigid adherence to initial requirements and the need for flexibility in fostering true innovation. The practical implementation of scrum was associated with difficulties, with concerns being raised about its suitability for testing and deviations from the design-oriented framework. The company's experience with SAFe highlighted the need to critically evaluate and adapt agile frameworks to avoid excessive rigidity. Despite the emphasis on multifunctional roles to promote team autonomy, challenges remained in acquiring the necessary technical expertise, particularly for leadership positions. Ultimately, the third company illustrated the complexity of integrating agile methods in practice and emphasised the need for continuous learning and adaptation to navigate the evolving landscape of product development in the media industry.

1.2.3.2.3 Product Development Process and Approaches

This section deals with the interpretation of the analysis of the product development process and approaches of the third Swiss media company.

Primary code	Subcode
PRODUCT_DEVELOPMENT_PROCESS_AND_APPROACHES	PROJECT_MANAGEMENT_AND_GOVERNANCE
PRODUCT_DEVELOPMENT_PROCESS_AND_APPROACHES	NPD_IDEOLOGIES
PRODUCT_DEVELOPMENT_PROCESS_AND_APPROACHES	DATA_DRIVEN_DECISION_MAKING_AND_STAKEHOLDER_MANAGEMENT

The table above shows one primary code and the three subcodes used to analyse and interpret the product development process and approaches.

The third company's approach to NPD showcased a blend of structured processes and adaptive strategies. It emphasised a selective approach to formal project management and demonstrating that business cases or MVPs were not always necessary. The company underscored the importance of data-driven decision-making and cautioned against re-evaluating a project's target solution mid-stream. It also stressed the need to critically assess input from stakeholders external to the NPD project.

The third company only worked with formal project management when very large new products based on a new technology were developed and three key criteria were met (Interviewee 8, 03.05.2024, TB 129, and 130). Firstly, it was essential that the undertaking be a genuinely new product, not merely an incremental development of an existing one (Interviewee 8, 03.05.2024, TB 249). Secondly, if there were major dependencies on other teams in the development process (Interviewee 8, 03.05.2024, TB 131). Thirdly, whether many new users will be using the new product (Interviewee 8, 03.05.2024, TB 132).

Furthermore, the third company worked with flexible approaches to NPD, whereby it was identified that business cases and working with a most viable product (MVP) were not always needed. Specifically, a business case was not needed if matters other than the purely financial aspects were relevant, which could not be quantified easily (Interviewee 8, 03.05.2024, TB 11). An MVP was considered necessary only for non-business-critical functions. For functions deemed essential to the business, an MVP was considered

insufficient, and a complete solution was required from the outset (Interviewee 8, 03.05.2024, TB 9, and 10).

The third company recognised that working with checkpoints during an NPD process was important (Interviewee 8, 03.05.2024, TB 39). This company operated with a steering committee that approved decisions at the outset of new projects. Following this initial approval, the committee maintained a supporting role throughout the project lifecycle (Interviewee 8, 03.05.2024, TB 286). It was explained that the hierarchical structure of Swiss media companies could play a major role in decision-making authority (Interviewee 8, 03.05.2024, TB 252). Therefore, escalations that occurred during the NPD process had to be addressed at a higher management level. This also includes the fact that the editorial teams are given a high priority (Interviewee 8, 03.05.2024, TB 248). In this respect, the editorial team, but also the entire third media organisation, was data-oriented (Interviewee 8, 03.05.2024, TB 16). The editorial team relied on data to ensure accurate interpretation of their articles (Interviewee 8, 03.05.2024, TB 253). However, it was acknowledged that data could not always illuminate every possible solution. Consequently, the media company sometimes had to make decisions based on other factors, without relying solely on data-driven insights (Interviewee 8, 03.05.2024, TB 16).

Finally, the third company emphasised the critical importance of maintaining a clear direction throughout the NPD process. This would prevent costly and time-consuming reassessments mid-project (Interviewee 8, 03.05.2024, TB 8, 298, and 300). It was also noted that stakeholders external to the NPD process were rarely involved in projects. Consequently, they often lacked an understanding of the complexities involved in translating an initial idea into a fully developed solution (Interviewee 8, 03.05.2024, TB 249, and 250).

“And many people who have never been involved in the conception phase and are then suddenly actively involved in it get a completely different picture of new product development and only then realise that a lot happens in the conception phase” (Interviewee 8, 03.05.2024, TB 17).

These external stakeholders also lacked understanding of the complexities of functional roles outside of technical areas (Interviewee 8, 03.05.2024, TB 251). It was thus crucial to go

beyond simply fulfilling the requests of these external stakeholders (Interviewee 8, 03.05.2024, TB 249).

In conclusion, the third company took a pragmatic but potentially restrictive approach to NPD. While it used selectively structured processes and valued data-driven decision-making, the emphasis on adhering to a fixed project schedule and limited use of MVPs could impair agility and responsiveness. Balancing these tendencies with more flexibility could foster innovation and contribute to more success in the dynamic media landscape.

1.2.3.3 Company Specific Insights

In the third company, individual company-specific key insights were found, which are structured in this section analogue to the topics in Appendix 1.2.3.2:

1.2.3.3.1 Customer-Centric Focus

The third company relied strongly on customer-centred approaches. This included beta testing to obtain more concrete problems than in controlled test environments. However, because beta testing was conducted with friends and family members, it could limit the identification of real customer issues. In addition, the interpretation of customer co-creation appeared to be rather restrictive, which could hinder the deep potential of customer co-creation.

1.2.3.3.2 Agile Development and Collaboration

Company three was a Swiss media company that relied heavily on agile practices. However, there was a discrepancy between the practical and theoretical application of agile process frameworks. Although cross-functional teams were considered relevant, problems were identified in meeting deadlines and providing constructive feedback. It was also mentioned that finding and maintaining technical expertise was difficult and that the roles of product owner and product manager overlapped, reinforcing the organisational challenges.

1.2.3.3.3 Product Development Process and Approaches

The third company showed a Swiss media company that used formal project management strategically for large-scale, technology-driven new products, while remaining flexible in other areas through the selective use of business cases and MVPs. This approach, combined with a strong emphasis on data-driven decision making and clear project alignment, aimed

to balance structure and adaptability within their NPD process. However, this approach may also have limitations in terms of responsiveness to new information.

1.2.4 Fourth Within-Company Analysis

This section deals with the within-company analysis of the fourth company. The company is described first, followed by the analysis and interpretation of the primary as well as sub-codes and concluded with company-specific insights.

1.2.4.1 Introduction

In the fourth company, a person with the job title “Chief Product Officer” was interviewed using a semi-structured interview process. The fourth company concerned a Swiss media company, one of the five largest in Switzerland, with its largest business area focused on publishing, digital media, marketing and advertising as well as technology and service solutions. The fourth company has recognised the importance of customer orientation but is struggling to implement a truly user-centric approach in its NPD process.

1.2.4.2 Primary and Subcode Analysis

In this section, the primary codes and the associated subcodes of the fourth company are analysed and interpreted. A total of 6 primary codes and 15 subcodes were created, representing the primary codes and subcodes of the fourth company. The codebook for the analysis can be found in Appendix 1.3.3.4 and is based on the approach of Mackieson et al. (2019). The text blocks (TB) of the quotations from the transcribed interviews can be found in the codebook, which is based on the approach of Richards and Hemphill (2018), in Appendix 1.3.2.

1.2.4.2.1 Process-Oriented Factors

This section deals with the interpretation of the analysis of the process-oriented factors of the fourth company.

Primary code	Subcode
AGILE_METHODS_IMPLEMENTATION_AND_CHALLENGES	SCRUM_ADOPTION_GAP
AGILE_METHODS_IMPLEMENTATION_AND_CHALLENGES	RIGID_PLANNING_VS_AGILITY
CUSTOMER_CENTRIC_NPD_APPROACH	CUSTOMER_VALIDATION_NEED_IDENTIFICATION
CUSTOMER_CENTRIC_NPD_APPROACH	CHALLENGES_AND_ADAPTABILITY_USER_CENTRIC_APPROACHES

RISK_AND_UNCERTAINTY_MANAGEMENT_IN_NPD	EARLY_STAGE_RISK_ASSESSMENT_AND_VALIDATION
RISK_AND_UNCERTAINTY_MANAGEMENT_IN_NPD	ADAPTING_PROCESS_TO_MITIGATE_RISKS
RISK_AND_UNCERTAINTY_MANAGEMENT_IN_NPD	MANAGING_TECHNICAL_UNCERTAINTY
ORGANISATIONAL_STRUCTURE_AND_GOVERNANCE_IN_NPD	PROCESS_MODELS_AND_LIFECYCLE_MANAGEMENT

The table above shows the four primary codes and the eight subcodes used to analyse and interpret the process-oriented factors.

The fourth media company's narrative highlighted the real-world challenges of implementing agile principles, revealing potential areas for improvement in customer orientation and process standardisation. It also illustrated their unexplored approach to customer co-creation and detailed the roles of business cases, assumptions, technologies, and prototypes within their NPD process. Additionally, the media company explained the importance of adopting an overarching lifecycle model at both portfolio and product levels.

The fourth company explained that at the beginning of an NPD, the focus was on what customers wanted (Interviewee 9, 10.05.2024, TB 3). During the development phase in NPD, however, the company explained that it had problems establishing customer feedback using the scrum technique. This was because despite typical scrum ceremonies such as sprint planning or sprint reviews being used, the actual goal of scrum, which is to define and validate hypotheses and then quickly adapt them using customer feedback, was not implemented (Interviewee 9, 10.05.2024, TB 29). Rather, a roadmap was created that mapped a longer term and then development was carried out precisely according to this roadmap plan. Most of the feedback came from the stakeholders involved and not from the customers. Consequently, the predefined roadmap rarely underwent adjustments. This resulted in diminished motivation to verify whether the developed products truly aligned with customer needs (Interviewee 9, 10.05.2024, TB 31). It was mentioned that this problem with scrum not only occurred the fourth company but was generally a problem in the Swiss media industry (Interviewee 9, 10.05.2024, TB 29, and 31). In addition, the company relied on the scaled agile framework (SAFe) at the programme level of product management. Accordingly, the product increments were defined at quarterly level and work was carried out at team level with product owners, as is the case in established scrum teams (Interviewee 9, 10.05.2024, TB 30).

Even though the fourth company made it clear that a user-centred process would be very helpful in the NPD process to put the customer even more at the centre (Interviewee 9, 10.05.2024, TB 119), it was pointed out that no user-centred process had yet been implemented in the company but that a situational approach had been taken (Interviewee 9, 10.05.2024, TB 72). Therefore, there was no standard procedure that was applied throughout the entire NPD process (Interviewee 9, 10.05.2024, TB 72). Nevertheless, the company described how assumptions and hypotheses could be validated in different ways by customers when developing new functions (Interviewee 9, 10.05.2024, TB 122). If it was a function that was new on the market, then the risk was high that a function would be developed that nobody wanted on the market. For such products, it was therefore highly relevant that customers were involved in a business case or in the idea generation phase to precisely identify customer needs (Interviewee 9, 10.05.2024, TB 73). However, if it was a function that was already in use on other media platforms, then the company had the certainty that the function was often used by customers. Accordingly, customers had to be involved less in the case of functions that were already established on the market (Interviewee 9, 10.05.2024, TB 121).

The following was explained about customer co-creation:

“I believe that the influence would be marginal if customers were actively involved in the new product development process, that is, in the customer co-creation approach” (Interviewee 9, 10.05.2024, TB 92).

In this regard, however, it was mentioned that it would be difficult to judge whether the customer co-creation approach would have made a difference to what had already been carried out in the company’s customer involvement approach (Interviewee 9, 10.05.2024, TB 96). It was also explained that it would not hurt to use the customer co-creation approach in the business to customer (B2C) context (Interviewee 9, 10.05.2024, TB 95), for example through workshops with customers (Interviewee 9, 10.05.2024, TB 93). However, it had been explained that it was important to note that if a customer said something in an interview, this would not always correspond to their actual behaviour (Interviewee 9, 10.05.2024, TB 95). Based on these contradictory statements on customer co-creation, it could be interpreted accordingly that the customer co-creation approach was never considered in the

fourth company and therefore it was not possible for the company to assess whether customer co-creation was worthwhile.

In the fourth company, it was further analysed that a waterfall-oriented approach was used at the beginning in the business case of a new NPD project (Interviewee 9, 10.05.2024, TB 18). However, the choice of technology did not play a role at the start of a new NPD project (Interviewee 9, 10.05.2024, TB 3). It was acknowledged that a business case could not capture every detail at the outset of an NPD project. However, this was not considered detrimental, as the reality often diverged from the initial business case anyway. Rather, it was about defining the biggest assumptions, and the biggest risks (Interviewee 9, 10.05.2024, TB 12), which had to be validated as quickly as possible to decide whether to continue with the NPD project (Interviewee 9, 10.05.2024, TB 48). Such an assessment and assumptions in the business case were carried out using a business model canvas, for example (Interviewee 9, 10.05.2024, TB 18). Ultimately, it was stated that a business case always had to be approved if it involved the development of a new source of revenue (Interviewee 9, 10.05.2024, TB 40).

As soon as a business case was then implemented, the fourth company worked iteratively and leanly so that the most important assumptions could be validated (Interviewee 9, 10.05.2024, TB 41). Some of the assumptions or hypotheses were, however, set at a technical level, for example when a function was desired on the market but there were uncertainties regarding the technical implementation of this function (Interviewee 9, 10.05.2024, TB 19). To validate the assumptions, stages and gates were used. However, a standardised process for the use of stages and gates did not exist in the company (Interviewee 9, 10.05.2024, TB 41). Rather, the use of control gates depended on the granularity of the further development (Interviewee 9, 10.05.2024, TB 40) and was used differently at technical and business level (Interviewee 9, 10.05.2024, TB 42). Accordingly, it was important for the fourth company to separate the NPD phases and gates between business and technology (Interviewee 9, 10.05.2024, TB 42).

At a certain point in the NPD process, technology played an important role in the fourth company. However, the principle of the fourth company was never that a new product was developed because they wanted to use a new technology, but that the technology was a

means to an end to solve a problem (Interviewee 9, 10.05.2024, TB 150). Furthermore, it was described that it depends on whether it is a new or an established technology (Interviewee 9, 10.05.2024, TB 165). Generative artificial intelligence (AI) was mentioned as an example of a new technology that, has a lot of potential, but also entailed risks because it was necessary to experiment with this technology. To find out whether generative AI could solve certain opportunities, it had to be integrated very early on in the NPD process (interviewee 9, 10.05.2024, TB 163). Conversely, for familiar technologies with proven track records, technicians were integrated into the NPD process later. Their prior experience provided them with sufficient knowledge to anticipate and address potential challenges associated with these technologies (Interviewee 9, 10.05.2024, TB 164).

In addition to the actual NPD process itself, the focus was also placed on an overarching model for the NPD process.

“I believe that there is far too little focus on the entire lifecycle when it comes to launching new products or new features. You tend to have a process basis for the actual development, which means, for example, that you start with a business case and then develop prototypes in which hypotheses are validated. But when it comes to managing the entire portfolio and considering when a product will reach the end of its lifecycle, you don't think enough about that. And this is exactly why it makes sense to use an overarching framework that effectively incorporates the entire lifecycle and not just the initial phase when new products and features are created. This would help to identify where complexity can be removed from the process” (Interviewee 9, 10.05.2024, TB 136).

While many companies employed an implicit or explicit NPD process, the fourth company lacked a lifecycle model. This meant their process did not follow an overarching framework for NPD, nor did it clearly define when a product reached the end of its lifecycle (Interviewee 9, 10.05.2024, TB 135). In this respect, it would have been relevant at portfolio level to recognise how different products would have worked together and to recognise when a product was no longer profitable enough. At product level, it would have been possible to recognise when individual functions were no longer needed or had almost no effect, so that they could have

been removed from the product (Interviewee 9, 10.05.2024, TB 137). This approach ensured that only necessary functions were utilised, ultimately reducing maintenance and operating costs. This, in turn, freed up capacity for developing new features relevant to customer needs (Interviewee 9, 10.05.2024, TB 138).

The fourth company also highlighted the role of (technical) prototypes in their NPD process. Prototypes were used to create software designs, allowing for adaptation without compromising quality (Interviewee 9, 10.05.2024, TB 61). However, it was acknowledged that the results of these technical prototypes could influence the final software design or concept (Interviewee 9, 10.05.2024, TB 63). Regardless of the specific application, the company stressed the importance of defining a clear objective for each prototype. For instance, prototypes could be used for design purposes to conduct usability tests, after which the results of these tests flowed into the technical development of the product (Interviewee 9, 10.05.2024, TB 62). Lastly, proof of concepts (PoCs), which could be compared with technical prototypes (Interviewee 9, 10.05.2024, TB 63), were also used to find out whether the technical solution in question could work. However, PoCs were more concerned with verifying the problems relating to performance and costs (interviewee 9, 10.05.2024, TB 42).

In conclusion, although the fourth company acknowledged the importance of customer centricity, it struggled to implement a truly customer-centric approach in its NPD process. Reliance on roadmap-driven development, coupled with limited customer feedback and a lack of standardised processes, hindered its capability to adapt to changing customer needs. Despite recognising the potential value of customer co-creation, the company did not actively explore or implement this approach, missing precious opportunities for deeper customer engagement and innovation. This discrepancy between recognising the value of customer centricity and implementing practices that could facilitate it could lead to overlooked market opportunities and a less successful NPD process. Furthermore, a lack of focus on an overarching model for the entire lifecycle of a product was also explained. It could be interpreted that this neglect resulted in missed opportunities to rationalise products, reduce costs, and focus development efforts on features that really matter to customers. Accordingly, a comprehensive lifecycle model could address these issues and provide a more strategic and sustainable approach to NPD.

1.2.4.2.2 Organisational Factors

This section deals with the interpretation of the analysis of the organisational factors of the fourth Swiss media company.

Primary code	Subcode
CROSS_FUNCTIONAL_TEAM_STRUCTURE_AND_DYNAMICS	TEAM_COMPOSITION_AND_ROLES
CROSS_FUNCTIONAL_TEAM_STRUCTURE_AND_DYNAMICS	BENEFITS_AND_RATIONALE
CROSS_FUNCTIONAL_TEAM_STRUCTURE_AND_DYNAMICS	INTEGRATION_AND_COLLABORATION
ROLES_AND_RESPONSIBILITIES_IN_PRODUCT_DEVELOPMENT	TALENT_AND_SKILL_GAPS
ROLES_AND_RESPONSIBILITIES_IN_PRODUCT_DEVELOPMENT	ROLE_IT_ARCHITECT
ROLES_AND_RESPONSIBILITIES_IN_PRODUCT_DEVELOPMENT	ROLES_OF_PM_AND_PO
ORGANISATIONAL_STRUCTURE_AND_GOVERNANCE_IN_NPD	DECISION_MAKING_AND_GOVERNANCE_STRUCTURES

The table above shows the three primary codes and the seven subcodes used to analyse and interpret the organisational factors.

The narrative of the fourth company showed a complex interplay of strengths and challenges in the organisational factors of the company in connection with NPD. There was a strong focus on cross-functional teams, although the role of the IT architects was not part of the cross-functional team. In addition, the definition of the roles of product manager and product owner revealed a lack of consensus in the Swiss media industry. The fourth company worked with steering committees but was considering moving towards a product advisory board.

The fourth company worked with cross-functional teams for each platform, which included technical and non-technical roles (Interviewee 9, 10.05.2024, TB 187, and 189) and focussed mainly on feature development (Interviewee 9, 10.05.2024, TB 188). The technical roles were different development roles (Interviewee 9, 10.05.2024, TB 187) and tech leads (Interviewee 9, 10.05.2024, TB 230) and non-technical roles were user experience experts (Interviewee 9, 10.05.2024, TB 187) as well as product managers and product owners (Interviewee 9, 10.05.2024, TB 189, and 277). It was of great relevance that the cross-functional teams had to be autonomous, that their composition did not change constantly and that they focussed specifically on one product or one feature. This was the only way to

ensure stability within the cross-functional team, work efficiently, minimise dependencies, work agilely, and react quickly to changes (Interviewee 9, 10.05.2024, TB 190). It was emphasised that Swiss media companies would need to focus in the future on establishing stable, autonomous cross-functional teams capable of covering the most necessary skills. This was mentioned, among other things, because the world was changing rapidly due to artificial intelligence, and cross-functional teams would need to understand these new possibilities and derive their potential (Interviewee 9, 10.05.2024, TB 317). It was further explained that it was important that developers had to be integrated into a cross-functional team so that they did not work in isolation and that full-stack developers, for example, were well suited for this (Interviewee 9, 10.05.2024, TB 191). However, one problem described with cross-functional teams was their limited involvement in user interactions.

Consequently, the teams lacked a comprehensive understanding of the users, their motivations, and their needs (Interviewee 9, 10.05.2024, TB 206). In this regard, it was not believed that cross-functional teams would become less efficient if they interacted more with users during the development process (Interviewee 9, 10.05.2024, TB 215); however, it was noted that the efficiency in a cross-functional team would depend on when and how customers were involved in the NPD process. For instance, if workshops were held exclusively with customers, the process could become inefficient. On the other hand, if interactions with customers were integrated at regular intervals throughout the NPD process, maintaining a healthy balance, the process within the cross-functional teams would remain efficient (Interviewee 9, 10.05.2024, TB 216). It was also mentioned around cross-functional teams that roles such as DevOps team, system architects and solution architects were present in the NPD process (Interviewee 9, 10.05.2024, TB 229), but that the architecture roles were not part of the cross-functional team. They were only involved when major architectural decisions had to be made (Interviewee 9, 10.05.2024, TB 231).

Furthermore, it was mentioned that the fourth company worked with product owners, product managers, and project managers (Interview 4, 10.05.2024, TB 276). Regarding the NPD, however, the product manager and the product owner were more closely involved; in this context, it was highlighted that the product manager was strategic as well as business-orientated and defined the major epics (interviewee 9, 10.05.2024, TB 278). The product owner referred to the epics defined by the product manager and then broke them down into user stories together with the scrum team (Interviewee 9, 10.05.2024, TB 279). However, it

was seen as problematic that there is no consensus in the Swiss media industry about the specific tasks of product managers and product owners. Thereby, it was suggested that it would be logical for these two roles to be combined into one (Interviewee 9, 10.05.2024, TB 276). However, it was mentioned that this approach was only practical for smaller products, given the more manageable scope of such projects. For larger products, it was proposed that it might be necessary to either break the product down into smaller components or separate the product manager and product owner roles (Interviewee 9, 10.05.2024, TB 276).

In addition, the decision making and governance structure regarding NPD in the fourth company was explained.

“We also work with steering committees. However, our steering committees are not yet set up quite so systematically and are often used for initiatives, which are larger product initiatives that run over several quarters. However, not always the same people are represented in the steering committees for all the initiatives. However, there is always a similar constellation of people on the steering committees, which means that people from different areas of the company are involved, which are usually the key stakeholders”
(Interviewee 9, 10.05.2024, TB 287).

To counteract the problem that the same people are not always represented on the steering committees, the fourth company considered setting up a product advisory board. This committee would set the strategic focus and determine product priorities on a quarterly basis. It was considered crucial that all areas of the company were represented on this committee to ensure that different perspectives were considered when setting the strategic direction. Ideally, this process would have been based on objectives and key results (OKRs). This would have enabled management to set core objectives that would then have determined product priorities (Interviewee 9, 10.05.2024, TB 303).

It was also explained that in the fourth company, the technical roles were not only operational but also strategic. The “Chief Technology Officer” occupied the highest technical function at hierarchical level and the “Chief Product Officer” at product level. At both levels, there were director positions below the two executive functions, which showed that the business and technology sides were equally organised hierarchically (Interviewee 9, 10.05.2024, TB 255).

Finally, it was pointed out that it was very difficult for the Swiss media industry to find sufficient talent for the NPD because the media industry was not the most attractive industry and had a rather bad reputation. Many job seekers thought of the media industry directly in terms of journalism and content, even if the Swiss media industry was increasingly focussing on technology and digital products (Interviewee 9, 10.05.2024, TB 309).

In conclusion, cross-functional teams were seen as important in the fourth company, although it was mentioned that the Swiss media industry still had room for improvement in terms of autonomy, stability, and user-orientation in cross-functional teams. In addition, the lack of media industry consensus on roles such as product manager and product owner led to ambiguity within the NPD process. The company's desire to merge these roles for smaller projects emphasised the need for more streamlined decision making but also highlighted the challenges of scaling this approach for larger products. The difficulty in finding suitable candidates for NPD was also highlighted, observing that the media industry is perceived as an unattractive sector. Therefore, it could be assumed that the fourth company needed to cultivate a stronger reputation for innovation and technical advancement.

1.2.4.3 Company Specific Insights

In the fourth company, individual company-specific key insights were found, which are structured in this section analogue to the topics in Appendix 1.2.4.2:

1.2.4.3.1 Process-Oriented Factors

The fourth company, while employing agile methodologies, was constrained in its ability to adapt and integrate customer feedback due to its rigid adherence to roadmap planning. This company lacked a standardised customer-centric process and did not explore customer co-creation as a means of fostering customer centricity. Furthermore, the absence of an overarching model for the product lifecycle in NPD hindered cost savings and the prioritisation of relevant feature development.

1.2.4.3.2 Organisational Factors

Although the fourth company utilised cross-functional teams, the study revealed a need to promote autonomy, stability, and user-centricity within these teams across the Swiss media industry. Furthermore, a lack of industry consensus on roles such as product manager and

product owner created ambiguities in the NPD process. The company also encountered challenges in recruiting skilled employees for NPD, as the media industry was perceived as less attractive.

1.2.5 Fifth Within-Company Analysis

This section deals with the within-company analysis of the fifth company. The company is described first, followed by the analysis and interpretation of the primary as well as sub-codes and concluded with company-specific insights.

1.2.5.1 Introduction

In the fifth company, a person with the job title “Head of Digital Activities and Business Development” was interviewed using a semi-structured interview process. The fifth company concerned a Swiss media company, one of the five largest in Switzerland, with its largest business area focused on print media, broadcast media, and online media. The fifth company used customer surveys and recognised the importance of user-centric development but acknowledged that it did not fully consider co-creation with customers, noting potential challenges and a lack of necessary structures.

1.2.5.2 Primary and Subcode Analysis

In this section, the primary codes and the associated subcodes of the fifth company are analysed and interpreted. A total of 5 primary codes and 12 subcodes were created, representing the primary codes and subcodes of the fifth company. The codebook for the analysis can be found in Appendix 1.3.3.5 and is based on the approach of Mackieson et al. (2019). The text blocks (TB) of the quotations from the transcribed interviews can be found in the codebook, which is based on the approach of Richards and Hemphill (2018), in Appendix 1.3.2.

1.2.5.2.1 Customer Centricity

This section deals with the interpretation of the analysis of the customer centricity of the fifth Swiss media company.

Primary code	Subcode
CUSTOMER_CENTRICITY_IN_NPD	IMPORTANCE_AND_CHALLENGES_USER_CENTRICITY
CUSTOMER_CENTRICITY_IN_NPD	POTENTIAL_AND_BARRIERS_FULL_CUSTOMER_COCREATION

The table above shows the one primary code and the two subcodes used to analyse and interpret the customer centricity.

The narrative of the fifth company revealed that the value of customer centricity was understood within the organisation, but that the full implementation of customer co-creation was fraught with challenges.

The media company worked with user-centred process approaches in NPD, in which customer surveys were conducted (Interviewee 10, 10.05.2024, TB 74).

“It is important for every company to develop user-centric because otherwise the product will fail” (Interviewee 10, 10.05.2024, TB 123).

Nevertheless, it was explained that a problematic situation arose when the product manager believed in the proposed solution, but customer interviews indicated otherwise. This inevitably raised the question of whether to proceed with development regardless or to prioritise customer feedback (Interviewee 10, 10.05.2024, TB 207).

The customer co-creation approach was discussed further.

“The complete customer co-creation approach is very interesting because it ensures that customer needs are fully integrated” (Interviewee 10, 10.05.2024, TB 105).

Thereby, it was described that the fifth company did not work enough with customer co-creation (Interviewee 10, 10.05.2024, TB 97). However, it was pointed out that it was important to understand that customers could not develop solutions or product visions themselves, but that they were only able to describe their needs and problems (Interviewee 10, 10.05.2024, TB 98). However, it was noted that if a full customer co-creation approach had been chosen, an MVP would not have been necessary as all information would have already been collected from customers during the development process. As a result, NPD as it was known at the time would have been revolutionised (Interviewee 10, 10.05.2024, TB 100), which would have brought fundamental benefits. For example, good iteration planning in the NPD process would have saved time because the company could have received direct feedback from customers (Interviewee 10, 10.05.2024, TB 101). The role of the customer

would also have changed from passive to active. Previously, the customer was used at the end of the value stream, but with the customer co-creation approach, the customer would have become a member of the company, helping to develop the product in the right direction and taking on an even stronger role than before (Interviewee 10, 10.05.2024, TB 103 and 104). The customer's co-creation approach would also have influenced the marketability of the company's products. If the customer had co-developed the product, it could be assumed that the product would work well on the market, which would mitigate a previously prevalent risk (Interviewee 10, 10.05.2024, TB 106). A final advantage identified was the potential for customer co-creation to foster a sense of community. This stemmed from the idea that customers, having actively participated in the product's development, would feel a strong connection to it and be intrinsically motivated to ensure its success (Interviewee 10, 10.05.2024, TB 107).

Despite all the advantages, challenges were also associated with the customer co-creation approach. For example, the product experts would have had to be heavily involved in the collaboration with the customers to define the solution well (Interviewee 10, 10.05.2024, TB 102). It was also explained that relying heavily on customer input carried the risk of diluting a company's visionary outlook. Since not all customers possess the same level of foresight, this could hinder the development of truly groundbreaking products (Interviewee 10, 10.05.2024, TB 108). The adoption of a customer co-creation approach would have necessitated a fundamental shift within the company. Careful consideration would have been required to determine how best to integrate customers as co-creators in the NPD process (Interviewee 10, 10.05.2024, TB 105).

Finally, it was made clear that customer centricity and the partial use of customer co-creation will be of fundamental importance for the Swiss media industry in the future (Interviewee 10, 10.05.2024, TB 310). However, this was considered almost impossible with the previous way of thinking. This reluctance stemmed from several factors: the lack of necessary governance structures to manage a customer co-creation approach; an anticipated initial slowdown in development time until customer feedback iterations were streamlined; and the need for new budgets to compensate participating customers (Interviewee 10, 10.05.2024, TB 311).

In conclusion, the fifth company recognised the value of customer centricity but faced significant challenges in fully implementing customer co-creation. Although the company pursued user-centric approaches, there was a tension between prioritising customer feedback and maintaining the product manager’s vision. Despite the recognised benefits of a full customer co-creation approach, concerns about corporate governance, development time, and budget constraints prevented its implementation. Ultimately, the fifth company showed that the Swiss media industry needs to rethink how it fully utilises customer co-creation and overcomes these challenges.

1.2.5.2.2 Product Development Approaches

This section deals with the interpretation of the analysis of the product development approaches of the fifth Swiss media company.

Primary code	Subcode
PRODUCT_DEVELOPMENT_PROCESS_AND_APPROACHES	QUALITY_ASSURANCE_AND_TESTING
PRODUCT_DEVELOPMENT_PROCESS_AND_APPROACHES	PROTOTYPING_AND_PROOF_OF_CONCEPT
PRODUCT_DEVELOPMENT_PROCESS_AND_APPROACHES	FRAMEWORKS_AND_PROCESS_FLEXIBILITY
SCRUM_METHODODOLOGY_EVALUATION	LIMITATIONS_AND_BENEFITS_OF_SCRUM

The table above shows the two primary codes and the four subcodes used to analyse and interpret the product development approaches.

The narrative of the fifth company showed the use of the agile process framework “scrum”, in which the iterative nature was valued. In addition to scrum, quality controls and prototypes were also used during the NPD process. Furthermore, the fifth company expressed the desire for an overarching NPD framework to provide guidance.

The fifth company used the agile process framework “scrum” in its NPD process. Scrum was evaluated positively because it offered the possibility of breaking projects down into manageable packages (Interviewee 10, 10.05.2024, TB 32), working iteratively and learning during the process (Interviewee 10, 10.05.2024, TB 34), being efficient, and achieving the greatest possible benefit for customers (Interviewee 10, 10.05.2024, TB 35). The only identified limitation of scrum was the necessity for teams to effectively decompose project ideas into manageable components and meticulously consider the details. Without this meticulous approach, implementing scrum could prove challenging (Interviewee 10, 10.05.2024, TB 33).

It was further explained that although the fifth company worked with quality controls in the NPD process, this was not carried out sufficiently (Interviewee 10, 10.05.2024, TB 44).

“In future, I would refuse to launch the product without having sufficiently tested, and that also means without having had some cross check along the way” (Interviewee 10, 10.05.2024, TB 44).

The composition of quality control meetings was deemed crucial. It was emphasised that attendees should align with the nature of the discussion. Non-technical personnel were considered essential for product-focused discussions, while technical experts were deemed necessary for technical discussions. This approach aimed to ensure efficiency and avoid unproductive discourse (Interviewee 10, 10.05.2024, TB 43). Accordingly, it could be interpreted that the fifth company separated quality controls from business-related and technical-related topics. However, to achieve the most viable product (MVP) as quickly as possible, it was made clear that it was important not to overburden the NPD process with quality controls (Interviewee 10, 10.05.2024, TB 45). An MVP was used in the media company to develop user-centred products by iteratively testing with different user groups and obtaining feedback. The feedback was then used to introduce improvements until the new product was launched on the market. It was explained that this type of rapid iteration could also be seen as quality control after an MVP (Interviewee 10, 10.05.2024, TB 49).

The fifth company also worked with prototypes and proof of concepts (PoVs):

“I would very much like it if we could carry out more proof of concepts with prototypes” (Interviewee 10, 10.05.2024, TB 65).

While prototypes were acknowledged as a highly valuable tool for gathering direct user feedback, their high cost sometimes precluded their use. However, it was suggested that prototypes could be particularly beneficial for software designs associated with large-scale new product developments (Interviewee 10, 10.05.2024, TB 64). PoVs were particularly relevant in the company to decide whether the use of a technology was worthwhile (Interviewee 10, 10.05.2024, TB 151). However, PoVs were also expensive and therefore it had to be assessed whether the use of a PoV was worth it (Interviewee 10, 10.05.2024, TB 152).

Finally, it was explained that an overarching framework for the NPD process in the company of the fifth company would have been very valuable to provide concrete orientation and guidance throughout the NPD process (Interviewee 10, 10.05.2024, TB 139). However, it was mentioned that it was important that such an overarching framework would still have allowed the process some freedom to remain flexible. Accordingly, a theoretical model was needed that could also be used in practice (Interviewee 10, 10.05.2024, TB 141, and 144) and would also have helped to ensure that no process steps were overlooked (Interviewee 10, 10.05.2024, TB 140). It was also found that an organisation's maturity level in NPD influenced the role of an overarching framework. In organisations with extensive NPD experience, the framework served primarily as a checklist. Conversely, in organisations with limited NPD experience, the framework was considered essential for guiding and managing the NPD process. This was particularly true when numerous departments were involved, as the framework provided crucial guidance for aligning activities and integrating governance perspectives (Interviewee 10, 10.05.2024, TB 142 and 145).

In conclusion, the fifth company demonstrated a good understanding of agile methodologies, particularly "scrum", and acknowledged the importance of incorporating customer feedback in the NPD process. It was also shown that technical and business-related quality controls existed within the NPD process. Nonetheless, the company's approach highlighted potential pitfalls. The somewhat reactive attitude towards quality controls and the lack of an overarching framework for the NPD process indicated that better strategic planning was needed in the NPD process. Accordingly, with a more proactive approach to quality assurance and a defined overarching framework for the entire NPD process, potential risks such as resource drain or process speed within the process phases, which are associated with a highly iterative and feedback-driven approach, could be improved.

1.2.5.2.3 Team Structure in NPD

This section deals with the interpretation of the analysis of the team structure in NPD of the fifth Swiss media company.

Primary code	Subcode
TEAM_STRUCTURE_IN_NPD	OUTSOURCING_AND_EXTERNAL_PARTNERSHIPS
TEAM_STRUCTURE_IN_NPD	CORE_TEAM_VS_CROSS_FUNCTIONAL_TEAM
TEAM_STRUCTURE_IN_NPD	ROLES_AND_RESPONSIBILITIES

The table above shows one primary code and the three subcodes used to analyse and interpret the team structure in NPD.

The narrative of the fifth company illustrated a Swiss media company that employed both core teams for strategic projects and cross-functional teams for smaller NPD initiatives. Notably, technical roles within the core teams were outsourced. A key challenge identified was the prioritisation of journalists over customers within the media company.

The fifth Swiss media company distinguished between using a core team or a cross-functional team for NPD based on the specific circumstances. When significant NPD experience existed within the company, a core team was preferred, as its members possessed a clear understanding of the priorities and focus areas (Interviewee 10, 10.05.2024, TB 192). It was also determined that a core team was necessary when developing a product of strategic importance to the company's future (Interviewee 10, 10.05.2024, TB 193). Ultimately, it mattered how big the NPD project was and how much time was needed for it. If it was only a small product that would be completed within a few months, then it made sense to work with a lean cross-functional team that not only worked on a product but delivered business value by combining different functions. Accordingly, the risk was also lower with cross-functional teams because it was a product that was not business-critical but had the potential to generate new revenue streams (Interviewee 10, 10.05.2024, TB 195). In other words, the importance of the project had to be weighed against the risk and the financial impact to decide whether to use a cross-functional team or a core team (Interviewee 10, 10.05.2024, TB 194, and 196).

It was also analysed which roles or responsibilities had to be present in a core team or cross-functional team. It was explained in the fifth company that a cross-functional team needed one person who was responsible for ensuring that all relevant functions were brought together to drive the project forward (Interviewee 10, 10.05.2024, TB 195). This core team consisted of a product owner and a product manager: the product manager was responsible for conceptualising the entire NPD project and designing the product vision, whereas the product owner was responsible for coordinating the people involved in the NPD project, for stakeholder management, and for implementing the product vision (Interviewee 10, 10.05.2024, TB 280). Furthermore, it was explained that a core team typically comprised not

only the product owner and product manager but also individuals from data-related roles and technical disciplines (Interviewee 10, 10.05.2024, TB 234, and 235). Thereby, the company also worked with external partners for the development of new products, who took on the role of IT architect (Interviewee 10, 10.05.2024, TB 232). The advantage of working with external partners was that the company was advised when it was possible to use cheaper technologies that delivered the same result as other more expensive technologies (Interviewee 10, 10.05.2024, TB 234). Furthermore, solution architects or system architects were present in the fifth company, but for matters other than NPD (Interviewee 10, 10.05.2024, TB 232). In this regard, even though it was clearly stated that IT architects are extremely relevant for the development of a digital product to determine the technical roadmap on a high-level foundation as a basis for the developers and from which it could be derived which backend and frontend developers were needed (Interviewee 10, 10.05.2024, TB 233), all technical roles for NPD were nevertheless outsourced (Interviewee 10, 10.05.2024, TB 235). The reasons for this were twofold: on the one hand, all technical roles were outsourced because they could not be occupied in the company throughout the year (Interviewee 10, 10.05.2024, TB 234). On the other hand, the company was not product-driven, instead prioritising functional roles that aligned with its established organisational structure and culture (Interviewee 10, 10.05.2024, TB 232).

Finally, a major problem was identified:

“When it comes to editorial topics, journalists play a major role in the development of products. However, this is still problematic because journalists are more relevant than customers” (Interviewee 10, 10.05.2024, TB 288).

This prioritisation of internal perspectives over customer needs could potentially hinder the development of successful products that truly resonate with the target audience.

In conclusion, the company showed that it was able to deal with complex structures in the NPD process and was therefore able to deploy core teams and cross-functional teams differently depending on the initial situation. Although this approach offered flexibility, the fact that technical roles were outsourced led to restrictions in product innovation and the

ability to react to the market. Furthermore, the high value placed on journalists over customers suggested that working with customers and focusing on their needs was not at the centre of the development of editorial-driven products. This prioritisation could have serious consequences for the future of the fifth company, as it could result in products for which the market had no need.

1.2.5.2.4 Media Industry Transformation

This section deals with the interpretation of the analysis of the media industry transformation based on the fifth Swiss media company.

Primary code	Subcode
MEDIA_INDUSTY_TRANSFORMATION_AND_ADAP TATION	NEED_FOR_DISRUPTION_AND_INNOVATION
MEDIA_INDUSTY_TRANSFORMATION_AND_ADAP TATION	SHIFTING_CONSUMER_BEHAVIOUR_AND_MARKET_ TRENDS
MEDIA_INDUSTY_TRANSFORMATION_AND_ADAP TATION	ROLE_OF_TECHNOLOGY

The table above shows one primary code and the three subcodes used to analyse and interpret the media industry transformation.

The narrative of the fifth company revealed the need for innovation and disruption in the Swiss media industry.

The fifth company highlighted various aspects relevant to the Swiss media industry. It was emphasised that a willingness to disrupt was crucial (Interviewee 10, 10.05.2024, TB 321) and that the relatively unregulated nature of the media industry would facilitate this disruption (Interviewee 10, 10.05.2024, TB 5). This suggests that Swiss media companies could benefit from proactively embracing innovation and challenging traditional approaches to remain competitive, as can be seen from the quote below:

“In the future you need to disrupt yourself because if you don’t do it, your company will not survive. You will not have the same landscape in ten years as the landscape that you have today. To be disruptive you need to realise as a media company that the advertising share is shrinking and that the business model with the number of journalists that is existing today is not possible in the future. If you simply cut 2% to 5% of your staff every year,

you will only be able to survive but this is not a transformation” (Interviewee 10, 10.05.2024, TB 320).

It was also mentioned that customer co-creation would be crucial for the future of the Swiss media industry, coupled with a need for “out-of-the-box thinking”. This need arose from a perceived lack of genuine innovation in the media industry over the past decade (Interviewee 10, 10.05.2024, TB 319), evidenced by the initial scepticism towards disruptors like Netflix, which ultimately revolutionised the television landscape (Interviewee 10, 10.05.024, TB 5). Consequently, it was suggested that simply relying on traditional subscription models would not be a sustainable solution for the Swiss media industry (Interviewee 10, 10.05.024, TB 5). Rather, it would have been relevant to focus even more strongly on reorienting the future of journalism (Interviewee 10, 10.05.2024, TB 321). In this regard, the question was also raised about how and why the younger generation engaged with new media and technologies, and whether the media industry should increase its focus on entertainment (Interviewee 10, 10.05.2024, TB 312). The Swiss media industry, therefore, needed to look to the future, not the past, and not simply redesign the old business, because otherwise sooner or later the needs of the market would no longer be met (Interviewee 10, 10.05.2024, TB 313).

The final point of discussion centred on technology. While technology was primarily viewed as a tool to implement ideas, the need for the Swiss media industry to proactively engage with the future relevance of new technologies, including artificial intelligence, was emphasised (Interviewee 10, 10.05.2024, TB 321). This suggests a need for the Swiss media industry to not only utilise technology effectively but also anticipate and adapt to emerging technological advancements to remain at the forefront of innovation.

In conclusion, the fifth company exposed an urgent need for innovation and disruption within the Swiss media industry. While the company acknowledged the importance of customer co-creation and unconventional thinking, its own practices demonstrated a disconnect between rhetoric and action. Furthermore, although the company recognised the need to adapt to evolving media consumption habits and engage with new technologies, a clear strategy for achieving this appeared absent.

1.2.5.3 Company Specific Insights

In the fifth company, individual company-specific key insights were found, which are structured in this section analogue to the topics in Appendix 1.2.5.2:

1.2.5.3.1 Customer Centricity

The fifth company recognised the importance of customer centricity and embraced user-centric processes, but full customer co-creation was impeded by perceived challenges and practical constraints. While the company recognised the benefits of customer co-creation, it struggled to align these with its existing mindset and organisational structure, demonstrating the need for a strategic shift towards greater customer involvement. Despite these challenges, the company was convinced that customer-centricity and greater customer co-creation were crucial for future success in the Swiss media industry.

1.2.5.3.2 Product Development Approaches

The fifth company recognised the iterative and customer-centric nature of scrum but felt the need for improved quality control and a more structured overarching NPD framework. It also identified the potential benefits of prototypes and PoVs, although cost seemed to be a limiting factor.

1.2.5.3.3 Team Structure in NPD

The fifth company used cross-functional teams for small products. For strategically relevant products, however, it worked with a core team. Technical roles were outsourced holistically because the company was not product driven. In the case of NPD for editorial topics, journalists had a higher priority than customers, which was a critical point of view for the future of the company.

1.2.5.3.4 Media Industry Transformation

In the analysis of the fifth company, it was pointed out that the Swiss media industry urgently needed to move away from traditional business models and focus on ensuring that the media consumption of younger generations was understood. The introduction of new technologies and the reorientation of journalism were also described as critical factors for the transformation of the Swiss media industry.

1.2.6 Conclusion of Within-Company Analysis

The within-company analyses of the five Swiss media companies highlighted the multiple challenges and opportunities that Swiss media companies faced when implementing NPD. Together, the interviewees emphasised the importance of customer centricity, agile methods and cross-functional collaboration. However, the practical implementation of these concepts often fell short of theoretical understanding, hampered by organisational barriers, outdated mindsets and the complexity of a fast-evolving media landscape. The findings from these interviewees highlighted important questions about the applicability of the empirical artefact developed in the development phase of this research, in section 6.2. Particularly in areas such as: the operationalisation of customer co-creation; the balance between agile flexibility and strategic planning; the structure of cross-functional teams; and the focus on technology. The gaps between the theoretical ideals and the practical reality identified in these companies suggest that a more refined empirical artefact needs to be developed to better reflect the challenges faced by these Swiss media companies in practice and to integrate future-oriented development approaches.

The insights gained from these individual companies were invaluable in addressing the study's research questions in section 1.4.2, providing a solid foundation for subsequent analysis and interpretation. The interviewees offer insights into the complexity of ensuring strong collaboration within cross-functional teams, and sustainably integrating customer co-creation approaches, particularly when using hybrid process structures that combine elements of waterfall and agile methodologies in NPD. The challenges and constraints characterised through the interviewees indicate areas where current practices in the five Swiss media companies are insufficient and highlight the need for innovative solutions and strategic changes in the Swiss media industry. The use of the multi-phase qualitative research design and design science research as the methodological basis for the within-company analysis proved helpful in gaining these rich and contextually grounded insights. Firstly, the multi-phase qualitative research design enabled an in-depth exploration of NPD processes in five organisational contexts. Secondly, the rigorous analysis of these companies, not only revealed precious insights into the challenges and opportunities in customer co-created NPD, but also fostered the iterative refinement of the empirical artefact in Figure 6.5 to obtain a design-oriented framework for operational applicability in the context of the

Swiss media industry and consequently supported the acquisition of important new insights of current research.

Based on this within-company analysis, feedback on the empirical artefact can be found in section 7.1. In section 7.2, the feedback was deepened through a cross-company analysis that aimed to identify overarching patterns, contrasts, and interdependencies between the five companies in detail. This cross-company investigation provided a more comprehensive understanding of the opportunities and challenges of NPD in the Swiss media industry and ultimately led to the evaluation of the empirical artefact in section 7.3. This evaluation allowed for the refinement of the empirical artefact, which in turn resulted in the development of the design-oriented framework of this study in section 7.4.

1.3 Codebooks

This section addresses all codebooks used in this research.

1.3.1 Codebook for the Thematic Analysis of the Awareness and Suggestion Phase

This section shows the codebook for the thematic analysis of the awareness and suggestion phase based on Richards and Hemphill (2018) in chapters 4 and 5.

Requirement	Characteristic
Agile Process Frameworks	Scrum
Definition	
Insights from the interviewees on the application of scrum, highlighting variations in implementation and challenges faced.	

Text block	Interviewee 1
TB 1	Yes, scrum is only used in the delivery phase.
TB 2	For technical developments, the teams work with scrum. That means we work in sprints of 2 to 3 weeks, depending on the team, and develop that way.
TB 3	We have noticed that a pure scrum approach is good for the development itself, but it is not a project management approach.
Text block	Interviewee 3
TB 4	We mainly use scrum. We currently have 4 product teams that all work according to scrum. Some teams have 2-week sprints, but others have 3-week sprints.
TB 5	We already try to use scrum according to theory, but I think I'm speaking not only for us, but that you first must find companies that really implement the scrum process perfectly according to theory. So, for example, that you really do the estimation in story points. But even then, we always have regular retrospectives in the teams, where we look at whether we can improve the process. But we are, and we know it, not yet where we want to be in terms of scrum based on the theory. However, we have implemented the most important elements. There is also pseudo-scrum. Companies that say they use scrum and have the ceremonies like dailies, sprints, and sprint planning, but they don't use the core principles of the scrum process, like collecting feedback quickly or reacting quickly to user feedback. But we also have a lot of further potential.
TB 6	So now we have integrated like one level higher (than just short sprints) to have a cadence also on quarterly level where we can also check the higher priorities and decide together if they are still correct. So, this is not an alternative to scrum itself, but a complement to scrum because we are 4 product teams.
Text block	Interviewee 5
TB 7	Officially, the agile processes we use are based on scrum. However, we do not work according to scrum as described in the textbook. We have two-week sprints.

Requirement	Characteristic
Agile Process Frameworks	SAFe
Definition	
Insights from the interviewees into the practical application and adaptation of the Scaled Agile Framework (SAFe) within their organisations, including the integration of other agile methodologies and the challenges and benefits associated with implementation	

Text block	Interviewee 2
TB 8	When we started SAFe, we had a clear and big challenge that we had to solve. We were in a situation 10 years ago where we had all the digital products and offers from different brands and had to merge them. We had to decide which information architecture and which apps we would have. The decisions from that then led to a big renewal project and then we realised that it was relatively difficult to continue with the way we had been bodging projects so far. So we had to find another way to do it. One of the reasons was that we were suddenly under a lot of time pressure. We had resources but strict deadlines, which made us realise that there are not so many other methods like SAFe that make it possible to meet the deadlines.
TB 9	SAFe had a lot of points in favour of managing the requirements, scaling, deadlines, etc. However, it is not a question of introducing SAFe as a model 100 per cent and with the exact naming. SAFe is generally only used after bigroom planning. It may happen a little earlier that SAFe is used before bigroom planning, if you say that the teams carry out evaluations in the sprints.
TB 10	The process under SAFe works from the moment we find that we have a need, for example. a change project.
TB 11	For the development of new features, we have our own system, meaning our own framework. The framework for feature development is very close to SAFe.
Text block	Interviewee 3
TB 12	In my old company we used SAFe as a scaled Scrum framework. And in the current company, we have now adapted it so that we also have a quarterly planning cycle, where we effectively look more at the epic level, what the fundamental topics are and then break them down.
TB 13	There are several cycles. But this is now rather new at the annual level, where we have OKR. OKR stands for Objectives and Key Results. We define priorities for the company, but also derived from them for the product areas. In other words, a broader direction and greater priorities are set. And then we also have a quarterly process where we look at what the greater priorities are for the respective product. Of course, this always considers the annual goals of the OKR.
TB 14	We have a quarterly process where we look at what the major priorities are for the respective product. Of course, this always considers the OKR's annual objectives. So, if you talk about quarterly planning and prioritisation in terms of Scrum or other agile product developments, then that is the epic level. And then at epic level, i.e. quarterly level, the individual Scrum teams, i.e. our product teams, are broken down into sprints and then into user stories.
TB 15	This also means for a new product that the basic goal is to break it down into a roadmap. In the roadmap, you then decide what the biggest topics are for the next quarter, which you address and then break down again. So, the process is similar whether it's a new product or an existing product that you can develop further.
TB 16	So, in summary, we start with annual targets, which are then broken down into quarterly targets. And these quarterly goals are then broken down into sprints by the product teams. Then we work agilely in the direction of these goals.
TB 17	However, as already mentioned, we do not use SAFe 1 to 1 in our company, but only certain elements that we use.

Requirement	Characteristic
Agile Process Frameworks	Kanban
Definition	
Insights from the interviewees on the situational use of Kanban, especially for tasks that are difficult to predict or plan in advance, and the preference for more traditional agile methods such as Scrum for projects with clearer requirements and timelines	

Text block	Interviewee 1
TB 18	We work sometimes according to Kanban or not in fixed sprints.

Text block	Interviewee 3
TB 19	For certain products or product challenges, we sometimes consider whether to go in the direction of Kanban. This is mainly because it is not so easy to plan for these products or product challenges. This often involves a lot of operational issues where it is very difficult to plan, sometimes not even for 2 weeks. So, for example, on one day we have problem X, on another day problem Y, which must be tackled. So, with certain teams or with certain topics that are more operational in nature, we tend to go with Kanban. As I said, however, these are rather current considerations in our company.
Text block	Interviewee 5
TB 20	We use Kanban as a board.

Requirement	Characteristic
Agile Process Frameworks	Build-Measure-Learn cycle
Definition	
Insights from the interviewees on the importance of rapid feedback cycles and user testing in product development, particularly to validate assumptions and ensure product market fit, while also recognising the challenges and limitations of these practices in certain contexts, such as disruptive innovation or time constraints	

Text block	Interviewee 1
TB 21	When a feature or a product is live, the findings flow back as ideas. The basic premise is that we go from a lot of ideas to very little delivery, so that we only implement what is really viable in business and goes hand in hand with the user. This is certainly one of the biggest challenges.
Text block	Interviewee 3
TB 22	The same approach, meaning getting to the market quickly and testing it on the market, can also be used for existing products. For example, if there is a major feature, it should be validated first. So, with our mobile apps and web apps, for topics that we are not sure if the solution will work and if it will be understood by the users, we go to the web app first, because we are faster with the web apps. With web apps, for example, we don't have to wait with the publishing process in the app store and can therefore publish something more quickly.
TB 23	With prototypes, we are iterative. That is also the goal, so that we can learn from the prototype and find out according to the measure-learn cycle whether the new solution fits or whether we must adapt something again and then test it again.
TB 24	We are slowly moving away from first designing a business case, then doing a big upfront concept, and then developing, and even having a release date within 1 to 1.5 years at most. We are slowly moving away from this, because in the current rather dynamic world it is rather difficult to predict, especially with new products, whether the product will be successful and whether the basic considerations are right. We want to move towards making a business case, but then trying to validate the larger assumptions relatively quickly. That means that we want to go to market very quickly with a small MVP product, validate it with the biggest assumptions we had, and only then start iterating. That means working in this way rather than going to market with a big bang, in other words a big upfront concept.
Text block	Interviewee 4
TB 25	However, big companies like Tesla or Apple which are launching very novel and disrupting products, they are not doing, as far as I know, testing with external users. This is because, they don't want to spoil and they are convinced that people will not understand it because they don't know yet, that they will need it. So, in this case you need a founder who creates a vision and a need. So, in the case of a transformative value, the rapid feedback cycles will not be there with external people. But this doesn't mean that internally it is not possible because the rapid feedback cycle you need for every project. For disruptive or transformative projects however, this is not possible with external people.
Text block	Interviewee 5
TB 26	For the briefing newsletter, we used the procedure of quick feedback testing with users.

	There we realised that we have a very large reach, but many users only read the newsletter without paying for the articles. However, since the newsletter is responsible for 15% of online conversions, we can't do a paid newsletter.
TB 27	The aim, however, would be for us to work with faster user feedback testing. However, there are two risks for us as to why we have not yet fully utilised rapid feedback testing with users. Firstly, the philosophy of fail fast and learn would have to be introduced first. Secondly, we don't always have the time to do a lot of feedback iterations, which is obviously not good.
TB 28	With a new app, if we know that it's not perfect, we may well go live and then test it with real users to find out where the problems are. We then improve the launched product.

Requirement	Characteristic
Project framework conditions	Quality management
Definition	
Insights from the interviewees on the critical importance of quality control in product development, emphasising the need for established frameworks, empowered decision makers and the delicate balance between maintaining standards and adapting to project deadlines	

Text block	Interviewee 4
TB 29	The top management of the company they need a framework for risk management and quality control in place. They want to know that there are milestones to know where we are at the moment in the project.
TB 30	Of course, you want to be able to say no and sound the product back for another iteration in your process methodology. But it needs to be the right person that says no for the right reasons. So the quality control is of course super important, but it needs to be at the right place with the right people.
Text block	Interviewee 5
TB 31	We are already synchronised in terms of quality control thanks to the specialists in the team, as many things are already considered. In the mission board, for example, if there is a conflict where we can only do two initiatives instead of three, we often prioritise and take the time to answer questions so that everyone is on the same page.
TB 32	Now, for example, certain editorial processes from different newspapers are being merged. However, there are two different CMS systems, which means that articles could look different. If something does not match the quality we wanted in this migration, we would address this and point out the pros and cons of the scenario in case we go live now or later.
TB 33	The quality rhythm can be different. When it comes to editorial topics where the content raises questions, then we would never publish something like that because we want to maintain our quality standards.

Requirement	Characteristic
Project framework conditions	Governance
Definition	
Insights from the interviewees on the need for clear project governance, including transparent communication, clearly defined roles and responsibilities, and the strategic alignment of projects with the organisation's overall objectives and risk management strategies	

Text block	Interviewee 1
TB 34	The danger in innovative projects is very great that the team builds something for itself and then quickly comes to the depressing reality that there are many dependencies and problems and limitations. You must think about things like that, otherwise it doesn't work. So, in a competitive market, you can't just only be visionary.

TB 35	But what is important is that when we have large undertakings, meaning complex technical problems that have a lot of interdependencies between the different teams, we always advocate for central project management. There we also have steering committees and weekly meetings.
Text block	Interviewee 2
TB 36	If we discontinue an app, then the question arises whether we want to continue to maintain this app and thus must apply for a new investment for it. This investment for this app was then examined as part of the strategy consideration. So, should we continue to afford this kind of app or is this an offer for us in the current constellation where we find that it fits our value proposition, and it helps us with our target groups? In other words, there was always a strategy review that was triggered by technological triggers. Sometimes it's the other way around, there's a strategy review and an offer review, and in this context, we then ask ourselves whether the current apps are still the right ones, whether the brand is still right, and whether it's cut correctly.
TB 37	In the strategy process, we consider which target groups are relevant for us with which offers.
TB 38	You could say, for example, that we don't just have a news app and a sports app in one app, but that we have two different apps that focus fully on sports and fully on news. These questions come up again and again in cycles. But these questions then come directly from the strategy target group. There is then an answer to these questions and the answer may have technical implications, or a new product development or a further development of the app must be made. So, a strategy review can lead to us saying that we want to continue to operate the app, but it would have to realign itself, for example. Then we must decide again what that means if we only expand or renew an app in terms of content, function or technology.
Text block	Interviewee 4
TB 39	Asking for accountability and asking to be partially involved to the person you are reporting to. Here it remains crucial, that you also set the boundaries. No one wants to receiving feedback from a board member that says, "let me see how it looks like" and then "Uh, but my son wouldn't like it like this.". But unfortunately, this kind of feedback happens a lot. So the roles and responsibilities are extremely important.
TB 40	So, when I talk about the size, I mean the financial aspect of it. So, the more expensive, especially compared to the size of your company, your project is and the more complex it is, the more management will not just accept that you tell them "you give me a check of 5'000'000 and I see what I can do".
TB 41	The project size is relative to your revenue size. Everything that goes over 2% of your annual revenue in terms of cost is significant. So, for example, if you are a company with 100'000'000 revenue and the project is about 2'000'000, then it starts getting some attention.
TB 42	So, these are the five aspects in terms of the process constellation that are relevant for board members or the people that you have to report to: the importance of the project, the size of the project, the complexity of the project, the accountability of the project and the involvement in level of transparency in terms of the project.
TB 43	I think that one of the key aspects is when you sufficiently explain what you're doing. This allows you to prevent a lot from the problems that you don't always know in advance. To give an example, our CEO informed the press about the internal launch of streaming platform because he didn't receive sufficient explanation of it. Once this is out, it is out and there is no taking back.
TB 44	So, a restriction list as well towards the management is crucial. So, this means, that you have to explain the consequences before. Meaning when we are launching a brand new product, something we have never done before, we cannot expect to launch exactly on time. Because if we do this, we will jeopardise the quality and on top of that we will jeopardise the first impression that people will have of your product. This could mean that some people will not give a second chance to the product because the market is extremely fragmented now.
TB 45	The underlying requirement, so that everybody knows what they have to do, is to have an open and transparent communication. This is the underlying structure. Because without this

	structure you don't achieve anything as far as I'm concerned. Besides that you need some frameworks like the "RACI matrix" with the patterns "responsible", "accountable", "consulted" and "informed". This is important because otherwise people will overstep and they think that they have a contribution to make, even if they don't.
TB 46	You can explain the stakeholders with the RACI matrix from a governance point of view that on this project they don't have a say. As people want to be heard and to contribute, with this RACI matrix you will not be mean, you just can show them what has been decided in terms of project governance. So, my point is that some tools helped in providing clarity in terms of rules and responsibilities for everyone.
TB 47	When the project governance is wrongly set, then the wrong people are meddling in, and they can slow down the process. They can put personal thinking into it because they're not experiencing product development processes.
Text block	Interviewee 5
TB 48	Ultimately, there is no right and wrong. The important thing is to decide on a process and then implement it. Every company has a different organisation chart. Ultimately, you have to find the one that suits you and try to define the processes accordingly. However, the problem is that many companies do not define these processes.

Requirement	Characteristic
Project framework conditions	Lifecycle Management
Definition	
Insights from the interviewees on the lack of a formal framework for managing product lifecycles and the reliance on ad hoc decision-making processes involving the assessment of technical constraints, strategic fit and cost-benefit analyses when considering the discontinuation or redevelopment of a product	

Text block	Interviewee 2
TB 49	We do not have a model or framework for a lifecycle that has a name.
TB 50	When we reach a point where we can say that the digital product has a lifecycle, meaning it has a technical lifecycle, then we have to consider in the technical lifecycle whether we have to keep the digital product alive and how long we have to keep the digital product alive. If the existing digital product has to be kept alive for longer than 1 or 2 years, then the question arises as to whether we have to develop this digital product in a new way.
TB 51	"Discontinue" is perhaps not quite the right word for an app, but rather that the version we have has to be replaced by a technical or otherwise new version. On second thought, that's not quite true. Sorry. We have also already shut down apps completely. The reasons for discontinuing the app were that it had technically reached the end of its lifecycle or that it was seen in the budgeting process that it cost too much and that we were no longer able to continue developing the app because it was no longer technically up-to-date.
TB 52	In the case of the meteo app, we wouldn't do a huge ideation now. There, the meteo app would rather be redeveloped, because we would be at the end of the technological lifecycle of the meteo app.
Text block	Interviewee 3
TB 53	We don't have a specific framework for lifecycles. But of course, we look at our products and focus on a certain lifecycle management.
TB 54	When a product has reached the end of its life, a decision is made at that time, depending on the extent of the problem, then together with the management to discuss how to proceed with the issue. Last year, for example, we out-phased a video player and replaced it with a new one. At the beginning, we had to go through a process that involved the management to decide whether we wanted to replace the old product, the video player, with a new video player, a new product. Another reason of replacement, however, was the provider of this player, as the cooperation had not been entirely optimal for us. The reason for replacing the video player was therefore on a technological and partnership level.

Requirement	Characteristic
New product development methods	Hybrid development (agile + waterfall)
Definition	
Insights from the interviewees on the challenges and complexities of implementing hybrid project management approaches, particularly in terms of balancing the need for transparency and predictability with the flexibility and adaptability of agile methodologies, as well as the potential pitfalls of misaligned processes and resource constraints	

Text block	Interviewee 4
TB 55	As soon as you reach a critical size and critical complexity, you can't really go around of implementing a hybrid approach.
TB 56	So that the agile part of it, where you are working is sprints is not telling the management where we are in the project in terms of stages. And questions will arrive like "Are we on time?". So, you need to combine both aspects, meaning waterfall and agile, to ensure the level of transparency that the board is expecting.
TB 57	Transparent communication is crucial. So firstly, having a deep understanding of what both methods, meaning agile and sequential, are. That means also educating your top management because they maybe only hear the word agile and then think that you can change quickly but they don't know exactly what agile means. Many of the of the management people they have had a very long career sometimes and they had these stage gate project approaches, and they are convinced that this works well.
Text block	Interviewee 5
TB 58	The hybrid process scenario is not ideal in our company. We have two scenarios (pure agile and pure waterfall).
TB 59	The problem is that we have a small IT team and that all our different teams, meaning the editorial team, the marketing team, and the product team, need technical resources. That's why there are always conflicts. Sometimes the IT employees are dedicated to a project, in which case the agile processes work. However, if this is not the case, then you slip back into the classic waterfall principle. This is our current situation.
TB 60	There are two possibilities for agile and sequential processes in a company. The first option is to work in a project purely according to one principle, that is, agile or incremental. The second option is to separate the agile and incremental principles from each other in the new product development process so that the two principles do not interact with each other. This means that the two principles must not be applied together to the same people in the same project step. This is because if someone in the project works purely agile and the other person with a pure waterfall principle, then it becomes very inefficient. In such a case, the waterfall principle would have a negative impact on the agile principle. However, it often fails because a company has not enough resources, so that nothing is shared. This is also the case with large companies such as Google.
TB 61	I think the biggest risk with hybrid approaches is that some projects run separately from product development. For example, if you introduce new subscription software that has always been part of marketing but interferes with the core experience of the website, this can lead to a waterfall process and block resources. This means that we can no longer carry out our own projects on the website. That's the risk I see. So, in future, everything will have to run via the product itself, because the product is the core experience. This is similar to the structure where we used to link marketing with the 4 Ps. However, this structure is no longer so clearly separable for digital products.

Requirement	Characteristic
New product development methods	Agile development
Definition	
Insights from the interviewees on the preference for agile methodologies in product development, particularly for their flexibility and adaptability to change, but also the need for a hybrid approach that incorporates elements of traditional project management for larger and more complex projects to ensure transparency and effective communication with stakeholders	

Text block	Interviewee 1
TB 62	We basically work according to agile principles.
TB 63	For overall product development, we apply influences from different areas. Everything happened on different product development cycles, from ideas backlog to discovery phase and delivery phase.
TB 64	If we go to a deeper level, we use an ideas backlog. This means that every idea that comes from somewhere, be it from us or from other stakeholders, goes into a backlog, which then has the status "idea". Someone then takes an idea and briefly checks it for initial factors such as "what problem is the idea trying to solve?", "what is it about?", "what is the goal?", "what are the hypotheses in it?" or "have we done something like this before?", "does it somehow fit with our user research?" or "is it a small or a big development idea?". The rule of thumb is 1 hour. Sometimes it's quicker, sometimes it takes a bit longer. This idea is then presented to the whole product team and challenged by everyone. The idea is that we "tollgate" it and decide whether we take it over to the discovery phase.
TB 65	The discovery phase is about developing the idea further and turning it into a concept or a possible product or feature. It is also about testing it in all possible ways, for example with user tests. Sometimes it can also include an implementation. During the discovery phase, the aim is to collect as much data as possible to evaluate whether the original idea works at all.
TB 66	The delivery phase is about how something can be implemented. The delivery phase is not just about programming, but about conceptualising the idea in more detail, working it out to find out how something can be implemented, where the design and user flows also play a role. We also have many products that are not technically developed. These are more editorial concepts. That means that the delivery phase is not purely technically bound.
TB 67	If it becomes clear that it is worth continuing with the idea in the discovery phase, then the whole thing moves on to the delivery phase.
TB 68	My personal attitude is also that in all the agile thinking, the outcome is before the process. So, in the sense of, too much process, partly kills certain things.
TB 69	So, let's say we want to make a new website. Then the development itself is agile and step by step and it is always evaluated whether something needs to be adapted. So, we are very flexible on a small scale.
TB 70	We have also tried to develop large products in an agile way. This was also tried once in a team. The Scrum team took care of a product backlog and wanted to develop a large product. The problem was that the communication with the stakeholders was insufficient and there were no reliable timelines. For example, when it comes to an internal tool that is used by many people internally, then it is mandatory that there is clean communication and it is cleanly planned. Because the success then partly depends more on the training than on how good the tool itself is. That's why sometimes it's exactly the right thing to really work with a project management. Agile processes are simply not project management.
Text block	Interviewee 2
TB 71	We had the feeling that agile was good and worked with different teams but realised that we had to start scaling. This is because teams alone are not enough, as there are many requirements that we must consider. There is not just one app, but there is a need to do X in one app and Y in another. The same goes for the website. The question then arose as to how we could get all of this under control.
TB 72	In the preliminary process, meaning before the implementation, we do ideation and conduct surveys with customers. However, it is not systematic and every app is different because every challenge is different.
TB 73	The part with ideation, although this is not optimal in our case, can also be taken before, in other words before we have a change project. Within the initiatives we have goals, and we want to sharpen the goals along the way. In this context, we also do ideation and try to get a better grasp of what we want to do with it.
TB 74	At some point, however, we reach the point where we say that the project is now mature enough to move on to implementation. Then there is big room planning. In this big room planning, there are roles that ensure that the initiatives are broken down into work. This work is planned like in sprint planning. Therefore, we cannot do different initiatives at the

	same time. The entire new product development process therefore starts at the very beginning.
Text block	Interviewee 3
TB 75	You must have an idea and a kind of business case and know what you expect from it. But then the approach should be agile and lean, step by step.
Text block	Interviewee 4
TB 76	One of the key requirements is the size and the complexity of the project. For a small project that is not complex, you would not go into a hybrid model because you can do it quick, meaning agile. You don't have any milestones.
TB 77	Of course, some companies will do only the stage gate part of it and say, well, we don't do it agile, we just do it like this. But I think this time is over in most companies because everyone recognises the advantages of Scrum and working agile. This means, adopting the agile methodology in terms of having quick iterations, and therefore getting better by iterations and then doing quick validations.
TB 78	Agile brings you an incremental progress and that you can do quick decision makings. So, it allows you to recognise change because the last thing that you want to have is a clear process but when you need to change something that you need to get it validated by 4 persons. That will hinder your fast development approach
Text block	Interviewee 5
TB 79	In our cross-functional team setting we conceptualise the topics together, and we always have epics. Epics are the bigger topics. These epics then have sub-tickets. As soon as the design is finalised, IT gets involved, continues working on it and returns the developments to the design team for review. So, we are becoming more and more agile, but we are not yet perfect.
TB 80	When it comes to product development, we have our own web platform, meaning where the articles are displayed and how the customer journey looks on it. Here we work in an agile process. This means that we have two-week sprints where we drive our product roadmap forward.
TB 81	In future, however, we would like to change everything to agile processes. This means that even licensed systems such as the CRM system will be part of product development rather than marketing, because these systems influence the product experience. As I said, however, we are not there yet.

Requirement	Characteristic
New product development methods	Waterfall development
Definition	
Insights from the interviewees on the historical shift away from traditional waterfall project management towards more agile and iterative approaches, recognising that waterfall methodologies can still be used for certain types of projects, particularly software renewals or complex technical implementations where a more structured and predictable approach is preferred	

Text block	Interviewee 3
TB 82	Historically, we had big waterfall projects for new products that had the biggest possible big bang at the end. We have now realised that it doesn't work like that in the technology world.
TB 83	So, whenever a new idea comes up, first a business case is created. And then a certain committee decides, usually with the involvement of the management, whether this is a topic that should be pursued further.
Text block	Interviewee 4
TB 84	In projects, where the management gives you the permission to decide yourself what you are doing with your budget, there is not a purely waterfall stage gated project where you have the ideation, the case, the development, the testing and furthermore some iterations as in a hybrid model constellation and then the launch. So, this means that we do everything we want with our budget and we think we know exactly where we are heading with this.

TB 85	The more you try to have some kind of sequential approach, the less agile you are. Meaning that the process becomes a waterfall-oriented process.
Text block	Interviewee 5
TB 86	When it comes to replacing software, such as a paywall system, the Salesforce Marketing Cloud or the CRM, we work in a classic waterfall approach. In other words, with a project lead, the system is introduced and then we write an IT ticket and IT tells us how much time is needed to handle the ticket.
TB 87	However, when it comes to developing our website in an agile and user-orientated way, meaning that we ask ourselves when bookmarks are used or when we need to change the article format, we tend to be reactive. This is because we sometimes fall into the waterfall method trap instead of working in an agile way and are therefore not as fast as the others. A big topic for us, which can also be seen as a digital service, is the login. This makes it possible, for example, to personalise better or to use content across platforms. This is a service, for example, that we have not integrated now for various reasons, such as complexity and uncertainty and whether it is really a real user value.

Requirement	Characteristic
New product development methods	User-centred process methods
Definition	
Insights from the interviewees into the selective and situational use of user-centred design concepts and the varying degrees of customer involvement in the new product development process, often focusing on a problem-solving approach and adapting methods to specific project requirements and contexts	

Text block	Interviewee 1
TB 88	The approaches we use are inspired by user-centred paradigms, but we don't use a fixed paradigm of them. We are very situational in our approach.
TB 89	What we don't do, for example, are fixed design sprints. We know these frameworks, but we prefer to identify the appropriate approach from problem to problem, because we don't believe that one process solves everything.
Text block	Interviewee 2
TB 90	We don't do design thinking during development because we've already got the information together. In the whole new product development process, my UX colleagues would say at best that they are using a user-centred paradigm, but I say no.
TB 91	So, with the news app we would be more in the research area in relation to customers. Although I don't think design thinking was used in the development of the current news app either.
TB 92	It can also be the case that design sprints are carried out with the inclusion of SAFe if we are still very uncertain.
Text block	Interviewee 3
TB 93	Yes, we use design thinking, but as I said, more with internal stakeholders. For example, we look at what a solution could look like to come up with an initial solution proposal. But this solution proposal is then verified by the end users.
Text block	Interviewee 4
TB 94	Let's say you think, OK, I need to launch a new news app. And we only had newspapers, no digital version and digital is picking up and therefore we see that we need the digitised version of newspapers. So then at the ideation phase, you know what you want, which is to digitise the version of my newspaper in a user-friendly way, so that also my 90 years old readers will be able to understand and be able to use properly. So that's kind of the ideation part. So, in this case the questions arises if you need external people with whom you are going to co-create. I would say as far as your vision is crystal clear, maybe you will not need the external people to co-create, but in the development phase for sure. This is because if you have been confident enough in the ideation phase to do it without external people, then in the development at least you have to do it to validate your assumption. The question then of course is, if it is already too late. Did we lose too much time? Did we go completely in the wrong direction? So, at the end it is all about, how fast do you go from start to MVP. And

	again, here we go back to the project size and to look at the complexity of the project. If you're launching something really big, you want to check in the ideation phase if everything is going the right way. That can also be not by involving external directly, but by commissioning research services, because with research services it's still about checking. So, I think research anyway is part of what everyone should do. We have done it as well and that should always be there.
Text block	Interviewee 5
TB 95	No, we do not use customer-centred frameworks in detail.
TB 96	We use elements from design thinking and have UX research, but not detailed customer-centred processes where we have a user or customer involved from start to finish in every product development.
TB 97	I think it is important to know who the customer is for whom you are building a product or service. But I can't judge whether you must integrate the customer into the entire new product development process. For certain phases, however, it definitely makes sense to involve the customer in the development of new products.

Requirement	Characteristic
Cross-functional interaction	Functional roles
Definition	
Insights from the interviewees on the challenges and benefits of cross-functional teams in product development, emphasising the importance of clear roles and responsibilities, effective communication and shared accountability to drive innovation and achieve successful outcomes	

Text block	Interviewee 4
TB 98	You can have a cross functional team as well for the ideation. Some companies like us, they don't have an ideation team, so those companies start putting people together. And those people together, will be doing the ideation.
TB 99	The first of three problems with cross-functional teams are, the communication issues, so maybe not clear roles, and responsibilities in terms of who does what, who is deciding who is owning, who is providing just input, who is controlling, who is just being informed. This is absolutely a source of conflicts and challenges.
TB 100	It would not make sense to have a list where you define a goal for each cross-functional team during each process step. Ideally it should be clear enough for everyone also because otherwise you have a huge administrative burden on your project. The process needs to be self-explanatory, otherwise it means that it is badly done. So, your project documentation needs to cover part of it, but nevertheless it needs to remain clear what is expected of every cross-functional team member.
TB 101	Customer interaction is a duty between the product owner and the customer team, all the B2C teams. Most likely it is a shared responsibility between both.
Text block	Interviewee 5
TB 102	In the media industry, the editorial department is also a major risk. Editorial staff can write and produce articles perfectly, but they are still print- or desktop-orientated and not yet mobile-orientated. This cultural shift into the product development world is therefore very stressful.
TB 103	At the beginning of 2023, we created new cross-functional teams. We now have 4 cross-functional teams. Each cross-functional team has a team leader who represents the product manager. The cross-functional teams are organised along the customer journey. The first mission focuses on making people discover our media company and fall in love with the brand. The second mission focuses on subscribing. The third mission focusses on ensuring that customers stay, namely customer engagement. The fourth mission focusses on increasing consumption with our media company.
TB 104	It is also very important that every team member of a cross-functional team sees the ownership in themselves so that they push their area of expertise. This is important so that

	the product manager doesn't have to go to marketing and tell them what to do. It is precisely this ownership of the team members in a cross-functional setting that we want to drive forward.
TB 105	We conduct qualitative interviews with UX researchers. UX research works with customers on a qualitative level. The data analysts work with customers on a quantitative level.
TB 106	Today, the roles are implemented in such a way that the UX designer puts together everything that needs to be done together with the product manager. The UX designer looks at the UX research and the product manager makes sure that everything makes sense conceptually and is aligned with the business. Then there is a Jira ticket and then this ticket is handed over to IT and IT then implements everything in the delivery phase.
TB 107	In the long term, however, we want the IT team to become an active co-creator and not just do the implementation and indicate what works, what doesn't and how long it will take. We don't believe that we can drive innovation with reactive IT team.
TB 108	At the moment, as product manager, I handle the tickets in the delivery phase. As a product manager, I therefore have both a management and an operational role. However, this should change in the long term, so that a junior product manager is also hired to take care of the delivery phase. However, this is not yet possible in terms of budget.

Requirement	Characteristic
Cross-functional interaction	Team efficiency
Definition	
Insights from the interviewees on the challenges associated with cross-functional teams, including communication issues, different work cultures and mindsets and potential conflicts in team dynamics, and the importance of clear communication, well-defined roles and responsibilities and strong leadership to overcome these challenges	

Text block	Interviewee 4
TB 109	The second of the three problems with cross-functional teams, are the work cultures which can be a big challenge. This is because, if you are in a young agile team or you are trying to be agile and then you work with very established teams that have had a lot of experience but maybe this experience is in the non-digital field, the work culture can also not be the best at first because you just talk a different language. So, this can go back to the communication point as well, but I mean it more in sense of work culture and mindset.
TB 110	The third of the three challenges with cross-functional teams is, the team dynamics. Because everyone is a human being in this company, and you can have different dynamics in the team. You can have different types of leaders in cross-functional team, we are acting in different manners. Some can be very assertive. Some cannot be super collaborative. And that can also provide some challenges, because sometimes one team is in charge but another department is also taking part in the process and the leader is so assertive and so bullish and so strong in his ideas so that this can make the people from the leading team feeling a bit like, that this person from the other department is trying to tell us how to do it, whereas we are in the lead. So, these are the three things for me that are most often providing the biggest obstacles.
TB 111	Briefly summarised, open, and transparent communication is the underlying basis. And above that with tools you already define well enough the rules and responsibilities that already prevents a lot of the communication issues. Again, there's still the human factor, and sometimes there is no connection between the two people, and it's complicated.
Text block	Interviewee 5
TB 112	The most important thing is to have a concrete goal, meaning a goal that all cross-functional teams understand. You can only derive this goal if you have a corporate strategy, because otherwise you are making product development in a blind way. In certain aspects, we even do in a blind way.
TB 113	Before we had these 4 cross-functional teams, there was a Chief Product Officer and product

	and design teams were attached to him. There was also a Chief Technology Officer and the developers and product owners were attached to him. Due to cutbacks, the product managers were then moved to the commercial department, which means to marketing. But then we realised that we weren't going to get anywhere that way.
TB 114	The aim is to bring the trio of technology, design, and product management closer together in a more agile way, because that's what you need to build and launch a product. Thereby, UX research, data analysts and marketing are simply nice to have. But without UX research you don't know whether you're solving a problem, without data analysts you can't confirm the outcome and without marketing you can't spread the product. But ultimately, to build a product, you need technology, design, and product management. So, the core team consists of people from technology, design, and product management.
TB 115	Every mission, or rather every cross-functional team, has a weekly meeting. IT is also always present at this weekly meeting. However, this meeting is not a classic stand-up. As team leader and product manager, I give an update on what's going on at the moment, what other initiatives are in the pipeline and what could come top-down. At the same time, we look at what we want to achieve for our mission. We want to discover new target groups and think about what products might make sense.
TB 116	When we work on product development, there is always a Jira or story ticket. These tickets are always structured in such a way that the motivation is described, in other words why something is being done, the requirements are listed and the acceptance criteria are defined. The developer then develops the descriptions in the ticket, which then has a quality and assurance person who checks whether all acceptance criteria are met. If an acceptance criteria is not met, it is commented, and forwarded to the product manager. The product manager then decides whether we should postpone development until the acceptance criteria has been met, whether there is an alternative solution, or whether we should go live despite this unfulfilled acceptance criteria and solve this acceptance criteria later. However, critical issues always go to the steering board because we also want to protect ourselves.
TB 117	The topic of cross-functional teams is fundamentally a rather new topic, which means that this research will be a new addition to the research literature.

Requirement	Characteristic
Cross-functional interaction	Dependency between teams
Definition	
Insights from the interviewees on the challenges of achieving full agility in larger organisations due to the need for cross-functional collaboration and shared resources, which can lead to prioritisation conflicts and a partial reliance on waterfall processes	

Text block	Interviewee 1
TB 118	I think the difficulty with new products is that if you don't want to be dependent on other teams, you have to start very small. But if the goal is that the product has to be very big and successful on the market, then you have to work with other teams.
Text block	Interviewee 2
TB 119	We have to synchronise, because we don't have teams that can be completely independent, and we can't divide ourselves into pure feature teams. We are simply too big an organisation for that. Many things that are needed in one app are also needed in another app. For a video app, for example, you need video editors.
Text block	Interviewee 4
TB 120	So, when you start with a new project and you do therein the project setup, you will show your timeline and you will show which departments are affected. And during this project setup meeting someone needs to explain what will happen and what are the key validation steps from every department, so that those departments then can take over.
TB 121	Brainstormings in the team is also where you start to have the cross functional teams that evolved from several departments that are chiming in. Because you think you have an idea,

	and, as less clear the idea is, the more important it is to gather feedback from various units to actually build something together. This is because it will also be easier to drive the idea forward when more people and more departments have contributed, because then they will onboard on the idea. In this case they feel like co-creators and therefore they will be engaged.
Text block	Interviewee 5
TB 122	In an ideal world, each of these cross-functional teams would have one person dedicated to just one mission, so we would have a full focus and could be completely agile. However, we are not that big, which means that often the cross-functional team members who work in mission 1 and 2 or 3 and 4 are the same and share the tasks. Certain people who come from IT also have to work on other projects, such as changes to the CMS for journalists. Therefore, we always have to prioritise in the end, which then throws us out of the agile setting and we then fall into a waterfall process due to other departments.

Requirement	Characteristic
Cross-functional interaction	Team structure
Definition	
Insights from the interviewees on the importance of cross-functional teams in product development, particularly in fostering collaboration, aligning different perspectives and ensuring the successful delivery of projects, while also recognising the challenges of coordination, communication and the need for clear roles and responsibilities within these teams	

Text block	Interviewee 1
TB 123	A website development, for example, needs a big timeline. So, for example, advertising and marketing also need to know which campaigns they are doing. That takes several months to prepare and as soon as these dependencies exist, it is imperative to have a project management, also with regard to the go-live date.
Text block	Interviewee 2
TB 124	It may also be that up to the implementation phase, product teams are also working, which are not necessarily development teams, which means scrum teams. These product teams would be, for example, UX teams, business project managers, business owners of the initiatives. These teams work together to find out what it is all about and what exactly the organisation and the users want. These teams may also work in iterations. Therefore, it can sometimes be a parallel process for the previous phases of the initiative. In these previous phases, other people may be involved than in the implementation.
Text block	Interviewee 4
TB 125	So cross functionals teams means that you have a team that's made of different departments.
TB 126	Netflix for example, they have 1500 developers. But here we are speaking about the cross-functional teams. This is where you start to create the core team and maybe you'll have a head of product, a product owner, a software developer, a person who is closer to the end user, a graphic designer in this team. Whoever is in there depends on the size and depends on what your product is trying to achieve.
TB 127	So I will take quality control of the product testing as an example for cross-functional teams, because for the whole NPD process I would maybe need 10 different product teams. So first, you want someone that is very closely synchronising everything, so that would be the product owner. Then you need to have a software developer who has really deep understanding of technical functionalities. Maybe the product owner could do this as well. So that he knows, where the feedbacks belong from a technical point of view. Marketing could be important to some extent as well if it is a B2C marketing. And for sure somebody from the editorial team, because at the end of the day, the editorial team is doing the content on a news app and they have a feeling of what is good or bad. So somebody from the operational team as for example the Editor-in-Chief. Moreover, it is important that you receive direct feedback from the members in testing groups where they are working with

	quick feedback loops. So, the point is not to write everything down and then talking to all departments because otherwise you won't have a quick feedback loop.
TB 128	The product team has the right people for quality control. The right setup of having the right people in the right circles, having the correct roles and responsibilities is one of the key success factors in the project. The wrong set up here can kill your product, your project and your timeline. It can really kill it, so this is quite crucial and the cross functional teams as well. I can't tell how the ideal team is set up because it really depends on what kind of projects you have.
Text block	Interviewee 5
TB 129	We currently have cross-functional teams. This also includes people from IT. However, this is not ideal at the moment. IT is also integrated in the discovery phase. Before the implementation of cross-functional teams, IT was separate. This means that the IT department was briefed, and they then delivered.
TB 130	Exactly, it depends on the initiative who is involved, but it can be that everyone, meaning UX researchers, data analysts, people from marketing, people from the editorial department, product managers, product owners, designers, and people from IT, is needed.
TB 131	This means a UX designer, a UX researcher, a developer, sometimes a product owner, people from marketing, people from the editorial department and people from the data department.
TB 132	Even though we are not yet fully where we want to be, we are now in a phase where we expect IT to be proactive, which means that they are involved in brainstorming and know what is happening in UX research. We have not yet fully arrived there because this means a change. So, if the IT team has been working according to the old scheme for 6 or 7 years, it's difficult to change immediately.
TB 133	We have test persons in the IT team for quality assurance who check if a developed solution works technically. These testers and a few developers are outsourced to Ukraine. This is already a long-term partnership and counts for us as internal employees who work in Ukraine.
TB 134	Due to the reason, that the product is often defined by the content as well as the platform itself, we've put together the four cross-functional teams, where technology, marketing and editorial are represented and everyone is involved. The steering committee is composed of the Editor-in-Chief, the Chief Commercial Officer and the Chief Technology Officer, to whom the four team leads report once a month regarding the approval of the roadmap.

Requirement	Characteristic
Testing methods with customers	Smoke Test
Definition	
Insights from the interviewee on the use of smoke tests to determine user interest and behaviour, including for products or offerings that are not yet available, and the importance of maintaining positive user relationships during such tests.	

Text block	Interviewee 5
TB 135	To analyse the briefing newsletter, we carried out smoke tests and showed newsletter subscribers offers that we don't even have. People who responded to the smoke test were then told that it was just a test, but that they would receive a gift so that they wouldn't be annoyed.

Requirement	Characteristic
Testing methods with customers	Surveys
Definition	

Insights from the interviewees into the different methods used to gather user feedback and conduct market research, with a focus on surveys, and the importance of recognising potential biases and limitations in these approaches.

Text block	Interviewee 1
TB 136	But usually we try to do surveys directly about the product. That means on the site itself, a push message in the app or via newsletters or something like that.
TB 137	A big difficulty with user testing or surveys is that it has a certain self-selection, unless you do totally representative surveys. The people have to want to take part in the user testing. There is always a bias towards highly engaged users or users who have a strong opinion. With these users, it is simply important to classify these opinions according to their representativeness for the overall user community. A good example of this is comment writers. A lot of people read comments, but very few people write comments. If, for example, comment writers write that they absolutely have to have feature X, then we know that this opinion is in the single-digit range of the overall user community.
TB 138	In the discovery phase, there are many different ways we do this. On the one hand, we have very classic market research. We conduct quantitative and qualitative market research ourselves.
Text block	Interviewee 2
TB 139	We have both ways to conduct surveys in our channels, meaning online and offline. We have also done online-only tests but without any of us being there. So we just saw the results afterwards.
Text block	Interviewee 3
TB 140	User interviews are also used in development.
TB 141	We do the surveys directly via our products. In other words, we display the surveys directly on our products and ask the users directly whether they have 5 minutes to take part in a survey, for example.
TB 142	In an online survey, the feedback is then consolidated and processed. With classic user interviews, the UX team makes an evaluation, consolidates, and interprets and then sometimes makes a recommendation. Sometimes you can directly take a topic that comes up in the surveys or user interviews and then implement it. Sometimes everything is fine and the results from the surveys or user interviews are parked.
TB 143	We do online surveys with market studies, where you ask potential users.
Text block	Interviewee 4
TB 144	But one thing I wish is that we had more budget for even testing features with external user groups. However, right now it is not the case.
Text block	Interviewee 5
TB 145	It depends a little on which problem you are solving in the discovery phase. Like a scientific paper, we have qualitative and quantitative approaches.
TB 146	For example, we have NPS surveys.

Requirement	Characteristic
Testing methods with customers	Group work
Definition	
Insights from the interviewees on the limited and selective involvement of customers in the ideation and brainstorming stages of product development, often preferring to involve them at later stages for feedback and validation of concepts or features, and the realisation that directly involving customers in ideation can be resource intensive and does not always lead to implementable solutions	

Text block	Interviewee 1
TB 147	I am relatively sceptical about the very innovative approach based on brainstorming. We just had such a project where we evaluated a new product. In the end, however, it failed due to financial feasibility. The danger is that when you start something new, you quickly get lost in

	“wishful thinking”. There is usually a kind of “hype” and you think that the new product is great and then don’t even notice that you inevitably don’t solve the customers’ problems.
TB 148	We also have a Lab for one of our newspapers. There we have a group of highly committed users via different profiles, with whom we meet in person 4 times a year. Then we hold a workshop for 2 to 3 hours and pick up certain topics. We have worked a lot with readers. Readers can give us a lot of insight into their needs, what they need, how proposed solutions affect them and how they judge concepts from us. But what readers can’t do is generate solutions. Because that is sometimes a bit of a fallacy, because if you ask them how they would solve something, for example, they start to become aware of the limitations themselves. So, for example, if you do X, then Y doesn’t work anymore. As soon as they get into this process, you lose all the input you wanted to have. Basically, the task should not be for customers to find the solution, but to challenge our solutions or our hypotheses and give us insights.
Text block	Interviewee 2
TB 149	We have not yet reached the point where we invite customers to our offices for brainstorming sessions or to prioritise individual features.
Text block	Interviewee 3
TB 150	So not to the extent that we do a workshop with end users.
Text block	Interviewee 4
TB 151	It could be the case of inviting customers for workshops when you are talking about a new feature development but not a new product development. For instance, if you think that a voice command of your streaming app would be good but nevertheless you are not sure, if this really is needed. Here user interviews or surveys can take place. Or having them coming in and having a chat. Or just by sounding your own network. All of these things are kind of providing valuable input.
TB 152	What remains rare is the actual involvement in the ideation process of people sitting at the table saying that something could be an idea which has nothing to do with your company. This is something that you can do if you have a lot of money and a lot of time in your ideation process.

Requirement	Characteristic
Testing methods with customers	Prototyping
Definition	
Insights from the interviewees on the diverse use of prototypes in the product development process, ranging from paper-based and clickable prototypes to programmed and even live implementations, primarily for user testing, usability evaluation and validation of product concepts and features.	

Text block	Interviewee 1
TB 153	For user interviews we usually have prototypes.
TB 154	Partly we make paper-based prototypes, partly clickable prototypes, partly we work with 2 to 3 images, partly they are programmed prototypes and partly they are even live implemented.
Text block	Interviewee 2
TB 155	Perhaps there is already a development in the ideation. For example, with prototypes or to check whether the project is realistic at all.
Text block	Interviewee 3
TB 156	When it then goes into development, it depends on where you are with the product or with the feature and what assumptions or risks you have and how you want to validate them. So it can be that you first make a click dummy, a prototype. That’s what we do in the “figma” software.
TB 157	Our UX experts use prototypes to test usability to see whether the user understands the design or finds it attractive.
TB 158	Mostly we use prototypes to verify product content with customers.
TB 159	If we find out in prototypes that we have made major errors in thinking, then we iterate and see how we can improve it.

Text block	Interviewee 5
TB 160	In the discovery phase, for example, we could realise that customers no longer just want to read news. Then we go into user research and find out that customers are more interested in optimising themselves by reading articles on how they can eat more healthily. We then use these user research insights to build prototypes for new product features. These product features are then tested and launched. So, we are very agile in this respect.

Requirement	Characteristic
Testing methods with customers	AB-Testing
Definition	
Insights from the interviewees on the use of AB testing and beta prototypes in the delivery phase to gather quantitative data, measure user reactions and validate assumptions about product features and functionality, enabling iterative improvements and informed decisions.	

Text block	Interviewee 1
TB 161	What we don't do much is build something from scratch to be able to test it, unless we develop it one way or the other, then it's beta prototypes. But then it's more about how something should work. That means more technical and usability questions. These prototypes are then AB tests. In the delivery phase, this would be user testing, meaning more application-based questions, such as functionality or usability of the product, which are adapted with the new findings for the product.
Text block	Interviewee 3
TB 162	We then test on the web app and can also measure this. We work with AB tests or tracking, for example. We can then see whether our assumptions about how the user reacts are true or not and can then iterate very quickly. We do this until we have a solution that we say fits and then adapt this solution to native in the mobile app.
Text block	Interviewee 5
TB 163	For example, if you see on the website that a section is not working well, then you can test this quantitatively using AB tests.
TB 164	We also carried out AB tests to analyse the briefing newsletter because we knew that the briefing newsletter alone would not be able to justify subscription prices, but that we would have to combine it for example with articles. The AB test enabled us to determine the perfect number of articles for this product after two months. So, we only tested this with the briefing newsletter audience.

Requirement	Characteristic
Testing methods with customers	Usability evaluation method
Definition	
Insights from the interviewees into the different methods used for user testing and feedback gathering, mainly focussing on usability testing, to gain valuable insights and validate product concepts and features.	

Text block	Interviewee 1
TB 165	We also do usability tests with our readers in the discovery phase. This can be done directly with the readers or via online portals or surveys where certain things are asked. Partly we do this internally, partly with external customers, because certain usability topics can also be done internally, because the employees are also users of software products.
Text block	Interviewee 2
TB 166	During the development of the current app there was a great exchange with the customers and many studies were carried out. If I remember correctly, customers were also invited and certainly many UX tests were carried out. What was surprising was that the customers didn't want so many new things. It was less about features and more about content.
Text block	Interviewee 3

TB 167	So, with our mobile apps and web apps, for topics that we are not sure if the solution will work and if it will be understood by the users, we go to the web app first, because we are faster with the web apps. With web apps, for example, we don't have to wait with the publishing process in the app store and can therefore publish something more quickly.
TB 168	Our UX team also does regular usability sessions, if I remember correctly, every 2 to 4 weeks, where users are invited remotely. Various questions are then asked. Some of these questions are general about the product. Sometimes these questions are about certain use cases or features that you want to dive into specifically. These would be qualitative surveys.
Text block	Interviewee 4
TB 169	With the external group you will have a pair of fresh eyes that has nothing to do with the product and that they don't even know for what they are testing. And with those people you can analyse their behaviour. For example, what are they doing at first, are they clicking, are they scrolling, do they get bored of the app? So external people are extremely important. Do they scroll?
TB 170	But and this is very important, for products, which are already existing and are getting updated with new features and so on, we reach out to our users and want to receive feedback. So, they can test and provide us feedback so that we can factor in that feedback and that is very important. So, then you basically also need to teach them, because it means giving them access to a staging environment, not to the production environment. I would like to have that everywhere, but for budgetary reasons, it's not always the case.
Text block	Interviewee 5
TB 171	When we launch a new product, we also work with evaluation surveys, where we try to involve 100 to 200 users.

Requirement	Characteristic
Testing methods with customers	Testing with Internal stakeholders
Definition	
Insights from the interviewees on the importance of conducting internal and external user testing during product development, with internal testing often used for early-stage feedback and troubleshooting, while external testing provides a more objective perspective on user experience and product-market fit, although cost considerations may influence the extent of external testing.	

Text block	Interviewee 1
TB 172	In large projects, we try to start as early as possible by adapting products through new discoveries. First internally, with the aim of fixing obvious bugs before we test with the users. Then, from bug to bug or feature to feature, it's important to find out what the importance is and how it can be implemented. We have also postponed go-live dates because certain things were not good enough. In other cases, we've decided that we'll include certain points, but they're not important enough for the overall user community.
Text block	Interviewee 3
TB 173	We only do ideation with internal stakeholders.
Text block	Interviewee 4
TB 174	You always have an internal and external part and then you're trying to take that feedback together. So, the internal user group is testing as well and giving feedback.
TB 175	The honest answer is that we are doing user tests it more internally than externally. For cost reasons, we sometimes take internal user groups. In this case, somebody needs to design the internal testing group. And if possible, these internal testing groups in the media company should be as far away from the actual product as possible. So, that these people are like someone you would ask on the street. Because this is what you are trying to achieve. You don't want to have people in your internal digital division taking all the decisions and bringing all the feedback and the inputs.

Requirement	Characteristic
Testing methods with customers	Social media

Definition	
Insights from the interviewees on the cautious and selective use of social media for customer surveys, recognising its potential but also highlighting concerns about representativeness and the need to match the social media audience to the product or service being evaluated.	

Text block	Interviewee 1
TB 176	Social media is not representative. We do surveys on social media when we feel that we are reaching a user group.
Text block	Interviewee 2
TB 177	No, we did not use social media for customer surveys. Maybe no one has ever thought of using social media for customer surveys. Or it could also be that our social media channels are already very specific. I'm not so sure whether the social media channels really fit with the target groups.
Text block	Interviewee 3
TB 178	Certainly, social media is not used enough for surveys. But I cannot say for sure that social media is not used for surveys at all.
TB 179	On social media, you usually have a different target audience. So, if you say as a company that I am not interested in this target group for the specific case, then it makes less sense. But if you see that the target group on social media is the potential target group for the specific case, then it makes sense again. You just must be careful not to mix up the results and be aware that the target group on social media may have different needs than the customers we already know for our products. So, in conclusion, it definitely makes sense to use social media for surveys, but it depends on what the goals are from a product perspective.

Requirement	Characteristic
Customer centricity	Market intelligence
Definition	
Insights from the interviewees into the various sources of inspiration and information for product development, including market intelligence, competitor research, industry networks and user discussions, as well as the importance of understanding market trends, cultural nuances and user needs in driving innovation and product success.	

Text block	Interviewee 4
TB 180	We do a lot of market observation in terms of competitive research
TB 181	Thanks to my previous experiences, I have a strong network of other people in similar companies that run VOD services or research and development departments. So, we talk a lot
TB 182	I attend all the trade fairs I can, as for example Dmexco or Mobile World, to see all the trends. Some of those trends are coming from China and some are interesting to adopt, others are not.
TB 183	There is a cultural aspect of it as well. For instance, Switzerland, just like Germany, is one of the most resilient markets for newspapers. They still represent something like, 15 to 20% of the advertising market, whereas in the US it's only 2%. This means that the cultural aspect is very important, which will have an impact on how a trend and how fast is being adopted.
TB 184	So, this competitive research and networking is crucial to keep being updated and being aware of what's happening.
TB 185	After Covid, we come to today's situation, where people are a bit fed up with the accumulation of subscriptions. So, people are dropping their subscriptions a little. This means that we still see people watching TV normally, not even with the replay function, because they also want to be able to consume in a more leaned-back way and not always lean forwards. So, you, I, and everyone has already spent 20 minutes browsing through Netflix trying to find something to watch although they have 25000 titles available. So

	sometimes you just want to sit down and watch something that someone chooses for you because it's also kind of relaxing.
TB 186	At one point we just realised that it would be interesting to launch a gamification extension on our platform. This gamification element means that people are receiving points throughout their activities and then are earning prizes. But this was not integrated on the platform because a user has complaint about not having this possibility. It was integrated because we thought that this is an interesting way to boost engagement. So, the requirement came not from the market, but from us because we wanted to optimise our product, make it more successful, make it more attractive. So, finally it depends. It can be a requirement from the market. But it can also be an internal requirement because we just want to be more successful with our product.
Text block	Interviewee 5
TB 187	A great source of inspiration for services is INMA, the International News Media Association. Most of the major publishers are connected to it and there is a lot of dialogue there.
TB 188	Furthermore, the New York Times is the pioneer of newspapers that have created a business model based on quality content with expensive subscriptions. The New York Times often does things before us that inspire us.
TB 189	The New York Times uses these weekly user discussions for their ideation.
TB 190	The New York Times discusses to 6 users every Thursday morning about any topic. This gives you insights into what people who have subscribed to the New York Times are concerned about. I think that's a very exciting approach that we might be able to introduce on a smaller scale in the future. The problem is that without such discussions with users, you are only researching what you think might be important.
TB 191	I don't know exactly what scheme the New York Times uses to implement the user discussions. But during a presentation, it sounded like they selected 6 users on a new games platform and spoke to them. They ask things like "what does your everyday life look like?" to which the users answer how they integrate the games platform into their everyday lives. With these answers, the New York Times then knows how they can optimise games to drive engagement.

Requirement	Characteristic
Customer centricity	Corporate culture
Definition	
Insights from the interviewees on the importance of a customer-centred approach to new product development. They emphasised the need to understand customers' needs and preferences through various research methods, including user interviews, surveys and market analysis, to ensure the development of products that truly address customers' problems and provide added value.	

Text block	Interviewee 1
TB 192	The development of new products for an app basically works according to very similar criteria. So, you always must start from the customer's need. So, what really needs to be solved? And the need can never be that we need a new app, but it can be, for example, that the customers or the readers have need X and if it then turns out that the best way to satisfy the need is that we must develop a new product, then this would be a whole new project in itself. This project then goes through the same phases again, meaning the discovery phase and the delivery phase.
TB 193	We also have personas that we have created and we also work with the user groups of fög. Fög has 6 different user groups that are representative of the Swiss population. We work with them for new products or in market research. This is because the personas we have are based on our existing users, which are divided according to needs, and for overall market hypotheses or overall market analyses we use the user groups
Text block	Interviewee 2
TB 194	The fact that we now have our own department that has the task of paying attention to customer centricity is certainly already an important step.

TB 195	The integration of our customers' wishes or needs into the new product development process is already a maxim, meaning that new product development should be user-centred. We want to make something that is useful to the users and not politically motivated or that the person with the loudest voice can get his way. We try to think as broadly as possible and understand well what the target group wants. And always along the new product development process.
TB 196	For large new product developments, I would say yes, user-centred thinking is used. For smaller functions, user-centred thinking is not necessarily used, although we now have tools there as well. We have built up a small team, a user group, which can be approached.
TB 197	We are certainly not yet optimally on the road in terms of customer centricity.
TB 198	Not all of our business processes are customer centric. As I mentioned, we are only on the way to achieving this. It is typically the case that when you are in a transformation, you are very busy with yourself. But I think we are on a good path and will certainly get better and better. At least that's what I would like to see.
TB 199	Before implementation, it is more in the context of researching the basic needs of the customers and more the focus on scientific studies.
TB 200	We have our own market research. Market research is very much involved with us to find out what the customer wants.
TB 201	When we create a new meteo app, for example, we know from a lot of experience what users like and what they need. With the meteo app, it would be more about UX testing to find out how to optimise the meteo app. In the case of the meteo app, we wouldn't be doing a huge ideation. We would rather redesign the meteo app because we would be at the end of the technological lifecycle of the meteo app.
Text block	Interviewee 3
TB 202	In general, I see our company as customer centred. But we certainly still have a lot of upward potential in customer centricity. On the product side, however, we have a strong user focus. We also have a strong user focus in the newsroom, where we are very data-driven and data-centric.
TB 203	But we still have room for improvement in customer centricity.
TB 204	In the case of a new business case, the customer is basically already involved through a market survey. Or it is based on user interviews from the past. That is actually the basis for the business case.
TB 205	If you have an idea, you first do a market study and see if there really is an opportunity
Text block	Interviewee 4
TB 206	Users are important partners in product development. As I said before, you have to make sure that you don't build something that nobody needs, but that it really fulfils the right expectations and meets the users' needs.
TB 207	We are digitising everything we are doing because this is the right way and because there is a high fragmentation coming from the users. So, a new type of user needs which wants to consume not only videos, but everything they do at anytime, anywhere on any device for as long and as conveniently as they want. It needs to be fast, reliable, and secure.
TB 208	There are three areas where cross-functional teams and customers will come together. First, research of focus groups. Second, user testing steps, mostly between the product testing and the validation. Third, the feedback sessions or the famous rapid feedback cycles that we talked about from the lean startup method. Again, as I said, due to budget constraints, because it costs money and time to do that at every step, we don't always do everything of the three areas.
Text block	Interviewee 5
TB 209	The problem is that the Swiss media industry is old-fashioned. Journalists are output-orientated and not outcome-orientated, which means that they want to produce content. Therefore, it is sometimes difficult to convince them of developing products. However, the media industry should be more outcome-orientated to understand which new products and which new stories are important based on customer needs.
TB 210	In terms of product testing, many things are simply launched because they are tied to a top-down decision. However, when we introduce new things, we still try to see whether the traffic, conversion or re-engagement has achieved what we set as our goal. If this is not the

	case, then we must think again.
TB 211	We were very successful with this user-driven approach for our newsletter because we were able to build up the reach quickly. This means that people were happy with the new product. The added value of our newspaper was increased because we were able to bring the newspaper to life in a mini format. The links we integrated, which led to the full article in a paywall, were responsible for 15% of all online conversions. That was a big learning for us. If we really understand the customer's problem, then we can create better products.
TB 212	Qualitative approaches are about finding out what the customer needs are, so we do a need-finding study and interview 10 to 15 people. In such interviews, we then analyse the data as in a scientific paper, meaning with codes. The questions are designed to find out the user's problem without creating a bias, so we often don't say which media company we come from.
TB 213	For example, we had a newsletter that only provided a list of the most important articles of the day. However, we found out with the newsletter that people want to know briefly and concisely what happened that day. This with the option of diving deeper into the entire article.
TB 214	We also found out for our newsletter that you don't need pictures. If you write about the EU, for example, and a picture of the EU building or the EU flag simply pops up, it does not help anyone. We used these findings to optimise the newsletter.

Requirement	Characteristic
Customer centricity	Corporate strategy
Definition	
Insights from the interviewees into the varying degrees of customer-centricity in their corporate strategies, ranging from explicit inclusion in vision statements to a more aspirational goal, and the challenges of reconciling user-centred approaches with top-down initiatives and internal cultural norms.	

Text block	Interviewee 2
TB 215	We want to make products for people, that is also written somewhere in our strategy. The implementation is always the most difficult part. But the commitment to customer centricity is present in our company.
Text block	Interviewee 3
TB 216	No, user-centredness is not yet quite so explicitly defined in our corporate strategy, which means that it is included in a statement. It is defined in our OKR, which means that the user is the highest entity. And it just occurred to me that the user is at the centre of our company's vision statement.
Text block	Interviewee 4
TB 217	Where to involve customers into the NPD process depends on three things, the budget, the project complexity and on how clear your vision is.
Text block	Interviewee 5
TB 218	In summer 2024, we would also like to introduce a pricing strategy whereby people choose an offer in the mid-price range. In other words, we will offer an entry-level subscription, a classic subscription, and an expensive subscription, allowing us to pick up the willingness to pay based on customer needs. This is because some people only want an overview, others want more in-depth information and still others want financial reports, which is a niche product.
TB 219	We have a culture of perfectionism. This is also related to our high-quality journalism. And the fail fast and learn philosophy is still a foreign culture for us
TB 220	The ideal case would be that we get all the problems from the customers. However, many initiatives are driven by management.
TB 221	With the briefing newsletter, we were able to find out from our analyses that article subscriptions through the newsletter occur within the first 100 days after newsletter

	registration. After 100 days, people remain in the newsletter, read the newsletter for free, but do not click. These people are therefore not willing to pay, as they have not converted. Using these analyses, we were then able to iterate data-driven and switch off the newsletter after 10 weeks and inform people that they now must pay for the newsletter.

Requirement	Characteristic
Customer centricity	Customer co-creation
Definition	
Insights from the interviewees on the importance of involving customers throughout the NPD process, particularly during the implementation and development phases, to ensure that the final product meets users' needs and expectations, and the importance of selecting appropriate methods for gathering customer feedback based on available resources and project requirements.	

Text block	Interviewee 1
TB 222	Well, of course, the customer is involved, especially in the discovery phase. In the discovery phase, it is based more on basic research.
Text block	Interviewee 2
TB 223	Customers are not asked directly everywhere in the company.
TB 224	We have departments that are not active in digital development, but rather develop content or offers such as audios and videos. Video formats or programme formats have already been developed together with customers or users. So here we are already working very professionally in customer-centricity for new concepts.
TB 225	The customer plays a role in both phases, before and during implementation. During implementation, it is simply much more concrete, because you already know much more and have a more precise picture.
TB 226	We have tried all kinds of things and I think it is always a question of which method is best suited to the purpose or the question. We don't have an unlimited number of resources in the form of people.
Text block	Interviewee 3
TB 227	User interviews are also used in development. But when it comes to see if a product should be adapted, we do it more through tracking and see, for example, how the conversion rate is for the new feature or product. In the end, you involve the customer where you have questions about it.
TB 228	We have also integrated a feedback tool where you can generally give feedback as a user.
Text block	Interviewee 4
TB 229	What is extremely important is to have an external user group that maybe you are paying just to test the developed version of your app. For the external people you need people that have nothing to do with your company. Usually, you pay marketing agencies that find you these groups.
TB 230	The less you incorporate external people or an external test user group, the more likely your product is to fail. This is because you may be launching the product you thought people wanted and needed, but they don't because you were wrong.
TB 231	The first reason why you need external user groups is because you need the validation of your research by the users to know if it is true. The second reason why external user groups are important is that from the time you had the idea for your project and started working on it until the time you tested the first version, a disruptive factor could have appeared on the market.
TB 232	Involving customers early allows you to minimise the process of building something that no one needs.
Text block	Interviewee 5
TB 233	Otherwise, we deal with services from user interactions, where we see what a problem could be and how we can fix it.
TB 234	We want to have regular dialogue with users. At the moment, we only have dialogue with customers as part of product development when we want to officially launch a new product.

TB 235	So in our case external people mostly are involved in the development part. And there you are going to have your rapid feedback cycles.

Requirement	Characteristic
Customer value	Digital service
Definition	
Insights from the interviewees on the increasing importance of digital services in today's market, the challenges of defining and prioritising these services and the need for companies to adapt and innovate to meet changing customer needs and expectations.	

Text block	Interviewee 2
TB 236	The term "service" is now a little difficult for me to understand. If something is important so that the app is used, then it must be clear that this must be part of the app.
TB 237	It is important to mention, however, that we do not develop everything ourselves. For example, we buy push messages externally and then integrate them into our app.
TB 238	Yes, digital services, for example push messages, we do at the same time as the actual app development. Because such digital services are an integral part of the app.
TB 239	I would never separate digital services like push messages from the parallel app development. We are not just making a technical platform, but a product, and everything is part of it, including content, for example.
TB 240	It is worth considering whether a digital service is sufficient for an MVP. In other words, whether it is a mandatory feature for the MVP. For example, we decided that push notifications had to be included as a mandatory MVP feature. However, we then didn't prioritise other digital services in the MVP.
Text block	Interviewee 3
TB 241	For example, a personal consultation would be a digital service for me. So, if you have a hotline and the user can call and receive a service where a person is behind it. Very often, this service is not directly scalable. So, once you have implemented a service, it is then scalable to hundreds of thousands of users. You would need a whole team behind it, for example, to provide a hotline. Or if you have a subscription model, for example, then you also have a customer service, for example, where the customer is specially served. So, for me, these are services. But, as I said, I associate service very strongly with people who provide some kind of advice, support, or something along those lines. This means that such a service is less digitally scalable.
TB 242	So, I also have the question of whether a newsletter is a service topic or a product topic. So, if a user wants to be regularly informed about a specific topic, then a newsletter could go in the direction of service. For me, however, a newsletter remains more of a product topic. But that doesn't really matter, because at the end of the day we want to deliver value to our users.
TB 243	Basically, we want to connect service features that make sense for us and for our users.
TB 244	When this feature comes up, we first look at whether there is only one user who wants it, or whether there are several users who want it. We also look at the opportunity costs for this, which means that if we prioritise this specific service feature, what else can't be developed and whether it fits into the strategic orientation. Of course, we look at the effort involved, so what does it cost to develop this service feature. Therefore, there are many factors that are considered to decide whether this service feature will be developed. Therefore, the final decision is whether the service feature is an issue to develop now or to develop at a later stage. The priority of the feature therefore plays a central role.
Text block	Interviewee 4
TB 245	I think it is no surprise for everyone, when I am saying that everything is being digitised. So, in China for example, most people don't go to the stores anymore. Everything is delivered. So, if they need bread, the bread is delivered to their home. This means that everything becomes a digitised service. And I guess this will be the same case in Europe to some extent.
TB 246	Our response to digital services is the like for every company on the market, that we need to be there and we need to be not too late. So, for our streaming service we were already late

	in the game, also because the Swiss market is kind of late to the game in general. Because the concept on this market is more about waiting and seeing what others are doing. So, we are never first movers and not really risk takers in terms of doing something that nobody has ever done before.
Text block	Interviewee 5
TB 247	A digital newspaper is basically already a service. We help users to understand world events with structured, simply presented and summarised information.
TB 248	The biggest service element the media industry has seen so far is editorial newsletters. This is despite the fact that newsletters have a negative connotation such as marketing spam and are therefore difficult to get young people to sign up for a newsletter. What we have seen, however, is that the newsletter is a new mini-version of the former print newspaper because it has a beginning and an end. The need of an editorial newsletter is to receive a compilation of news. Whether this is driven by artificial intelligence or by a journalist is of course a second matter. But it means that I don't have to go to the website and have an endless experience.

Requirement	Characteristic
Customer value	Product characteristics
Definition	
Insights from the interviewees on the complexity of digital products in the media industry, encompassing both the content and the platform itself, and the challenges of defining and managing this duality in the context of product development and user experience.	

Text block	Interviewee 2
TB 249	For us, the digital products are the website and the various apps.
TB 250	With websites, the focus is more on the amount of content and what it takes to create the content.
TB 251	So content, function or feature and technique or technology are the triggers for an app.
Text block	Interviewee 5
TB 252	In the media industry the product is often defined by the content as well as the platform itself. At Facebook, for example, the product is just the platform, because the content comes from the users. And it is very difficult to depict this dual world, where the product can be experienced with the content, the features and the appearance.

Requirement	Characteristic
Customer value	Personalisation
Definition	
Insights from the interviewees on the challenges and opportunities associated with personalisation as a digital service, including the need to balance user preferences with editorial control, allaying user concerns about missing important information or being limited to a narrow content area, and the strategic use of data models and AI to enhance the personalisation experience.	

Text block	Interviewee 2
TB 253	A big topic for us, which can also be seen as a digital service, is the login. This makes it possible, for example, to personalise better or to use content across platforms. This is a service, for example, that we have not integrated now for various reasons, such as complexity and uncertainty and whether it is really a real user value.
Text block	Interviewee 3
TB 254	The example of app personalisation as a service would now be more of a product issue than a service issue for me, as it is another feature on the app. So, it's more like a capability feature of the product.
Text block	Interviewee 5

TB 255	With regard to personalisation, we found out with UX research that people do want personalisation, but that there are two fears associated with it. One fear is that they will miss the most important news because a specific topic is not categorised as being relevant to them in the personalisation logic. For example, someone is not interested in war, but if Israel is attacked, they still want to be informed. The second fear is that you get stuck in your own frame of mind and don't get any new inspiration.
TB 256	For both fears, we have also developed data models. The first fear is avoided because we take editorial recommendations into account. For the second fear, we recommend articles to people who have similar interests. For example, if a person does not like sports articles, but still reads a sports article, then this sports article will also be suggested to other people who generally do not like sports articles. Because if one person likes it, then another person in the same categorisation scheme might also like it. This increases the chance that a user will read more new topics in the future. So these are service elements that we use.
TB 257	We are very proactive in the area of newsletters and artificial intelligence personalisation, where we are often invited to give presentations on these topics. This is because we have driven everything forward ourselves. Now there is also good software that we buy and introduce for our products because it is cheaper.
TB 258	With the editorial newsletter, we realise that it helps users, for example with climate change or German politics newsletters, to get what is important to them. We also use artificial intelligence and our own data models. This is very helpful for personalising the experience and getting articles that people like individually.

1.3.2 Codebook for the Thematic Analysis of the Feedback and Evaluation Phase

This section shows the codebook for the thematic analysis of the feedback and evaluation phase based on Richards and Hemphill (2018) in Appendix 1.2 and chapter 7.

Requirement	Characteristic
Strategic Alignment	Market Research and Analysis
Definition	
Insights from the interviewees on the importance of understanding customer needs and preferences before developing new products or relaunching existing products, and the need to align product development with market trends and user requirements.	

Text block	Interviewee 6
TB 1	One app has just been relaunched. However, the new app still has the same focus as the old one. For various reasons, however, we have redone a lot of things, even if you can't tell by looking at the app itself. It's technically new, more focussed in terms of content and has new branding.
Text block	Interviewee 7
TB 2	For example, we can see that cooking or other lifestyle-related content is booming. If we were to think about how we could incorporate these topics into our platform, we would conduct qualitative interviews with users who are interested in these topics. We would do this to find out what users actually want so that we have an idea of where we need to start.
Text block	Interviewee 9
TB 3	The first step must therefore focus on whether customers want a new product at all, and the technology that is used for the product does not yet play a role here.

Requirement	Characteristic
Strategic Alignment	Competitive Landscape Assessment
Definition	
Insights from the interviewees on the competitive landscape assessment, emphasising unique selling propositions of a digital product and disruption in the media industry.	

Text block	Interviewee 6
TB 4	I believe that we in the Swiss media industry need to think very carefully about what we can offer customers as a unique selling proposition for a digital product.
Text block	Interviewee 10
TB 5	Nobody believed in Netflix at the beginning but now they are extremely successful because they were completely disruptive in the business from going out of the physical DVD market to streaming online. However, the more regulated an industry is, the more complicated it gets to be disruptive, but the media industry is not one of the most regulated industries. And finally having subscriptions will not be the answer to success in the media industry.

Requirement	Characteristic
Strategic Alignment	Strategic Planning and Vision
Definition	
Insights from the interviewees on the importance of business cases in assessing the financial feasibility and strategic direction of new product development projects, particularly for large-scale initiatives, and the need for flexibility and adaptability in the face of changing market conditions and evolving user needs.	

Text block	Interviewee 6
TB 6	To estimate the size of something for a long time requires an approach that scales large new features or large new products and allows a go or no-go decision to be made accordingly.
TB 7	I think it's extremely important to think again about whether we really have a business case that shows that the investment is justified. Even if we are perhaps not so good at this, I think it is important that this has already been tested at a low level. So here you can say that customer co-creation would be perfect for testing the business case at a low level and going live with prototypes that can't do that much, but the focus is on seeing whether people click on them and are interested.
Text block	Interviewee 8
TB 8	We have also had a project where the management changed several times. In the middle of this project, at some point we were no longer sure whether we were still working with the best solution approach. We then carried out a re-evaluation of the solution in the middle of the project, but this was secret. Only the senior positions knew about it. We kept it secret because we didn't want to unsettle everyone involved in the project. Because if everyone had known about it, we would have had a lot of unrest and there would probably have been a blockage in the project implementation for two months.
TB 9	For productive tools, such as a new editor tool, we only work indirectly with an MVP. This is because such tool must not be down for a single day, otherwise we would no longer be able to publish. Time is therefore a critical factor here.
TB 10	An MVP is great if it is not exclusively about business-critical functions. If it is purely business-critical functions, then something has to be fully developed.
TB 11	A business case always includes the financial aspects of a development. However, if other things are relevant, which perhaps cannot be quantified as easily as finances, then you may not need a business case per se.
Text block	Interviewee 9
TB 12	A business case means that not all details are available and not everything is calculated down to the last detail. This is also important, because the reality after the business case is usually different again anyway. It is therefore important to define the rough key points and specify what the biggest assumptions and therefore the biggest risks are.

Requirement	Characteristic
Strategic Alignment	Business development approach
Definition	
Insights from the interviewees on the combination of waterfall and agile methods in their new product development processes, highlighting the use of waterfall for initial planning and validation of the business case, followed by a shift to agile methods for iterative development and customisation, also emphasising the importance of data-driven decision making and the need for flexibility and freedom within structured processes.	

Text block	Interviewee 6
TB 13	As soon as a product is live, the next big project comes alive, because as soon as a product is live and is being further developed, the validation or development release process is run through again. From this point of view, there is also a kind of ideation, in other words a kind of feedback.
Text block	Interviewee 7
TB 14	The empirical framework makes sense to me so far. I've never seen a framework for the new product development process for digital products, but it definitely makes sense the way it's put together in the empirical artefact.
TB 15	We have a hybrid system that mixes waterfall-orientated processes with agile processes. For example, you need a new app. A top-down waterfall-oriented business case is then created from this. As a lot of money is required in the business case, this must be approved by the management. From then on, the agile and customer-centred process starts, in which conceptual work is carried out.
Text block	Interviewee 8

TB 16	It's important to mention that we work heavily with data. We try to decide everything in a data-driven way, but in the end the data doesn't give you an answer to everything. Therefore, it is sometimes relevant to decide whether to choose solution A or solution B. Ultimately, choosing solution A or solution B is more a decision about which direction we are moving in.
TB 17	It may sound like I'm not a fan of processes, but that's not true. Processes and principles are very important. You simply can't just processualise everything, you also have to offer freedom in the process. And many people who have never been involved in the conception phase and are then suddenly actively involved in it get a completely different picture of new product development and only then realise that a lot happens in the conception phase.
Text block	Interviewee 9
TB 18	The assessment of the business case can be based on the business model canvas and a decision is made as to whether or not you believe in this new revenue stream. This means that you always have a lot of assumptions, but basically believe that it is a possible business case. This business case together with the business model canvas is waterfall-driven because you have to make a certain forecast
TB 19	It is often also about value hypotheses, meaning that you determine whether it is a product or a feature that users want. In this case, the hypothesis would be based on the assumption that users want a new product or a new feature. However, the hypothesis can also be of a technical nature, meaning that although it may be a product or feature that the market wants, there are uncertainties on the technical side as to whether the solution can be developed in exactly the same way as the market wants.

Requirement	Characteristic
Process Efficiency	Agile Methodologies
Definition	
Insights from the interviewees on the benefits and limitations of agile process frameworks, particularly scrum and SAFe, highlighting their flexibility, adaptability and ability to increase team productivity and quality, but also recognising the challenges around long-term planning, managing complex dependencies and maintaining the true spirit of agility in practice.	

Text block	Interviewee 6
TB 20	The advantage of agile process frameworks is that you can move quickly as long as there are no overlaying processes. For example, you can say that a breakthrough will take place in the next three weeks, and something will be developed to see how it works.
TB 21	Another observation is that the quality of the teams increases because it is more fun to work with agile process frameworks, because you always deliver something and have a purpose.
TB 22	The limitations that arise from agile process frameworks are when there are topics that go beyond the length of a sprint and therefore require long-term thinking. In other words, you can't estimate the size of something for a long time and how much you have to invest to make it good enough.
Text block	Interviewee 7
TB 23	A big advantage with Scrum is that you have a lot of flexibility to plan the sprints. It is also very good if you have a dedicated team that only concentrates on developing the backlog.
Text block	Interviewee 8
TB 24	I believe it is important in principle to work according to scrum. In practice, however, I see that very often scrum masters only have a purely organisational task. For example, a scrum master sets up the meetings or organises the retrospective. In practice, however, it usually falls to the product manager to get the impediments out of the way, which in theory would be the scrum master's job. From my point of view, that's okay.
TB 25	In reality, and this is actually contrary to scrum theory, is that the product manager, and not the scrum master, gets the impediments out of the way. So, in practice, the product manager is responsible for the content, which means that the product manager focuses on what and why something needs to be developed, what the users want, what is the right way to develop something and what the product should look like.

TB 26	What I don't like is when someone has an idea, makes a requirement out of it, writes it down and then says directly that it has to be developed in this way. This principle is also part of the agile principles, meaning that you think you can have everything developed directly with scrum and that the task of the person who formulated the requirement is then complete. But it doesn't work that way, because in the end the music plays in the details, and you have to keep at it the whole time. Over time, you know what can go wrong, but it's never the things that you think will go wrong that actually go wrong, it's always other things that end up going wrong.
TB 27	There are things that are not so sexy, such as extensive testing. So, it's about things where someone has to sit down and really test from A to Z and write down test cases. Scrum teams are not good for such testing purposes. Scrum teams do test, but in my experience, scrum teams are not well suited to providing an Excel spreadsheet containing 300 test cases that need to be tested because it's not fun. But if you have scrum teams that provide these 300 test cases and carry out the tests, then the problem is that they become inflexible because they have already planned everything in the sprints and no longer want to change and say that there is no more room for other things in the backlogs.
TB 28	I am not an extreme fan of agile methods such as SAFe. SAFe is great in theory, but in practice it takes away the spirit that you actually wanted, because you didn't want to be so complicated and originally wanted to have a process in which you can be completely flexible and can discuss things briefly in the team and then change the plan with quick decisions. However, when you overlay SAFe on top of all the processes, I have always found that you take the spirit out of it because you are no longer spontaneous. Unless you have an environment in the company where you need the rigidity of SAFe. So if you can use SAFe in the right place, like in app development, then it can work well.
Text block	Interviewee 9
TB 29	One problem we have in the media industry is that scrum is not effectively practised. This means that the original principles and the reason for using scrum are rarely present. You have the typical scrum ceremonies such as sprint reviews, sprint planning, a daily stand-up and so on, which at least provides a certain structure and planning. However, the aim of scrum is to define and validate hypotheses and make quick adjustments using feedback. However, few teams in the media industry pursue this goal, that is, to really work in iterations to quickly measure whether the assumptions made have been proven to be correct or whether the defined plan needs to be adjusted.
TB 30	We refer to SAFe. So, there is a programme level for product management, where work is based on programme increments at quarterly level. There is also a team level where work is carried out with product owners analogue to scrum teams.
TB 31	In many cases, including ours, it is more the case that you have a roadmap, that is, a larger plan, and this roadmap is then broken down into sprints. Then you execute more or less exactly according to this plan. In other words, you always rely on the respective sprints and then show what has been done. In the best case scenario, there is feedback, but most of this comes from stakeholders, but the plan itself rarely changes and is always carried out exactly as planned. This means that there is less intrinsic motivation to really rely on whether the released feature has the impact that is desired. And if the feature does not have the desired impact, that the planning is then changed. So this is definitely not done enough.
Text block	Interviewee 10
TB 32	In general, I don't see limitations in scrum. This is because I firmly believe in Scrum. This has to do with the fact that Scrum enables you to break projects down into individual packages and gives you a lot of visibility.
TB 33	The limitations of scrum that I discovered are that scrum only works well as long as a team is able to break down the project idea into smaller packages and take the details into account.
TB 34	What I love about scrum is the very iterative approach, where you learn a lot. So, in scrum there are a lot of test, learn, fail, repeat cycles, which are working very well.
TB 35	At the end, the goal with scrum is to ensure the maximum of value to the customer. Meaning that the developers spend their time in the most efficient way to bring the greatest amount of value to the to the customers.

Requirement	Characteristic
Process Efficiency	Stage-Gate Models
Definition	
Insights from the interviewees on the need for checkpoints in the NPD process, particularly for large or complex projects, to ensure quality, manage risk and make informed decisions while balancing the need for flexibility and avoiding unnecessary bureaucracy or delays.	

Text block	Interviewee 6
TB 36	Regarding control gates, there are people who think that this is not agile and takes responsibility away from certain people. But I think it's extremely important
TB 37	Scaling large new products or features and allowing a go or no-go decision cannot be done by the product owner alone, because it is often the case that not just one team and not just one product is involved and therefore the best for the customer cannot be permanently developed. We are too large an organisation for this and have too many dependencies between the teams.
Text block	Interviewee 7
TB 38	There is always a need for control mechanisms. For example, there is a gate between the discovery and delivery phase or gates that are based on customer feedback and change the scope, which means that more budget may have to be requested from the management.
Text block	Interviewee 8
TB 39	We don't call it gates for large new product development projects, but it is clear that you need control points in a new product development process.
Text block	Interviewee 9
TB 40	The use of control gates depends on the granularity of the further development. When it comes to the development of new products, whereby a new revenue stream is developed, an assessment of the business case is required.
TB 41	When the business case is then implemented, it is important to work lean and iteratively to validate these assumptions. Depending on what these assumptions are, the thinking of stages and gates is then applied. However, it is not possible to predict exactly what this stage-gate process will effectively look like because the assumptions are not in the same place for different projects.
TB 42	Stages and gates can be different when it comes to business topics or technical topics. It is therefore very important to separate the stages and gates on business and technical level. At a technical level, we always have assumptions or risks that are identified. With a proof of concept, we then try to obtain a certain degree of certainty as to whether the envisaged technical solution will work. These are often problems in the area of costs or performance.
Text block	Interviewee 10
TB 43	As we are working with external partners in the development of our new products, it is very important for quality control who is present at the quality control meetings. This is where basically you can kill your company's agility just in one meeting by having the wrong people there. So usually, you can have non-technical people also taking part of the meeting for quality control, but then the discussion should really be about the product itself. Because, when business related people with limited technical knowledge are involved in quality meetings you have a risk of everything being destroyed because then the meeting totally lose the focus on the technicalities, and the meeting is going into tiny details without focusing on the big picture.
TB 44	So, I think quality check is totally fine, but I think that we are not doing it enough. In future, I would refuse to launch the product without having sufficiently tested, and that also means without having had some cross check along the way.
TB 45	It is important that the new product development process is not overlaid with quality checks, so that you are able to have an MVP soon to be able to test it soon.

Requirement	Characteristic
Process Efficiency	Lean Startup Principles
Definition	
Insights from the interviewees on the importance of iterative development and early testing with users, particularly using MVPs to validate assumptions, gather feedback and make informed decisions on product direction and enhancements, while also recognising the need for flexibility and adaptability in the development process.	

Text block	Interviewee 6
TB 46	In the case of this app relaunch, however, we will take a different approach in future. This means that we want to develop our product much more iteratively in future and no longer want to create a completely new app, even technically, which would otherwise take a year to develop.
Text block	Interviewee 8
TB 47	For example, if only the front end of a system needs to be adapted, then we would most likely not resort to formal project management but would consider this to be a further development of the digital product. We take an agile approach to such further development of the digital product. Here too, however, there is first a planning phase, after which work continues iteratively.
Text block	Interviewee 9
TB 48	It is important to have identified the biggest risks and the biggest assumptions of the idea to be developed and to have them validated as quickly as possible. This allows you to determine whether you want to continue with the process or not.
Text block	Interviewee 10
TB 49	With an MVP we are going in the direction of a user centric product development. If you plan with enough of a buffer in time, you basically have enough time in your project, which is ideal for having an MVP early on. This is the point where you start working with a user group that tests and you get a lot of feedback. You can then use this feedback to decide whether you need to improve something. After the improvement, a new user group is added, which tests and gives feedback again. Then you go back to the board and iterate until you think the product is good enough to launch. That's the ideal case, and it can also be seen as a gate check. However, this type of gate check only takes place after the MVP.

Requirement	Characteristic
Process Efficiency	Iterative Development and Experimentation
Definition	
Insights from the interviewees on the value of rapid prototyping and beta testing in the new product development process, particularly for gathering user feedback, validating technical feasibility and iteratively refining software designs, while recognising the costs involved and the need to balance speed, quality and user experience	

Text block	Interviewee 6
TB 50	Personally, I would work much more with rapid approaches such as prototyping or the build-measure-learn cycle. Also to get features live quickly. In our company, however, there is a direct fear of reputational damage. In principle, however, I think it would be very good.
TB 51	The word "rapid" in rapid prototyping probably already means that it is fundamentally unsuitable for long-term product operation. In other words, if you work with prototypes, you still have work to do later on because you have to integrate the new findings or scale up.
TB 52	The second place in the new product development process where customers are needed is during ideation. This means thinking about what would be good for the product and working with the rapid feedback cycle with customers.
Text block	Interviewee 7
TB 53	We will soon be launching a new app and have tried to develop it as user-centred as possible. We have launched two beta versions for the new app. The first beta version was for

	our most loyal users, in which the most loyal users can provide feedback. The subsequent second beta version was then accessible to a larger group of users and not just the most loyal users. We also wanted to generate feedback there again so that we can ensure that we can fix problems that are very relevant to users before we launch a final version.
TB 54	I think it's good to create software designs with prototypes.
TB 55	In principle, you can use prototypes or the rapid feedback cycle to create software designs and then adapt them without any major loss of quality. However, users may find that something fundamental in the first feedback cycle is poor. But then you have to evaluate whether you have to provide a new software design because of the poor feedback, or whether we as a company are convinced that our initial intuition for the technical basis of the product is correct and that it will only be perceived as good by the user at a later stage. But either way, the more user feedback you can gather, the better.
TB 56	There are three different types of user feedback. Firstly, it's basically about getting feedback from existing users to see if they understand what we've changed. Secondly, with new users who have never used the app before, for example, we also want to carry out counter-tests to the feedback received from existing users. Thirdly, we also want to test products with users who are live. This user feedback is then used for the further development of the product. This shows that users can be embedded in every phase of development.
Text block	Interviewee 8
TB 57	If you can validate the basic technical solution using technical prototypes, which is actually the most relevant, then you can go into the details properly.
TB 58	I think it is very important, even if not always necessary, to work with technical prototypes, because they are a very good way of checking whether the envisaged technical solution can really work. And even if you can't use the technical prototypes in the end, that's not a problem.
TB 59	In a beta version, the testers can be customers as well as friends or family. This is because many of our employees also use the products privately and we have therefore already come a long way with family and friends. The advantage of a beta version is that you can identify real problems that you won't find out during testing. Of course, the type of product always plays a role. A daily newspaper is a good choice because everyone wants to read the news and you always discover bugs in the evening or at the weekend.
TB 60	App reviews are almost always negative. Users don't write app reviews when everything is going well, but only report when something is not good. When we launched a brand new app version, we received around 3 to 5 app reviews a day and our developers were shocked by the feedback because it sounded as if something had gone very wrong. And with app reviews like that, it was extremely important that we put it in the right context. This means that these app reviews were not negative, but very positive, because 3 out of 5 reviews only referred to the fact that something was different in the new app version than in the old app version, for example that the old red color was better than the new blue color. The rule is therefore that if the majority of users are quiet, or if you don't receive any feedback, then everything is fine.
Text block	Interviewee 9
TB 61	I would say that prototypes can be used to create a software design that can then be adapted without compromising on quality.
TB 62	It is important to first decide what the aim of a prototype should be. Prototypes are usually used to verify or test something again with the help of the prototype. In the design sector, for example, you work with prototypes to carry out an initial usability test. The test results are then transferred to development and are taken into account there for the technical development of the product.
TB 63	Prototypes can also be used at a technical level. We regularly make prototypes, which can be compared to a proof of concept, to see whether we can implement something technically and whether the idea also works technically and has the desired performance. Depending on the outcome of the prototype, it then has an impact on the software design or the software concept.
Text block	Interviewee 10
TB 64	With prototypes it is easier to receive direct feedback from users, the problem is however, that it is very costly. So, the question is, if you have enough budget for doing prototypes to

	create software designs. However, when it comes to a very large new product, it can make a lot of sense to use prototypes for software designs.
TB 65	I would very much like it if we could carry out more proof of concepts with prototypes.

Requirement	Characteristic
Customer-Centricity	User Research and Needs Assessment
Definition	
Insights from the interviewees on the different approaches to incorporating user-centricity into the new product development process, ranging from ad hoc and situational methods to more structured frameworks, and the recognition of the importance of involving customers at different stages, particularly in the early stages of ideation and validation, to ensure the development of products that meet the actual needs and preferences of users.	

Text block	Interviewee 6
TB 66	In the current new product development process, the customer is involved through anonymous data, meaning usage data, feedback on prototypes and user experience research, meaning interviews.
TB 67	The first place in the new product development process where you need customers is right at the beginning of the process, where you compare the strategic part of the business case with the customer needs. The need doesn't come from the business, it comes from data or observations. Our data analysts and product management are in the lead here.
Text block	Interviewee 7
TB 68	The second phase where we involve customer in the new product development process is as soon as we have a first draft solution. For example, when we reorganised the newsletter portfolio, we had the newsletter portfolio validated with user testing. This was to see whether the users understood the names of the individual newsletters or the group allocation in the newsletters. Based on this user feedback, we then adjusted the categories and names in the newsletters.
TB 69	The first phase where we involve customers in the new product development process is about finding needs.
Text block	Interviewee 8
TB 70	For user testing, we work more with other test methods, such as non-technical prototypes in the figma software, surveys or UX testing.
TB 71	At the beginning of the new product development process, it is important to involve customers to understand what problems customers have and what problems we need to solve effectively.
Text block	Interviewee 9
TB 72	We do not work with a specific user-centred process for involving customers in the new product development process. How we involve customers in the new product development process depends more on the situation. We apply methods such as design thinking or user-centred design in one form or another, but not consistently, which means that we do not have a standard procedure based on user-centred processes for every problem.
TB 73	If it is a completely new feature that does not yet exist on the market, then you have very high assumptions and risks that you are building something that nobody wants. With such features or products, it is very important to involve the customer in the business case or in the idea generation phase of the business case. The aim of this is to find out whether customers want the new feature or product at all.
Text block	Interviewee 10
TB 74	We are already integrating user-centred process approaches in our new product development process. We have the customer quite central, this means that we are doing customer surveys and we will continue doing it because it is crucial for the new product development process.

Requirement	Characteristic
Customer-Centricity	Co-Creation
Definition	
Insights from the interviewees on the potential benefits and challenges of fully involving customers in the new product development process through a co-creation approach, including considerations of feasibility, resource allocation and impact on company vision and innovation.	

Text block	Interviewee 6
TB 75	The idea that several customers, because one customer alone is not representative, are directly involved as co-creators together with a product team in a new product development would be a completely new situation for us. That means it would be a complete change and we would have to think about how we deal with it and how we handle this new situation.
TB 76	The question of whether you have to pay customers to actively act as co-creators would also arise.
TB 77	We would also have to consider how we would integrate customers within the customer co-creator approach into our processes, for example whether they would be part of the daily ceremony in the scrum framework.
TB 78	The idea behind customer co-creation is very difficult for me because there is no procedural basis for it in our company.
TB 79	We are not yet going one step further, which means fully integrating the customer in terms of customer co-creation approach into the new product development process.
TB 80	When I hear the term customer co-creation, I imagine that a customer is part of the product team throughout the entire new product development process and not just for testing prototypes.
TB 81	But to go one step further than only working with user experience researchers and fully involve the customer as a co-creator in the new product development process, I don't know how we are supposed to solve that. Customers don't always have the time and are therefore not always available to be fully integrated into the new product development process on a permanent and long-term basis.
TB 82	First of all, we would need a fundamental decision within the organisation that we want to actively integrate the customer co-creation approach. We would first have to clarify a few things, including the financial aspects.
Text block	Interviewee 7
TB 83	If you were to involve users or customers directly in the new product development process, then you would have to invite customers into the company and conduct the workshops, which you would conduct internally anyway, together with the customers. Such workshops with customers would be realistic to carry out, especially if you work with core users, in other words people who use the product a lot and therefore have a strong brand loyalty.
TB 84	My feeling is that it would help us if we could get input from young people who take part in our workshops to drive forward smaller innovations. However, such workshops would not solve the problems that exist with our heavy users. This is because users or customers cannot predict what the journalism of the future will look like. This is in line with Henry Ford's statement that people wanted faster horses but didn't realise that the solution was a car. But it is still better to invite customers to a workshop than to do nothing at all.
TB 85	It is worth involving customers indirectly in the new product development process, as it is undeniable that this is profitable. Actively involving customers in the new product development process could help to drive smaller innovations, but active involvement in the entire new product development process is extremely time-consuming.
TB 86	As far as I know, one media company has already invited young people to a workshop. I think that workshops with young people help to get inspiration and drive ideas forward.
Text block	Interviewee 8
TB 87	We already involve customers directly and actively in the process. The active customer involvement we do with users who visit us four times a year and take part in workshops and testing. We also often test new products and new hypotheses with customers. We also actively ask customers for input. I'm a big fan of looking at things with users and listening to their thoughts and why they do or don't do things the way they do.

TB 88	You have to involve customers closely in the new product development process and we do that with the group that comes four times a year, with various customer interviews and other things
TB 89	Customers are not product managers. You can't ask customers how to build a product. The customer can only answer what considerations they make, what problems they have and what challenges they deal with. But they can't tell you what the solution is, and that's an incredibly important distinction.
TB 90	You always need this level of abstraction, which means that even though the customer group says something, it doesn't mean you have to do it that way.
TB 91	I think the co-creation process with the customer is important, but you have to know what comes out of it and what does not.
Text block	Interviewee 9
TB 92	I believe that the influence would be marginal if customers were actively involved in the new product development process, that is, in the customer co-creation approach.
TB 93	You could hold workshops directly with users and it certainly wouldn't do any harm to hold such workshops. However, it is questionable whether we would really have much more added value or even more relevant insights with the customer co-creation approach than if we conducted user interviews or user tracking on the product itself and therefore indirectly involve customers in the new product development process.
TB 94	We primarily work B2C, where we focus on the users of the product. Several hundred thousand or even millions of users use our digital products every day.
TB 95	It is very important to note that a user often says something in an interview that ultimately does not match the behaviour when the product is used. I therefore believe that the customer co-creation approach in the B2C sector in the media industry can do no harm and thereby gain a different kind of insight.
TB 96	It is very difficult to assess whether the customer co-creation approach makes a really big difference to what we are already doing today with the indirect involvement of users.
Text block	Interviewee 10
TB 97	We don't do enough co-creation with customers.
TB 98	It is extremely important to differentiate what type of product we are dealing with. When it comes to groundbreaking new products, as was the case when Apple integrated the iPod into the iPhone, for example, the customers may not even know that they need this product. It is extremely important to realise that customers cannot develop solutions. They can only explain what their needs are, where they have problems and give feedback on solutions that have been developed. But customers cannot create a product vision.
TB 99	A customer problem could be that they are annoyed that they browse through Netflix for 15 minutes without knowing what to watch. After that, you know that content discovery is a problem. Based on this problem, possible solutions are then sought. Netflix then built a linear channel for customers, where they can watch something directly without having to search for it. However, customers never said that they wanted a linear channel. Very few customers are really able to communicate a solution to a problem, so it is very important that you know the customer's problem and that the product team itself starts looking for possible solutions.
TB 100	If you co-create everything in the new product development process from A to Z with the customer, then you no longer need an MVP because you have already gathered all the information from the customer during the new product development process. This means that you actively collaborate with the customer during every step of the process. Complete customer co-creation would therefore completely change the current new product development process, because many months have already been invested in the current process up to the launch of the MVP.
TB 101	With a complete customer co-creation process, however, you start working closely with the customer right from the beginning. In theory, this could mean that you gain time. However, the time gained depends on how well the process is managed and how many feedback iterations are carried out.
TB 102	One problem with a complete customer co-creation approach could be that customers are not good at finding solutions. On the other hand, they know best what their problems are.

	This means that product experts need to be heavily involved to manage the gap between customer problem and solution finding.
TB 103	With a complete customer co-creation approach the role of the customer would also change accordingly, because up to now the customer has tended to be used at the end of the value stream, but with a complete customer co-creation approach the customer would be a kind of member of the company who helps to shape the product in a certain direction. The new role of the customer would therefore be very different from the current role, meaning that the customer would move from a passive integration to a completely active integration in the new product development process.
TB 104	Another aspect of a complete customer co-creation approach would be the decision-making process. In today's new product development process, the customer simply provides input, but in the complete customer co-creation approach, the customer is heavily involved in influencing what the product should look like in the end. This will make the role of the customer even more important than it is today.
TB 105	The complete customer co-creation approach would entail a major realignment of corporate orientations. In other words, you have to think carefully about how you can fully involve the customer in a new product development process as a co-creator. However, this new company orientation is very complex, even if such an orientation could be very interesting. The complete customer co-creation approach is very interesting because it ensures that customer needs are fully integrated.
TB 106	Another advantage with a complete customer co-creation approach is that you don't have to pivot the product once you've launched it, because the customer has already been involved from the start. You can therefore assume that the new product is very likely to work on the market and that is important because you always see products that are not well received on the market.
TB 107	It is also exciting that the customer co-creation approach could create a kind of community around the product. This can lead to customers feeling closely connected to the product because they were involved in the co-creation of the product themselves and are intrinsically motivated to ensure that the product is successful.
TB 108	The risk, however, is that a company can no longer be as visionary as it would like to be because it may have many customers who are not visionary. As a result, a company cannot develop a new product that is absolutely groundbreaking.

Requirement	Characteristic
Customer-Centricity	Customer-centred development approach
Definition	
Insights from the interviewees on the growing recognition of the importance of user-centred approaches in new product development, but also on the challenges of full implementation, the need for strategic and selective application of user-centred methods based on project specifics and the constant efforts to balance user needs, business objectives and technical feasibility.	

Text block	Interviewee 6
TB 109	We are already trying to integrate user-centred process methods into our new product development process, but not completely. For example, we have already integrated ideation, testing and obtaining feedback from the user-centred process methods.
TB 110	Once the product is live, you can work at a lower level with customers because you have more customer usage data available and can therefore derive certain conclusions.
Text block	Interviewee 7
TB 111	I think that you basically have to have user-centred process principles in the new product development process.
TB 112	We already have some user-centred processes in place and would like to strengthen them.
TB 113	We currently involve customers in the entire new product development process on a selective basis.
Text block	Interviewee 8

TB 114	I believe that we are already incorporating user-centred designs into our new product development process. However, when it comes to the content, meaning how the content is structured, the difficulty is that we have very different users with incredibly different use cases. This means that you can ask or test many things with data and with users, but with certain things, there is ultimately no right or wrong, you simply have to decide which way to go.
TB 115	I believe that it is relevant to involve customers at many stages of the new product development process.
TB 116	In the conceptualisation part, it is important that the hypotheses we have formed are validated by customers. These hypotheses are derived from the problems that customers have identified.
TB 117	It is also important to carry out beta rounds before a go-live, because the productive MVP is often not only minimal in practice. With a beta version, you can let testers go ahead with a product that effectively corresponds to an MVP. What we also often do is work with titles in a beta version. This means, for example, that we put a new newspaper setup live a month before the actual go-live date. In this way, we have already been able to work out almost all the major bugs and the damage is limited.
TB 118	The customer service thinks that everything is bad because they only receive negative feedback. So, this is sometimes very difficult for customer service employees because they think that everyone hates the media company and that everything is bad. Here it is also very important to tell the customer service employees that this is not the case because we have 1 million users and only 10 of them complain. So, everything is fine.
Text block	Interviewee 9
TB 119	However, it would help us if we based our new product development process on user-centred frameworks, because any method that puts the user more at the centre is the right step.
TB 120	The question is where you have the greatest leverage when you work with user-centred methods. In other words, you have to ask yourself which user-centred method generates the greatest impact at which point in time.
TB 121	If it is a feature where you know that many other media platforms are already using this feature, then you already have a lot of confidence because you can assume that it will be used a lot. If you then sort of copy this feature, there is very little risk that users will not understand it. In this case, you don't have to involve the user from the start and explicitly ask them at the beginning whether they want this feature and understand it. So, you can save yourself this effort.
TB 122	It is therefore important to consider where you have the greatest assumptions or hypotheses and to define these clearly each time you implement a new product or feature. It is then important to show how these hypotheses can be validated the best. Depending on the hypothesis, customer involvement may or may not be present. In the case of a no-brainer, for example, there is no need to involve the customer at all because it is already clear that the new feature or the new product is relevant for the customer.
Text block	Interviewee 10
TB 123	It is important for every company to develop user-centric because otherwise the product will fail.

Requirement	Characteristic
Development Process	Lifecycle Model
Definition	
Insights from the interviewees on the value of a structured framework or model for the new product development process, particularly in larger organisations or complex projects, to provide direction, ensure consistency and facilitate decision making, while recognising the need for flexibility and adaptation to specific project needs and the importance of the framework not stifling creativity or innovation.	

Text block	Interviewee 6
TB 124	If you make a major change to something existing, then I'm talking about new product development. So, it's not just about a new user story. It is relatively rare for us to develop a product such as an app from scratch. We've had the apps we have for a long time.
TB 125	I'm not sure that we effectively don't have an overarching model based on a lifecycle. So explicitly, we don't have a model based on a lifecycle. But implicitly we do, because at some point there was a decision that we would first develop a use case, see what the need is and then see if we have the money for it. We did the same with the new app. As a result, it was also clear that we would do the middle part with ideation. So, it probably wouldn't really change much if we would work with an overarching model.
Text block	Interviewee 7
TB 126	Our strategy department works according to a model that is based on business logic, as is the case in Application Lifecycle Management. Product development, on the other hand, works more according to processes, as is the case in the artefacts below Application Lifecycle Management in the empirical artefact.
TB 127	However, I believe that it would make sense to agree on a company-wide process model, but I don't know how realistic this is. This is because in the media industry, the theoretical derivation of how software products should be developed is not based on the development of a technical platform, but on the content itself. Content is therefore the core of the business in the media industry, which means that content creation helps to shape the product. So, no matter how good the technical basis of a digital product is, you have to be able to influence the content in the media industry. This is because the content experience can influence the customer, whether they churn or how engaged they are. Ultimately, this means that you have more dependencies in the media industry because you have to provide both the technical basis and the content. I think it will take time for editorial teams to become truly user-centred and this will require a longer change process.
TB 128	It would make our work easier if we could refer to an overarching project management model at the start of a project. For me, however, it is much less important which method you use than that you agree on it in a project team.
Text block	Interviewee 8
TB 129	For very large projects, we proceed in a setup with project management frameworks, but this is really for very, very large new developments that are based on a new technological foundation. In such cases, a completely new product is developed.
TB 130	Formal project management, which means working out a business case and having a project group, is only carried out if three criteria are met.
TB 131	The second criterion for formal project management is if we have major dependencies on other teams, especially other development teams.
TB 132	The third criterion for formal project management is if the new development affects a very large number of users.
TB 133	So, when a completely new development and many teams are involved, we work with formal project management. We did this, for example, when we had to introduce completely new front ends in various systems with a new content management system, or when we also introduced a new editor in the content management system. So, at first it was an external editor and now it's an internal one. With the editor, however, the criterion for formal project management was not that we had to work with many technical teams, but that this involved many users. Accordingly, we had to inform and train all system users.
Text block	Interviewee 9
TB 134	Every model and every structure helps to organise a new product development process at an overarching level, including a lifecycle model such as Application Lifecycle Management.
TB 135	Most companies that develop software already have an implicit or explicit process in place. We also have a certain implicit process that we follow, but it is not based on a lifecycle model that takes a very overarching approach to new product development and also shows where a product reaches the end of its lifecycle.
TB 136	I believe that there is far too little focus on the entire lifecycle when it comes to launching new products or new features. You tend to have a process basis for the actual development, which means, for example, that you start with a business case and then develop prototypes

	in which hypotheses are validated. But when it comes to managing the entire portfolio and considering when a product will reach the end of its lifecycle, you don't think enough about that. And this is exactly why it makes sense to use an overarching framework that effectively incorporates the entire lifecycle and not just the initial phase when new products and features are created. This would help to identify where complexity can be removed from the process.
TB 137	The portfolio level in an overarching process model, which you should look at, helps to see how different products interact to be able to analyse which products are no longer viable. You might even do this in companies because you realise that a product is no longer profitable enough. But at product level, when it is declared that it has features that are no longer needed or have very little impact, it would help to have a process basis to remove the complexity from the product.
TB 138	Nowadays, it is usually the case that you simply add new features to a digital product, which leads to the product becoming larger and more complex and ultimately results in more operational overhead and more maintenance. This ultimately means that you have less capacity to discover and develop new features. And this is precisely why it is important to be able to visualise which features are obsolete and no longer have an impact and are therefore removed from the product. It is usually the case that features that have become obsolete are still used by a small number of users. If you then remove the feature from the product, it is annoying for these users who still use the feature, but in the end you have to decide whether the feature is still really useful for the business.
Text block	Interviewee 10
TB 139	In theory it would help us to have a framework based on project management for our new product development process so that we are not getting lost and having a proper structure. In practice however, it is important to have a model that allows you to have model that goes from ideation to the go to market, so that you have a plan how to execute the process.
TB 140	A framework helps to not miss any step in the process, as it could be with a checklist.
TB 141	What is important however is to not see the framework as a prison, which finally can be resilient for creativity. This means that you still need the freedom to be able to change the framework to be flexible. Many frameworks have the limitation that you must process them as in theory, and that can be a problem.
TB 142	Another important point is the maturity level of the organisation. When you are developing your hundredth product, you are already very far into the maturity level, and it can happen that you use a framework that has been adapted from theory because you have realised through the many new product developments what really suits the company. If you are making a completely new product and do not yet have an overarching structure for this product, then it is very crucial to follow a framework. Otherwise, you don't know where to start.
TB 143	So, these are the two most important points when it comes to using an overarching framework in a new product development process.
TB 144	Firstly, it is important to be able to act flexibly even with a theoretical model. This is the case when you realise that the theoretical model is not fully suitable for the new product development process in the company.
TB 145	Secondly, the maturity level of the company. In other words, how much experience you already have in the development of new products in the company. If you already have a lot of experience, then a framework can serve more as a checklist and reminder because you have already developed a structure for your new product development process. However, if you don't have that much experience yet, then the use of a theoretical overarching framework is crucial because you need guidance in the process implementation, from the idea to the launch of the new product. Especially if you have a lot of departments that need to be aligned in the new product development process, it is very important to rely on an overarching framework in the new product development process so that the governance perspective is integrated like with a RACI matrix.

Requirement	Characteristic
Development Process	Technology Assessment
Definition	
Insights from the interviewees on the strategic use of technical prototypes and proof-of-concepts in new product development to validate technical feasibility, assess potential risks and make informed decisions on technology choices and investments, taking into account cost constraints and the need to balance innovation and practicality.	

Text block	Interviewee 6
TB 146	One thing that is relevant is that you don't come up with products that are technically impossible to realise or can only be realised at very high cost.
Text block	Interviewee 7
TB 147	From a technical perspective, the question arises, of whether to build or buy. In other words, whether we build something technically ourselves when it comes to the core experience of our users, for example. Or, whether we buy and integrate an external solution, as in the case of a paywall system, because external systems are often better in this context than an in-house development would be.
Text block	Interviewee 8
TB 148	We brought in external partners for a proof of concept for one project because we had a very complex technical project. As we were not sure whether we could manage the new project technically well enough, a proof of concept was created over two or three months. In the end, however, we were unable to use any of this proof of concept effectively because a detailed analysis of the proof of concept revealed that too many shortcuts had been made in the technical prototypes. The developers who then implemented the proof of concept confirmed that the concept works in principle, but not completely as a technical solution.
TB 149	I believe that it happens quite often that technical solutions cannot be fully validated by technical prototypes, but you should consciously accept this because you then place fewer limits on the proof of concept. This means that you can test dirty what you actually want to test and simply leave the rest alone.
Text block	Interviewee 9
TB 150	At a certain point in the new product development process, technology is an important element that must be taken into account. However, it is important that a new product is not developed because you want to use the latest technologies, but technology is always a means to an end to solve a problem.
Text block	Interviewee 10
TB 151	Proof of concepts are particularly worthwhile for us to be able to decide whether a technology is worth using in the first place. For example, whether it is worthwhile to technically test a new source of revenue for monetisation income from third-party providers. If it is already clear in the proof of concept, which is tested live, that the solution does not work because no interactions are made by users, then we often abandon the idea because the data measurement can prove that the intended solution does not work.
TB 152	It always plays a role how expensive it is to carry out the proof of concept. If the proof of concept is too expensive and takes up a large part of the overall budget, then no proof of concept can be carried out.

Requirement	Characteristic
Development Process	Resource Allocation
Definition	
Insights from the interviewees on the challenges of resource allocation and project management associated with new product development, particularly the need for long-term financial planning, the difficulty of attracting and retaining technical specialists, and the importance of effective project management to ensure timely delivery and overcome potential obstacles.	

Text block	Interviewee 6
TB 153	With an overarching model, we would be able to keep an eye on everything relating to operations and, when deciding whether or not we can afford an investment, we would also know whether we can afford to operate this new product in the long term.
Text block	Interviewee 7
TB 154	The disadvantage of scrum is the spontaneous coordination, because if you need more resources, for example, you don't simply get more budget from the management within one sprint, so within two weeks.
Text block	Interviewee 8
TB 155	I think the technical components are very important in a new product development process. It's not that we don't have a focus on the technical components, but it's very difficult to find the right people for them, as they are mostly senior positions that can cover the technical components of a new product development process well. The problem is that the career path in the technological world of work leads via team management. This means that technical specialists also have to take the management path to climb the career ladder.
TB 156	The project manager has the task of seeing whether there is a problem because a person is not delivering the work and wants to find out why they are not delivering. For example, the reason why this person is not delivering is because the person has simply forgotten, or because there is a problem and whether an escalation is needed to address this problem.

Requirement	Characteristic
Development Process	Technical development approach
Definition	
Insight from the interviewees on the crucial role of technology in the development of new products. They emphasise the need for early integration of technical considerations, careful evaluation of technological decisions and a balance between the use of existing and exploration of new technologies to ensure the feasibility, sustainability and effectiveness of digital products.	

Text block	Interviewee 6
TB 157	It is extremely important that the technological aspects are incorporated more into new product development, because otherwise we only focus on the front end. This is the case with another of our projects, for example. I therefore see it as a great danger if the technological aspects are not utilised enough.
TB 158	The other thing that is relevant is that technical lifecycle management is integrated from the start and that the right technological decisions are made accordingly. For example, you always ask yourself the technical question of whether you want to develop natively or non-natively, which technical framework you want to use and how you want to position yourself technically in the long term.
TB 159	The issue of technical sustainability and the possibility of simple technical developments and technical operation also play a role here. Sustainability means whether you can reuse something that you build in app A in app B as well. Ultimately, it's about being able to utilise the money invested as effectively as possible in a technological sense, because the entire technical operation or even a single feature is not free.
TB 160	However, the technology does not necessarily have to be the driver, unless you want to replace the old technology with a new one.
Text block	Interviewee 7
TB 161	The technical components are very important to us in the new product development process. Historically, however, we have always had an IT department that was more active in the implementation, for example, business requirements were technically assessed to explain what can and cannot be effectively realised technically. Now, however, the IT team is also a co-creator, which means that they are actively involved in product development and the technology is also at the centre.
TB 162	Technology is a central aspect of our business, because journalism would no longer exist without technology.
Text block	Interviewee 9

TB 163	If we take generative artificial intelligence as an example, we can see that it is a technology that has a lot of potential, but also harbours a lot of risks. Generative artificial intelligence is therefore a technology that we need to experiment with. However, there are a lot of technical uncertainties here because it is a new technology. That's why we need to involve generative artificial intelligence very early on in the solution finding process, because we need to see whether certain opportunities can be solved with generative artificial intelligence. Generative artificial intelligence as a technology is therefore heavily involved in the new product development process right from the start.
TB 164	When it comes to technologies that we have already used very often, the technical people who deal with this technology are only involved later in the new product development process. This is because we already have experience with this technology and therefore know that we can solve the problem with this specific technology.
TB 165	When the focus is placed on the technology in the new product development process depends on whether it is a new technology or a technology that we have already used many times.

Requirement	Characteristic
Cross-functional Teams	Cross-functional Team Composition
Definition	
Insights from the interviewees on the importance of flexible team structures and the role of core teams and project managers in new product development, emphasising the need to adapt team composition according to project size, complexity and strategic importance, as well as the value of cross-functional collaboration and clear communication for successful project delivery.	

Text block	Interviewee 6
TB 166	I would rely on a product manager who is responsible for the entire NPD process and assembles the required roles for each process phase.
TB 167	We are currently considering whether it would make sense to bring everything together in one core team for certain situations. But that depends very much on how big the team is and how many interfaces there are in this core team. Basically, I don't think a team of twenty would work.
TB 168	In principle, you can have both, which is a core team for all new product development and a product manager who coordinates new product development.
TB 169	At the moment we have a core team for major new product developments, which meets every 1-2 weeks and all the people involved, such as design members or technology members, say where they stand. So, at first it's more of a synchronisation. From the time of delivery onwards, you then work more together because everyone needs each other's work. From this point onwards, it's more of a joint effort.
TB 170	We also have a user panel of assembled users who we can ask questions directly. This all runs via our user experience researcher, who can be consulted for questions about the user.
TB 171	The part with the user experience researcher, where he creates a prototype and conducts interviews with customers, these are processes that we have mastered and are part of our system. UX researchers are integrated into the new product development process from A to Z. So that's good.
Text block	Interviewee 7
TB 172	As cross-functional roles, you need a UX manager, a product manager and people from IT engineering. This forms the core expertise in a team. Depending on the size of the company, you can then have 1 or 20 such cross-functional teams.
TB 173	However, it is important that each team has a specific goal, such as the further development of a core product, which could be an app.
TB 174	Another goal of a cross-functional team can be innovation, for example that the entire audio experience is driven forward innovatively by this team.
TB 175	Another goal of a cross-functional team could be to focus more on customer journeys, where the aim is to reach new target groups and ultimately find the need.

TB 176	Depending on the development cycles, the teams can be reorganised every 3 to 6 months. This is how you can establish agility in a company. This means that the teams can change within the phases of a new product development process.
TB 177	When teams are changing during the new product development process, the structure on the first level is always based on UX, IT and product management and forms the basis of a team.
TB 178	When teams are changing during the new product development process, the structure on the second level is based on people from the data area and from the UX research area, who show what makes sense and how to be successful, although these people do not have to be a fixed part of the entire new product development process, but are important at the beginning for creating the basic requirements. Basic requirements means that people from UX research interact with customers and people from the data area define the KPIs.
TB 179	During and after development, there is less interaction with customer feedback, which means that people from the data and research area are less intensively involved.
TB 180	In the media context, there is a third level and that is the editorial team. If you are developing a new journalistic product that needs to convince the market with its content, then you need an editor. The editorial team is important as soon as a topic is about content. However, if you make structural adjustments to an app or website that do not change the content significantly, but are relevant to increasing engagement through personalisation, then you don't need an editor or anyone from marketing.
TB 181	Marketing is needed when you are running a campaign. For example, if you are launching a completely new product which is intended to appeal to young people then you need people from marketing to set up campaigns.
Text block	Interviewee 8
TB 182	There doesn't have to be a contradiction between a core team and a superordinate project manager for the cross-functional structure in a new product development process. There are always things that are tedious, such as having to chase deadlines or always having to check whether every person involved has delivered their part. So, keeping things accountable and sometimes going to where the pain is and telling a person that they are the best friend of all but still haven't delivered is something that a project manager has to do. We also use project managers who are really good at this and have this distance.
TB 183	When it comes to developing a cool digital product, I would form a cross-functional core team so that there is a spirit and ideas. For example, we currently have a cross-functional team for the topic of artificial intelligence, which was formed from all areas of the company. This cross-functional core team has a lot of freedom and can basically do whatever they want. So of course, they pick up all the relevant people, but this cross-functional team drives its own agenda and sees what comes out of it. I would never use a project manager in such a setting because it makes no sense.
TB 184	If you have to transfer 800 people from system A to system B on an exact date and ensure that all websites and newspapers are online on that date, for example, then you need a project manager. This means that in a project like this, a lot of things come down to an exact date and many things are tedious. It is tedious when you have to tell a close colleague that his performance is inadequate, and this is difficult to say in a cross-functional team because there is usually a close bond and a good spirit.
TB 185	When it comes to being fast, innovative and disruptive and trying things out, it's good to work with cross-functional teams. In other words, if there is no fixed structure, then cross-functional teams are worthwhile. On the other hand, when it comes to developing business-critical products, I would never work without a project manager.
TB 186	If it's a new feature on the website, then it's worth having a cross-functional team or a development team that develops the feature in an agile way, regardless of how big the feature is. However, large projects such as the replacement of a payment system always require higher-level project management with all the unpleasant tasks that go with it. For large projects, you then hold a meeting for the pre-go-live, where you look at each of the twenty people in the room in the eye and ask everyone whether they are sure that everything is ready to go live. We also made detailed documentation for such pre-go-live meetings because the details are important there.
Text block	Interviewee 9

TB 187	We have a cross-functional product team for each platform, which includes developers, including web developers, backend developers, iOS developers, Android developers, a tech lead and UX experts.
TB 188	Our cross-functional teams are focussed on feature development.
TB 189	There are also non-technical roles in the cross-functional teams, in which a product owner prioritises the backlog in the scrum context. There are also other roles that are not present in the cross-functional teams, such as the quality assurance team, which is brought in to carry out functional testing.
TB 190	You need an autonomous cross-functional team that focuses on one product or feature so that you can drive the product or feature forward end-to-end. This is the only way to minimise dependencies, be agile and react quickly to changes. It is also important that the team is stable and that the setup is not constantly changing, because otherwise you become inefficient if you always have to form a new team. In other words, if you have a close team that works together for a long time, then you have better performance.
TB 191	It is important that the developers are also a part of the autonomous cross-functional team. It is important that developers do not work in their own world, isolated from the rest of the team. Accordingly, it is good to have full-stack developers who can also take on other tasks.
Text block	Interviewee 10
TB 192	If a company has a lot of experience in the development of new products, then it makes sense to work with a core team. This is because the people involved in this core team only work on new product development.
TB 193	Another important argument for working with a core team is when the new product is strategically extremely important for the future of the company.
TB 194	It is important to define how much focus the new project requires. This can be shown with two interdependent criteria, namely the importance of the project for the entire company on the one hand and the risk and financial impact for the entire company on the other. If you put these two criteria against each other, you get a matrix with four boxes. Depending on which box the new project is in, you can determine the team setup.
TB 195	Ultimately, it is relevant how important the project for a new product is for the company and how long it takes to develop such a product. For example, if the project is only for a small product that will be completed in 2 months and does not require 2 years, then you do not need a dedicated core team. A lean cross-functional team would be sufficient here, which not only develops this one product, but delivers business value through the combination of different functions. With such projects, the risk is usually also lower because it is more of a nice to have product, but the financial impact could be interesting for the company. This means that you would appoint a person who is responsible for putting together all the relevant functions in the project to drive the project forward.
TB 196	Finally, you can go either way, which means forming a core team or forming a team that has an overarching role responsible for ensuring that the team is formed correctly.

Requirement	Characteristic
Cross-functional Teams	Cross-Functional Collaboration
Definition	
Insights from the interviewees on the importance of effective communication and collaboration between cross-functional teams, the role of project managers in coordinating complex projects and ensuring on-time delivery, and the challenges of balancing user feedback, product vision and strategic decision-making in the new product development process.	

Text block	Interviewee 6
TB 197	Until now, in addition to the development teams, there was a kind of meta-team that functioned as a core team and synchronised across several teams. However, they did not work together intensively
TB 198	This means that a core team works close together from the start and synchronise more often with each other to see whether this works better and whether there is less friction and

	communication loss. However, the business doesn't generally add anything to the technical development, but provides more feedback on the current status.
TB 199	In the experiment for new product development that we are currently conducting, it is very important that we have the technical experts on board early on to decide whether we need to invest financially or whether we can replace the existing product with a new one. I then suggested whether it wouldn't make sense for us to take a more iterative approach from a technological perspective. Ultimately, it is therefore extremely important to focus on technology in the new product development process.
Text block	Interviewee 7
TB 200	So operationally, scrum is good because you can work as agilely as possible. The biggest disadvantage I see with scrum is, as I mentioned, the coordination.
TB 201	To define the goals, it is then important to work with OKRs, for example, or to choose some method that shows the vision and the goals as well as the KPIs and is included in a roadmap that shows how these goals can be achieved.
Text block	Interviewee 8
TB 202	The product manager is in a detailed exchange with the designers and developers and negotiates with them accordingly. This is because, for example, you have built a prototype, tested it and then handed it over for implementation. Then you realise that you still have to change half of the prototype because it doesn't work as intended and you have to make a lot of compromises.
TB 203	Statements from stakeholders who basically have no idea about the process within new product development make life difficult for the product manager. This is because the product manager becomes the spoilsport who has to tell the person with the great idea that the idea alone is not enough to have a clean, successful product.
TB 204	Cross-functional teams are not so good when it comes to dealing with potential difficulties. For example, if you have 5 different tech teams that have to deliver on a certain date, then you sometimes have to push a little harder. So, the issue of delivery on a specific date is a key factor in why you need a higher-level project manager.
TB 205	For example, if you are changing a payment system in a bank, I would never do it without a project manager. The project manager must ensure that all test cases have been carried out. Because if something goes wrong, it's a really big risk for a business-critical product. In comparison, if a feature in an artificial intelligence tool that is not business-critical doesn't work right away, it's not as dramatic as it would be with a business-critical product.
Text block	Interviewee 9
TB 206	It is very important that the entire cross-functional team is even more involved in the interactions with users, because this still happens too little. It is important that the entire cross-functional team understands who the user is and what keeps them engaged. To understand this, it is therefore relevant that the entire cross-functional team interacts with users on a regular basis.
Text block	Interviewee 10
TB 207	What can become problematic, however, is when a user group thinks that something in the product is not good, but the Head of Product is convinced that this is the right approach. In this case, the question then arises, who do we trust, the customer or the Head of Product, who is convinced of the solution? In this case, the question then arises, who do we trust, the customer or the Head of Product, who is convinced of the solution?

Requirement	Characteristic
Cross-functional teams	Team Efficiency and Customer Involvement
Definition	
Insights from the interviewees on the importance of strategically involving customers throughout the new product development process, particularly in the early stages of ideation and needs assessment, to ensure that products meet the actual needs and preferences of users, while balancing the level of customer involvement with the efficiency and effectiveness of cross-functional teams.	

Text block	Interviewee 6
TB 208	Because the customer co-creation approach is also very much about the ideation context, it would be relevant for the UX researcher to take care of the customer. But I can't answer this conclusively, this could also be the Product Manager. Ultimately, the team has to think together about where the customers could be utilised in a beneficial way. Either way, we would have to think a lot more about how to work with a customer co-creation approach.
TB 209	A team made up of product managers and designers asked themselves the question of how customers can be utilised in the area of ideation so that efficiency and collaboration in the cross-functional team is not impaired. This means validating and releasing an idea before it is already there. This team concluded that customers are specifically needed in two places in the new product development process.
Text block	Interviewee 7
TB 210	I think it's most important that customers are involved at the beginning of a new product development process so that user needs can be researched and ultimately a need can be solved. Because otherwise you end up with pure assumptions that you want to solve and, in this case, it's only based on a gut feeling. If you work effectively with customer needs as a basis, then you can get off to a much better start.
TB 211	During development, it's important to involve customers in the new product development process to test prototypes and get user feedback. However, using customers to test prototypes or get feedback requires less effort than exploring user needs at the beginning of the new product development process, as exploring user needs requires more planning.
TB 212	This means that at the beginning of the new product development process, although the integration of customers is extremely important for need-finding, it is also the most critical for the cross-functional team because it requires a lot of planning as well as debriefings, for example.
TB 213	Before a business case is created, some things are simply clear without having to involve customers. For example, measurements show that people are spending more time on podcast platforms and listening to podcasts since Covid. This is because people can listen to podcasts when they are travelling, for example. With a product like this, you wouldn't need to involve users because the data speaks for itself. What is more exciting, if we want to work with podcasts, is how the podcast product has to look effectively so that it is accepted by users.
Text block	Interviewee 8
TB 214	With the background idea that cross-functional teams are not negatively impacted, I would also deploy customers along all three phases, namely the idea phase, the discovery phase and the delivery phase.
Text block	Interviewee 9
TB 215	I don't believe that a cross-functional team becomes more inefficient if you involve the customer in the new product development process.
TB 216	It depends on how often a customer is involved in the new product development process, meaning that if the cross-functional team is almost exclusively involved in workshops with customers, then the process within the cross-functional team becomes inefficient. However, if the customer is involved in the new product development process at regular intervals and there is a healthy balance, then the process within the cross-functional team is efficient.

Requirement	Characteristic
Cross-functional teams	Technical Expertise in Cross-functional Teams
Definition	
Insights from the interviewees on the changing role of IT and the increasing importance of technical expertise, such as IT architects and technical leads, in the new product development process, particularly in ensuring technical feasibility, selecting strategic technologies and balancing business needs with technical constraints, while also recognising the challenges of attracting and retaining such talent and the potential for organisational restructuring to facilitate closer collaboration between technical and non-technical teams.	

Text block	Interviewee 6
TB 217	Our developers would say that they are integrated far too late in the new product development process. On the other hand, they would say that they can't contribute to business-critical topics
TB 218	In our agile teams, we have so-called tech leads who are more involved in IT architecture. We try to integrate them into the new product development process at an early stage so that the technical issues are also given priority and we can decide whether the technology we are using today will also help us tomorrow.
Text block	Interviewee 7
TB 219	Specific technical roles, such as that of an architect, are relevant for us and are becoming increasingly relevant.
TB 220	Previously, however, IT departments in the media industry were generally more responsible for operations. Now, however, IT departments are there to define the core experiences.
TB 221	This shift from operations to active involvement in the development process of IT departments has been going on for some time, but is now becoming more and more important, partly because the business model of media companies has changed, and the technical level therein is becoming increasingly relevant.
TB 222	If it is a very technical topic, then you need more technical people, such as a solution architect or system administrators. System administrators are relevant for a CRM system, for example.
Text block	Interviewee 8
TB 223	Traditionally, we don't necessarily have system architects, but tech leads who have the architecture task together.
TB 224	I generally believe that we are not so strong when it comes to technology. I would like to see us in a better technical position because in the past, very committed product managers with a technical understanding described the solution too firmly and not enough the problem to be solved. As a result, something is built that may not be the best technical solution. I therefore believe that roles such as that of an IT architect have a technical conscience. In other words, they can point out where things are too complicated.
TB 225	I believe that technical partners are needed who recognise risks and can say, for example, when they receive requirements that technology X and Y cannot cover these requirements. Nevertheless, what I always expect from a product perspective is that the technical teams show that there are different solution variants, and I have rarely seen that. This means that variants should also be shown that may not cover all requirements but would still be very good as a variant because the variant that covers all requirements is three times more complex. This technical solution-finding process is extremely important, and, in my view, you should invest a lot of time in it so that you can be sure at the end that you have selected the best technical solution.
TB 226	One of the main problems I see is that people think far too quickly in terms of solutions and not what problem we actually want to solve. It would be the job of a solution architect to find the right technical solution.
TB 227	What I have seen with solution architects is that the solution architect writes something down on paper, isolated from the rest of the team, but is ultimately not a technical specialist in all technical areas. This means that a lot of assumptions are made, but these are not documented as assumptions.
TB 228	We work with DevOps teams to some extent, but more in the area of IT infrastructure. Otherwise, we don't work with DevOps teams.
Text block	Interviewee 9
TB 229	We have cross-functional teams and also technical roles such as the DevOps team, system architects and solution architects.
TB 230	Typically, we work with tech leads and multiple developers. We have different technologies and platforms in use, namely a web platform for desktop, which is a browser-based solution, and native solutions for iOS and Android. Accordingly, we have corresponding developers in

	the cross-functional teams for the different solutions.
TB 231	IT architects are not directly integrated into our cross-functional teams. IT architects are usually part of another team and are called in when major architectural decisions need to be made.
Text block	Interviewee 10
TB 232	In our company, solution architects or system architects can only be found in the IT departments, but they do not develop products. For the development of new products, we work together with external companies that provide the IT architect roles. This is because we are not a product-driven company, and we only have functional roles internally that correspond to our DNA as a media company.
TB 233	It is clear that IT architects are highly relevant for a new digital product. Architects are relevant to determine the technical roadmap on a high-level basis, which the developers then rely on. This also determines which developer roles we need. For example, backend or frontend developers.
TB 234	All of our technical roles are outsourced because we can't keep them busy all year round. Only technical roles in the data area are employed by our company. Outsourcing also has the advantage that we receive advice when it comes to using cheaper technologies that ultimately deliver the same result. This ultimately helps to harmonise the business requirements with the technical requirements.
TB 235	In the end, we have a product owner, a product manager and technical roles in the data area. However, all roles for the entire technical development of products are outsourced.

Requirement	Characteristic
Company Culture and Organisation	Organisational Design and Culture
Definition	
Insights from the interviewees into the organisational structures and roles within their companies, highlighting the importance of cross-functional collaboration, the evolving role of IT and the need for clear communication and coordination between different departments and hierarchical levels in the new product development process.	

Text block	Interviewee 6
TB 236	It was clear from the beginning which teams were dedicated to this new product development. For example, which UX people are responsible for new product development. We have different levels of governance at management level and there is a level in between that is responsible for the delivery organisation of the digital products. Accordingly, we are able to say that we need person X and person Z.
TB 237	We want to have the forces of the four forces model on board everywhere, for example people who provide the content, people who then distribute the product, people from the delivery team, which includes product managers and UX people, as well as people from technology. Distribution is carried out by marketing or cross-promo, for example.
TB 238	At our company, for example, app development is assigned to a clear development delivery organisation, which has a product manager who is responsible for this product.
TB 239	The strategic discussions are held outside of this development delivery organisation, in which the product manager is not necessarily involved.
TB 240	The strategic processes are managed by a different department. The strategic part is therefore separate, but if we say that we need a new product, then there is a person in it, analogous to a business owner, who represents the business. However, we don't work with the title of business owner, but have a 4-power model, which comes from the content.
TB 241	These scrum teams or agile teams not only work on one product, but can also work on several products.
TB 242	For example, the team that developed the new app is also responsible for two other apps. In this case, there are also two other teams responsible for tracking and the backend. However, we now realised that this is too big and we have to split up the teams. So, our hypothesis is that a large product cannot be managed by one team. That's why we need product

	managers to ensure that the work reaches all teams and that all teams know what's important at that moment.
TB 243	Each team works on different features or projects. However, as soon as something reaches a certain size, we have to ask ourselves whether we are doing the right thing, because it cannot be that a team always does the right thing for itself but is not so important in the overall context. So, for example, you have a product that is constantly being developed by the teams, but this further development does nothing for the overall concept and there is a much bigger construction site elsewhere. So, we also need to be able to say that we are scaling back on a certain project and allocating more resources to another project. You can only really have this broader view if you know what's going on everywhere. That's probably why everyone does it these days by having a backlog at team level and scaling this backlog across all teams to ask themselves where they should invest. In practice, however, it is not so easy to find a tactical, operational or strategic basis for decision-making.
TB 244	Due to public holidays and other influencing factors, we have three weeks a year that our teams can use to play around. This is very exciting because it results in very creative ideas and gives the product managers the opportunity to decide whether these ideas can be realised. However, it is important that these ideas are not tested by the customer, but only internally. But we are also customers of our products.
Text block	Interviewee 7
TB 245	When merging the role of a product manager and product owner and not having a project manager for digital products, in my opinion, a new hierarchically structure is needed. This means that there is a Head of Product Management who works more on product strategy and a senior or lead product manager who is responsible for an entire area. An entire area can be, for example, user journeys or new target groups or channel-specific areas such as apps. And then there are product managers at an operational level who are responsible for a section, such as the homepage of the website. We are currently in the process of moving into these three hierarchy levels.
TB 246	When there will be a new hierarchically structure for product management, all product managers would develop new digital products together. However, as this new hierarchy structure for product management is under development, we now still have the overlap between project manager, product owner and product manager.
TB 247	We are trying to move our organisation more in the direction of scrum.
Text block	Interviewee 8
TB 248	Escalation refers to whether a specific concern needs to be entered one hierarchical level higher. The project manager is therefore responsible for checking whether and which risks are managed. This is how we handle it and it works very well for us.
TB 249	Even if a stakeholder says something, it does not mean that it has to be made that way. Because something I often notice is that you need an idea at the beginning and then you need to develop it later. But the part in between, that is the conception, where you ask yourself whether the idea is right and what problem exactly the idea solves and how you solve the problem and what you will actually realise from the idea, that is not seen as an effort from the stakeholders. I often hear stakeholders say that we already had this idea once and why it wasn't simply implemented. They have the feeling that the conceptualisation part is mega easy and quick.
TB 250	A lot happens between the idea and development and a lot of twists and turns have to be made. Stakeholders usually only understand that an idea alone is not enough for realisation when they are closely involved in the process. I fundamentally believe that the effort involved in conceptualisation is difficult to understand if people are not involved in the conceptualisation itself.
TB 251	What is also extremely exciting is that when the discussion is about technological aspects, nobody is interfering. Technological aspects are immediately perceived as complicated, as our Chief Technology Officer also says. In product management or marketing, however, everyone believes that they know better and could do better, for example, everyone believes they know how they could have done the marketing campaign better. So if a campaign doesn't go so well, you hear afterwards that it was clear since the beginning that the campaign wasn't good. The same applies to the design. Everyone has an opinion when

	you show someone the design. But the problem is that these people, who think they know better, don't realise the complexity that such functional roles have to work with.
TB 252	Publishing is actually just the carrier material for the content. But without the right preparation and without the right carrier material, in other words where content is published, the content is worth nothing. But in the internal hierarchy of media companies, content is certainly very relevant. Depending on the Swiss media company, it is more pronounced, also in the internal hierarchy, which person has what to say.
TB 253	The editorial team also looks at how articles are read throughout the day. However, it is more relevant for the editorial team to draw the right interpretations from the data.
TB 254	We are very reader-driven because we provide end-user products. This is certainly less the case with business-to-business products. We definitely can't complain about a lack of feedback, because someone always gets in touch with customer service.
Text block	Interviewee 9
TB 255	At our company, technical roles are also strategically involved and not just operationally. At our company, the Chief Product Officer, who is responsible for the entire product portfolio from a digital perspective, works very closely with the Chief Technology Officer. The Chief Technology Officer has the highest technical level in the hierarchy, with directors below him. On the product side, we have a director of product and on the technical side a director of engineering. There is also a director of operations. This means that the product, or business side, works on an equal footing with the technical side.

Requirement	Characteristic
Company Culture and Organisation	Leadership Roles
Definition	
Insights from the interviewees into the different leadership roles and responsibilities within product development teams, including product managers, product owners and project managers, and the ongoing discussions and experimentation around the optimal configuration of these roles to achieve effective collaboration, strategic alignment and successful product outcomes.	

Text block	Interviewee 6
TB 256	As soon as it becomes clear that we are developing a new product, the product manager takes the lead.
TB 257	The product manager is the project lead. He could also share the tasks with another person if there is too much work. For example, there could also be a technical project lead alongside the product manager.
TB 258	Where possible, however, we are trying to experiment with having a core team. However, we don't yet know whether the product owner has the same role as the product manager. But we believe that the product owner can take on the role of the product manager and announce in certain situations that they need things from another team. In other words, there is ultimately a shared role between the product owner and product manager.
TB 259	We have two assumptions regarding the product owner. The first assumption is that product owners and their scrum team or agile team have a certain responsibility for the product. However, this also includes ensuring that the product is maintainable and operable, that updates happen and that there are no security problems.
TB 260	The second assumption regarding the product owner is that not just one scrum team is needed for a new product. For example, we have a scrum team that focuses more on the backend and provides APIs. So, you need different teams working together. However, the product owner can be deployed across all teams, because it makes no sense to have three product owners for a product, for example, and then not knowing who is in the lead.
Text block	Interviewee 7
TB 261	In a cross-functional team, there needs to be a superordinate person who is the tech lead and a superordinate person who is the business lead.
TB 262	As things stand today, a product owner owns a technical platform. For example, we have product owners for the website, an app or for systems such as a CRM system that we source externally.

TB 263	Product owners are very close to the developers. When the business wants something, product owners look at how it can be implemented. The business can be either a Product Manager or a Project Manager.
TB 264	Product managers and project managers define the why and the what and the product owner defines the how. However, this means that the technology only implements and that is not a good thing, because people in the technical area, such as the product owner, should be co-creators, just as people from the business are.
TB 265	The difference between project managers and product managers is that product managers also own products, like a product owner, but manage the product together with UX managers, for example. However, the technical realisation of this is the responsibility of the Product Owner.
TB 266	We can now see that the roles of Product Owner and Product Manager should be merged.
TB 267	There should be fewer or no project managers for digital products in the future. There are still project managers today, but they are involved in very strategic projects that are close to the management and play a role in merging and acquisition or remodelling a building, for example. However, you no longer need a project manager to develop digital product; the product manager should do that instead.
Text block	Interviewee 8
TB 268	So, when it comes to the further development of an existing digital product, we also have much less governance, meaning that the product manager is the main driver and coordinates everything.
TB 269	In the case of an overarching project we often have project managers in addition to the product manager, who have a coordinative rather than a content-related task and therefore must chase after the people involved.
TB 270	In fact, we use the term Product Manager and Product Owner in the same way, which means that there is no difference here.
TB 271	Personally, I am a big opponent of the idea that only the product manager makes the strategic considerations, and the product owner works tactically. Because it leads to a situation where the product manager thinks, and the product owner has to implement what the product manager has thought. In reality, you can of course separate the tasks of the product manager and the product owner, but in my opinion, this is not linked to the title.
TB 272	In our company, it is often the case that the employees affected assign the title to themselves, meaning that some call themselves product managers because it sounds more strategic, and others call themselves product owners because they want to be closer to scrum approach and closer to the developers. However, there is no formal difference between the role of product manager and product owner in our company.
TB 273	The project manager, or project leader, on the other hand, is a dedicated, non-content-related role. The project manager is therefore a very coordinative role that has the task of managing the timelines, ensuring that everyone has delivered, seeing what everyone must deliver and by when, and that the project manager holds the people involved in the project accountable.
TB 274	Over time, the project manager naturally also becomes a specialist in the product but has no opinion on the product.
TB 275	If you are really unsure about the path you have taken during the process, a project manager could for example have the task to discuss the other paths again with the senior positions in the project for reasons of risk. However, under no circumstances should other people involved in the process be involved in this discussion, as this would cause extreme uncertainty.
Text block	Interviewee 9
TB 276	We have all three roles, namely product owner, product manager and project manager in place. With these roles, I am convinced that there is no agreement in the media industry as to what the task of each role is. If it were up to me, then the product manager and the product owner would be the same person who is responsible for the product end to end, defines the vision and the strategy, creates the roadmap and is involved right up to the delivery of the product. However, this approach is mainly feasible for smaller products because the scope of the product is manageable. For larger products, you have to ask

	yourself whether you should break the large product down into smaller products or whether you should divide up the roles.
TB 277	In our company, we have a product manager and a product owner.
TB 278	The product manager is basically responsible for looking ahead and is therefore more orientated towards strategy and business. This means that the product manager plans at quarterly or annual level and at epic level in the scrum context. This means that the product manager defines the major epics.
TB 279	The product owner refers to the epics defined by the product manager and breaks them down into user stories together with the scrum team.
Text block	Interviewee 10
TB 280	In a core team, a product owner is needed who is responsible for coordinating all the people involved in the project. There is also a product manager who conceptualises the entire product. This means that the product manager designs the product vision, and the product owner implements the product vision and carries out stakeholder management. This is exactly how we work with a core team, but there is both a product manager and a product owner in this core team.

Requirement	Characteristic
Company Culture and Organisation	Decision-Making Authority
Definition	
Insights from the interviewees on the role of product managers and steering committees in overseeing and managing the new product development process, highlighting the importance of collaboration, communication and decision-making authority, but also recognising the challenges of balancing top-down directives with user-centric approaches and the need for clear governance structures.	

Text block	Interviewee 6
TB 281	With digital products, it's very clear who has to take the lead, which is the product manager. Apart from the whole strategic part, which is placed earlier in the process, in which there are also other participants and is even more open.
TB 282	The product manager is responsible for ensuring that the processes take place from start to finish in this new product development process and that the business case with the estimated costs and the ideation are officially approved.
Text block	Interviewee 7
TB 283	We try not to work in a purely top-down manner. This means that if something is rejected by the steering board, but the product managers see that it is very relevant for the user, then the product managers enter into a dialogue with the steering board and try to convince the steering board.
TB 284	We have agile teams that report to a board, in other words, a steering committee, which consists of three people, namely the Editor-in-Chief, Chief Technology Officer, and Chief Commercial Officer. Most things are dealt with by this board, unless they are new budget requests, in which case it goes to the entire executive board.
Text block	Interviewee 8
TB 285	It is the product manager or the product owner, who is technically responsible and can decide whether something is technically suitable or not.
TB 286	We work with steering committees at the start of the project. The steering committee always approves all decisions and supports the entire project.
Text block	Interviewee 9
TB 287	We also work with steering committees. However, our steering committees are not yet set up quite so systematically and are often used for initiatives, which are larger product initiatives that run over several quarters. However, not always the same people are represented in the steering committees for all the initiatives. However, there is always a similar constellation of people on the steering committees, which means that people from different areas of the company are involved, which are usually the key stakeholders.
Text block	Interviewee 10

TB 288	When it comes to editorial topics, journalists play a major role in the development of products. However, this is still problematic because journalists are more relevant than customers.

Requirement	Characteristic
Change Management	Change Readiness and Impact Analysis
Definition	
Insights from the interviewees on the challenges and opportunities of the Swiss media industry's approach to new product development, including the need for greater customer focus, the integration of technological considerations, the influence of cultural factors and the importance of formal project management for large-scale initiatives.	

Text block	Interviewee 6
TB 289	The problem is that we are not that brave. At least the control gate, that is, at the beginning of the business case, where we decide whether we want to implement this business or not, based on user insights, would be hugely relevant. There's too much in the funnel, meaning that the new system is already packed full and not being challenged enough.
TB 290	In future, we should integrate the technological aspects as early as possible, including in the governance process, because it ultimately has something to do with the lifecycle.
Text block	Interviewee 7
TB 291	The problem I see with direct customer involvement is that the media industry is struggling to appeal to the future users of its product because the news product as it is today no longer meets the needs of younger people. Especially among young women.
TB 292	The fact that Product development does not work according to the same principle as our strategy department, in other words with an overarching model, is a problem within the company.
Text block	Interviewee 8
TB 293	I believe that this has a lot to do with our Swiss culture. If you look at Swiss apps in the app store, this becomes very clear. Although there are also positive app reviews, they are usually actively requested by the app manufacturers. Otherwise, if you don't actively ask for app reviews, you will almost exclusively receive negative app reviews, because you only get in touch if something doesn't work.
TB 294	The first criterion for formal project management is if it is a fundamentally new technological development. In other words, it is not just a further development of the project but, for example, a completely new tool that is used by many people.

Requirement	Characteristic
Change Management	Change Communication, Engagement, and Implementation
Definition	
Insights from the interviewees on the benefits of agile process frameworks in minimising risk and promoting flexibility, the challenges of aligning different processes and models within an organisation, and the importance of clear decision-making and committing to a specific path when developing new products to avoid uncertainty and potential setbacks.	

Text block	Interviewee 6
TB 295	Another advantage of agile process frameworks is that you can minimise risk with agile process frameworks.
Text block	Interviewee 7
TB 296	You can create subcultures. This means that you have a cross-functional team that is already working with new methods such as user-centred process foundations and celebrating success with them. Such success stories in subcultures can then spread throughout the company.

TB 297	I believe that it would have an impact on our new product development process if we were to work with an overarching lifecycle model. The problem is that a company often uses several processes or several models, which means that concrete planning as in a theoretical model often doesn't work. The biggest challenge here would be for all employees to work according to the same model.
Text block	Interviewee 8
TB 298	During this re-evaluation phase, we considered other tools and other providers again and used Excel lists to list the requirements. This re-evaluation was very time-consuming, but in the end we were able to confirm that the route we were taking was not the absolute best, but that the opportunity costs would have been too high to switch to another route. It was therefore very important that we carried out this re-evaluation, as it allowed us to definitely stick to our plan and remove the uncertainty.
TB 299	The most important thing is that there is always someone involved in the new product development process who knows how to deal with customer feedback and how to categorise it. To give you an example, we often receive customer feedback from app reviews.
TB 300	What is poison for any project, and I've seen it happen, is that you doubt the target solution in the middle of new product development. It is therefore very important at the beginning of a new project, even if you know that a lot will change, that you decide in favour of an explicit path. The worst thing that can happen is that in the middle of the process you are still working with the hypothesis of what would have happened if you had taken a different path.

Requirement	Characteristic
Change Management	Change Monitoring and Evaluation
Definition	
Insights from the interviewees on the challenges of resource allocation and the need for effective governance structures in new product development, including the importance of considering long-term operating costs, the difficulty of finding and retaining technical talent, and the potential benefits of establishing advisory boards or similar committees to facilitate cross-functional collaboration and strategic decision-making.	

Text block	Interviewee 6
TB 301	The only thing it would change when we would work with an overarching lifecycle model as the application lifecycle management is that we would talk more consciously about the money again. We subsequently realised that we hadn't made it clear enough what consequences an investment in a new product could have for the business later on. In other words, it is not enough to simply say that we are making a new product, have money available for it but then there is no organisation to take up the product. Or the organisation that takes on the new product already has a lot of other things in the pipeline, so it then has a massive impact on the other products.
Text block	Interviewee 8
TB 302	A staff engineer, for example, is rarely found in medium-sized companies, but rather in large companies. And what you need are staff engineers or tech leads who have a very high level of technical expertise. We have the complexity that we often also pack the management component into such roles and then the question arises as to how much time these tech leads still have for the technical part of their work because they also have a leadership or management role overall. So, it's very difficult to find the right IT people. When someone leaves us in the tech area, it's always a very difficult situation for us to replace the role because it's a complex role with management but also tech expertise. I believe that we need to divide this up better in future, which means that we need to rethink this staff engineer path, which involves senior positions.
Text block	Interviewee 9
TB 303	We are currently discussing setting up a product advisory board, which will define the focus of the strategy at quarterly level and decide where the product priorities lie. Of course, the priorities should also be driven and proposed by product management in the product advisory board, but people from other areas of the company should also be involved so that,

	for example, the editorial or commercial perspective is also included. These different perspectives can then be used to jointly define where the focus should be placed. Ideally, we would also work with OKRs here so that the core objectives can be set at management level and the product priorities can then be determined based on these OKRs. With the advisory board, we would then have a committee that, in contrast to the steering committees, would always have the same people represented.

Requirement	Characteristic
Future orientation of the media industry	Adaptability and Innovation
Definition	
Insights from the interviewees on the challenges and opportunities facing the Swiss media industry as it adapts to the digital age. These include the need for a shift towards a more user- and outcome-centric mindset, the importance of empowering technology teams and the realisation that traditional business models and content strategies may no longer be sufficient to meet the changing needs and expectations of consumers.	

Text block	Interviewee 7
TB 304	The principle of using user-centred design also plays a major role in corporate culture. The media, especially newspapers, explained the world to us for 200 years before the Internet came along, which means that they had the power to tell the population that they understood the world better and that the population could read the information. However, this has changed and nowadays you can get information from anywhere. The population has also become much smarter in this respect. As a result, the demands placed on media companies in terms of content have increased. So, in future, customers will be forced to help shape and develop products. The problem is, however, and I have already worked in several media companies, that the acceptance that the world has changed has not yet fully arrived.
TB 305	I think it is relevant that in future, at a cultural level in the Swiss media industry, the technology teams will be empowered, and the editorial teams will become more user-centred. Editorial teams still think in terms of output and not outcome. And thinking in terms of outcome must be encouraged.
TB 306	The problem is that the mindset in some Swiss media companies towards customer-centricity is not yet where it could be. For example, if you invite people from the IT department to a workshop, the feedback from IT employees is often that the business should simply tell IT what the business wants and IT will then analyse whether the implementation is realistic. But if you do exactly that, I mean give the IT department a list of requirements, then the question arises as to why they have not been integrated before and because they don't just want to implement the requirements. And it is precisely such conflicts between business and IT that can be resolved with a user-centred process basis.
Text block	Interviewee 8
TB 307	the things that make the difference are not the big things, but the little things. This means that for us it is more relevant whether you insert the links cleanly in every article than whether you have a cool new fancy function in which you can create a personalised profile. Our figures show that perhaps 3% of users need such a fancy function, but 100% of users need the links to be inserted correctly and the articles to be of high quality. And it is very difficult for outsiders to understand that it is not necessarily cool fancy new artificial intelligence chat bots that are relevant for us. It is much more relevant that the text is written cleanly and that every link that is placed links to the right place. In other words, the quality of the text and small inconspicuous aspects are ultimately decisive in determining whether a user becomes a subscriber and not the super cool fancy features are relevant to become a subscriber in the media industry. The same is the case on Instagram, for example. In the end, what matters is whether you see beautiful or exciting pictures on Instagram and all other functionalities are secondary. So the experience on the app has to be so seamless that the other functions are not distracting.
TB 308	I would like to see more proactivity from the tech teams, which is not part of the scrum approach. For example, I have often seen a product manager or product owner sign off

	entire tickets and only hand them over to the tech team once the last business detail has been specified. Personally, it would suit me better if the product manager or product owner had put together the idea, the concept and the user flow and clarified the business issues, but didn't go into defining the technical solution because that is not their area of expertise. So the product manager should not be responsible for how something is solved, but what needs to be solved, and I sometimes see an imbalance in practice.
Text block	Interviewee 9
TB 309	Specifically in the Swiss media industry, it is difficult to find the necessary talent within a new product development process because the media industry itself is not necessarily the most attractive industry. This is despite the fact that we in the Swiss media industry deal with cutting-edge technologies. But the problem is more the reputation of the media industry in the minds of job seekers, because they think it's primarily about journalism and content. However, there is an increasing trend in the Swiss media industry towards technology and products, so that these topics are becoming highly relevant and highly valued in Swiss media companies. Nevertheless, it remains difficult to find good talent in the Swiss media industry.
Text block	Interviewee 10
TB 310	Customer centricity and partial customer co-creation will be fundamentally important for the Swiss media industry in the future.
TB 311	With the current mindset, it is almost impossible for a complete customer co-creation approach to be introduced in the new product development process in the Swiss media industry. However, I would find the approach extremely interesting. However, a lot of time would first have to be invested in the topic of governance to clearly manifest how such a customer co-creation approach could really be implemented in practice. Ultimately, you want to fully integrate customers but at the same time speed up the new product development process and that requires precise planning. The issue of paying customers also plays a role, because you would need an additional budget. I assume that in practice the new product development time could slow down because you have more iterations. But that could also change in the future because you can save time when you always have customer feedback. On the technical side there would still be a lot of freedom, when a company would work with the real customer co-creation approach. Unless a company wants to rely on a completely new technology, which requires a completely new product design, then the active customer co-creation approach does not work.
TB 312	The question is to ask yourself why something is happening, as for example, why people are not watching TV anymore. What is important to see is, that we have a highly fragmented market with a lot of smartphone apps and push notifications for example. For example, the young generation is spending several hours a day only on one app and not jumping from one app to another. This could be TikTok or Snapchat. The question is then, what is them keeping on those apps and a solution could be that a media company should concentrate more on entertainment, for example.
TB 313	It is important that Swiss media companies do not rely on the past but are driven by the future. If you simply keep redesigning the old business, then at some point you will no longer meet the needs of the market. The market share of print media advertising in Switzerland is 25%, compared with just 2% in the USA. The trend in Switzerland will also move towards possibly 10%, which means that the cash cow of advertising revenue will disappear.

Requirement	Characteristic
Future orientation of the media industry	Efficient teams
Definition	
Insights from the interviewees on the importance of fostering a collaborative and agile culture in the Swiss media industry. They emphasise the need for cross-functional teams with shared goals, clear communication and a willingness to embrace new technologies and approaches to drive innovation and adapt to the changing media landscape.	

Text block	Interviewee 7
TB 314	It is also important for the future of the Swiss media industry that models are used to really look at how to become agile and put together cross-functional teams. With cross-functional teams, it is important that everyone speaks the same language and works in an agile way so that silos are broken down.
Text block	Interviewee 8
TB 315	It is important that you need good employees, in other words, you need multi-functional roles that can think outside the box and work well together. That's half the battle.
TB 316	Perhaps this is a major problem in Switzerland, that a technical team does not want to generate any work for other technical teams and therefore sees this as a restriction right from the start, that they do not want to generate any work for the other teams. However, this scenario only occurs if the technical teams are not set up correctly. Ultimately, a solution architect must always be responsible for the entire product or the entire system. If they only work in one area, then that is very dangerous, because even if you have the best intentions, you don't want to interfere in others business and so you end up building technical solutions that are more complex than they need to be. This means that if you employ a solution architect, they must be responsible for the entire product or system and not just one area of the product or system.
Text block	Interviewee 9
TB 317	For the future of the Swiss media industry, it is important to ensure that you have very stable cross-functional teams that are autonomous and cover the most necessary capabilities. In a world that is strongly driven by artificial intelligence and new opportunities are arising as a result, it is important that the cross-functional team understands these new opportunities and can derive the potential and the boundaries from them. This is relevant so that a cross-functional team can apply these new possibilities in the software development process or in the development of new solutions.

Requirement	Characteristic
Future orientation of the media industry	Entering new business areas
Definition	
Insights from the interviewees on the need for the Swiss media industry to embrace collaboration, innovation and disruption to meet the challenges of the digital age, including seeking partnerships with other media organisations, adopting new technologies and rethinking traditional business models and journalistic practices to ensure future success.	

Text block	Interviewee 6
TB 318	We should consider how we in the Swiss media industry can work together rather than against each other as media companies. In other words, as partner co-creation. This is because the competition is not in Switzerland. This means that all of us media companies in Switzerland could, at best, carry out a joint ideation process where all the advantages are disclosed, and we consider what could be done together. But the problem is that we already have the problem of pulling together internally, so I don't know what it will be like if we also brainstorm ideas with external media companies.
Text block	Interviewee 10
TB 319	In addition to customer-centred co-creation, you also have to start thinking outside of the box. There has been no innovation in the Swiss media industry in the last decade. The only one who innovated in 2004 was the then CEO of Axel Springer, who sold a large part of his portfolio and reinvested in digitisation. Everyone labelled him crazy, but in the end, he did everything right because he saw that the peak had been reached and that revenues would now decline. Axel Springer is now the only publisher in Europe to have pushed ahead with digitisation 30 years before the competition. So, this shows that you need to be disruptive these days.
TB 320	In the future you need to disrupt yourself because if you don't do it, your company will not survive. You will not have the same landscape in ten years as the landscape that you have today. To be disruptive you need to realise as a media company that the advertising share is

	shrinking and that the business model with the number of journalists that is existing today is not possible in the future. If you simply cut 2% to 5% of your staff every year, you will only be able to survive but this is not a transformation.
TB 321	And finally having subscriptions will not be the answer to success in the media industry. The question will also be how important new technologies such as AI will be and what the future of the journalism will look like. So, for example, should the journalism be local or national wide, could be a question. The disruption readiness will be an important aspect for the future of the Swiss media industry. Technology after all is only an enabler, what is important however, is what the idea behind using a certain technology is. This means, that technology is only showing how to deliver an idea but not showing the answer how to get an idea.

1.3.3 Codebook for the Within-Company Coding of the Feedback and Evaluation Phase

This section shows the codebook for the within-company analysis of the feedback and evaluation phase based on Mackieson et al. (2019) in Appendix 1.2.1.

1.3.3.1 Interview 6

This section shows the codebook for the within-company analysis of interview 6 (company 1) based on Mackieson et al. (2019) in section 1.2.1.2.

Code	FEASABILITY_ASSESSMENT
Level	1 (Primary code)
Short definition	Feasibility assessment of a new product development
Full definition	Text that discusses the evaluation of the viability and practicality and of developing a new product.
When to use	Text that addresses the assessment of whether a new product is worth developing.
Example	“Ultimately, it’s about being able to utilise the money invested as effectively as possible in a technological sense, because the entire technical operation or even a single feature is not free.”
When not to use	If the text focuses solely on the technical aspects of product development or the decision-making process without explicitly mentioning the assessment of feasibility, this code cannot be used.

Code	TECHNICAL_FEASIBILITY
Level	2
Links to	FEASABILITY_ASSESSMENT (Level 1)
Short definition	Technical feasibility assessment of a new product development
Full definition	Text that addresses the assessment of the technical aspects of developing a new product, including the availability of expertise, resources and technology required to develop and implement the product.
When to use	This code is applied when assessing whether the development of a new product is technically feasible, including consideration of technical expertise, resources and technological barriers.
Example	“One thing that is relevant is that you don’t come up with products that are technically impossible to realise ...”
When not to use	If the text refers to technology, in particular to technical considerations, but does not address technological feasibility, reference must be made to the primary code “TECHNOLOGICAL_CONSIDERATIONS_IN_NPD” and all associated subcodes.

Code	FINANCIAL_VIABILITY
Level	2
Links to	FEASABILITY_ASSESSMENT (Level 1)
Short definition	Financial viability assessment of a new product development
Full definition	Text that addresses the assessment of the financial viability of a new product, including the cost and potential return on investment, and the availability of funding to assist in the development and launch of the product.

When to use	This code is used when discussing the financial considerations of developing a new product, including the associated costs, the potential for generating revenue and the funding availability.
Example	"... or can only be realised at very high cost."
When not to use	This code is not applied if the text refers to ongoing awareness and management of costs throughout the development process. In this case, the code "COST-CONSCIOUSNESS" is applied.

Code	ADVANTAGE_AGILE
Level	1 (Primary code)
Short definition	Advantages of agile process frameworks
Full definition	Text that addresses the positive aspects and benefits of using agile process frameworks in product development, including increased speed and flexibility, improved team morale and productivity, and reduced risk.
When to use	This code is applied when the texts refer to the positive effects of agile process frameworks.
Example	"The advantage of agile process frameworks is that you can move quickly as long as there are no overlaying processes."
When not to use	If it concerns limitations of agile process frameworks, reference is made to the code "LIMITATION_AGILE". If it concerns

Code	SPEED_AND_FLEXIBILITY
Level	2
Links to	ADVANTAGE_AGILE (Level 1)
Short definition	Speed and flexibility in agile process frameworks
Full definition	Text that addresses the ability of agile process frameworks to facilitate rapid development and iteration in the absence of bureaucratic processes.
When to use	This code is applied when the texts emphasise the speed and adaptability of agile methods, particularly when contrasting them with more traditional or structured approaches that may hinder rapid progress.
Example	"For example, you can say that a breakthrough will take place in the next three weeks, and something will be developed to see how it works."
When not to use	If the texts are process frameworks that are not agile and yet talk about speed or flexibility, this code cannot be used.

Code	TEAM_MORALE_AND_PRODUCTIVITY
Level	2
Links to	ADVANTAGE_AGILE (Level 1)
Short definition	Team morale and productivity in agile process frameworks
Full definition	Text that addresses the positive impact of agile process frameworks on team morale, motivation, and overall team performance due to the sense of accomplishment and purpose derived from frequent deliveries and tangible progress.
When to use	This code is applied when the texts discuss the positive effects of agile methods on team dynamics, collaboration, job satisfaction, and the sense of purpose derived from regular achievements and visible progress.
Example	"Another observation is that the quality of the teams increases because it is more fun to work with agile process frameworks, because you always deliver something and have a purpose."
When not to use	If the text discusses the technical aspects of agile frameworks, project management in general, or team dynamics unrelated to the use of agile methods, this code cannot be used.

Code	RISK_MITIGATION
Level	2
Links to	ADVANTAGE_AGILE (Level 1)
Short definition	Risk mitigation strategies in agile process frameworks
Full definition	Text that addresses the ability of agile process frameworks to reduce the risks associated with product development, such as the risk of project failure, cost overruns, or missed deadlines, through iterative development, frequent feedback, and adaptability to change.
When to use	This code is applied when the texts discuss the risk reduction benefits of agile methods, emphasising their ability to identify and address issues early on, adapt to changing requirements, and deliver value incrementally
Example	“Another advantage of agile process frameworks is that you can minimise risk with agile process frameworks.”
When not to use	If the text discusses general project management risks or risk mitigation strategies that are not specific to agile frameworks, this code cannot be used.

Code	LIMITATION_AGILE
Level	1 (Primary code)
Short definition	Limitation of agile process frameworks
Full definition	Text that addresses the limitations or drawbacks of using agile process frameworks, particularly in situations that require long-term planning, estimation of project scope, or significant upfront investment.
When to use	This code is applied when texts highlight the challenges or limitations of agile methods, especially in contexts where long-term planning, resource estimation, or substantial upfront investment are necessary.
Example	“Regarding control gates, there are people who think that this is not agile and takes responsibility away from certain people.”
When not to use	If the text discusses the general challenges of project management or the limitations of other methodologies without specific reference to agile frameworks, this code cannot be used.

Code	LONG_TERM_PLANNING
Level	2
Links to	LIMITATION_AGILE (Level 1)
Short definition	Long term planning with agile process frameworks
Full definition	Text that addresses the difficulties agile process frameworks face when dealing with projects or features that extend beyond the typical short-term sprint cycles, requiring long-term planning and resource allocation.
When to use	This code is applied when the texts discuss the challenges of using agile methods for projects that necessitate long-term vision, strategic planning, or resource allocation beyond the scope of individual sprints.
Example	“The limitations that arise from agile process frameworks are when there are topics that go beyond the length of a sprint and therefore require long-term thinking.”
When not to use	If the text discusses the general challenges of long-term planning or resource estimation without specific reference to the limitations of agile frameworks in these contexts, this code cannot be used.

Code	ESTIMATION_AND_SCOPING
Level	2
Links to	LIMITATION_AGILE (Level 1)
Short definition	Estimation and scoping within an agile process framework

Full definition	Text that addresses the difficulty of accurately estimating the scope, size, and required investment for long-term projects or features within an agile process framework, which typically focuses on short-term iterations and incremental delivery.
When to use	This code is applied when the texts discuss the challenges of estimating project scope, resource needs, or timelines for larger initiatives within the agile framework, particularly when these extend beyond the typical sprint cycles.
Example	"In other words, you can't estimate the size of something for a long time and how much you have to invest to make it good enough."
When not to use	If the text discusses estimation or planning challenges in general project management contexts without specific reference to the limitations of agile frameworks in this regard, this code cannot be used.

Code	ADVANTAGE_OF_ITERATIVE_DEVELOPMENT
Level	1 (Primary code)
Short definition	Advantages of iterative development
Full definition	Text that addresses the benefits of using iterative development processes, which involve creating, testing, and refining a product in repeated cycles.
When to use	This code is applied when the texts mention the benefits of iterative development, such as faster time to market, increased flexibility, improved product quality, and enhanced customer satisfaction.
Example	"Personally, I would work much more with rapid approaches such as prototyping or the build-measure-learn cycle. Also to get features live quickly."
When not to use	If the text discusses the challenges or limitations of iterative development, or to text that focuses on other development methodologies, this code cannot be used. The code "LIMITATION_OF_ITERATIVE_DEVELOPMENT" is referenced for iterative development limitations.

Code	CONTINUOUS_FEEDBACK_LOOP
Level	2
Links to	ADVANTAGE_OF_ITERATIVE_DEVELOPMENT (Level 1)
Short definition	Continuous feedback loop in iterative development
Full definition	Text that addresses the continuous process of gathering feedback, validating assumptions, and generating new ideas throughout the product development lifecycle, even after the initial launch
When to use	This code is applied when the texts discuss the ongoing nature of feedback and iteration in product development, where the release of a product is not the end but rather a starting point for further refinement and innovation based on user feedback and data
Example	"As soon as a product is live, the next big project comes alive, because as soon as a product is live and is being further developed, the validation or development release process is run through again. From this point of view, there is also a kind of ideation, in other words a kind of feedback."
When not to use	If the text focus on one-time feedback or evaluation processes, or to text that discusses feedback mechanisms unrelated to the iterative development of a product, this code cannot be used.

Code	RAPID_ITERATION
Level	2
Links to	ADVANTAGE_OF_ITERATIVE_DEVELOPMENT (Level 1)
Short definition	Rapid iteration in iterative development
Full definition	Text that emphasises the use of agile methodologies to quickly develop and release product features or updates, often using prototypes, the build-measure-learn cycle, or other rapid development techniques.

When to use	This code is used when iterative development is mentioned in the texts, thus emphasising the acceleration of the development process.
Example	“In the case of this app relaunch, however, we will take a different approach in future. This means that in future we want to develop our product much more iteratively in future and no longer want to create a completely new app, even technically, which would otherwise take a year to develop.”
When not to use	If the text discusses the broader benefits of iterative development without specifically focusing on the speed or rapidity of the process, this code cannot be used.

Code	CUSTOMER_CENTRIC_DEVELOPMENT
Level	2
Links to	ADVANTAGE_OF_ITERATIVE_DEVELOPMENT (Level 1)
Short definition	Customer centric development with the use of iterative development
Full definition	Text that emphasis the involvement of customers in the ideation and development process, using their feedback and insights to shape the product and ensure it meets their needs and preferences
When to use	This code is applied when the texts discuss the importance of incorporating customer feedback and perspectives into the product development process, particularly when mentioning iterative development.
Example	“The second place in the new product development process where customers are needed is during ideation. This means thinking about what would be good for the product and working with the rapid feedback cycle with customers.”
When not to use	If the text focuses solely on internal business needs or technical considerations without reference to customer input or feedback or iterative development, this code cannot be used.

Code	LIMITATION_OF_ITERATIVE_DEVELOPMENT
Level	1 (Primary code)
Short definition	Limitations of iterative development
Full definition	Text that discusses the limitations of rapid prototyping or iterative development approaches.
When to use	This code is applied when the texts mention the challenges or concerns associated with using rapid prototyping or iterative development approaches, particularly in relation to potential negative impacts on the company’s reputation, the need for additional work to refine and scale prototypes, and the accumulation of technical debt.
Example	“In other words, if you work with prototypes, you still have work to do later on because you have to integrate the new findings or scale up.”
When not to use	If the text discusses advantages of benefits of iterative development, this code cannot be used. In this case, reference is made to the code “ADVANTAGE_OF_ITERATIVE_DEVELOPMENT”.

Code	REPUTATIONAL_RISK
Level	2
Links to	LIMITATION_OF_ITERATIVE_DEVELOPMENT (Level 1)
Short definition	Reputational risk as a part of iterative development
Full definition	Text that expresses concerns about the potential negative impact on a company’s reputation
When to use	This code is applied when the texts highlight concerns about how releasing early versions of a product might be perceived by customers, stakeholders, or the public, potentially leading to negative brand image or loss of trust.
Example	“In our company, however, there is a direct fear of reputational damage with rapid prototyping.”

When not to use	If the text discusses general risks associated with product development or risks unrelated to reputational damage, this code cannot be used.

Code	TECHNICAL_DEBT
Level	2
Links to	LIMITATION_OF_ITERATIVE_DEVELOPMENT (Level 1)
Short definition	Technical debt as a part of iterative development
Full definition	Text that addresses
When to use	This code is applied when the texts discuss the accumulation of technical debt due to rapid prototyping or iterative development.
Example	"In other words, if you work with prototypes, you still have work to do later on because you have to integrate the new findings or scale up."
When not to use	If the text discusses general technical challenges or issues unrelated to the accumulation of technical debt due to rapid prototyping or iterative development, this code cannot be used.

Code	CHALLENGE_IMPLEMENTATION_CUSTOMER_CO_CREATION
Level	1 (Primary code)
Short definition	Challenges for the implementation of customer co-creation
Full definition	Text that discusses the challenges and obstacles encountered when trying to implement customer co-creation within an organisation.
When to use	This code is applied when the texts highlight the difficulties, concerns, or practical issues faced when attempting to incorporate customer co-creation into existing organisational structures, processes, or workflows.
Example	"The idea behind customer co-creation is very difficult for me because there is no procedural basis for it in our company."
When not to use	If the text focuses on the general benefits or advantages of customer co-creation, or to a text that focuses on the theoretical aspects of co-creation without addressing the practical challenges of implementation, this code cannot be used.

Code	UNCERTAINTY_AND_RESISTANCE
Level	2
Links to	CHALLENGE_IMPLEMENTATION_CUSTOMER_CO_CREATION (Level 1)
Short definition	Uncertainty and resistance as challenge for the implantation of customer co-creation
Full definition	Text that describes hesitation, concerns, or pushback regarding the adoption and implementation of customer co-creation.
When to use	This code is applied when the texts highlight uncertainties, hesitations, or concerns about the feasibility, practicality, or potential negative consequences of implementing customer co-creation within the organisation
Example	"We would first have to clarify a few things, including the financial aspects."
When not to use	If the text discusses specific challenges or obstacles in the implementation process without expressing broader uncertainty or resistance towards the concept of customer co-creation itself, this code cannot be used.

Code	INTEGRATION_CHALLENGES
Level	2
Links to	CHALLENGE_IMPLEMENTATION_CUSTOMER_CO_CREATION (Level 1)
Short definition	Organisational integration of a customer co-creation as a challenge for the implantation of customer co-creation
Full definition	Text that addresses the practical difficulties and considerations involved in integrating customer co-creation into existing organisational processes, workflows, and team structures.

When to use	This code is applied when the texts discuss the specific challenges of incorporating customer co-creation into daily operations.
Example	“When I hear the term customer co-creation, I imagine that a customer is part of the product team throughout the entire new product development process and not just for testing prototypes.”
When not to use	This code is applied when the texts express general concerns about customer co-creation or discusses challenges unrelated to the practical integration of the approach into existing processes, this code cannot be used.

Code	RESOURCE_IMPLICATIONS
Level	2
Links to	CHALLENGE_IMPLEMENTATION_CUSTOMER_COCREATION (Level 1)
Short definition	Resource implications as a challenge for the implantation of customer co-creation
Full definition	Text that addresses the financial, human, or time resources required for successful customer co-creation.
When to use	This code is applied when the texts mention the costs, resources, or investments associated with implementing customer co-creation, such as incentives for customer participation, allocation of staff time, or the need for specialised skills or knowledge.
Example	“The question of whether you have to pay customers to actively act as co-creators would also arise.”
When not to use	If the text discusses general resource constraints or challenges unrelated to the specific requirements of customer co-creation, this code cannot be used.

Code	STRATEGIC_CUSTOMER_INTEGRATION
Level	1 (Primary code)
Short definition	Strategic considerations for customer co-creation
Full definition	Text that discusses the strategic considerations and approaches for integrating customer feedback and data into the new product development process.
When to use	This code is applied when the texts discuss the strategic planning and decision-making processes related to incorporating customer feedback and data into product development, including identifying target customer segments, defining the scope of customer involvement, and aligning customer-centric approaches with overall business goals and product strategies.
Example	“In the current new product development process, the customer is involved through anonymous data, meaning usage data, feedback on prototypes and user experience research, meaning interviews.”
When not to use	If the text focuses solely on the challenges or obstacles encountered during the implementation of customer co-creation, this code cannot be used. In this case, reference is made to the code “CHALLENGE_IMPLEMENTATION_CUSTOMER_COCREATION” and all the concerning subcodes.

Code	UNIQUE_SELLING_PROPOSITION
Level	2
Links to	STRATEGIC_CUSTOMER_INTEGRATION (Level 1)
Short definition	Unique selling proposition as a strategic consideration for customer co-creation
Full definition	Text that addresses the identification and development of unique features or benefits that a digital product can offer to customers, differentiating it from competitors and creating a compelling value proposition.
When to use	This code is applied when the texts explore the specific aspects of a digital product that make it stand out in the market, appeal to customer needs or preferences, and provide a competitive advantage.

Example	"I believe that we in the Swiss media industry need to think very carefully about what we can offer customers as a unique selling proposition for a digital product."
When not to use	If the text discusses general marketing strategies or product features without explicitly addressing the unique selling proposition or the customer need of a digital product, this code cannot be used.

Code	CUSTOMER_FEEDBACK_AND_DATA
Level	2
Links to	STRATEGIC_CUSTOMER_INTEGRATION (Level 1)
Short definition	Customer involvement in the new product development process
Full definition	Text that discusses the collection and utilisation of various forms of customer feedback and data, including usage data, feedback on prototypes, user experience research, and interviews, to inform and validate product development decisions.
When to use	This code is applied when the texts mention the gathering and analysis of customer feedback or data at any stage of the product development process, including pre-launch, during development, and post-launch, to understand customer needs, preferences, and behaviours.
Example	"Once the product is live, you can work at a lower level with customers because you have more customer usage data available and can therefore derive certain conclusions."
When not to use	If the text discusses customer involvement without explicitly mentioning the collection or analysis of feedback or data, or to text that focuses solely on internal decision-making processes without reference to customer input, this code cannot be used.

Code	USER_CENTRED_APPROACH
Level	2
Links to	STRATEGIC_CUSTOMER_INTEGRATION (Level 1)
Short definition	Customer integration strategy as a strategic consideration for customer co-creation
Full definition	Text that addresses the adoption and integration of user-centred design principles and processes into the new product development process.
When to use	This code is used when the texts focus primarily on the application of user-centred design methods.
Example	"We are already trying to integrate user-centred process methods into our new product development process, but not completely."
When not to use	If the text focuses solely on customer co-creation or other aspects of customer involvement without explicitly mentioning user-centred design principles or processes, this code cannot be used.

Code	CHALLENGE_SCALABILITY
Level	1 (Primary code)
Short definition	Challenges of scalability
Full definition	Text that addresses the difficulties and complexities faced when trying to expand or adapt products, features, or processes to accommodate growth or increased complexity within an organisation.
When to use	This code is applied when text describe the difficulties, obstacles, or complexities faced when attempting to scale products, features, or processes, particularly in the context of large organisations or projects with multiple dependencies.
Example	"To estimate the size of something for a long time requires an approach that scales large new features or large new products and allows a go or no-go decision to be made accordingly."
When not to use	If the text discusses the general benefits or advantages of scaling, or to text that focuses on the technical aspects of scaling without addressing the organisational or managerial challenges involved, this code cannot be used.

Code	RESOURCE_ALLOCATION_AND_OVERSIGHT
Level	2
Links to	CHALLENGE_SCALABILITY (Level 1)
Short definition	Resource allocation and oversight as a challenge of scalability
Full definition	Text that addresses the challenges of allocating resources effectively and maintaining oversight of multiple projects or features, particularly in the context of scaling and resource constraints.
When to use	This code is applied when the texts mention the challenges of managing resources, prioritising projects, or maintaining oversight of multiple initiatives, especially when scaling or facing resource limitations.
Example	“There’s too much in the funnel, meaning that the new system is already packed full and not being challenged enough.”
When not to use	If the text discusses resource allocation or project management in general without specifically addressing the challenges associated with scaling or resource constraints, this code cannot be used.

Code	COORDINATION_AND_DEPENDENCY_CHALLENGES
Level	2
Links to	CHALLENGE_SCALABILITY (Level 1)
Short definition	Coordination and dependency as a challenge of scalability
Full definition	Text that addresses the difficulties in coordinating and aligning the work of multiple teams, particularly in large organisations.
When to use	This code is applied when the texts mention the challenges of coordinating work across different teams, managing dependencies between teams, or aligning the goals and priorities of multiple teams, especially in the context of scaling products or features.
Example	“Scaling large new products or features and allowing a go or no-go decision cannot be done by the product owner alone, because it is often the case that not just one team and not just one product is involved and therefore the best for the customer cannot be permanently developed. We are too large an organisation for this and have too many dependencies between the teams.”
When not to use	If the text discusses general challenges of teamwork or collaboration without specifically addressing the issues of scaling or dependencies between teams, this code cannot be used.

Code	NEED_FOR_SCALABILITY_AND_ALIGNMENT
Level	2
Links to	CHALLENGE_SCALABILITY (Level 1)
Short definition	Need for scalability and alignment as a challenge of scalability
Full definition	Text that addresses the necessity of scaling products or features to accommodate growth and the importance of aligning individual team efforts with the overall strategic goals and vision of the organisation.
When to use	This code is applied when the texts highlight the need for scalability to handle larger projects or features, the importance of assessing the viability of scaling before proceeding, and the challenges of ensuring that individual team efforts contribute to the broader organisational goals.
Example	“However, as soon as something reaches a certain size, we have to ask ourselves whether we are doing the right thing, because it cannot be that a team always does the right thing for itself but is not so important in the overall context. So, for example, you have a product that is constantly being developed by the teams, but this further development does nothing for the overall concept and there is a much bigger construction site elsewhere.”

When not to use	If the text discusses focuses solely on the technical aspects of scaling or the challenges of coordinating multiple teams without addressing the strategic alignment of scaling efforts, this code cannot be used.

Code	INDUSTRY_COLLABORATION
Level	1 (Primary code)
Short definition	Collaboration between different media companies in the Swiss media industry
Full definition	Text that addresses the potential for and challenges of collaboration between companies within the same industry, particularly in the context of new product development and ideation.
When to use	This code is applied when the texts mention the possibility of partnering with competitors, sharing resources or knowledge, or engaging in joint ideation or development processes to achieve mutual benefits or address common challenges.
Example	"We should consider how we in the Swiss media industry can work together rather than against each other as media companies."
When not to use	If the text focuses solely on competition between companies, internal collaboration within a single company, or general discussions of industry trends without mentioning collaboration, this code cannot be used.

Code	PARTNER_CO_CREATION
Level	2
Links to	INDUSTRY_COLLABORATION (Level 1)
Short definition	Doing co-creation with partner organisations
Full definition	Text that addresses the concept of collaboration between companies within the same industry to co-create.
When to use	This code is applied when the texts mention the potential for or actual instances of collaboration between competitors.
Example	"... all of us media companies in Switzerland could, at best, carry out a joint ideation process where all the advantages are disclosed, and we consider what could be done together."
When not to use	If the text discusses a co-creation approach which does not refer to partners, this code cannot be used.

Code	ORGANISATIONAL_STRUCTURE
Level	1 (Primary code)
Short definition	Internal product development structure within the media company
Full definition	Text that addresses the organisational structures, processes, and decision-making mechanisms involved in product development.
When to use	This code is applied when the texts describe the organisational context of product development, including the structure of teams, the roles and responsibilities of different individuals or departments, the decision-making processes involved, and the financial considerations that influence product development decisions.
Example	"With an overarching model, we would be able to keep an eye on everything relating to operations."
When not to use	If the text focuses solely on the technical aspects of product development, customer feedback, or the specific challenges of scaling products or features, this code cannot be used.

Code	DECISION_MAKING_MODEL
Level	2
Links to	ORGANISATIONAL_STRUCTURE (Level 1)

Short definition	Overarching model or framework for new product development to guide decision-making processes
Full definition	Text that addresses the presence or absence of an overarching model or framework for new product development to guide the decision-making process in new product development.
When to use	This code is applied when the texts mention the use of a specific decision-making model (or lack thereof), the steps involved in the decision-making process, and the factors considered when making decisions about new product development, particularly those related to financial resources and potential impact on the business.
Example	"The only thing it would change when we would work with an overarching lifecycle model as the application lifecycle management is that we would talk more consciously about the money again."
When not to use	If the text focuses solely on the technical aspects of product development, customer feedback, or team structures without explicitly discussing the decision-making process itself, this code cannot be used.

Code	DECISION_MAKING_PROCESS
Level	2
Links to	ORGANISATIONAL_STRUCTURE (Level 1)
Short definition	Organisational structures, processes, and roles for decision making
Full definition	Text that addresses the organisational structures, processes, and roles involved in strategic decision-making for new product development, including the involvement of different departments, governance levels, and decision-making authorities.
When to use	This code is applied when the texts mention how strategic decisions are made within the organisation, who is involved in the process, and how different departments or roles contribute to the decision-making process.
Example	"The strategic discussions are held outside of this development delivery organisation, in which the product manager is not necessarily involved."
When not to use	If the text focuses solely on the technical aspects of product development, customer feedback, or team structures without explicitly discussing the decision-making process itself, this code cannot be used.

Code	TEAM_STRUCTURE
Level	1 (Primary code)
Short definition	Team structure of a new product development process
Full definition	Text that addresses the composition, roles, and responsibilities of teams involved in the new product development process.
When to use	This code is applied when the texts describe the structure and organisation of teams, the roles and responsibilities of team members, and the interactions between different teams or individuals involved in the new product development process.
Example	"At our company, for example, app development is assigned to a clear development delivery organisation, which has a product manager who is responsible for this product."
When not to use	If the text focuses solely on the technical aspects of product development, customer feedback, or the strategic considerations of new product development without explicitly discussing team structures or roles, this code cannot be used.

Code	CORE_TEAM_STRUCTURE
Level	2
Links to	TEAM_STRUCTURE (Level 1)
Short definition	
Full definition	Text that addresses the composition, roles, and functioning of a core team within the new product development process.

When to use	This code is applied when the texts mention the structure and dynamics of a core team, the roles and responsibilities of team members, and the specific processes or meetings used to facilitate collaboration and coordination within the core team.
Example	"In principle, you can have both, which is a core team for all new product development and a product manager who coordinates new product development."
When not to use	If the text discusses other types of teams involved in the new product development process, such as scrum teams or cross-functional teams, or to text that focuses on individual roles without reference to the core team structure., this code cannot be used.

Code	TEAM_ROLES_AND_RESPONSIBILITIES
Level	2
Links to	TEAM_STRUCTURE (Level 1)
Short definition	Team roles and responsibilities within the new product development process
Full definition	Text that addresses the specific roles and responsibilities of individuals or teams within the new product development process.
When to use	This code is applied when the texts mention the roles of individuals or teams involved in the new product development process, their specific responsibilities, and how their expertise contributes to the overall development effort.
Example	"We also have a user panel of assembled users who we can ask questions directly. This all runs via our user experience researcher, who can be consulted for questions about the user."
When not to use	If the text is focusing explicitly on the responsibilities of the product manager, then the primary code "PM_RESPONSIBILITIES" and the subcodes it contains must be selected. If it is explicitly about the responsibilities of the product owner, then the primary code "PO_RESPONSIBILITIES" and the subcodes it contains must be used.

Code	PO_RESPONSIBILITIES
Level	1 (Primary code)
Short definition	Responsibilities of a product owner
Full definition	Text that addresses roles and responsibilities of a product owner in the context of new product development.
When to use	This code is applied when the texts describe the product owner's role, their responsibilities in the product development process, and their interactions with other teams or stakeholders.
Example	"The first assumption is that product owners and their scrum team or agile team have a certain responsibility for the product."
When not to use	If the text discusses other roles in the product development process, such as product managers or UX researchers, without specifically mentioning the product owner's responsibilities. For roles or responsibilities of a product manager the primary code "PM_RESPONSIBILITIES" and the subcodes it contains must be used. For other roles and responsibilities of a team member of a new product development process, the sub code "TEAM_ROLES_AND_RESPONSIBILITIES" must be used.

Code	COORDINATION_ACROSS_TEAMS
Level	2
Links to	PO_RESPONSIBILITIES (Level 1)
Short definition	Coordinating and communicating role of a product owner
Full definition	Text that addresses the role of the product owner in coordinating and communicating with multiple teams involved in the new product development process.
When to use	This code is applied when the texts mention the product owner's involvement in coordinating the work of multiple teams, communicating needs and priorities across teams, or acting as a central point of contact for cross-team collaboration.

Example	“However, the product owner can be deployed across all teams ...”
When not to use	If the text focuses solely on the product owner’s responsibilities within a single team or their role in managing the product backlog without reference to cross-team coordination, this code cannot be used.

Code	PRODUCT_OPERATIONAL_RESPONSIBILITY
Level	2
Links to	PO_RESPONSIBILITIES (Level 1)
Short definition	Operational responsibility of the product as a role of the product owner
Full definition	Text that addresses the product owner’s responsibility for the ongoing maintenance, operation, and security of the product after its initial development and launch.
When to use	This code is applied when the texts mention the product owner’s role in ensuring the product remains functional, up-to-date, and secure, including tasks such as managing updates, addressing bugs, and monitoring security vulnerabilities.
Example	“However, this also includes ensuring that the product is maintainable and operable, that updates happen and that there are no security problems.”
When not to use	If the text discusses focuses solely on the product owner’s responsibilities during the development phase, such as gathering requirements or prioritising features, this code cannot be used.

Code	PM_RESPONSIBILITIES
Level	1 (Primary code)
Short definition	Responsibilities of a product manager
Full definition	Text that addresses the roles and responsibilities of a product manager in the new product development (NPD) process.
When to use	This code is applied when the texts explicitly mention the product manager’s role, their responsibilities in the NPD process, and their interactions with other team members or stakeholders. This includes discussions of the product manager’s involvement in project planning, execution, and decision-making, as well as their role in coordinating resources and ensuring the successful completion of the NPD process.
Example	“I would rely on a product manager who is responsible for the entire NPD process and assembles the required roles for each process phase.”
When not to use	If the text discusses other roles in the product development process, such as product managers or UX researchers, without specifically mentioning the product manager’s responsibilities, this code cannot be used. For roles or responsibilities of a product owner the primary code “PO_RESPONSIBILITIES” and the subcodes it contains must be used. For other roles and responsibilities of a team member of a new product development process, the subcode “TEAM_ROLES_AND_RESPONSIBILITIES” must be used.

Code	PROJECT_LEADERSHIP
Level	2
Links to	PM_RESPONSIBILITIES (Level 1)
Short definition	Project leadership as a role of the product manager
Full definition	Text that addresses the product manager’s role as the primary leader and decision-maker throughout the new product development (NPD) process, responsible for overseeing the entire project from start to finish.
When to use	This code is applied when the texts explicitly identify the product manager as the leader of the NPD process, responsible for driving the project forward, making key decisions, and ensuring the successful completion of all stages of development.
Example	“The product manager is responsible for ensuring that the processes take place from start to finish in this new product development process.”

When not to use	If the text discusses the roles or responsibilities of other team members without specifically mentioning the product manager's leadership role, this code cannot be used. This code can also not be used if texts are discussing general project management principles or practices without specifically referencing the product manager's leadership responsibilities.

Code	SHARED_ROLES
Level	2
Links to	PM_RESPONSIBILITIES (Level 1)
Short definition	Shared responsibilities of the product manager
Full definition	Text that addresses the sharing or overlapping of responsibilities between different roles in the new product development process, such as the product owner and product manager, or the product manager and technical project lead.
When to use	This code is applied when the texts mention that the product manager occupies other roles or shares roles with other roles within the new product development process.
Example	"In other words, there is ultimately a shared role between the product owner and product manager."
When not to use	If the text focuses solely on the responsibilities of a single role without mentioning the involvement or collaboration of the product manager, this code cannot be used.

Code	TECHNOLOGICAL_CONSIDERATIONS_IN_NPD
Level	1 (Primary code)
Short definition	Technological considerations in new product development
Full definition	Text that addresses the importance of considering and integrating technological aspects throughout the new product development (NPD) process.
When to use	This code is applied when the texts explicitly mention the role of technology in NPD, the involvement of technical experts, the consideration of technical sustainability, or the strategic use of technology to drive innovation or replace outdated systems.
Example	"It is extremely important that the technological aspects are incorporated more into new product development, because otherwise we only focus on the front end."
When not to use	If there is no explicit focus on technological considerations in the new product development process, this code cannot be used. If the focus is on the technical feasibility of a new product, then reference is made to the subcode "TECHNICAL_FEASIBILITY".

Code	EARLY_INTEGRATION_OF_TECHNOLOGY
Level	2
Links to	TECHNOLOGICAL_CONSIDERATIONS_IN_NPD (Level 1)
Short definition	Early integration of technology in the new product development process
Full definition	Text that emphasises the importance of involving technical experts and considering technological aspects early in the new product development (NPD) process.
When to use	This code is applied when the texts mention the need for early integration of technical considerations in NPD, the involvement of technical experts in the early stages of development, and the importance of aligning technological decisions with the overall product lifecycle.
Example	"We try to integrate them into the new product development process at an early stage so that the technical issues are also given priority and we can decide whether the technology we are using today will also help us tomorrow."
When not to use	If the text focuses solely on technical details or specific technologies without addressing the broader importance of early integration in the NPD process, this code cannot be used.

Code	TECHNICAL_DECISION-MAKING_AND_SUSTAINABILITY
Level	2
Links to	TECHNOLOGICAL_CONSIDERATIONS_IN_NPD (Level 1)
Short definition	Technical decision making and sustainability during the new product development process
Full definition	Text that addresses the technical choices and considerations made during the new product development process.
When to use	This code is applied when the texts mention specific technical decisions, such as choosing between native or non-native development, selecting a technical framework, or evaluating the long-term sustainability and reusability of technological components.
Example	“For example, you always ask yourself the technical question of whether you want to develop natively or non-natively, which technical framework you want to use and how you want to position yourself technically in the long term.”
When not to use	If the text discusses general technological considerations without reference to specific decision-making processes or the evaluation of different technological options., this code cannot be used.

1.3.3.2 Interview 7

This section shows the codebook for the within-company analysis of interview 7 (company 2) based on Mackieson et al. (2019) in Appendix 1.2.2.2.

Code	AGILE_METHODS
Level	1 (Primary code)
Short definition	Agile methods in new product development
Full definition	Text that addresses the use of agile methodologies, such as scrum, in the new product development process.
When to use	This code is applied when the texts describe the use of agile methodologies like Scrum, Kanban, or Lean, or hybrid development approaches with agile methods.
Example	"We are trying to move our organisation more in the direction of scrum."
When not to use	If the text discusses other project management methodologies, or to text that focuses solely on the technical aspects of product development without reference to agile practices, this code cannot be used.

Code	HYBRID_DEVELOPMENT_APPROACH
Level	2
Links to	AGILE_METHODS (Level 1)
Short definition	Waterfall and agile (hybrid) development approach
Full definition	A product development approach that combines elements of both waterfall and agile methodologies, typically starting with a structured waterfall-oriented business case for initial planning and approval, followed by agile and customer-centric processes for the actual development and implementation.
When to use	This code is applied when the texts mention the use of a combined waterfall and agile approach in the new product development process.
Example	"We have a hybrid system that mixes waterfall-orientated processes with agile processes."
When not to use	If the text discusses the use of a purely waterfall or purely agile approach, or to text that discusses other project management methodologies without mentioning the combination of waterfall and agile elements, this code cannot be used.

Code	ADVANTAGE_AGILE_MODELS
Level	2
Links to	AGILE_METHODS (Level 1)
Short definition	Advantages of agile models
Full definition	Text that addresses the advantages and benefits of using agile methodologies, such as Scrum or OKR, in the new product development process.
When to use	This code is applied when the texts mention the positive aspects of using agile methodologies.
Example	"A big advantage with Scrum is that you have a lot of flexibility to plan the sprints."
When not to use	If the text discusses the disadvantages or challenges of using agile methodologies, this code cannot be used. In this case the subcode "DISADVANTAGE_AGILE_MODELS" is used.

Code	DISADVANTAGE_AGILE_MODELS
Level	2
Links to	AGILE_METHODS (Level 1)
Short definition	Disadvantages of agile models

Full definition	Text that addresses the disadvantages and challenges of using agile methodologies, such as scrum, in the new product development process.
When to use	This code is applied when the texts mention the negative aspects or challenges of using agile methodologies, specifically scrum.
Example	"The biggest disadvantage I see with scrum is, as I mentioned, the coordination."
When not to use	If the text discusses the advantages or benefits of using agile methodologies, this code cannot be used. In this case the subcode "ADVANTAGE_AGILE_MODELS" is used.

Code	CUSTOMER_INVOLVEMENT
Level	1 (Primary code)
Short definition	Customer involvement in new product development
Full definition	Text that addresses the involvement of customers or users in various stages of the new product development (NPD) process.
When to use	This code is applied when the texts describe the active participation of customers or users in any stage of the NPD process, the use of customer feedback to inform product decisions, or the organisation of workshops or other activities to gather customer insights.
Example	"I think it's most important that customers are involved at the beginning of a new product development process so that user needs can be researched and ultimately a need can be solved."
When not to use	If the text focuses solely on internal business processes, technical specifications, or development timelines without mentioning customer involvement or feedback, this code cannot be used.

Code	CUSTOMER_INVOLVEMENT_BENEFITS
Level	2
Links to	CUSTOMER_INVOLVEMENT (Level 1)
Short definition	Benefits of customer involvement in new product development
Full definition	Text that addresses the positive outcomes and advantages of involving customers in the new product development process.
When to use	This code is applied when the texts mention the benefits or positive impacts of actively involving customers in the NPD process.
Example	"Actively involving customers in the new product development process could help to drive smaller innovation ..."
When not to use	If the text discusses the challenges or limitations of customer involvement, this code cannot be used. In this case, the subcode "CUSTOMER_INVOLVEMENT_CHALLENGES_AND_LIMITATIONS" must be used.

Code	CUSTOMER_INVOLVEMENT_CHALLENGES_AND_LIMITATIONS
Level	2
Links to	CUSTOMER_INVOLVEMENT (Level 1)
Short definition	Challenges and limitations of customer involvement in new product development
Full definition	Text that addresses the challenges and limitations of involving customers in the new product development process.
When to use	This code is applied when the texts mention the difficulties or drawbacks of involving customers in the NPD process.
Example	"... active involvement in the entire new product development process is extremely time-consuming."
When not to use	If the text discusses the positive outcomes or benefits of customer involvement, this code cannot be used. In this case, the subcode "CUSTOMER_INVOLVEMENT_BENEFITS" must be used.

Code	CUSTOMER_INVOLVEMENT_METHODS
Level	2
Links to	CUSTOMER_INVOLVEMENT (Level 1)
Short definition	Methods for customer involvement in new product development
Full definition	Text that addresses specific methods or approaches for involving customers in the new product development process, such as workshops, interviews, surveys, prototypes, user testing, beta versions or feedback sessions.
When to use	This code is applied when the texts mention or describe specific activities or methods used to gather customer input, feedback, or insights during the new product development process.
Example	"I think that workshops with young people help to get inspiration and drive ideas forward."
When not to use	If the text discusses the general importance of customer involvement or the benefits of customer feedback without mentioning specific methods or approaches, this code cannot be used.

Code	CUSTOMER_INVOLVEMENT_NPD_STAGES
Level	2
Links to	CUSTOMER_INVOLVEMENT (Level 1)
Short definition	Stages of new product development (NPD) where customer should be involved
Full definition	Text that addresses the specific stages of the NPD process where customers are involved
When to use	This code is applied when the texts explicitly mention the different stages of the NPD process where customer involvement is sought, the specific activities or methods used to engage customers at each stage, and the rationale behind involving customers at specific points in the development process.
Example	"The first phase where we involve customers in the new product development process is about finding needs."
When not to use	If the text discusses the general importance of customer involvement or the benefits of customer feedback without specifying the particular stages of the NPD process where customers are involved, this code cannot be used.

Code	USER_CENTRIC_NPD
Level	1 (Primary code)
Short definition	User centric development in new product development
Full definition	Text that addresses discusses the importance of incorporating user needs, preferences, and feedback into the new product development process to create products that are relevant, useful, and engaging for the target audience.
When to use	This code is applied when the texts describe the use of user-centred design principles, the importance of understanding user needs, the collection and analysis of user feedback, or the development of products that prioritise user experience and satisfaction.
Example	"I think that you basically have to have user-centred process principles in the new product development process."
When not to use	If the text discusses focuses solely on the technical aspects of product development, business goals, or internal processes without explicitly mentioning the user perspective or user-centred design principles, this code cannot be used.

Code	USER_CENTRIC_NPD_NEEDS_AND_DESIGN
Level	2
Links to	USER_CENTRIC_NPD (Level 1)
Short definition	Understanding user needs in the design and development

Full definition	Text that addresses the importance of understanding and addressing user needs in the design and development of new products.
When to use	This code is applied when the texts mention the significance of user research, needs assessment, and user-centred design principles in creating products that resonate with the target audience and solve their problems effectively.
Example	"If you work effectively with customer needs as a basis, then you can get off to a much better start."
When not to use	If the text focuses solely on the technical aspects of product development, business goals, or internal processes without explicitly mentioning user needs or design considerations, this code cannot be used.

Code	USER_CENTRIC_NPD_PROCESS_AND_IMPLEMENTATION
Level	2
Links to	USER_CENTRIC_NPD (Level 1)
Short definition	Integration and implementation of user-centred processes
Full definition	Text that addresses the practical implementation and integration of user-centred processes and principles into the new product development process.
When to use	This code is applied when the texts mention that describes the specific steps, actions, or initiatives taken to implement user-centred design principles in the NPD process, the challenges faced in adopting these practices, and the ongoing efforts to improve and refine the user-centred approach.
Example	"We already have some user-centred processes in place and would like to strengthen them."
When not to use	If the text discusses the general importance of user-centred design or the theoretical benefits of user-centricity without mentioning specific implementation efforts or challenges, this code cannot be used.

Code	CONTENT_CENTRIC_DEVELOPMENT
Level	1 (Primary code)
Short definition	Content centric development for new digital products in the Swiss media industry
Full definition	Text that addresses the central role of content in shaping the development of software products in the media industry, emphasising the importance of content creation and the ability to influence content throughout the development process.
When to use	This code is applied when the texts describe the significance of content as the core of the business in the media industry, the influence of content creation on product development, and the unique challenges and dependencies that arise from the need to provide both technical infrastructure and content.
Example	"This is because in the media industry, the theoretical derivation of how software products should be developed is not based on the development of a technical platform, but on the content itself."
When not to use	If the text discusses focuses solely on the technical aspects of product development, user feedback, or team structures without explicitly mentioning the central role of content in the media industry, this code cannot be used.

Code	CONTENT_AS_CORE
Level	2
Links to	CONTENT_CENTRIC_DEVELOPMENT (Level 1)
Short definition	The central role of content for the development of software products in the media industry
Full definition	Text that addresses the central role of content in driving the development of software products in the media industry.
When to use	This code is applied when the texts mention the importance of content as the primary driver of product development in the media industry, where the focus is on creating,

	curating, and delivering high-quality content that meets the needs and interests of the target audience.
Example	"Content is therefore the core of the business in the media industry, which means that content creation helps to shape the product."
When not to use	If the text discusses focuses solely on the technical aspects of product development, user feedback, or team structures without explicitly mentioning the central role of content in shaping the product, this code cannot be used.

Code	PROCESS_MODEL_ALIGNMENT
Level	1 (Primary code)
Short definition	Alignment of different process models
Full definition	Text that addresses the challenges and benefits of aligning different departments or teams within an organisation to a unified process model for new product development, as well as the potential impact of such alignment on the overall development process.
When to use	This code is applied when the texts describe the need for a company-wide process model, the difficulties of achieving alignment across different departments or teams, the benefits of using a consistent approach, or the comparison of different process models used within the organisation.
Example	"The fact that Product development does not work according to the same principle as our strategy department, in other words with an overarching model, is a problem within the company."
When not to use	If the text discusses that focuses solely on the specific details of a particular process model, the technical aspects of product development, or customer feedback without discussing the broader issue of process model alignment within the organisation, this code cannot be used.

Code	PROCESS_MODEL_STANDARDISATION_DESIRE
Level	2
Links to	PROCESS_MODEL_ALIGNMENT (Level 1)
Short definition	Desire or need for standardising the process models
Full definition	Text that addresses a desire or need for standardising the process model used across different teams or departments within the organisation to improve efficiency, alignment, and communication in new product development.
When to use	This code is applied when the texts mention the desire for a unified or company-wide process model, the perceived benefits of standardisation, or the challenges of working with multiple or inconsistent processes.
Example	"However, I believe that it would make sense to agree on a company-wide process model ..."
When not to use	If the text discusses the specific details of a particular process model, the technical aspects of product development, or customer feedback without expressing a desire for standardisation or a unified approach., this code cannot be used.

Code	PROCESS_MODEL_DISPARITY
Level	2
Links to	PROCESS_MODEL_ALIGNMENT (Level 1)
Short definition	Discrepancies and inconsistencies between different process models
Full definition	Text that addresses the discrepancies and inconsistencies between different process models or approaches used within the organisation, particularly between departments or teams, leading to challenges in coordination, communication, and overall efficiency.
When to use	This code is applied when the texts mention the differences in process models or approaches used by various departments or teams within the organisation, emphasising the negative impact of these disparities on collaboration, decision-making, and project outcomes.

Example	"The problem is that a company often uses several processes or several models, which means that concrete planning as in a theoretical model often doesn't work."
When not to use	If the text discusses the general challenges of implementing a new process model or the benefits of a unified approach without specifically mentioning the discrepancies between existing models within the organisation, this code cannot be used.

Code	CROSS_FUNCTIONAL_TEAM_STRUCTURE_DYNAMICS_EVOLUTION
Level	1 (Primary code)
Short definition	Cross functional team structure, dynamics and evolution
Full definition	Text that addresses the structure, dynamics, and evolution of cross-functional teams in the new product development (NPD) process.
When to use	This code is applied when the texts describe the composition and functioning of cross-functional teams, the specific roles and expertise of team members (e.g., UX managers, product managers, IT engineers, editors, marketers), the changing dynamics of team interactions throughout the NPD process, and the challenges and benefits of cross-functional collaboration.
Example	"With cross-functional teams, it is important that everyone speaks the same language and works in an agile way so that silos are broken down."
When not to use	If the text focuses solely on the technical aspects of product development, customer feedback, or individual roles without reference to the broader context of cross-functional team dynamics, this code cannot be used.

Code	EVOLVING_ROLE_OF_IT
Level	2
Links to	CROSS_FUNCTIONAL_TEAM_STRUCTURE_DYNAMICS_EVOLUTION (Level 1)
Short definition	Evolving role of IT
Full definition	Text that addresses the changing role of IT departments in the new product development process, from a primarily operational and implementation-focused role to a more active and collaborative role as co-creators and definers of core experiences.
When to use	This code is applied when the texts mention the historical or current role of IT departments in product development, the shift towards greater involvement in the creative and strategic aspects of product development, and the challenges or benefits associated with this evolving role.
Example	"Historically, however, we have always had an IT department that was more active in the implementation, for example, business requirements were technically assessed to explain what can and cannot be effectively realised technically. Now, however, the IT team is also a co-creator, which means that they are actively involved in product development and the technology is also at the centre."
When not to use	If the text focuses solely on the technical aspects of product development, specific technologies, or the roles of other departments without reference to the changing role of IT, this code cannot be used.

Code	TECHNICAL_ROLES_AND_EXPERTISE
Level	2
Links to	CROSS_FUNCTIONAL_TEAM_STRUCTURE_DYNAMICS_EVOLUTION (Level 1)
Short definition	Technical roles and expertise in new product development
Full definition	Text that addresses specific technical roles and expertise required in the new product development process.
When to use	This code is applied when the texts mention specific technical roles or expertise needed in the NPD process, the tasks and responsibilities associated with these roles, and the growing importance of technical expertise in shaping product development decisions.
Example	"Specific technical roles, such as that of an architect, are relevant for us and are becoming increasingly relevant."

When not to use	If the text discusses general technical considerations or challenges without reference to specific roles or expertise, or to text that focuses on the collaboration between IT and business teams without specifying the technical roles involved, this code cannot be used.

Code	CROSS_FUNCTIONAL_TEAM_DYNAMICS
Level	2
Links to	CROSS_FUNCTIONAL_TEAM_STRUCTURE_DYNAMICS_EVOLUTION (Level 1)
Short definition	Team dynamics in cross-functional teams
Full definition	Text that addresses the interactions, communication, and collaboration within cross-functional teams throughout the new product development process.
When to use	This code is applied when the texts mention the dynamics of cross-functional teams, such as communication patterns, collaboration methods, the alignment of different skill sets and perspectives, and the ability of teams to adapt and evolve over time.
Example	"This means that at the beginning of the new product development process, although the integration of customers is extremely important for need-finding, it is also the most critical for the cross-functional team because it requires a lot of planning as well as debriefings, for example."
When not to use	If the text focuses solely on the individual roles within a team, the technical aspects of product development, or the overall organisational structure without specifically addressing the interactions and dynamics within cross-functional teams, this code cannot be used.

Code	CROSS_FUNCTIONAL_TEAM_ROLES
Level	2
Links to	CROSS_FUNCTIONAL_TEAM_STRUCTURE_DYNAMICS_EVOLUTION (Level 1)
Short definition	Team roles in cross-functional teams
Full definition	Text that addresses the specific roles and responsibilities of individuals from different functional areas within cross-functional teams.
When to use	This code is applied when the texts mention the roles of individuals from different functional areas within cross-functional teams, their specific responsibilities, and how their expertise contributes to the overall development effort at different stages of the process.
Example	"As cross-functional roles, you need a UX manager, a product manager and people from IT engineering."
When not to use	If the text focuses solely on general team structures or collaboration without specifying the roles and responsibilities of individual team members from different functional areas, this code cannot be used.

Code	PRODMAN_PRODOWN_PROJMAN_ROLES
Level	1 (Primary code)
Short definition	The roles of product managers, product owners and project managers in new product development
Full definition	Text that addresses the roles and responsibilities of product owners, product managers, and project managers in the context of new product development.
When to use	This code is applied when the texts describe the roles of product owner, product manager, or project manager, their specific responsibilities, and any discussions about the potential merging or redefinition of these roles. This code is further applied when the text is mentioning the hierarchical structure of product management.
Example	"Product managers and project managers define the why and the what and the product owner defines the how."

When not to use	If the text focuses solely on the technical aspects of product development, customer feedback, or team structures without explicitly discussing the roles and responsibilities of product owners, product managers, or project managers, this code cannot be used.

Code	ROLE_MERGING_AND_ELIMINATION
Level	2
Links to	PRODMAN_PRODOWN_PROJMAN_ROLES (Level 1)
Short definition	Merging and elimination of specific roles in new product development
Full definition	Text that addresses the merging or elimination of specific roles, such as product owner, product manager, or project manager, in the context of new product development, and the potential implications of these changes for team structure and hierarchy.
When to use	This code is applied when the texts explicitly mention the merging or elimination of roles.
Example	"However, you no longer need a project manager to develop digital product; the product manager should do that instead."
When not to use	If the text discusses that discusses the general roles and responsibilities of individuals in the new product development process without mentioning the merging or elimination of specific roles, this code cannot be used.

Code	NEW_PRODUCT_MANAGEMENT_HIERARCHY
Level	2
Links to	PRODMAN_PRODOWN_PROJMAN_ROLES (Level 1)
Short definition	New hierarchy for product managers
Full definition	Text that addresses the hierarchical structure of product management roles within the organisation, including the different levels of management and their respective responsibilities in the new product development process.
When to use	This code is applied when the texts explicitly mention the different levels of product management hierarchy, the roles and responsibilities associated with each level, and the potential impact of this hierarchical structure on the new product development process.
Example	"When there will be a new hierarchically structure for product management, all product managers would develop new digital products together."
When not to use	If the text discusses the general roles and responsibilities of product managers without reference to the specific hierarchical structure within the organisation, this code cannot be used.

Code	ROLE_DEFINITIONS_AND_RESPONSIBILITIES
Level	2
Links to	PRODMAN_PRODOWN_PROJMAN_ROLES (Level 1)
Short definition	Role definitions and responsibilities of product managers, product owners and project managers in the new product development process
Full definition	Text that addresses the distinct roles and responsibilities of product owners, product managers, and project managers in the new product development process
When to use	This code is applied when the texts explicitly define or differentiate the roles of product owner, product manager, or project manager, outlines their specific responsibilities, or discusses the division of labour and collaboration between these roles.
Example	"The difference between project managers and product managers is that product managers also own products, like a product owner, but manage the product together with UX managers, for example. However, the technical realisation of this is the responsibility of the Product Owner."
When not to use	If the text discusses general team structures or processes without specifically addressing the unique roles and responsibilities of product owners, product managers,

	or project managers, this code cannot be used. In this case the subcode "CROSS_FUNCTIONAL_TEAM_ROLES" must be used.

Code	MEDIA_INDUSTY_TRANSFORMATION_AND_ADAPTATION
Level	1 (Primary code)
Short definition	Transformation and adaption in the media industry
Full definition	Text that addresses the ongoing transformation of the media industry due to technological advancements and changing consumer behaviour, emphasising the need for adaptation, customer-centricity, and the empowerment of technology teams.
When to use	This code is applied when the texts describe the changing landscape of the media industry, the shift in power from traditional media outlets to consumers, the increasing demands on content creators, and the need for media companies to adapt their strategies and processes to remain relevant.
Example	"The problem is, however, and I have already worked in several media companies, that the acceptance that the world has changed has not yet fully arrived."
When not to use	If the text focuses solely on specific product development processes, team structures, or technical details without addressing the broader context of the media industry's transformation, this code cannot be used.

Code	SHIFTING_POWER_DYNAMICS_AND_AUDIENCE_EXPECTATIONS
Level	2
Links to	MEDIA_INDUSTY_TRANSFORMATION_AND_ADAPTATION (Level 1)
Short definition	The shift in power dynamics within the media industry
Full definition	Text that addresses the shift in power dynamics within the media industry, from traditional media outlets holding authority over information dissemination to a more empowered audience with higher expectations for content quality and relevance due to the rise of the internet and increased access to information.
When to use	This code is applied when the texts mention the changing relationship between media companies and their audience, the democratisation of information access, the increased demands placed on media companies in terms of content quality and relevance, and the need for media companies to adapt to these changing dynamics.
Example	"The media, especially newspapers, explained the world to us for 200 years before the Internet came along, which means that they had the power to tell the population that they understood the world better and that the population could read the information. However, this has changed and nowadays you can get information from anywhere. The population has also become much smarter in this respect."
When not to use	If the text discusses focuses solely on the technical aspects of product development, specific user-centred design methods, or internal organisational structures without referencing the broader shift in power dynamics within the media industry, this code cannot be used.

Code	INTERNAL_CULTURAL_TRANSFORMATION_AND_AGILE_ADOPTION
Level	2
Links to	MEDIA_INDUSTY_TRANSFORMATION_AND_ADAPTATION (Level 1)
Short definition	The need for a cultural shift within the Swiss media industry
Full definition	Text that addresses the need for a cultural shift within the Swiss media industry, emphasising the empowerment of technology teams, the adoption of user-centred approaches by editorial teams, and the transition from output-focused to outcome-focused thinking.
When to use	This code is applied when the texts mention the need for cultural change within the media industry, the importance of empowering technology teams, the adoption of user-centred approaches by editorial teams, the shift from output to outcome-focused

	thinking, or the use of agile methodologies and cross-functional teams to drive this transformation.
Example	"I think it is relevant that in future, at a cultural level in the Swiss media industry, the technology teams will be empowered, and the editorial teams will become more user-centred."
When not to use	If the text discusses focuses solely on the technical aspects of product development, specific user-centred design methods, or the challenges of scaling products or features without referencing the broader cultural transformation needed within the media industry, this code cannot be used. For specific user-centred design methods the primary code "USER_CENTRIC_NPD" and all associated subcodes are used.

Code	PRODUCT_DEVELOPMENT_GOVERNANCE
Level	1 (Primary code)
Short definition	Governance structures in new product development
Full definition	Text that addresses the governance structures, processes, and decision-making mechanisms involved in new product development.
When to use	This code is applied when the texts describe the decision-making processes and approval mechanisms for new product development projects, the involvement of different stakeholders and the factors considered when deciding whether to build a solution in-house or buy an external solution.
Example	"For example, there is a gate between the discovery and delivery phase or gates that are based on customer feedback and change the scope, which means that more budget may have to be requested from the management."
When not to use	If the text focuses solely on the technical aspects of product development, customer feedback, or team structures without explicitly discussing the governance and decision-making processes involved, this code cannot be used.

Code	STEERING_BOARD
Level	2
Links to	PRODUCT_DEVELOPMENT_GOVERNANCE (Level 1)
Short definition	Steering board committee in the product development governance process
Full definition	Text that addresses the role and function of a steering board or committee in the product development governance process, including their decision-making authority, composition, and interactions with product managers.
When to use	This code is applied when the texts mention the steering board or committee, their role in approving or rejecting product development initiatives, their composition, and their interactions with product managers regarding user relevance and project prioritisation.
Example	"We have agile teams that report to a board, in other words, a steering committee, which consists of three people, namely the Editor-in-Chief, Chief Technology Officer, and Chief Commercial Officer."
When not to use	If the text discusses other governance bodies or decision-making processes not specifically related to the steering board or committee, or to text that mentions the board without detailing its role in product development governance, this code cannot be used.

Code	DECISION_MAKING_PROCESSES
Level	2
Links to	PRODUCT_DEVELOPMENT_GOVERNANCE (Level 1)
Short definition	Decision making process in new product development
Full definition	Text that addresses the decision-making processes involved in new product development.
When to use	This code is applied when the texts mention the specific steps and considerations involved in making decisions about product development, such as evaluating the

	feasibility of building a solution in-house versus buying an external solution, using gates or checkpoints to assess progress and adjust, and requesting additional budget based on changing project needs.
Example	“From a technical perspective, the question arises, of whether to build or buy. In other words, whether we build something technically ourselves when it comes to the core experience of our users, for example. Or, whether we buy and integrate an external solution, as in the case of a paywall system, because external systems are often better in this context than an in-house development would be.”
When not to use	If the text focuses solely on the technical aspects of product development, customer feedback, or team structures without explicitly discussing the decision-making processes involved., this code cannot be used.

1.3.3.3 Interview 8

This section shows the codebook for the within-company analysis of interview 8 (company 3) based on Mackieson et al. (2019) in Appendix 1.2.3.2.

Code	AGILE_METHODS_IMPLEMENTATION_AND_CHALLENGES
Level	1 (Primary code)
Short definition	Implementation of agile methods and challenges for it
Full definition	Text that addresses the practical implementation and challenges of agile methodologies, including scrum and SAFe, in the context of new product development and discussing the agile mindset.
When to use	This code is applied when the texts describe the specific practices, challenges, and adaptations related to implementing agile methodologies in the new product development process. This includes discussions of team dynamics, coordination, resource allocation, and the balance between flexibility, structure within an agile framework, as well as the agile mindset.
Example	"I am not an extreme fan of agile methods such as SAFe. SAFe is great in theory, but in practice it takes away the spirit that you actually wanted ..."
When not to use	If the text discusses solely on the theoretical benefits or general principles of agile methodologies without addressing the practical aspects of implementation or the specific challenges encountered in real-world scenarios, this code cannot be used.

Code	AGILE_MINDSET_AND_FLEXIBILITY
Level	2
Links to	AGILE_METHODS_IMPLEMENTATION_AND_CHALLENGES (Level 1)
Short definition	Agile mindset and flexibility
Full definition	Text that addresses the essence of adopting an agile mindset, emphasising flexibility, adaptability, and the ability to make quick decisions and changes throughout the development process. It also highlights the importance of continuous improvement and acknowledging that unexpected challenges can arise.
When to use	This code is applied when the texts mention the benefits of flexibility, adaptability, and quick decision-making in an agile environment. It can also be used when the text refers to the iterative nature of agile development and the importance of continuous learning and improvement.
Example	"... because you didn't want to be so complicated and originally wanted to have a process in which you can be completely flexible and can discuss things briefly in the team and then change the plan with quick decisions."
When not to use	If the text discusses on specific agile practices or ceremonies (e.g., sprints, retrospectives) or discusses the challenges or limitations of agile methodologies without emphasising the mindset or flexibility aspects, this code cannot be used. If the text refers to challenges of agile methods, then the subcode "AGILE_IMPLEMENTATION_CHALLENGES" must be referenced.

Code	AGILE_IMPLEMENTATION_CHALLENGES
Level	2
Links to	AGILE_METHODS_IMPLEMENTATION_AND_CHALLENGES (Level 1)
Short definition	Implementation challenges of agile methods
Full definition	Text that addresses the practical challenges and limitations encountered when implementing agile methodologies, particularly Scrum and SAFe, in real-world scenarios. It emphasises issues such as inflexibility in sprint planning, difficulties in handling extensive testing or non-exciting tasks, the potential for scrum masters to focus solely on organisational tasks, and the risk of overly rigid processes with

	frameworks like SAFe that can stifle the spontaneity and adaptability that agile methods are intended to promote.
When to use	This code is applied when the texts mention the practical difficulties, limitations, or unintended consequences of implementing agile methodologies, particularly in relation to team dynamics, task allocation, process rigidity, and the potential misalignment between agile principles and real-world practices.
Example	"I am not an extreme fan of agile methods such as SAFe. SAFe is great in theory, but in practice it takes away the spirit that you actually wanted ..."
When not to use	If the text focuses solely on the theoretical benefits or general principles of agile methodologies without addressing the practical challenges of implementation or the specific issues encountered in real-world scenarios, this code cannot be used.

Code	TEAM_STRUCTURE_IN_NPD
Level	1 (Primary code)
Short definition	Team structure in new product development
Full definition	Text that addresses the structure, roles, and challenges related to teams involved in the new product development process.
When to use	This code is applied when the texts describe the composition and organisation of teams in the NPD process, the specific roles and responsibilities of team members, the challenges of finding and retaining technical talent, and the importance of technical expertise in decision-making and successful product development.
Example	"We work with DevOps teams to some extent, but more in the area of IT infrastructure. Otherwise, we don't work with DevOps teams."
When not to use	If the text focuses solely on the technical aspects of product development, customer feedback, or strategic considerations without explicitly discussing the structure or dynamics of the teams involved, this code cannot be used.

Code	TECHNICAL_ROLES_AND_EXPERTISE
Level	2
Links to	TEAM_STRUCTURE_IN_NPD (Level 1)
Short definition	Technical roles and expertise in new product development
Full definition	Text that addresses the specific technical roles and expertise required in the new product development process.
When to use	This code is applied when the texts mention specific technical roles or expertise needed in the NPD process, the challenges of finding and retaining technical talent, the tasks and responsibilities associated with these roles, the importance of technical expertise in decision-making, and the evaluation of technical feasibility and sustainability of solutions.
Example	"I therefore believe that roles such as that of an IT architect have a technical conscience. In other words, they can point out where things are too complicated."
When not to use	If the text discusses general technical considerations or challenges without reference to specific roles or expertise, or to text that focuses on the collaboration between IT and business teams without specifying the technical roles involved, this code cannot be used.

Code	PROJECT_MANAGEMENT_ROLES_AND_RESPONSIBILITIES
Level	2
Links to	TEAM_STRUCTURE_IN_NPD (Level 1)
Short definition	Roles and responsibilities of a project manager in new product development
Full definition	Text that addresses the role and responsibilities of a project manager in the context of new product development.
When to use	This code is applied when the texts mention the role of a project manager, their tasks and responsibilities in overseeing project timelines, ensuring deliverables are met,

	managing risks, and facilitating communication between team members and stakeholders, particularly in the context of large or complex projects.
Example	"On the other hand, when it comes to developing business-critical products, I would never work without a project manager."
When not to use	If the text discusses project management in general without specifically mentioning the role or responsibilities of a project manager, or when it focuses on other roles within the team, such as product managers, product owners or technical roles, without highlighting their interaction with the project manager, this code cannot be used. If the text refers to roles or responsibilities of a product manager or product owner, then the subcode "PM_PO_ROLES_AND_RESPONSIBILITIES" must be referenced. If the text refers to roles or responsibilities of technical employees, then the subcode "TECHNICAL ROLES AND EXPERTISE" must be used.

Code	PM_PO_ROLES_AND_RESPONSIBILITIES
Level	2
Links to	TEAM_STRUCTURE_IN_NPD (Level 1)
Short definition	Roles and responsibilities of a product manager and a product owner in new product development.
Full definition	Text that addresses roles and responsibilities of product managers and product owners in new product development.
When to use	This code is applied when the texts mention the roles of product manager and product owner, their responsibilities in the new product development process, and the potential overlap or blurring of these roles within the company. It should also be applied to text that highlights the product manager's focus on understanding user needs, defining the product vision, and managing stakeholder expectations.
Example	"In fact, we use the term Product Manager and Product Owner in the same way, which means that there is no difference here."
When not to use	If the text focuses solely on the technical aspects of product development, the role of other team members such as technical employees or project manager, or the overall organisational structure without specifically addressing the roles and responsibilities of product managers and product owners, this code cannot be used. If the text refers to roles or responsibilities of technical employees, then the subcode "TECHNICAL_ROLES_AND_EXPERTISE" must be referenced. If the text refers to roles or responsibilities of project manager, then the subcode "PROJECT_MANAGEMENT_ROLES_AND_RESPONSIBILITIES" must be used.

Code	CROSS_FUNCTIONAL_TEAMS
Level	1 (Primary code)
Short definition	Cross-functional teams in new product development
Full definition	Text that addresses advantages, disadvantages, and appropriate use cases of cross-functional teams in the context of new product development.
When to use	This code is applied when the texts describe the formation, purpose, benefits, or challenges of cross-functional teams, especially in relation to new product development, innovation, and agile working environments.
Example	"When it comes to developing a cool digital product, I would form a cross-functional core team so that there is a spirit and ideas."
When not to use	If the text focuses solely on individual roles or responsibilities within a team, or to discussions about team structures that are not explicitly cross-functional. Additionally, avoid applying this code when the text discusses general team dynamics or collaboration without specific reference to the cross-functional nature of the team, this code cannot be used. If the text refers to team roles or responsibilities, then the primary code "TEAM_STRUCTURE_IN_NPD" and all the subcodes belonging to it must be referenced.

Code	CROSS_FUNCTIONAL_TEAMS_ADVANTAGES
Level	2
Links to	CROSS_FUNCTIONAL_TEAMS (Level 1)
Short definition	Advantages of cross-functional teams in new product development
Full definition	Text that addresses the positive aspects and benefits of using cross-functional teams, particularly in fostering innovation, agility, and a sense of ownership and purpose within the team.
When to use	This code is applied when the texts mention the advantages or benefits of using cross-functional teams, such as increased innovation, faster development cycles, improved collaboration, and a greater sense of ownership and purpose among team members.
Example	"It is important that you need good employees, in other words, you need multi-functional roles that can think outside the box and work well together. That's half the battle."
When not to use	If the text discusses the challenges or limitations of cross-functional teams, or to text that focuses on the roles and responsibilities within a team without explicitly mentioning the benefits of its cross-functional nature, this code cannot be used. If the text refers to challenges or limitations of cross-functional teams, then the subcode "CROSS_FUNCTIONAL_TEAMS_CHALLENGES" must be used. If the text refers to team roles or responsibilities, then the primary code "TEAM_STRUCTURE_IN_NPD" and all the subcodes belonging to it must be referenced.

Code	CROSS_FUNCTIONAL_TEAMS_CHALLENGES
Level	2
Links to	CROSS_FUNCTIONAL_TEAMS (Level 1)
Short definition	Challenges of cross-functional teams in new product development
Full definition	Text that addresses the challenges and limitations of cross-functional teams.
When to use	This code is applied when the texts mention the drawbacks or difficulties associated with cross-functional teams, such as challenges in enforcing deadlines, addressing performance issues, or managing conflicts within the team due to the close-knit nature of the team dynamics.
Example	"It is tedious when you have to tell a close colleague that his performance is inadequate, and this is difficult to say in a cross-functional team because there is usually a close bond and a good spirit."
When not to use	If the text focuses on the advantages or benefits of cross-functional teams, or when it discusses general team challenges without specifically highlighting the issues related to the cross-functional nature of the team, this code cannot be used. If the text refers to advantages or benefits of cross-functional teams, then the subcode "CROSS_FUNCTIONAL_TEAMS_ADVANTAGES" must be referenced. If the text refers to team roles or responsibilities, then the primary code "TEAM_STRUCTURE_IN_NPD" and all the subcodes belonging to it must be used.

Code	CUSTOMER_INVOLVEMENT_IN_NPD
Level	1 (Primary code)
Short definition	Customer involvement in new product development
Full definition	Text that addresses the involvement of customers in various stages of the new product development process.
When to use	This code is applied when the texts describe the participation of customers in the NPD process.
Example	"At the beginning of the new product development process, it is important to involve customers to understand what problems customers have and what problems we need to solve effectively."
When not to use	If the text discusses focuses solely on internal business processes, technical specifications, or development timelines without mentioning customer involvement. Additionally, do not apply this code to text that discusses general market research or

	data analysis without explicit reference to direct customer engagement in the NPD process., this code cannot be used.

Code	CUSTOMER_INVOLVEMENT_METHODS
Level	2
Links to	CUSTOMER_INVOLVEMENT_IN_NPD (Level 1)
Short definition	Methods and approaches for active customer involvement
Full definition	Text that addresses the specific methods or approaches for actively involving customers in the new product development process
When to use	This code is applied when the texts mention or describes specific activities or methods used for active customer involvement.
Example	"We already involve customers directly and actively in the process. The active customer involvement we do with users who visit us four times a year and take part in workshops and testing."
When not to use	If the text discusses the general importance of customer involvement or the benefits or challenges of customer involvement without mentioning specific methods or approaches, this code cannot be used. If the text refers to benefits or challenges for customer involvement the subcode "CUSTOMER_INVOLVEMENT_BENEFITS_AND_CHALLENGES" must be referenced.

Code	CUSTOMER_INVOLVEMENT_NPD_STAGES
Level	2
Links to	CUSTOMER_INVOLVEMENT_IN_NPD (Level 1)
Short definition	New produces development process stages where customers are involved
Full definition	Text that addresses the specific stages of the new product development process where customers are involved, such as the initial need-finding phase, the conceptualisation and hypothesis validation phase, and the later stages of development and delivery.
When to use	This code is applied when the texts mention the different stages of the NPD process where customer involvement is sought, the specific activities or methods used to engage customers at each stage, and the rationale behind involving customers at specific points in the development process.
Example	"I believe that it is relevant to involve customers at many stages of the new product development process."
When not to use	If the text discusses the general importance of customer involvement or the benefits or challenges of customer involvement without specifying the particular stages of the NPD process where customers are involved, this code cannot be used. If the text refers to benefits or challenges for customer involvement the subcode "CUSTOMER_INVOLVEMENT_BENEFITS_AND_CHALLENGES" must be referenced.

Code	CUSTOMER_INVOLVEMENT_BENEFITS_AND_CHALLENGES
Level	2
Links to	CUSTOMER_INVOLVEMENT_IN_NPD (Level 1)
Short definition	Benefits and challenges of customer involvement in new product development
Full definition	Text that addresses both the positive outcomes and the potential difficulties associated with involving customers in the new product development process.
When to use	This code is applied when the texts mention the advantages and disadvantages of customer involvement in new product development.
Example	"I think the co-creation process with the customer is important, but you have to know what comes out of it and what does not."
When not to use	If the text discusses general customer involvement or user-centred design principles without specifically addressing the trade-offs involved in customer involvement, this code cannot be used.

Code	USER_FEEDBACK_AND_TESTING
Level	1 (Primary code)
Short definition	User feedback and testing
Full definition	Text that addresses the importance of gathering and utilising user feedback and conducting various forms of testing.
When to use	This code is applied when the texts describe the collection and analysis of user feedback through various methods, including beta testing, surveys, interviews, and prototype testing. This code is also applied when the text discusses the importance of user feedback in identifying and addressing product issues, validating design decisions, and ensuring the product's success.
Example	"We also often test new products and new hypotheses with customers. We also actively ask customers for input."
When not to use	If the text focuses solely on the technical aspects of product development, internal decision-making processes, or team structures without explicitly mentioning the collection or utilisation of user feedback, this code cannot be used.

Code	USER_NEEDS_AND_EXPECTATIONS
Level	2
Links to	USER_FEEDBACK_AND_TESTING (Level 1)
Short definition	User needs and expectations
Full definition	Text that addresses the importance of understanding and prioritising core user needs and expectations.
When to use	This code is applied when the texts mention the importance of meeting fundamental user needs, ensuring a seamless user experience, and prioritising essential features and content quality over less critical or niche functionalities. The text may also emphasise the discrepancy between what outsiders perceive as important versus the actual needs and expectations of users.
Example	"And it is very difficult for outsiders to understand that it is not necessarily cool fancy new artificial intelligence chat bots that are relevant for us. It is much more relevant that the text is written cleanly and that every link that is placed links to the right place."
When not to use	If the text focuses solely on the technical aspects of product development, specific testing methods, or feedback collection without explicitly addressing the underlying user needs and expectations that drive those processes, this code cannot be used.

Code	TESTING_METHODS
Level	2
Links to	USER_FEEDBACK_AND_TESTING (Level 1)
Short definition	Testing methods during the new product development process
Full definition	Text that addresses the various methods and approaches used to test and validate products or features during the new product development process.
When to use	This code is applied when the texts mention specific testing methods or approaches used to gather feedback and evaluate the functionality, usability, and technical feasibility of a product or feature.
Example	"For user testing, we work more with other test methods, such as non-technical prototypes in the figma software, surveys or UX testing."
When not to use	If the text focuses solely on the general importance of testing or the benefits of user feedback without mentioning specific testing methods or approaches., this code cannot be used. Additionally, this code cannot be applied to a text that discusses feedback collection methods that are not directly related to testing, such as surveys or interviews.

Code	FEEDBACK_COLLECTION_AND_INTERPRETATION
Level	2
Links to	USER_FEEDBACK_AND_TESTING (Level 1)
Short definition	Process of gathering and interpreting user feedback
Full definition	Text that addresses the process of gathering and interpreting user feedback.
When to use	This code is applied when the texts mention the collection and interpretation of user feedback, the challenges of understanding and prioritising feedback from different sources, the importance of context in interpreting feedback, and the need for expertise in managing and analysing customer feedback.
Example	"I'm a big fan of looking at things with users and listening to their thoughts and why they do or don't do things the way they do."
When not to use	If the text focuses solely on specific feedback collection methods such as surveys or interviews or the technical aspects of product development without discussing the interpretation and analysis of the feedback itself, this code cannot be used.

Code	PRODUCT_DEVELOPMENT_PROCESS_AND_APPROACHES
Level	1 (Primary code)
Short definition	Processes and approaches in new product development
Full definition	Text that addresses the various processes, ideologies, and decision-making factors involved in new product development
When to use	This code is applied when the texts describe the steps, stages, or frameworks used in new product development, the criteria for choosing different approaches and the challenges and considerations involved in making decisions about product features, technology choices, and resource allocation.
Example	"You simply can't just processualise everything, you also have to offer freedom in the process."
When not to use	If the text focuses solely on the technical aspects of product development, customer feedback, or the broader organisational structure without explicitly discussing the product development process itself or the approaches used to manage it, this code cannot be used.

Code	PROJECT_MANAGEMENT_AND_GOVERNANCE
Level	2
Links to	PRODUCT_DEVELOPMENT_PROCESS_AND_APPROACHES (Level 1)
Short definition	Project management and governance in new product development
Full definition	Text that addresses the processes and structures for overseeing and controlling the product development process.
When to use	This code is applied when the texts mention the importance of clear decision-making and commitment to a chosen path, the challenges of mid-project re-evaluations and their potential impact on team morale and progress, the concept of escalation and its role in addressing project concerns, the involvement of steering committees or other governing bodies in the product development process, and the criteria or conditions that trigger the use of formal project management.
Example	"Escalation refers to whether a specific concern needs to be entered one hierarchical level higher."
When not to use	If the text focuses solely on the technical aspects of product development, customer feedback, or team structures without explicitly discussing the governance and decision-making processes involved., this code cannot be used. Furthermore, this code cannot be used if the text discusses the role of content or the internal hierarchy of media companies without direct connection to project management or governance.

Code	NPD_IDEOLOGIES
Level	2
Links to	PRODUCT_DEVELOPMENT_PROCESS_AND_APPROACHES (Level 1)
Short definition	Ideologies in the new product development process
Full definition	Text that addresses the various ideologies and principles used in the new product development process
When to use	This code is applied when the texts mention the importance of ideologies and principles in the new product development process, including the most viable product and gates.
Example	"We don't call it gates for large new product development projects, but it is clear that you need control points in a new product development process."
When not to use	If the text focuses solely on the technical aspects of product development, customer feedback, or team structures without explicitly discussing the ideologies or principles used in the new product development process, this code cannot be used.

Code	DATA_DRIVEN_DECISION_MAKING_AND_STAKEHOLDER_MANAGEMENT
Level	2
Links to	PRODUCT_DEVELOPMENT_PROCESS_AND_APPROACHES (Level 1)
Short definition	Data driven decision making and stakeholder management in new product development process
Full definition	Text that addresses the use of data-driven decision-making in the new product development process, the challenges of managing stakeholder expectations and communication, and the importance of balancing data-driven insights with intuition and qualitative understanding.
When to use	This code is applied when the texts mention the importance of managing stakeholder expectations and balancing data-driven insights with intuition and qualitative understanding in decision-making, the use of data and analysis to inform product development decisions, and the challenges of communicating complex information or technical details to stakeholders who may not have a deep understanding of the development process.
Example	"It's important to mention that we work heavily with data. We try to decide everything in a data-driven way, but in the end the data doesn't give you an answer to everything."
When not to use	If the text focuses solely on the technical aspects of product development, specific user-centred design methods, or team structures without explicitly discussing the role of data in decision-making or the challenges of stakeholder management, this code cannot be used.

1.3.3.4 Interview 9

This section shows the codebook for the within-company analysis of interview 9 (company 4) based on Mackieson et al. (2019) in Appendix 1.2.4.2.

Code	CUSTOMER_CENTRIC_NPD_APPROACH
Level	1 (Primary code)
Short definition	Customer-centred principles and methodologies in new product development (NPD)
Full definition	Text that addresses the adoption and adaptation of user-centred design principles and methodologies in the new product development process, with a focus on understanding and prioritising customer needs and preferences.
When to use	This code is applied when the texts describe the use of user-centred design principles or methodologies in NPD, the collection and analysis of customer feedback to inform product decisions, the balancing customer-centricity with business goals and technical feasibility, and the evaluation of different customer involvement methods and their impact on product development.
Example	“We do not work with a specific user-centred process for involving customers in the new product development process.”
When not to use	If the text focuses solely on the technical aspects of product development, internal processes, or team structures without explicitly mentioning the customer perspective or user-centred design principles, this code cannot be used. Furthermore, this code is not applied when the text discusses customer involvement without addressing the strategic or methodological aspects of adopting a customer-centric approach to NPD.

Code	CUSTOMER_VALIDATION_NEED_IDENTIFICATION
Level	2
Links to	CUSTOMER_CENTRIC_NPD_APPROACH (Level 1)
Short definition	Customer validation and need identification in the new product development process
Full definition	Text that addresses the importance of validating customer needs and desires for a new product or feature, especially when introducing novel concepts or facing high levels of uncertainty. It highlights the need to involve customers early in the development process to assess their interest and willingness to adopt the product.
When to use	This code is applied when the texts mention the necessity of confirming customer demand for a new product or feature before investing significant resources in development, the use of customer research or feedback to validate assumptions and hypotheses about product-market fit, and the distinction between innovative features that require extensive customer validation and established features that can be adopted with less upfront customer involvement.
Example	“The first step must therefore focus on whether customers want a new product at all, ...”
When not to use	If the text focuses solely on the technical aspects of product development, the specific methods of customer involvement, or the general benefits of customer-centricity without explicitly addressing the need for validating customer needs and desires for a new product or feature, this code cannot be used.

Code	CHALLENGES_AND_ADAPTABILITY_USER_CENTRIC_APPROACHES
Level	2
Links to	CUSTOMER_CENTRIC_NPD_APPROACH (Level 1)
Short definition	Challenges and adaptability in user centric approaches
Full definition	Text that addresses the challenges and considerations involved in adopting and adapting user-centred approaches in the new product development process. It highlights the lack of a standardised procedure, the situational nature of customer

	involvement, and the ongoing evaluation of the effectiveness of different user-centred methods. The text also touches on the potential limitations of user feedback and the need to balance it with other factors in decision-making.
When to use	This code is applied when the texts mention the lack of a standardised or consistent approach to user-centred design in the NPD process, the adaptation of customer involvement methods based on specific situations or project requirements, the evaluation and comparison of different user-centred methods and their effectiveness, the challenges of interpreting and utilising user feedback, especially in light of potential discrepancies between stated preferences and actual behaviour, and the ongoing effort to improve and refine the use of user-centred approaches in NPD.
Example	"I believe that the influence would be marginal if customers were actively involved in the new product development process, that is, in the customer co-creation approach."
When not to use	If the text focuses solely on the benefits of user-centred design or the specific methods used without addressing the challenges, adaptations, or evaluations involved in implementing such an approach, this code cannot be used.

Code	CROSS_FUNCTIONAL_TEAM_STRUCTURE_AND_DYNAMICS
Level	1 (Primary code)
Short definition	Cross-functional team structures and dynamics
Full definition	Text that addresses the composition, roles, and dynamics of cross-functional teams in the new product development process.
When to use	This code is applied when the texts discuss the composition and functioning of cross-functional teams, the roles and responsibilities of team members, the interactions between different teams or individuals involved in the new product development process, the benefits of cross-functional teams such as increased agility, efficiency, and innovation, the challenges of cross-functional teams such as coordination, communication, and maintaining a shared understanding, the importance of autonomy and stability within cross-functional teams, the need for collaboration and interaction between cross-functional teams and other parts of the organisation, and the role of cross-functional teams in driving innovation and adapting to new technologies.
Example	"Our cross-functional teams are focussed on feature development."
When not to use	If the text focuses solely on the technical aspects of product development, customer feedback, or individual roles without reference to the broader context of cross-functional team dynamics, this code cannot be used.

Code	TEAM_COMPOSITION_AND_ROLES
Level	2
Links to	CROSS_FUNCTIONAL_TEAM_STRUCTURE_AND_DYNAMICS (Level 1)
Short definition	Team composition and roles in cross-functional teams
Full definition	Text that addresses the composition of cross-functional teams, emphasising the inclusion of diverse roles and expertise, such as developers (web, backend, iOS, Android), tech leads, UX experts, and product owners. It also acknowledges the existence of other specialised roles outside the core team, like quality assurance, DevOps, system architects, and solution architects. The text further highlights the need for specific technical expertise within the teams, depending on the technologies and platforms used in product development.
When to use	This code is applied when the texts list or describe the various roles and expertise present within cross-functional teams, as well as any additional specialised roles that support the team's work.
Example	"We have a cross-functional product team for each platform, which includes developers, including web developers, backend developers, iOS developers, Android developers, a tech lead and UX experts."
When not to use	If the text focuses solely on the general concept of cross-functional teams or their benefits without specifying the actual roles and expertise involved, this code cannot be

	used. In addition, this code cannot be used when the text mentions team dynamics or collaboration without referring to the specific composition of the team.

Code	BENEFITS_AND_RATIONALE
Level	2
Links to	CROSS_FUNCTIONAL_TEAM_STRUCTURE_AND_DYNAMICS (Level 1)
Short definition	Benefits and rationale for cross-functional teams
Full definition	Text that addresses the advantages and the underlying reasons for utilising cross-functional teams in the context of new product development.
When to use	This code is applied when the texts mention the positive outcomes or the strategic rationale behind employing cross-functional teams, such as improved focus, minimised dependencies, enhanced agility, faster response to change, and the ability to leverage new technologies and opportunities effectively.
Example	"You need an autonomous cross-functional team that focuses on one product or feature so that you can drive the product or feature forward end-to-end. This is the only way to minimise dependencies, be agile and react quickly to changes."
When not to use	If the text discusses the challenges or limitations of cross-functional teams, or when it focuses on the specific composition or roles within a team without explicitly mentioning the benefits or rationale behind the cross-functional approach, this code cannot be used.

Code	INTEGRATION_AND_COLLABORATION
Level	2
Links to	CROSS_FUNCTIONAL_TEAM_STRUCTURE_AND_DYNAMICS (Level 1)
Short definition	Integration and collaboration within cross-functional teams
Full definition	Text that addresses the importance of integrating developers into cross-functional teams and fostering collaboration between developers and other team members. It also highlights the significance of involving the entire team in user interactions to gain a deeper understanding of user needs and expectations.
When to use	This code is applied when the texts mention the integration of developers into cross-functional teams and the importance of avoiding silos, the benefits of having full-stack developers who can contribute to various aspects of the development process, the value of involving the entire cross-functional team in user interactions and understanding user needs, and the potential positive impact of customer involvement on cross-functional team efficiency, as long as it is balanced and well-structured.
Example	"It is very important that the entire cross-functional team is even more involved in the interactions with users, because this still happens too little."
When not to use	If the text focuses solely on the technical aspects of product development, the roles and responsibilities within a team, or the overall structure of cross-functional teams without explicitly addressing the aspects of integration, collaboration, or customer involvement, this code cannot be used.

Code	ROLES_AND_RESPONSIBILITIES_IN_PRODUCT_DEVELOPMENT
Level	1 (Primary code)
Short definition	Roles and responsibilities in product development
Full definition	Text that addresses the various roles involved in the product development process, such as IT architects, product owners, product managers, and project managers, their respective responsibilities, and roles that are difficult to recruit for.
When to use	This code is applied when the texts describe the roles of individuals, roles that are difficult to recruit for, or teams involved in the product development process, their specific responsibilities, and any discussions about the ideal division of labour or potential overlap between roles.
Example	"In our company, we have a product manager and a product owner."

When not to use	If the text focuses solely on the technical aspects of product development, customer feedback, or team structures without explicitly discussing the roles and responsibilities of individuals or teams involved in the product development process, this code cannot be used.

Code	TALENT_AND_SKILL_GAPS
Level	2
Links to	ROLES_AND_RESPONSIBILITIES_IN_PRODUCT_DEVELOPMENT (Level 1)
Short definition	Talent and skill gaps in the Swiss media industry
Full definition	Text that addresses the challenges faced by the Swiss media industry in attracting and retaining technical talent for new product development.
When to use	This code is applied when the texts mention the difficulties in finding and hiring qualified individuals with the necessary technical skills and expertise for new product development within the Swiss media industry.
Example	"Nevertheless, it remains difficult to find good talent in the Swiss media industry."
When not to use	If the text discusses general challenges in the hiring process, skill gaps in other industries, or the importance of technical expertise without specifically addressing the unique challenges faced by the Swiss media industry in attracting and retaining technical talent, this code cannot be used.

Code	ROLE_IT_ARCHITECT
Level	2
Links to	ROLES_AND_RESPONSIBILITIES_IN_PRODUCT_DEVELOPMENT (Level 1)
Short definition	The roles of IT architects in product development
Full definition	Text that addresses the role of IT architects as external consultants who are not directly integrated into cross-functional teams but are brought in for specific expertise on major architectural decisions.
When to use	This code is applied when the texts mention the role of IT architects, their involvement in the decision-making process, and their specific area of expertise, which is major architectural decisions.
Example	"IT architects are usually part of another team and are called in when major architectural decisions need to be made."
When not to use	If the text discusses other technical roles or general technical considerations without specifically mentioning the role of IT architects or their involvement in architectural decision-making, this code cannot be used.

Code	ROLES_OF_PM_AND_PO
Level	2
Links to	ROLES_AND_RESPONSIBILITIES_IN_PRODUCT_DEVELOPMENT (Level 1)
Short definition	The roles of product managers and product owners in product development
Full definition	Text that addresses the roles and responsibilities of the product manager and product owner, highlighting the lack of industry consensus on their specific tasks and the potential for merging these roles.
When to use	This code is applied when the texts mention the roles of product manager and product owner, their responsibilities, the potential for merging these roles, or the challenges of defining their distinct tasks within the company or the media industry.
Example	"The product manager is basically responsible for looking ahead and is therefore more orientated towards strategy and business. This means that the product manager plans at quarterly or annual level and at epic level in the scrum context. This means that the product manager defines the major epics."
When not to use	If the text focuses solely on other roles in the product development process or discusses general team structures without specifically addressing the roles of product manager and product owner, this code cannot be used.

Code	RISK_AND_UNCERTAINTY_MANAGEMENT_IN_NPD
Level	1 (Primary code)
Short definition	Risk and uncertainty management in new product development (NPD)
Full definition	Text that addresses the importance of identifying and managing risks and uncertainties throughout the NPD process.
When to use	This code is applied when the texts describe the identification and assessment of risks and uncertainties in the NPD process, the use of prototypes, proof of concepts, and other validation methods to mitigate risks, the importance of data-driven decision-making and user feedback in managing uncertainty, the challenges of predicting future user needs and technological advancements, or the need for flexibility and adaptability in the face of uncertainty.
Example	“It is important to have identified the biggest risks and the biggest assumptions of the idea to be developed and to have them validated as quickly as possible. This allows you to determine whether you want to continue with the process or not.”
When not to use	If the text focuses solely on the technical aspects of product development, specific team structures, or the general benefits of customer involvement without explicitly addressing the management of risks and uncertainties in the NPD process, this code cannot be used.

Code	EARLY_STAGE_RISK_ASSESSMENT_AND_VALIDATION
Level	2
Links to	RISK_AND_UNCERTAINTY_MANAGEMENT_IN_NPD (Level 1)
Short definition	Early stage risk assessment and validation in the new product development process
Full definition	Text that addresses the importance of identifying and validating key assumptions and risks early in the new product development process.
When to use	This code is applied when the texts mention the identification and assessment of key assumptions and risks in the early stages of the new product development process, the use of tools or frameworks (such as the business model canvas) to evaluate the business case and potential revenue streams, the importance of validating assumptions and hypotheses through data analysis, user research, or other methods, or the need to make informed decisions about proceeding with development based on the assessment of risks and potential value.
Example	“It is often also about value hypotheses, meaning that you determine whether it is a product or a feature that users want. In this case, the hypothesis would be based on the assumption that users want a new product or a new feature.”
When not to use	If the text focuses solely on the technical aspects of product development, specific implementation details, or team structures without explicitly addressing the early-stage assessment and validation of risks and assumptions, this code cannot be used.

Code	ADAPTING_PROCESS_TO_MITIGATE_RISKS
Level	2
Links to	RISK_AND_UNCERTAINTY_MANAGEMENT_IN_NPD (Level 1)
Short definition	Adapting process to mitigate risks in the new product development process
Full definition	Text that addresses the importance of adapting the product development process to address specific risks and uncertainties.
When to use	This code is applied when the texts mention the use of prototypes or proof of concepts to test and validate assumptions before proceeding with full-scale development, the implementation of stage-gate processes or control points to manage risks and uncertainties throughout the development process, the adaptation of the development process based on the specific nature of the project, the level of uncertainty, or the type of risks involved, or the careful consideration of technology choices and their impact on project feasibility and risk.

Example	“The use of control gates depends on the granularity of the further development. When it comes to the development of new products, whereby a new revenue stream is developed, an assessment of the business case is required.”
When not to use	If the text focuses solely on the general benefits of user feedback or the importance of customer involvement without explicitly mentioning the adaptation of the development process to mitigate risks or uncertainties, this code cannot be used.

Code	MANAGING_TECHNICAL_UNCERTAINTY
Level	2
Links to	RISK_AND_UNCERTAINTY_MANAGEMENT_IN_NPD (Level 1)
Short definition	Managing technical uncertainty in new product development
Full definition	Text that addresses the identification and management of technical uncertainties and risks associated with new product development.
When to use	This code is applied when the texts mention the presence of technical uncertainties or risks in the NPD process, especially when dealing with new or unfamiliar technologies, the use of proof of concepts, prototypes, or other technical validation methods to assess feasibility and mitigate risks, the importance of early involvement of technical experts in the decision-making process, or the distinction between established and emerging technologies and their impact on the timing and approach to technical integration in NPD.
Example	“At a technical level, we always have assumptions or risks that are identified.”
When not to use	If the text focuses solely on the general benefits of technology or the specific features of a product without addressing the uncertainties or risks associated with the technical implementation, this code cannot be used.

Code	ORGANISATIONAL_STRUCTURE_AND_GOVERNANCE_IN_NPD
Level	1 (Primary code)
Short definition	Organisational structure and governance in new product development (NPD)
Full definition	Text that addresses the organisational structures, governance mechanisms, and decision-making processes involved in NPD.
When to use	This code is applied when the texts describe the use of steering committees or product advisory boards in the NPD process, the role of different departments and individuals in decision-making and prioritisation, the challenges of aligning strategic and operational levels within the organisation, and the importance of considering the entire product lifecycle in NPD.
Example	“At our company, technical roles are also strategically involved and not just operationally. At our company, the Chief Product Officer, who is responsible for the entire product portfolio from a digital perspective, works very closely with the Chief Technology Officer.”
When not to use	If the text focuses solely on the technical aspects of product development, customer feedback, or specific user-centred design methods without explicitly discussing the organisational structures, governance mechanisms, or decision-making processes involved in NPD, this code cannot be used.

Code	PROCESS_MODELS_AND_LIFECYCLE_MANAGEMENT
Level	2
Links to	ORGANISATIONAL_STRUCTURE_AND_GOVERNANCE_IN_NPD (Level 1)
Short definition	Process models and lifecycle management in new product development (NPD)
Full definition	Text that addresses the importance of adopting an overarching process model or lifecycle management framework in NPD.
When to use	This code is applied when the texts mention the use or absence of an overarching process model or lifecycle management framework in NPD, the importance of considering the entire product lifecycle, the challenges of managing product portfolios

	and identifying obsolete or low-impact features, the benefits of using a structured approach to reduce complexity and improve efficiency in NPD, or the need to balance the addition of new features with the removal of obsolete ones to maintain product focus and innovation capacity.
Example	“The portfolio level in an overarching process model, which you should look at, helps to see how different products interact to be able to analyse which products are no longer viable. You might even do this in companies because you realise that a product is no longer profitable enough.”
When not to use	If the text focuses solely on the technical aspects of product development, customer feedback, or specific team structures without explicitly discussing the broader process models or lifecycle management approaches in NPD, this code cannot be used.

Code	DECISION_MAKING_AND_GOVERNANCE_STRUCTURES
Level	2
Links to	ORGANISATIONAL_STRUCTURE_AND_GOVERNANCE_IN_NPD (Level 1)
Short definition	Decision making and governance structures for new product development (NPD)
Full definition	Text that addresses the organisational structures and governance mechanisms involved in the decision-making process for NPD.
When to use	This code is applied when the texts mention the roles and responsibilities of key decision-makers in the NPD process, the structure and function of steering committees or advisory boards, the use of specific frameworks or methodologies for setting objectives and priorities, or the collaboration and communication between different departments or teams in the decision-making process.
Example	“We also work with steering committees. However, our steering committees are not yet set up quite so systematically and are often used for initiatives, which are larger product initiatives that run over several quarters.”
When not to use	If the text focuses solely on the technical aspects of product development, customer feedback, or individual roles without explicitly discussing the broader organisational structures or governance mechanisms involved in decision-making, this code cannot be used.

Code	AGILE_METHODS_IMPLEMENTATION_AND_CHALLENGES
Level	1 (Primary code)
Short definition	Implementation of agile methods and challenges
Full definition	Text that addresses the challenges and misconceptions associated with implementing agile methodologies, particularly scrum and SAFe, in the media industry.
When to use	This code is applied when the text describes critiques or questions the effective implementation of agile methodologies, particularly in the media industry, highlights the discrepancy between the theoretical principles of agile and the actual practices observed, points out the lack of focus on hypothesis validation, iterative adaptation, and feedback-driven development, discusses the challenges of balancing flexibility and structure within agile frameworks, or mentions the potential pitfalls of overly rigid planning and execution in agile projects.
Example	“However, few teams in the media industry pursue this goal, that is, to really work in iterations to quickly measure whether the assumptions made have been proven to be correct or whether the defined plan needs to be adjusted.”
When not to use	If the text focuses solely on the theoretical benefits or general principles of agile methodologies without addressing the practical challenges of implementation, discusses the successful implementation of agile practices and the positive outcomes achieved, or mentions other project management methodologies without specifically referencing the challenges of implementing agile method, this code cannot be used.

Code	SCRUM_ADOPTION_GAP
Level	2
Links to	AGILE_METHODS_IMPLEMENTATION_AND_CHALLENGES (Level 1)
Short definition	Gaps of scrum adoption
Full definition	Text that addresses the discrepancy between the theoretical principles and the actual implementation of scrum in the media industry.
When to use	This code is applied when the texts mention the ineffective or incomplete adoption of scrum practices in the media industry, the gap between the intended purpose of scrum and its actual implementation, the lack of focus on key agile principles like hypothesis validation, iterative development, and adaptability, or the presence of scrum ceremonies without the underlying agile mindset and practices.
Example	“One problem we have in the media industry is that scrum is not effectively practised. This means that the original principles and the reason for using scrum are rarely present.”
When not to use	If the text focuses solely on the challenges of implementing agile methodologies in general, without specific reference to scrum, discusses the successful implementation of scrum and its positive outcomes, or mentions other project management methodologies without specifically highlighting the challenges of scrum adoption, this code cannot be used.

Code	RIGID_PLANNING_VS_AGILITY
Level	2
Links to	AGILE_METHODS_IMPLEMENTATION_AND_CHALLENGES (Level 1)
Short definition	Rigid planning and agility
Full definition	Text that addresses the tendency towards rigid planning and execution in agile implementations.
When to use	This code is applied when the texts mention the over-reliance on rigid roadmaps and predefined plans in agile development, particularly in the context of the scaled agile framework (SAFe), the lack of flexibility and adaptability in responding to feedback and changing requirements, the infrequent use of hypothesis validation and iterative adjustments based on data and insight, or the potential negative impact of rigid planning on team motivation and the ability to deliver impactful features.
Example	“We refer to SAFe. So, there is a programme level for product management, where work is based on programme increments at quarterly level. There is also a team level where work is carried out with product owners analogue to scrum teams.”
When not to use	If the text focuses solely on the general challenges of implementing agile methodologies without specifically addressing the issue of rigid planning, discusses the benefits of structured planning or the need for some level of predictability in the development process, or mentions other project management methodologies or frameworks without highlighting their impact on flexibility and adaptability, this code cannot be used.

1.3.3.5 Interview 10

This section shows the codebook for the within-company analysis of interview 10 (company 5) based on Mackieson et al. (2019) in Appendix 1.2.5.2.

Code	CUSTOMER_CENTRICITY_IN_NPD
Level	1 (Primary code)
Short definition	Customer centrality in new product development (NPD)
Full definition	Text that addresses the importance of adopting a customer-centric approach in the NPD process
When to use	This code is applied when the texts describe the importance of understanding and prioritising customer needs and preferences in NPD, the use of customer feedback and data to inform product decisions and validate hypotheses, the benefits and challenges of active customer involvement, including co-creation, the trade-offs between customer-centrality and other factors like business goals, technical feasibility, and time constraints, or the need to adapt customer involvement strategies based on the type of product and the level of innovation involved.
Example	"We have the customer quite central, this means that we are doing customer surveys and we will continue doing it because it is crucial for the new product development process."
When not to use	If the text focuses solely on the technical aspects of product development, internal processes, or team structures without explicitly mentioning the customer perspective or the strategic implications of adopting a customer-centric approach, this code cannot be used.

Code	IMPORTANCE_AND_CHALLENGES_USER_CENTRICITY
Level	2
Links to	CUSTOMER_CENTRICITY_IN_NPD (Level 1)
Short definition	Importance and challenges of user centrality in new product development (NPD)
Full definition	Text that addresses the significance of adopting a user-centric approach in NPD.
When to use	This code is applied when the texts mention the importance of user-centrality in product development, the methods used to gather and incorporate user feedback, and the potential conflicts or challenges that may arise when balancing user perspectives with internal opinions or strategic goals.
Example	"It is important for every company to develop user-centric because otherwise the product will fail."
When not to use	If the text focuses solely on specific user-centred methods or the benefits of customer involvement without addressing the broader importance of user-centrality or the potential challenges associated with it, this code cannot be used.

Code	POTENTIAL_AND_BARRIERS_FULL_CUSTOMER_COCREATION
Level	2
Links to	CUSTOMER_CENTRICITY_IN_NPD (Level 1)
Short definition	Potential and barriers for the full customer co-creation approach in the new product development (NPD) process
Full definition	Text that addresses the potential benefits and challenges of implementing a complete customer co-creation approach in the NPD process.
When to use	This code is applied when the texts mention the potential benefits and drawbacks of a complete customer co-creation approach, the impact of customer co-creation on the NPD process, timelines, and resource allocation, the challenges of managing customer expectations and aligning their input with the company's vision, the distinction between customer needs and solutions and the role of product experts in bridging this

	gap, or the potential impact of customer co-creation on the company's ability to innovate and develop groundbreaking products.
Example	"With a complete customer co-creation process, however, you start working closely with the customer right from the beginning. In theory, this could mean that you gain time. However, the time gained depends on how well the process is managed and how many feedback iterations are carried out."
When not to use	If the text focuses solely on specific customer involvement methods or the general benefits of customer-centricity without explicitly addressing the broader implications and challenges of a full customer co-creation approach, this code cannot be used.

Code	MEDIA_INDUSTRY_TRANSFORMATION_AND_ADAPTATION
Level	1 (Primary code)
Short definition	Transformation and adaptation in the media industry
Full definition	Text that addresses the significant transformation the media industry is undergoing due to technological advancements and changing consumer behaviour.
When to use	This code is applied when the texts describe the changing landscape of the media industry and the challenges it faces due to technological advancements and shifting consumer behaviour, the need for adaptation, innovation, and disruptive thinking in the media industry, the declining importance of traditional media outlets and the rise of digital platforms, the increasing importance of technology and product development in the media industry, the shift in power dynamics from media companies to consumers, or the need for media companies to focus on the future and adapt their business models to remain relevant.
Example	"The disruption readiness will be an important aspect for the future of the Swiss media industry."
When not to use	If the text focuses solely on the technical aspects of product development, specific user-centred design methods, or internal organisational structures without referencing the broader context of the media industry's transformation, this code cannot be used.

Code	NEED_FOR_DISRUPTION_AND_INNOVATION
Level	2
Links to	MEDIA_INDUSTRY_TRANSFORMATION_AND_ADAPTATION (Level 1)
Short definition	Need for disruption and innovation in the Swiss media industry
Full definition	Text that addresses the critical need for disruption and innovation in the Swiss media industry to adapt to the changing landscape and ensure future survival.
When to use	This code is applied when the texts mention the necessity of disruptive innovation and thinking outside the box in the media industry, the importance of adapting to the changing landscape and evolving consumer behaviour, the risks of complacency and the need for proactive transformation, the limitations of cost-cutting measures as a long-term strategy, or the success stories of companies that embraced disruption and innovation.
Example	"In the future you need to disrupt yourself because if you don't do it, your company will not survive. You will not have the same landscape in ten years as the landscape that you have today."
When not to use	If the text focuses solely on specific customer involvement methods, technical aspects of product development, or organisational structures without explicitly addressing the need for disruption and innovation in the broader context of the media industry's transformation, this code cannot be used.

Code	SHIFTING_CONSUMER_BEHAVIOUR_AND_MARKET_TRENDS
Level	2
Links to	MEDIA_INDUSTRY_TRANSFORMATION_AND_ADAPTATION (Level 1)
Short definition	Evolving consumer behaviour and market trends in the media industry
Full definition	Text that addresses the evolving consumer behaviour and market trends in the media industry.
When to use	This code is applied when the texts mention changes in how people consume media and the impact of digital platforms and mobile apps on traditional media consumption habits, the fragmentation of the media market and the rise of dominant apps among specific demographics, the implications of these changes for media companies, such as the need to adapt content strategies, business models, and explore new avenues for revenue generation, the evolving expectations and preferences of media consumers, particularly younger generations, and the uncertainties and questions surrounding the future of journalism and how media companies can remain relevant and engaging.
Example	“The question is to ask yourself why something is happening, as for example, why people are not watching TV anymore. What is important to see is, that we have a highly fragmented market with a lot of smartphone apps and push notifications for example. For example, the young generation is spending several hours a day only on one app and not jumping from one app to another. This could be TikTok or Snapchat. The question is then, what is them keeping on those apps and a solution could be that a media company should concentrate more on entertainment, for example.”
When not to use	If the text focuses solely on the technical aspects of product development, specific user-centred design methods, or internal organisational structures without referencing the broader context of shifting consumer behaviour and market trends in the media industry, this code cannot be used.

Code	ROLE_OF_TECHNOLOGY
Level	2
Links to	MEDIA_INDUSTRY_TRANSFORMATION_AND_ADAPTATION (Level 1)
Short definition	The role of technology in the media industry
Full definition	Text that addresses that technology serves as an enabler in the media industry, facilitating the delivery of ideas and content, but it does not generate the ideas themselves.
When to use	This code is applied when the texts mention the role of technology in the media industry, particularly its function as an enabler for content delivery and its potential impact on the future of journalism and content creation.
Example	“Technology after all is only an enabler, what is important however, is what the idea behind using a certain technology is. This means, that technology is only showing how to deliver an idea but not showing the answer how to get an idea.”
When not to use	If the text focuses solely on the technical aspects of specific technologies, the challenges of implementing new technologies, or the organisational structures involved in technology adoption, without addressing the broader role of technology as an enabler in the media industry, this code cannot be used.

Code	SCRUM_METHODODOLOGY_EVALUATION
Level	1 (Primary code)
Short definition	Evaluation of the scrum methodology
Full definition	Text that addresses opinions or evaluations of the scrum methodology, either positive or negative; discusses the benefits of scrum.
When to use	This code is applied when the texts express opinions or evaluations of the scrum methodology, either positive or negative, discuss the benefits of scrum, such as its iterative nature, focus on customer value, and ability to provide structure and visibility, highlight the challenges or limitations of scrum, particularly in relation to project

	complexity and the need for detailed task breakdown, or compare scrum to other project management methodologies or approaches.
Example	“What I love about scrum is the very iterative approach, where you learn a lot. So, in scrum there are a lot of test, learn, fail, repeat cycles, which are working very well.”
When not to use	If the text focuses solely on the technical aspects of product development or customer feedback without reference to scrum or discusses general project management principles or practices without specifically mentioning scrum or agile methodologies or describes the roles and responsibilities within a scrum team without evaluating the methodology itself, this code cannot be used.

Code	LIMITATIONS_AND_BENEFITS_OF_SCRUM
Level	2
Links to	SCRUM_METHODODOLOGY_EVALUATION (Level 1)
Short definition	Perceived limitations and benefits of scrum
Full definition	Text that addresses a strong belief in the scrum methodology, or the limitations of scrum.
When to use	This code is applied when the text mentions a positive or negative opinion about the scrum methodology, discusses the advantages of scrum such as its iterative nature, focus on customer value, and ability to provide structure and visibility, or highlights the challenges or limitations of scrum, particularly in relation to project complexity and the need for detailed task breakdown.
Example	“In general, I don’t see limitations in scrum. This is because I firmly believe in Scrum. This has to do with the fact that Scrum enables you to break projects down into individual packages and gives you a lot of visibility.”
When not to use	If the text focuses solely on the challenges of implementing agile methodologies in general, without specific reference to Scrum, discusses other project management methodologies or frameworks without comparing them to Scrum, or describes the roles and responsibilities within a scrum team without evaluating the methodology itself, this code cannot be used.

Code	TEAM_STRUCTURE_IN_NPD
Level	1 (Primary code)
Short definition	Team structure in new product development (NPD) process
Full definition	Text that addresses the various team structures and roles involved in the NPD process.
When to use	This code is applied when the texts describe the composition and structure of teams involved in NPD, including core teams, cross-functional teams, and the involvement of specialised roles, the roles and responsibilities of different team members, such as product owners, product managers, IT architects, and developers, the challenges of staffing technical roles and the importance of technical expertise in the NPD process, the factors that influence the choice of team structure, such as project size, complexity, and strategic importance, or the outsourcing of technical roles and its impact on the NPD process.
Example	“It is clear that IT architects are highly relevant for a new digital product. Architects are relevant to determine the technical roadmap on a high-level basis, which the developers then rely on. This also determines which developer roles we need. For example, backend or frontend developers.”
When not to use	If the text focuses solely on the technical aspects of product development, customer feedback, or the overall business strategy without explicitly discussing the structure or dynamics of the teams involved, this code cannot be used.

Code	OUTSOURCING_AND_EXTERNAL_PARTNERSHIPS
Level	2
Links to	TEAM_STRUCTURE_IN_NPD (Level 1)
Short definition	Outsourcing of team roles and external partnerships in new product development
Full definition	Text that addresses the practice of utilising external resources or expertise for specific roles or tasks in the new product development process.
When to use	This code is applied when the texts mention the outsourcing or external sourcing of specific roles or tasks in the NPD process, the reasons for outsourcing, or the benefits and challenges associated with working with external partners.
Example	“All of our technical roles are outsourced because we can’t keep them busy all year round. Only technical roles in the data area are employed by our company. Outsourcing also has the advantage that we receive advice when it comes to using cheaper technologies that ultimately deliver the same result. This ultimately helps to harmonise the business requirements with the technical requirements.”
When not to use	If the text discusses general team structures or internal roles without mentioning the use of external resources or partnerships, this code cannot be used.

Code	CORE_TEAM_VS_CROSS_FUNCTIONAL_TEAM
Level	2
Links to	TEAM_STRUCTURE_IN_NPD (Level 1)
Short definition	Core team vs. cross-functional team in new product development (NPD)
Full definition	Text that addresses the strategic considerations involved in choosing between a dedicated core team and a lean cross-functional team for NPD.
When to use	This code is applied when the text compares and contrasts the use of core teams and cross-functional teams in new product development, discusses the factors that influence the choice between these two team structures, highlights the advantages and disadvantages of each team structure in relation to specific project characteristics, or mentions the need to assess the project’s focus and potential impact on the company when making decisions about team structure.
Example	“If a company has a lot of experience in the development of new products, then it makes sense to work with a core team. This is because the people involved in this core team only work on new product development.”
When not to use	If the text focuses solely on the roles and responsibilities within a team, the technical aspects of product development, or customer feedback without explicitly discussing the choice between core teams and cross-functional teams, this code cannot be used.

Code	ROLES_AND_RESPONSIBILITIES
Level	2
Links to	TEAM_STRUCTURE_IN_NPD (Level 1)
Short definition	Roles and responsibilities in new product development (NPD) process
Full definition	Text that addresses the various roles and their responsibilities within the NPD process.
When to use	This code is applied when the texts mention the roles of individuals or teams involved in the new product development process, their specific responsibilities, and the interplay between these roles.
Example	“When it comes to editorial topics, journalists play a major role in the development of products.”
When not to use	If the text focuses solely on the technical aspects of product development, customer feedback, or team structures without specifically addressing the roles and responsibilities of individuals or teams, this code cannot be used.

Code	PRODUCT_DEVELOPMENT_PROCESS_AND_APPROACHES
Level	1 (Primary code)
Short definition	Process and approaches for new product development (NPD) process
Full definition	Text that addresses various aspects of the NPD process
When to use	This code is applied when the texts mention the overall process and stages involved in NPD, from ideation to launch, the use of specific methodologies or frameworks, such as agile, waterfall, or hybrid approaches, the role of quality control and testing in ensuring product success, the importance of iterative development and MVPs in validating ideas and gathering user feedback, the use of prototypes and proof of concepts to test technical feasibility and gather data, the challenges of balancing business and technical considerations in the development process, the importance of data-driven decision-making and the limitations of relying solely on data, or the role of external partners in providing expertise or resources for product development.
Example	“Proof of concepts are particularly worthwhile for us to be able to decide whether a technology is worth using in the first place.”
When not to use	If the text focuses solely on the technical aspects of product development, customer feedback, or team structures without explicitly discussing the broader product development process or the approaches used to manage it, this code cannot be used.

Code	QUALITY_ASSURANCE_AND_TESTING
Level	2
Links to	PRODUCT_DEVELOPMENT_PROCESS_AND_APPROACHES (Level 1)
Short definition	Quality assurance and testing in new product development (NPD)
Full definition	Text that addresses the critical role of quality control and testing in the new NPD process.
When to use	This code is applied when the texts mention the importance of quality control and testing in the new product development process, the challenges of balancing quality assurance with agility and the need for rapid iteration, the use of MVPs and iterative testing with user groups to gather feedback and improve the product, the role of different stakeholders in the quality control process, or the potential pitfalls of involving individuals with limited technical knowledge in quality control meetings.
Example	“So, I think quality check is totally fine, but I think that we are not doing it enough. In future, I would refuse to launch the product without having sufficiently tested, and that also means without having had some cross check along the way.”
When not to use	If the text focuses solely on the technical aspects of product development, customer feedback in general, or team structures without explicitly discussing the quality assurance and testing processes, this code cannot be used.

Code	PROTOTYPING_AND_PROOF_OF_CONCEPT
Level	2
Links to	PRODUCT_DEVELOPMENT_PROCESS_AND_APPROACHES (Level 1)
Short definition	Prototyping and proof of concept in in new product development (NPD)
Full definition	Text that addresses the use of prototypes and proof of concepts in the NPD process.
When to use	This code is applied when the texts mention the creation and use of prototypes or proof of concepts to gather user feedback, test technical feasibility, or validate new ideas or technologies in the product development process.
Example	“I would very much like it if we could carry out more proof of concepts with prototypes.”
When not to use	If the text focuses solely on other testing methods, such as beta testing or user interviews, or to general discussions about product development without specific reference to prototypes or proof of concepts, this code cannot be used.

Code	FRAMEWORKS_AND_PROCESS_FLEXIBILITY
Level	2
Links to	PRODUCT_DEVELOPMENT_PROCESS_AND_APPROACHES (Level 1)
Short definition	Frameworks and process flexibility in new product development (NPD)
Full definition	Text that addresses the importance of using frameworks and process models in NPD while also highlighting the need for flexibility and adaptability in their application.
When to use	This code is applied when the texts mention the use of frameworks or process models in new product development, the importance of balancing structure and flexibility in the application of frameworks, the need to adapt frameworks to the specific context and maturity level of the organisation, the challenges of rigidly adhering to theoretical models and the potential benefits of allowing for flexibility and adaptation, or the role of frameworks in providing guidance and ensuring that no steps are missed in the development process.
Example	"Firstly, it is important to be able to act flexibly even with a theoretical model. This is the case when you realise that the theoretical model is not fully suitable for the new product development process in the company."
When not to use	If the text focuses solely on the specific details of a particular framework or the technical aspects of product development without addressing the broader issue of framework flexibility and adaptability, this code cannot be used.

1.3.4 Codebook for the Cross-Company Coding of the Feedback and Evaluation Phase

This section shows the codebook for the cross-company analysis of the feedback and evaluation phase based on Mackieson et al. (2019) in section 7.2.

1.3.4.1 Customer Centricity

This section shows the codebook for customer centricity within the cross-company analysis of the feedback and evaluation phase in section 7.2.1.

Code	COMMON_PRACTICES_CUSTOMER_CENTRICITY
Level	1 (Primary code)
Short definition	Common practices in customer centricity in the companies
Full definition	Text that addresses the common practices employed by the companies to incorporate customer feedback and insights into their new product development process.
When to use	This code is applied when the texts describe specific activities, methods, or strategies that are commonly used by the company to involve customers in the NPD process and gather their feedback. This includes practices such as collecting and analysing anonymous usage data, conducting user experience research and interviews, utilising beta testing with diverse user groups, actively seeking customer input through surveys and workshops, and integrating user-centred design methods into the NPD process.
Example	"I'm a big fan of looking at things with users and listening to their thoughts and why they do or don't do things the way they do" (Interviewee 8).
When not to use	If the text discusses theoretical or conceptual aspects of customer centricity without mentioning specific practices, challenges or limitations of customer involvement in the NPD process, specific instances where customer involvement may not be necessary or feasible, or the role of specific teams or individuals in the NPD process without explicitly linking it to customer involvement practices, this code cannot be used.

Code	USER_FEEDBACK_COLLECTION
Level	2
Links to	COMMON_PRACTICES_CUSTOMER_CENTRICITY (Level 1)
Short definition	User feedback and collection as common practices in new product development in the companies
Full definition	Text that addresses the various methods employed to gather user feedback during the new product development process.
When to use	This code is applied when the texts mention specific methods or approaches used to collect user feedback, such as collecting anonymous usage data, conducting user experience research and interviews, launching beta versions for testing and feedback, or actively seeking customer input through surveys and other channels.
Example	"In the current new product development process, the customer is involved through anonymous data, meaning usage data, feedback on prototypes and user experience research, meaning interviews" (Interviewee 6).
When not to use	If the text discusses the interpretation or analysis of user feedback, the benefits of customer involvement, or the challenges associated with gathering feedback, this code cannot be used. The focus of this code is solely on the methods used to collect feedback, not the subsequent actions or implications.

Code	USER-CENTRIC_DESIGN_APPROACH
Level	2
Links to	COMMON_PRACTICES_CUSTOMER_CENTRICITY (Level 1)
Short definition	User-centric design approach n as common practices in new product development in the companies
Full definition	Text that highlights the integration and prioritisation of user-centred design principles and methods in the new product development process.
When to use	This code is applied when the texts mention the use of user-centred design methods or the integration of user-centred processes in the new product development process.
Example	"We have the customer quite central, this means that we are doing customer surveys and we will continue doing it because it is crucial for the new product development process" (Interviewee 10).
When not to use	If the text discusses customer involvement or feedback without explicitly mentioning user-centred design principles or processes, this code cannot be used.

Code	USER_NEEDS_AND_PROBLEM_IDENTIFICATION
Level	2
Links to	COMMON_PRACTICES_CUSTOMER_CENTRICITY (Level 1)
Short definition	User needs and problem identification as common practices in new product development in the companies
Full definition	Text that addresses the importance of understanding user needs and identifying their problems as a crucial first step in the new product development process.
When to use	This code is applied when the texts mention the importance of identifying and understanding user needs and problems in the early stages of the new product development process, the use of qualitative research methods, such as interviews, to gather insights into user desires and pain points, the focus on validating assumptions and reducing risks by ensuring that the product or feature being developed addresses genuine user needs, and the recognition that customer involvement in the early stages of development is crucial for identifying and addressing potential problems
Example	"I'm a big fan of looking at things with users and listening to their thoughts and why they do or don't do things the way they do" (Interviewee 8).
When not to use	If the text focuses solely on the technical aspects of product development, the specific methods of customer involvement beyond need identification, or the general benefits of customer-centricity without explicitly addressing the process of identifying and understanding user needs and problems, this code cannot be used.

Code	IMPLEMENTATION_VARIATIONS_CUSTOMER_CENTRICITY
Level	1 (Primary code)
Short definition	Implementation variations of customer centrality in the companies
Full definition	Text that addresses the varying levels and approaches to customer involvement in the new product development process.
When to use	This code is applied when the texts describe the different levels or degrees of customer involvement in the NPD process, ranging from minimal to full co-creation The use of various customer involvement methods, such as beta testing, user testing, workshops, and interviews, the situational and context-dependent nature of customer involvement, where the approach may vary based on the specific product or feature being developed, the challenges of achieving consistency in user-centred processes and the need for flexibility in adapting customer involvement strategies, and the recognition that certain types of products or features may require less upfront customer involvement due to established market needs or lower levels of risk
Example	"We already involve customers directly and actively in the process. The active customer involvement we do with users who visit us four times a year and take part in workshops and testing" (Interviewee 8).

When not to use	If the text focuses solely on the benefits or challenges of customer involvement in general, without addressing the variations in implementation or the factors that influence the level and type of customer engagement, this code cannot be used.

Code	METHODS_OF_CUSTOMER_ENGAGEMENT
Level	2
Links to	IMPLEMENTATION_VARIATIONS_CUSTOMER_CENTRICITY (Level 1)
Short definition	Methods of customer engagement in the companies
Full definition	Text that addresses the various methods and approaches used to engage customers in the new product development process.
When to use	This code is applied when the texts mention specific methods or techniques used to involve customers in the NPD process.
Example	"The advantage of a beta version is that you can identify real problems that you won't find out during testing. Of course, the type of product always plays a role. A daily newspaper is a good choice because everyone wants to read the news and you always discover bugs in the evening or at the weekend" (Interviewee 8).
When not to use	If the text discusses the general importance of customer involvement or the benefits of customer-centricity without mentioning specific methods or approaches, this code cannot be used. Furthermore, this code cannot be used, if the text focuses on the outcomes or impacts of customer involvement without detailing the methods used to achieve that involvement.

Code	CUSTOMER_IMPACT_ON_NPD
Level	1 (Primary code)
Short definition	The impact of customers on the new product development in the companies
Full definition	Text that addresses the significant impact that customer involvement and feedback have on the success of NPD.
When to use	This code is applied when the texts describe the positive impact of customer involvement on driving innovation and ensuring product-market fit, the importance of understanding and addressing customer needs and preferences in NPD, the role of customer feedback in validating assumptions, identifying potential problems, and guiding product improvements, the need for expertise in collecting, categorising, and interpreting customer feedback, and the prioritisation of essential features and quality over less impactful functionalities.
Example	"Actively involving customers in the new product development process could help to drive smaller innovation" (Interviewee 7).
When not to use	If the text focuses solely on the specific methods of customer involvement, the challenges of implementing a customer-centric approach, or the broader organisational structures and processes without explicitly discussing the direct impact of customer involvement on the NPD outcomes, this code cannot be used.

Code	IMPACT_ON_PRODUCT_SUCCESS
Level	2
Links to	CUSTOMER_IMPACT_ON_NPD (Level 1)
Short definition	The impact of customer on product success in the companies
Full definition	Text that addresses the positive impact that customer involvement and a focus on user needs can have on the success of new products.
When to use	This code is applied when the texts mention the positive impact of customer involvement and user-centricity on product success, including increased innovation, improved product-market fit, and higher user satisfaction, the importance of prioritising essential features and quality over less impactful functionalities, the risks of relying solely on assumptions and gut feelings in product development, and the

	connection between understanding and addressing customer needs and the overall success of a product
Example	"It is worth involving customers indirectly in the new product development process, as it is undeniable that this is profitable" (Interviewee 7).
When not to use	If the text focuses solely on the specific methods of customer involvement or the challenges of implementing a customer-centric approach without explicitly discussing the impact of these factors on product success, this code cannot be used.

Code	CUSTOMER_NEEDS_AND_PROBLEM_IDENTIFICATION
Level	2
Links to	CUSTOMER_IMPACT_ON_NPD (Level 1)
Short definition	Customer needs and problem identifications impacting the new product development (NPD) success in the companies
Full definition	Text that addresses that the initial step in new product development should focus on understanding if customers desire the proposed product to be successful in NPD.
When to use	This code is applied when the texts mention the necessity of confirming customer demand for a new product or feature before significant development investment, the value of involving customers in the early stages (business case or idea generation phase) to validate the need for the product or feature, and the importance of having someone who can effectively manage and categorise customer feedback.
Example	"If you work effectively with customer needs as a basis, then you can get off to a much better start" (Interviewee 7).
When not to use	If the text focuses solely on technical aspects of product development or the later stages of the development process or discusses customer involvement without explicitly addressing the need for validating customer needs and desires for a new product or feature as part of NPD success, this code cannot be used. For general consideration of focusing on customer needs and problems the subcode "USER_NEEDS_AND_PROBLEM_IDENTIFICATION" as part of the primary code "COMMON_PRACTICES_CUSTOMER_CENTRICITY" must be used.

Code	CHALLENGES_AND_BARRIERS_CUSTOMER_CO_CREATION
Level	1 (Primary code)
Short definition	Challenges and barriers for implementing customer co-creation in the companies
Full definition	Text that addresses various challenges and barriers associated with implementing a full customer co-creation approach in the new product development process.
When to use	This code is applied when the texts describe the organisational barriers and resistance to adopting a full customer co-creation approach, the financial and time constraints associated with involving customers throughout the NPD process, the limitations of customer feedback and the challenges of interpreting and prioritising customer input, the potential conflicts between customer expectations and the company's vision or strategic goals, and the need for clear communication and collaboration between different teams and stakeholders to overcome these challenges.
Example	"The idea behind customer co-creation is very difficult for me because there is no procedural basis for it in our company" (Interviewee 6).
When not to use	If the text focuses solely on the benefits of customer co-creation or the specific methods used to involve customers without addressing the potential challenges and barriers to implementation, this code cannot be used.

Code	ORGANISATIONAL_AND_CULTURAL_RESISTANCE
Level	2
Links to	CHALLENGES_AND_BARRIERS_CUSTOMER_CO_CREATION (Level 1)
Short definition	Organisational und cultural resistance to implement customer co-creation in the companies
Full definition	Text that addresses the challenges and resistance faced in implementing a customer co-creation approach due to the prevailing organisational culture and mindset
When to use	This code is applied when the texts mention the lack of established procedures or frameworks for customer co-creation within the organisation, the perceived difficulties or complexities of integrating customers into the development process, the resistance or hesitation from different departments or individuals towards adopting a customer co-creation approach, the prevailing organisational culture or mindset that may hinder the implementation of customer co-creation, and the need for a fundamental shift in mindset and culture to enable successful customer co-creation
Example	“With the current mindset, it is almost impossible for a complete customer co-creation approach to be introduced in the new product development process in the Swiss media industry” (Interviewee 10).
When not to use	If the text focuses solely on the benefits of customer co-creation, specific methods of customer involvement, or the challenges related to resource constraints or customer limitations without addressing the broader organisational and cultural barriers to implementation, this code cannot be used. For resource constraints the subcode “RESOURCE_TIME_AND_FINANCIAL_CONSTRAINTS” and for customer limitations the subcode “CUSTOMER_CAPABILITIES_AND_EXPECTATIONS” must be used.

Code	RESOURCE_TIME_AND_FINANCIAL_CONSTRAINTS
Level	2
Links to	CHALLENGES_AND_BARRIERS_CUSTOMER_CO_CREATION (Level 1)
Short definition	Resource, time, and financial constraints to implement customer co-creation in the companies
Full definition	Text that addresses the potential resource constraints, both in terms of time and finances, that can hinder the implementation of a full customer co-creation approach.
When to use	This code is applied when the texts mention the financial implications of customer co-creation, the time commitment required from both customers and the development team for active and continuous customer involvement, the potential for longer development cycles due to increased iterations and feedback loops, and the challenges of balancing the desire for customer co-creation with the need for efficient and timely product development.
Example	“The question of whether you have to pay customers to actively act as co-creators would also arise” (Interviewee 6).
When not to use	If the text focuses solely on other challenges or barriers to customer co-creation, such as organisational resistance or customer limitations, without explicitly addressing the resource and time constraints involved, this code cannot be used. For organisational resistance the subcode “ORGANISATIONAL_AND_CULTURAL_RESISTANCE” and for customer limitations the subcode “CUSTOMER_CAPABILITIES_AND_EXPECTATIONS” must be used.

Code	CUSTOMER_CAPABILITIES_AND_EXPECTATIONS
Level	2
Links to	CHALLENGES_AND_BARRIERS_CUSTOMER_CO_CREATION (Level 1)
Short definition	Customer capabilities and customer expectations as a challenge for implementing customer co-creation in the companies
Full definition	Text that addresses the limitations of customer insights and the challenges of relying solely on customer feedback in the new product development process.

When to use	This code is applied when the texts mention the limitations of customer insights in predicting future needs or envisioning groundbreaking solutions, the potential discrepancies between customer feedback and actual behaviour, the challenges of interpreting and prioritising customer feedback, especially when it conflicts with internal expertise or product vision, the importance of balancing customer input with the knowledge and experience of product teams, and the recognition that customers are best at identifying their problems and pain points, but may not always be able to articulate the ideal solutions
Example	"It is very important to note that a user often says something in an interview that ultimately does not match the behaviour when the product is used" (Interviewee 9).
When not to use	If the text focuses solely on the benefits of customer involvement, specific methods of gathering feedback, or the general challenges of implementing customer co-creation without addressing the specific limitations of customer capabilities and expectations in the NPD process, this code cannot be used.

Code	CULTURAL_TRANSFORMATION
Level	1 (Primary code)
Short definition	Cultural transformation based on content and journalists in the media companies
Full definition	Text that addresses the need for a cultural shift within the media industry.
When to use	This code is applied when the texts describe the need for cultural change and adaptation within the media industry, the shift towards a more customer-centric and user-focused approach, the transition from output-focused to outcome-driven thinking in editorial teams, or the challenges of overcoming traditional mindsets and hierarchies in the media industry.
Example	"But the problem is more the reputation of the media industry in the minds of job seekers, because they think it's primarily about journalism and content" (Interviewee 9).
When not to use	If the text focuses solely on the technical aspects of product development, specific user-centred design methods, or team structures without addressing the broader need for cultural transformation within the media industry, this code cannot be used.

Code	CONTENT_DRIVEN_PRODUCT_DEVELOPMENT
Level	2
Links to	CULTURAL_TRANSFORMATION (Level 1)
Short definition	Content driven product development in new product development (NPD) in the media companies
Full definition	Text that addresses the perspective that in the media industry, the development of software products is primarily driven by the content itself, rather than the technical platform.
When to use	This code is applied when the texts mention the central role of content in driving software product development in the media industry, the importance of content creation and curation as core business activities, the need to influence and shape content throughout the development process, the impact of content experience on customer engagement and churn, or the increased dependencies in the media industry due to the need to manage both technical and content aspects.
Example	"Content is therefore the core of the business in the media industry, which means that content creation helps to shape the product" (Interviewee 7).
When not to use	If the text focuses solely on the technical aspects of product development or user-centred design without explicitly mentioning the central role of content, discusses the challenges of organisational structure or governance without linking them to the content-driven nature of the media industry, or mentions the importance of customer feedback or data-driven decision-making without highlighting the specific role of content in shaping those processes, this code cannot be used.

Code	JOURNALIST_CENTRIC_CULTURE
Level	2
Links to	CULTURAL_TRANSFORMATION (Level 1)
Short definition	Journalistic centric culture in the media companies
Full definition	Text that addresses the traditional mindset within the media industry where editorial teams and journalists hold a central position
When to use	This code is applied when the texts mention, the dominant role of journalists and editorial teams in shaping content and product decisions, the prioritisation of journalistic expertise and output over audience needs and preferences, the challenges of shifting from a journalist-centric to a user-centric culture, the resistance or reluctance of editorial teams to adopt user-centred approaches, and the need for a cultural transformation within the media industry to prioritise audience engagement and satisfaction.
Example	“When it comes to editorial topics, journalists play a major role in the development of products. However, this is still problematic because journalists are more relevant than customers” (Interviewee 10)
When not to use	If the text focuses solely on the general challenges of cultural change or the need for innovation without specifically addressing the journalist-centric mindset in the media industry, this code cannot be used.

Code	FOCUS_ON_INNOVATION_AND_DISRUPTION
Level	2
Links to	CULTURAL_TRANSFORMATION (Level 1)
Short definition	Focus on innovation and disruption in the media industry
Full definition	Text that addresses the necessity of embracing innovation and disruption in the Swiss media industry to adapt to the changing landscape and ensure future survival.
When to use	This code is applied when the texts mention the necessity of disruptive innovation and thinking outside the box in the media industry, the importance of adapting to the changing landscape and evolving consumer behaviour, the risks of complacency and the need for proactive transformation, the limitations of traditional business models and the need for new revenue streams, or the importance of proactive transformation and the willingness to experiment and take risks.
Example	“The disruption readiness will be an important aspect for the future of the Swiss media industry” (Interviewee 10).
When not to use	If the text focuses solely on specific customer involvement methods, technical aspects of product development, or team structures without addressing the broader need for innovation and disruption within the media industry, this code cannot be used.

1.3.4.2 Agile Adoption

This section shows the codebook for agile adoption within the cross-company analysis of the feedback and evaluation phase in section 7.2.2.

Code	AGILE_FRAMEWORKS_AND_ADOPTION
Level	1 (Primary code)
Short definition	Agile frameworks and their adoption in the media companies
Full definition	Text that addresses the adoption and implementation of agile frameworks, specifically scrum and SAFe, in the context of new product development.
When to use	This code is applied when the texts describe the adoption or implementation of agile frameworks like scrum or SAFe, the benefits and advantages of agile methodologies, such as flexibility, iterative development, customer focus, and risk mitigation, the challenges and limitations of agile, including the gap between theory and practice, the need for adaptability, and the potential for rigidity, the integration of agile with other project management approaches, such as waterfall, in a hybrid model, or the role of specific agile practices, such as sprints, backlogs, and ceremonies.
Example	"I believe it is important in principle to work according to scrum" (Interviewee 8).
When not to use	If the text focuses solely on the technical aspects of product development or customer feedback without reference to agile principles or practices, discusses general project management principles or practices without specifically mentioning agile frameworks, or describes the roles and responsibilities within a team without evaluating the effectiveness or challenges of the agile framework being used, this code cannot be used.

Code	USE_OF_AGILE_PROCESS_FRAMEWORKS
Level	2
Links to	AGILE_FRAMEWORKS_AND_ADOPTION (Level 1)
Short definition	Use of agile process frameworks in the media companies
Full definition	Text that addresses the adoption and application of specific agile process frameworks, primarily scrum and SAFe, in the context of the Swiss media industry.
When to use	This code is applied when the texts mention the use of specific agile frameworks, such as scrum or SAFe, in the new product development process.
Example	"We are trying to move our organisation more in the direction of scrum" (Interviewee 7).
When not to use	If the text discusses general agile principles or concepts without mentioning specific frameworks or when it focuses on other aspects of the new product development process, such as customer involvement or technical considerations, without explicitly linking them to the use of agile frameworks, this code cannot be used.

Code	BENEFITS_ADVANTAGES_OF_AGILE
Level	2
Links to	AGILE_FRAMEWORKS_AND_ADOPTION (Level 1)
Short definition	Benefits and advantages of agile in the media companies
Full definition	Text that addresses the specific agile process frameworks utilised, primarily focusing on scrum, and the perceived advantages they bring to the new product development process.
When to use	This code is applied when the texts mention the use of specific agile frameworks, such as scrum, and the positive outcomes or benefits associated with their implementation.
Example	"A big advantage with Scrum is that you have a lot of flexibility to plan the sprints" (Interviewee 7).
When not to use	If the text discusses the general principles of agile development without mentioning specific frameworks or when it focuses on the challenges or limitations of agile

	methodologies, this code cannot be used. If challenges or limitations of agile methods are mentioned in the text, reference must be made to the subcode "CHALLENGES_OF_AGILE".

Code	CHALLENGES_OF_AGILE
Level	2
Links to	AGILE_FRAMEWORKS_AND_ADOPTION (Level 1)
Short definition	Challenges of agile in the media companies
Full definition	Text that addresses specific challenges and limitations associated with the implementation of agile process frameworks, particularly scrum and SAFe.
When to use	This code is applied when the texts mention the use of specific agile frameworks, such as scrum or SAFe, and discusses the challenges, limitations, or unintended consequences associated with their implementation.
Example	"The biggest disadvantage I see with scrum is, as I mentioned, the coordination" (Interviewee 7).
When not to use	If the text discusses the general benefits or advantages of agile methodologies without addressing the specific challenges of implementation, this code cannot be used. If benefits or advantages of agile methods are mentioned in the text, reference must be made to the subcode "BENEFITS_ADVANTAGES_OF_AGILE".

Code	HYBRID_DEVELOPMENT_IN_NPD
Level	2
Links to	AGILE_FRAMEWORKS_AND_ADOPTION (Level 1)
Short definition	Mix of agile and waterfall-oriented processes (hybrid) in the new product development process in the media companies
Full definition	Text that addresses the utilisation of a hybrid approach that combines elements of both waterfall and agile methodologies in the new product development process.
When to use	This code is applied when the texts mention the combination of waterfall and agile methodologies in the NPD process. The code can also be used if the text refers to the use of a business case for initial planning and approval, followed by the adoption of agile practices for subsequent development phases.
Example	"We have a hybrid system that mixes waterfall-orientated processes with agile processes. For example, you need a new app. A top-down waterfall-oriented business case is then created from this. As a lot of money is required in the business case, this must be approved by the management. From then on, the agile and customer-centred process starts, in which conceptual work is carried out" (Interviewee 7).
When not to use	If the text discusses the use of a purely waterfall or purely agile approach, this code cannot be used.

Code	IMPACT_OF_AGILE_ON_NPD
Level	2
Links to	AGILE_FRAMEWORKS_AND_ADOPTION (Level 1)
Short definition	Impact of agile on the new product development (NPD) process in the media companies
Full definition	Text that addresses the impact of agile frameworks on the NPD process.
When to use	This code is applied when the texts mention the specific effects, both positive and negative, of agile frameworks on the NPD process, the challenges of long-term planning and estimation in agile, the need for scalability and coordination in large or complex projects, the importance of clear communication and alignment between teams, and the limitations of agile in handling certain types of tasks or projects.
Example	"Scaling large new products or features and allowing a go or no-go decision cannot be done by the product owner alone, because it is often the case that not just one team and not just one product is involved and therefore the best for the customer cannot be

	permanently developed. We are too large an organisation for this and have too many dependencies between the teams" (Interviewee 6).
When not to use	If the text focuses solely on the theoretical principles or general benefits of agile without discussing its specific impact on the NPD process or discusses other project management methodologies or frameworks without comparing them to agile or describes the roles and responsibilities within an agile team without evaluating their impact on the NPD process, this code cannot be used.

1.3.4.3 Team Structure

This section shows the codebook for team structure within the cross-company analysis of the feedback and evaluation phase in section 7.2.3.

Code	SPECIALISED_IT_ROLES
Level	1 (Primary code)
Short definition	Specialised IT roles in the media companies
Full definition	Text that addresses the various specialised IT roles involved in the new product development process, such as tech leads, system architects, solution architects, and DevOps teams.
When to use	This code is applied when the texts describe specific technical roles or expertise required in the NPD process, such as tech leads, system architects, solution architects, or DevOps teams.
Example	"We have cross-functional teams and also technical roles such as the DevOps team, system architects and solution architects" (Interviewee 9).
When not to use	If the text focuses solely on the general concept of cross-functional teams or their benefits without specifying the technical roles involved, this code cannot be used.

Code	TECH_LEAD
Level	2
Links to	SPECIALISED_IT_ROLES (Level 1)
Short definition	Tech leads in the media companies
Full definition	Text that highlights the role of tech leads.
When to use	This code is applied when the texts mention the role of tech leads, their involvement in IT architecture or new product development, and any discussion about their responsibilities or the challenges they face in balancing technical and managerial tasks.
Example	"Traditionally, we don't necessarily have system architects, but tech leads who have the architecture task together" (Interviewee 8).
When not to use	If the text discusses other technical roles, such as system architects, developers, or general technical considerations without specifically mentioning the role of tech leads, this code cannot be used. The subcode "IT_ARCHITECTS" must be used for the role of the IT architect, and the subcode "DEVOPS_TEAM" for DevOps teams.

Code	IT_ARCHITECTS
Level	2
Links to	SPECIALISED_IT_ROLES (Level 1)
Short definition	IT architects in the media companies
Full definition	Text that addresses the role of IT architects or solution architects as technical experts who are crucial for making major architectural decisions and defining the technical roadmap in new product development.
When to use	This code is applied when the texts mention the role of IT architects or solution architects, their involvement in the decision-making process, their responsibilities in defining the technical roadmap and ensuring technical feasibility, and any challenges or limitations associated with their role or integration into the development process.
Example	"Specific technical roles, such as that of an architect, are relevant for us and are becoming increasingly relevant" (Interviewee 7).
When not to use	If the text discusses other technical roles or general technical considerations without specifically mentioning the role of IT architects or solution architects, this code cannot be used. The subcode "TECH_LEAD" must be used for the role of the tech lead, and the subcode "DEVOPS_TEAM" for DevOps teams.

Code	DEVOPS_TEAM
Level	2
Links to	SPECIALISED_IT_ROLES (Level 1)
Short definition	DevOps teams in the media companies
Full definition	Text that addresses the limited use of DevOps teams in the companies.
When to use	explicitly mention DevOps teams, their involvement in the new product development process or lack thereof, and their primary focus areas in the companies.
Example	"We work with DevOps teams to some extent, but more in the area of IT infrastructure. Otherwise, we don't work with DevOps teams" (Interviewee 8).
When not to use	If the text discusses other technical roles or general DevOps principles without specifically mentioning the presence or role of DevOps teams within the company's structure, this code cannot be used. The subcode "TECH_LEAD" must be used for the role of the tech lead, and the subcode "IT_ARCHITECTS" for IT architects.

Code	OUTSOURCING
Level	2
Links to	SPECIALISED_IT_ROLES (Level 1)
Short definition	Outsourcing of the technical roles in NPD
Full definition	Text that addresses the company's practice of outsourcing all technical roles involved in product development, except for those in the data area.
When to use	This code is applied when the texts mention the outsourcing of technical roles in the product development process, the reasons for outsourcing, and the perceived advantages or disadvantages of this approach.
Example	"However, all roles for the entire technical development of products are outsourced" (Interviewee 10).
When not to use	If the text discusses the roles and responsibilities of internal team members or the general challenges of staffing technical positions without explicitly mentioning the practice of outsourcing, this code cannot be used.

Code	NPD_ROLES_AND_GOVERNANCE
Level	1 (Primary code)
Short definition	Roles and responsibilities in the new product development (NPD) process
Full definition	Text that addresses the various roles and responsibilities involved in NPD process.
When to use	This code is applied when the texts describe the roles of individuals or teams involved in the new product development process, their specific responsibilities, and any discussions about the ideal division of labour or potential overlap between roles. Additionally, this code is applied to texts that discuss the governance structures and decision-making processes involved in new product development, including the roles of steering committees, advisory boards, and the considerations involved in prioritising and approving projects.
Example	"When it comes to editorial topics, journalists play a major role in the development of products. However, this is still problematic because journalists are more relevant than customers" (Interviewee 10).
When not to use	If the text focuses solely on the technical aspects of product development or customer feedback without explicitly discussing the roles and responsibilities of individuals or teams or the governance and decision-making processes involved in the product development process, this code cannot be used. For technical aspects, in other words specialised technical roles, the primary code "SPECIALISED_IT_ROLES" and all associated subcodes must be used.

Code	BASIC_ROLES_NPD_TEAM
Level	2
Links to	NPD_ROLES_AND_GOVERNANCE (Level 1)
Short definition	Basic roles in new product development (NPD) teams
Full definition	Text that addresses the fundamental roles typically involved in the NPD process.
When to use	This code is applied when the texts mention the key roles and their primary functions within the NPD team, particularly those that are consistently present across different projects or product types.
Example	“When teams are changing during the new product development process, the structure on the first level is always based on UX, IT and product management and forms the basis of a team” (Interviewee 7).
When not to use	If the text focuses on specialised or situational roles that are not consistently present in every NPD team, or to text that discusses the challenges or complexities of specific roles without highlighting their basic functions within the team., this code cannot be used. Additionally, this code cannot be used for text that primarily focuses on the broader organisational structure or governance mechanisms without directly addressing the specific roles and responsibilities within the NPD team. For specialised technical roles, the primary code “SPECIALISED_IT_ROLES” and all associated subcodes must be used. For aspects of the governance structure that mention steering committees, the subcode “STEERING_BOARD” must be used.

Code	PM_ROLES
Level	2
Links to	NPD_ROLES_AND_GOVERNANCE (Level 1)
Short definition	Roles of the product manager in new product development (NPD)
Full definition	Text that addresses the pivotal role of the product manager in leading and overseeing the NPD process.
When to use	This code is applied when the texts mention the product manager’s role and responsibilities in the NPD process, particularly their leadership in driving the project, defining the product vision and strategy, securing approvals, and advocating for user needs. It must also be used when the text discusses the product manager’s involvement in strategic planning and decision-making.
Example	“The product manager is the project lead” (Interviewee 6)
When not to use	If the text focuses on other roles within the NPD process or discusses general project management principles without specifically referencing the product manager’s responsibilities, this code cannot be used. The subcode “BASIC_ROLES_NPD_TEAM” must be used for general roles within an NPD process.

Code	SIMILAR_ROLE_OF_PM_AND_PO
Level	2
Links to	NPD_ROLES_AND_GOVERNANCE (Level 1)
Short definition	Similar roles of product managers and product owners in new product development (NPD)
Full definition	Text that addresses the observation that the roles of product owner and product manager are often blurred or even merged.
When to use	This code is applied when the texts mention the overlap or interchangeability of the product owner and product manager roles, the preference for merging these roles (especially for smaller products), the potential need to separate these roles for larger or more complex products, or the lack of clear distinction between the two roles in the company’s current practice.
Example	“In fact, we use the term Product Manager and Product Owner in the same way, which means that there is no difference here” (Interviewee 8).
When not to use	If the text focuses solely on the individual responsibilities of the product owner or product manager without discussing the potential overlap or merging of the roles,

	discusses other roles in the product development process without reference to the product owner or product manager, or describes the general challenges of defining roles and responsibilities without specifically addressing the similarity between these two roles., this code cannot be used. For specific texts that refer to the role of the product manager, the subcode “PM_ROLES” must be used. The subcode “BASIC ROLES NPD TEAM” must be used for general roles in the NPD process.

Code	STEERING_BOARD
Level	2
Links to	NPD_ROLES_AND_GOVERNANCE (Level 1)
Short definition	Use of a steering board in new product development (NPD)
Full definition	Text that addresses the role and function of steering committees in the product development governance process.
When to use	This code is applied when the texts mention the existence and function of steering committees in the product development process, the composition and roles of individuals within the steering committee, the decision-making authority and responsibilities of the steering committee, the current challenges or limitations of the steering committee structure, the plans or discussions regarding the establishment of a product advisory board, or the potential use of OKRs in setting strategic objectives and priorities.
Example	“We work with steering committees at the start of the project. The steering committee always approves all decisions and supports the entire project” (Interviewee 8).
When not to use	If the text discusses other governance bodies or decision-making processes not specifically related to the steering committee or the proposed product advisory board, this code cannot be used.

Code	RESPONSIBLE_ROLE_FOR_CUSTOMER_INTERACTION
Level	2
Links to	NPD_ROLES_AND_GOVERNANCE (Level 1)
Short definition	Responsible role for customer interaction in new product development (NPD)
Full definition	Text that addresses the ambiguity surrounding the role responsible for direct customer interaction in the new product development process.
When to use	This code is applied when the texts mention the specific role or individual responsible for interacting with customers during the NPD process, the ambiguity or lack of clarity regarding who should be responsible for customer interaction, the potential overlap between the roles of UX researcher and product manager in terms of customer engagement, or the importance of clearly defining responsibilities for customer interaction to ensure effective communication and collaboration.
Example	“Basic requirements means that people from UX research interact with customers” (Interviewee 7).
When not to use	If the text focuses solely on the general importance of customer involvement or the specific methods used for gathering customer feedback without addressing the question of which role or individual is responsible for these interactions, this code cannot be used.

Code	CROSS_FUNCTIONAL_TEAM_STRUCTURE
Level	1 (Primary code)
Short definition	Cross-functional team structure in the Swiss media companies
Full definition	Text that addresses the concept and implementation of cross-functional teams in the context of new product development (NPD).
When to use	This code is applied when the texts describe the composition and structure of cross-functional teams, including the various roles and expertise involved, discuss the advantages and disadvantages of using cross-functional teams in NPD, particularly in

	terms of innovation, agility, collaboration, and efficiency, highlight the factors influencing the decision to form a cross-functional team, such as project size, strategic importance, and the need for end-to-end ownership, or mention the importance of clear goals, autonomy, and stability within cross-functional teams.
Example	"I don't believe that a cross-functional team becomes more inefficient if you involve the customer in the new product development process" (Interviewee 9).
When not to use	If the text focuses solely on the roles and responsibilities of individual team members without addressing the broader context of the cross-functional team structure, discusses general team dynamics or collaboration without specific reference to the cross-functional nature of the team, or describes other team structures or organisational models not directly related to cross-functional teams, this code cannot be used.

Code	TEAM_PURPOSE_AND_CONTEXT
Level	2
Links to	CROSS_FUNCTIONAL_TEAM_STRUCTURE (Level 1)
Short definition	Team purpose and context in cross-functional teams in the Swiss media companies
Full definition	Text that addresses the diverse purposes and contexts in which cross-functional teams can be utilised.
When to use	This code is applied when the texts mention the specific goals or objectives of a cross-functional team, explains the context in which a cross-functional team is formed or deployed, highlights the reasons for choosing a cross-functional team structure over other team models, discusses the alignment between the team's purpose and the project's goals and requirements, or mentions the flexibility of cross-functional teams in adapting to different project types and needs.
Example	"Another goal of a cross-functional team could be to focus more on customer journeys, where the aim is to reach new target groups and ultimately find the need" (Interviewee 7).
When not to use	If the text focuses solely on the composition or roles within a cross-functional team without discussing its purpose or context, discusses the general benefits or challenges of cross-functional teams without reference to specific project goals or requirements, or describes other team structures or organisational models not directly related to cross-functional teams, this code cannot be used.

Code	TEAM_DYNAMICS
Level	2
Links to	CROSS_FUNCTIONAL_TEAM_STRUCTURE (Level 1)
Short definition	Team dynamics in cross-functional teams in the Swiss media companies
Full definition	Text that addresses the dynamics and interactions within cross-functional teams, emphasising the importance of clear communication, shared understanding, and a collaborative mindset.
When to use	This code is applied when the texts mention the importance of clear communication and shared understanding within cross-functional teams, the challenges of addressing performance issues or enforcing deadlines in close-knit teams, the benefits of team stability and the potential drawbacks of frequent team reorganisations, or the need for a collaborative and agile mindset among team members.
Example	"You need an autonomous cross-functional team that focuses on one product or feature so that you can drive the product or feature forward end-to-end. This is the only way to minimise dependencies, be agile and react quickly to changes" (Interviewee 9).
When not to use	If the text focuses solely on the composition or roles within a cross-functional team without addressing the dynamics and interactions between team members, this code cannot be used. Additionally, this code cannot be used when the text discusses general

	team dynamics or collaboration without specific reference to the unique challenges or benefits of cross-functional team dynamics.

Code	CORE_TEAMS_AND_PROJECT_MANAGER
Level	1 (Primary code)
Short definition	Core teams and the use of project managers as a part of it in the Swiss media companies
Full definition	Text that addresses the use of core teams and project managers in the context of new product development, highlighting their roles, responsibilities, and the factors influencing their involvement.
When to use	This code is applied when the texts describe the use of core teams or project managers in the new product development process, the roles and responsibilities of core teams and project managers, the factors influencing the decision to use a core team or a project manager, the potential overlap or distinction between product owner and product manager roles, or the challenges of balancing agility and structure in team setups.
Example	“At the moment we have a core team for major new product developments, which meets every 1-2 weeks and all the people involved, such as design members or technology members, say where they stand. So, at first it’s more of a synchronisation. From the time of delivery onwards, you then work more together because everyone needs each other’s work. From this point onwards, it’s more of a joint effort” (Interviewee 6).
When not to use	If the text focuses solely on the technical aspects of product development, customer feedback, or other organisational structures without explicitly discussing the use of core teams or project managers in the NPD process, this code cannot be used.

Code	USE_OF_CORE_TEAMS
Level	2
Links to	CORE_TEAMS_AND_PROJECT_MANAGER (Level 1)
Short definition	Use of core teams in the Swiss media companies
Full definition	Text that addresses the concept of core teams in the context of new product development, highlighting their characteristics, advantages, and the factors influencing their utilisation.
When to use	This code is applied when the texts mention the concept of core teams in the context of new product development, highlights the advantages of core teams, such as improved focus, reduced dependencies, and enhanced collaboration, discusses the factors influencing the decision to use a core team, such as project size, strategic importance, and development timeline, or compares and contrasts core teams with other team structures, such as lean cross-functional teams.
Example	“Another important argument for working with a core team is when the new product is strategically extremely important for the future of the company” (Interviewee 10).
When not to use	If the text focuses solely on the roles and responsibilities within a team without addressing the specific concept of a core team, discusses general team dynamics or collaboration without reference to the unique characteristics of core teams, or describes other team structures or organisational models not directly related to core teams, this code cannot be used.

Code	UNCLEAR_COORDINATING_ROLE
Level	2
Links to	CORE_TEAMS_AND_PROJECT_MANAGER (Level 1)
Short definition	Unclear coordinating role within core teams in the Swiss media companies
Full definition	Text that addresses the ambiguity and potential overlap in the coordinating roles within core teams, particularly between the product manager, the project manager and the product owner.
When to use	This code is applied when the texts mention the lack of clarity or explicit definition regarding the primary coordinating role in the NPD process, the potential overlap or sharing of coordination responsibilities between different roles such as product manager, product owner, or (technical) project lead.
Example	"In the case of an overarching project we often have project managers in addition to the product manager, who have a coordinative rather than a content-related task and therefore must chase after the people involved" (Interviewee 8)
When not to use	If the text discusses the responsibilities of each role without any ambiguity or overlap, focuses solely on the individual responsibilities of the product manager, product owner, or project manager without addressing the broader issue of coordination and leadership within the team, or discusses other aspects of team structure or dynamics without reference to the coordinating role or the potential confusion surrounding it, this code cannot be used. For explicit role descriptions for the product manager, the subcode "PM_ROLES" must be used. For explicit role descriptions for the project manager, the subcode "USE_OF_PROJECT_MANAGER" must be used.

Code	LEADERSHIP_OF_CORE_TEAM
Level	2
Links to	CORE_TEAMS_AND_PROJECT_MANAGER (Level 1)
Short definition	Leadership role in core teams in the Swiss media companies
Full definition	Text that addresses the leadership structure within cross-functional and core teams, emphasising the need for clear leadership and coordination, whether it's through a designated project manager or a combination of tech lead and business lead.
When to use	This code is applied when the texts mention the need for a superordinate person or leader within cross-functional or core teams.
Example	"This means that you would appoint a person who is responsible for putting together all the relevant functions in the project to drive the project forward" (Interviewee 10).
When not to use	If the text focuses solely on the specific tasks or responsibilities of individual team members without addressing the broader issue of leadership and coordination within the team, this code cannot be used.

Code	USE_OF_PROJECT_MANAGER
Level	2
Links to	CORE_TEAMS_AND_PROJECT_MANAGER (Level 1)
Short definition	Use of a project manager in the core teams in the Swiss media companies
Full definition	Text that addresses the role and necessity of project managers, particularly in the context of large, complex, or business-critical projects.
When to use	This code is applied when the texts mention the role of a project manager or project leader, discusses the need for project managers in specific contexts such as large, complex, or business-critical projects, highlight the responsibilities of project managers including managing timelines, ensuring deliverables, handling escalations, and coordinating team), contrast the role of a project manager with other roles such as product manager or product owner, or discuss the challenges of project management such as enforcing deadlines and addressing performance issues.
Example	"There should be fewer or no project managers for digital products in the future" (Interviewee 7).

When not to use	If the text focuses solely on the roles and responsibilities of other team members without mentioning the project manager, discusses general project management principles or practices without specifically referencing the role of a project manager, or describes agile methodologies or cross-functional teams without discussing the need for or role of a project manager in those contexts, this code cannot be used. For cross-functional teams, the primary code "CROSS_FUNCTIONAL_TEAM_STRUCTURE" and all associated subcodes are used.

1.3.4.4 Elements and Focus Areas of the NPD Process

This section shows the codebook for elements and focus areas of the NPD process within the cross-company analysis of the feedback and evaluation phase in section 7.2.4.

Code	FOCUS_ON_TECHNOLOGY
Level	1 (Primary code)
Short definition	Focus on technology in the Swiss media companies
Full definition	Text that addresses the critical role of technology in new product development (NPD).
When to use	This code is applied when the texts describe the importance of technology in the NPD process, highlight the need for early and continuous integration of technical expertise and considerations, mention the challenges of finding and retaining skilled technical talent, emphasise the role of technology in decision-making, innovation, and shaping the user experience, or address the need for technical feasibility assessments and the evaluation of technological solutions.
Example	"One thing that is relevant is that you don't come up with products that are technically impossible to realise" (Interviewee 6).
When not to use	If the text focuses solely on customer feedback or user-centred design principles without explicitly linking them to technological considerations, discusses general project management or team structures without specific reference to the role of technology in the NPD process, or mentions the use of technology without emphasising its strategic importance or the challenges associated with its integration, this code cannot be used.

Code	IMPORTANCE_OF_TECHNOLOGY_IN_NPD
Level	2
Links to	FOCUS_ON_TECHNOLOGY (Level 1)
Short definition	Importance of technology in the new product development (NPD) in the Swiss media companies
Full definition	Text that addresses the crucial role of technology in the NPD process.
When to use	This code is applied when the texts mention the significance of technology in NPD, advocates for the early involvement of technical experts, or stresses the need to consider technical feasibility and make informed technological decisions from the outset of the development process.
Example	"Technology is a central aspect of our business, because journalism would no longer exist without technology" (Interviewee 7).
When not to use	If the text discusses the broader challenges of integrating technology into the organisation or the specific roles and responsibilities of technical teams without directly emphasising the importance of technology in the NPD process itself, this code cannot be used.

Code	EARLY_INTEGRATION_AND_TECHNICAL_SUSTAINABILITY
Level	2
Links to	FOCUS_ON_TECHNOLOGY (Level 1)
Short definition	Early integration and technical sustainability in the new product development (NPD) process in the Swiss media companies
Full definition	Text that addresses the emphasis on involving technical experts early in the new product development process and considering the long-term maintainability and reusability of technology choices.
When to use	This code is applied when the texts mention the need for early integration of technical experts and considerations in the NPD process, the importance of addressing technical issues and making informed technology choices upfront, the evaluation of technical

	sustainability and reusability of solutions, or the distinction between new and existing technologies and their impact on the timing of technical involvement.
Example	“We try to integrate them into the new product development process at an early stage so that the technical issues are also given priority and we can decide whether the technology we are using today will also help us tomorrow” (Interviewee 6).
When not to use	If the text focuses solely on the general importance of technology or the specific challenges faced by developers without explicitly addressing the need for early integration or technical sustainability considerations, this code cannot be used.

Code	TECHNOLOGY_AS_ENABLER
Level	2
Links to	FOCUS_ON_TECHNOLOGY (Level 1)
Short definition	Technology as an enabler for new digital products in the Swiss media companies
Full definition	Text that addresses that technology should primarily serve as a tool or enabler to achieve specific goals or solve problems, rather than being the driving force behind product development.
When to use	This code is applied when the texts mention the view that technology is a means to an end, not the end itself, emphasise the importance of the underlying idea or concept over the specific technology used, highlight the role of technology in enabling or facilitating the implementation of solutions, or caution against developing products solely for the sake of using new or trendy technologies.
Example	“Technology after all is only an enabler, what is important however, is what the idea behind using a certain technology is. This means, that technology is only showing how to deliver an idea but not showing the answer how to get an idea” (Interviewee 10).
When not to use	If the text focuses primarily on the technical details or specifications of a particular technology, discusses the challenges or limitations of technology without addressing its role as an enabler, or advocates for technology-driven innovation where the technology itself is the primary focus, this code cannot be used.

Code	ARTIFICIAL_INTELLIGENCE
Level	2
Links to	FOCUS_ON_TECHNOLOGY (Level 1)
Short definition	The focus on artificial intelligence in the Swiss media companies
Full definition	Text that addresses the growing importance of artificial intelligence.
When to use	This code is applied when the texts mention the potential of AI, particularly generative AI, in new product development, the need for experimentation and exploration of AI capabilities, the early integration of AI in the solution-finding and development process, or the strategic importance of AI in shaping future products and services.
Example	“The question will also be how important new technologies such as AI will be ...” (Interviewee 10)
When not to use	If the text focuses solely on other technologies or general discussions about innovation without specifically mentioning AI or its potential impact on the new product development process, this code cannot be used.

Code	PROBLEMS_TECHNICAL_STAFF_FINDING
Level	2
Links to	FOCUS_ON_TECHNOLOGY (Level 1)
Short definition	Problem of finding technical staff members in the Swiss media companies
Full definition	Text that addresses the challenges faced by organisations in the Swiss media industry, in recruiting and retaining qualified technical staff for new product development.
When to use	This code is applied when the texts mention the difficulties in finding and hiring qualified technical personnel for NPD roles, the specific challenges faced by the Swiss media industry in attracting technical talent, the reasons behind the talent shortage

	such as the industry's reputation or the career paths available to technical specialists, the need to rethink traditional career paths or job structures to attract and retain technical talent, or the impact of the talent shortage on the NPD process and the company's ability to innovate.
Example	"it's very difficult to find the right IT people. When someone leaves us in the tech area, it's always a very difficult situation for us to replace the role because it's a complex role with management but also tech expertise" (Interviewee 8).
When not to use	If the text focuses solely on the general importance of technical expertise or the specific roles and responsibilities of technical staff without addressing the challenges of finding and retaining such talent, or to text that discusses the broader challenges of the NPD process or organisational structures without specifically mentioning the difficulties in staffing technical roles, this code cannot be used.

Code	WISH_BETTER_COOPERATION_BUSINESS_AND_TECH
Level	2
Links to	FOCUS_ON_TECHNOLOGY (Level 1)
Short definition	Wish for better cooperation between business and technology in the new product development (NPD) process in the Swiss media companies
Full definition	Text that addresses a desire for improved collaboration and integration between business and technical teams in the NPD process.
When to use	This code is applied when the texts mention a desire for better cooperation and collaboration between business and IT teams, highlight the current disconnect or lack of integration between these teams, emphasise the importance of involving technical experts early in the NPD process, suggest that technical teams should be seen as co-creators rather than just implementers, points out the potential negative consequences of not involving technical teams early on, such as suboptimal technical solutions.
Example	"However, this means that the technology only implements and that is not a good thing, because people in the technical area, such as the product owner, should be co-creators, just as people from the business are" (Interviewee 7).
When not to use	If the text focuses solely on the technical aspects of product development or the roles and responsibilities of technical teams without addressing the relationship or collaboration with business teams or discusses the general challenges of cross-functional collaboration without specifically mentioning the need for better cooperation between business and IT, this code cannot be used.

Code	PROTOTYPE_AND_POC_FOR_SOFTWARE_DESIGN
Level	1 (Primary code)
Short definition	Prototypes and proof of concepts for creating software designs in the media companies
Full definition	Text that addresses the use of prototypes and proof of concepts (PoCs) in software design and development.
When to use	This code is applied when the texts describe the creation and use of prototypes or proof of concepts in software design, the benefits of prototyping and PoCs for gathering user feedback, validating technical feasibility, and making informed decisions, the challenges and limitations of prototyping and PoCs, such as cost and the potential for incomplete validation, the importance of clearly defining the purpose and scope of prototypes and PoCs, or the role of prototypes and PoCs in de-risking the development process and facilitating iterative development.
Example	"I think it is very important, even if not always necessary, to work with technical prototypes, because they are a very good way of checking whether the envisaged technical solution can really work. And even if you can't use the technical prototypes in the end, that's not a problem" (Interviewee 8).
When not to use	If the text focuses solely on other aspects of the creation of software designs, without explicitly mentioning the use of prototypes or proof of concepts, this code cannot be used.

Code	USE_FOR_SOFTWARE_DESIGN
Level	2
Links to	PROTOTYPES_AND_POV_FOR_SOFTWARE_DESIGN (Level 1)
Short definition	Specific mention of using prototypes for the creation of software design in the media companies
Full definition	Text that addresses the application of prototypes in software design.
When to use	This code is applied when the texts mention the creation and use of prototypes specifically for software design or technical validation.
Example	"In principle, you can use prototypes or the rapid feedback cycle to create software designs and then adapt them without any major loss of quality" (Interviewee 7).
When not to use	If the text discusses the use of prototypes for other purposes, such as marketing or sales demonstrations, or to text that mentions prototypes without explicitly linking them to software design or technical validation, this code cannot be used.

Code	CHALLENGES_FOR_SOFTWARE_DESIGN
Level	2
Links to	PROTOTYPES_AND_POV_FOR_SOFTWARE_DESIGN (Level 1)
Short definition	Challenges for using prototypes for the creation of software designs
Full definition	Text that addresses the potential challenges and limitations associated with using prototypes in software design.
When to use	This code is applied when the texts mention the potential limitations of prototypes in fully validating technical solutions or capturing all user needs, the need for further development and refinement after initial prototype testing and feedback, the challenges of balancing user feedback with the company's vision and technical constraints, and the importance of gathering and utilising user feedback to improve software design, even if it requires significant adaptations or changes.
Example	"In other words, if you work with prototypes, you still have work to do later on because you have to integrate the new findings or scale up" (Interviewee 6).
When not to use	If the text focuses solely on the benefits of prototyping or the specific methods used to create and test prototypes without addressing the potential challenges or limitations associated with their use in software design, this code cannot be used.

Code	POC_VS_PROTOTYPE
Level	2
Links to	PROTOTYPES_AND_POV_FOR_SOFTWARE_DESIGN (Level 1)
Short definition	Difference between proof of concepts and prototypes in the media companies
Full definition	Text that distinguishes between prototypes and proof of concepts (PoCs) in the context of software development.
When to use	This code is applied when the texts differentiate between the purposes and use cases of prototypes and proof of concepts.
Example	"With a proof of concept, we then try to obtain a certain degree of certainty as to whether the envisaged technical solution will work. These are often problems in the area of costs or performance" (Interviewee 9).
When not to use	If the text discusses focuses solely on the general benefits of user feedback or testing without distinguishing between prototypes and PoCs, discusses other methods of validation or testing without comparing them to prototypes or PoCs, or mentions prototypes or PoCs without explicitly differentiating their purposes or use cases, this code cannot be used.

Code	CONTROL_GATES_IN_NPD_PROCESS
Level	1 (Primary code)
Short definition	Use of control gates in the new product development (NPD) process in the media companies
Full definition	Text that addresses the use and importance of control gates or checkpoints in the NPD process
When to use	This code is applied when the texts mention the use of control gates, checkpoints, or stage-gate processes in NPD.
Example	"We don't call it gates for large new product development projects, but it is clear that you need control points in a new product development process" (Interviewee 8)
When not to use	If the text focuses solely on the technical aspects of product development, customer feedback, or team structures without explicitly discussing the use of control gates or checkpoints in the NPD process, this code cannot be used.

Code	NO_SYSTEMATICALLY_USE
Level	2
Links to	CONTROL_GATES_IN_NPD_PROCESS (Level 1)
Short definition	No systematic use of control gates in the new product development (NPD) process the media companies
Full definition	Text that addresses the inconsistent and ad-hoc application of control gates or stage-gate processes in the NPD process.
When to use	This code is applied when the texts mention the absence of a systematic or standardised approach to using control gates or stage-gate processes in the NPD process, the recognition that quality checks and testing are not being conducted sufficiently, the desire for a more rigorous and consistent approach to quality assurance and testing before product launch, or the acknowledgment that the current process lacks clear control points or decision-making stages.
Example	"So, I think quality check is totally fine, but I think that we are not doing it enough. In future, I would refuse to launch the product without having sufficiently tested, and that also means without having had some cross check along the way" (Interviewee 10).
When not to use	If the text discusses the specific benefits or purposes of control gates or stage-gate processes without addressing their inconsistent application, focuses on the challenges of implementing specific quality control measures or testing methods without referencing the broader lack of a systematic approach, or describes the roles and responsibilities of individuals or teams involved in quality control without commenting on the overall consistency or effectiveness of the process, this code cannot be used.

Code	ONLY_SITUATIONALLY_USE
Level	2
Links to	CONTROL_GATES_IN_NPD_PROCESS (Level 1)
Short definition	Only situationally use of control gates in the media companies
Full definition	Text that addresses the use of control gates or checkpoints in the new product development process is not always standardised or consistently applied.
When to use	This code is applied when the texts mention that the use of control gates or checkpoints is dependent on the specific context or situation, the decision to implement control gates is influenced by factors such as project size, complexity, and the involvement of external partners, there is no standardised or one-size-fits-all approach to using control gates in the NPD process, the need to balance the use of control gates with the desire for agility and speed in development, or the importance of carefully considering who should be involved in quality control meetings to ensure their effectiveness.
Example	"For example, there is a gate between the discovery and delivery phase or gates that are based on customer feedback and change the scope, which means that more budget may have to be requested from the management" (Interviewee 7).

When not to use	If the text advocates for a strict and standardised implementation of control gates in all projects, focuses solely on the benefits or purposes of control gates without acknowledging the need for flexibility or situational adaptation, or discusses the challenges of quality control or testing without referencing the use of control gates or checkpoints, this code cannot be used.

Code	IMPLEMENTATION_AND_USE_OF_OVERARCHING_FRAMEWORKS
Level	1 (Primary code)
Short definition	Implementation and use of overarching frameworks for the new product development (NPD) process in the media companies
Full definition	Text that addresses the importance of utilising overarching frameworks or models, such as Application Lifecycle Management, in the NPD process.
When to use	This code is applied when the texts describe the presence or absence of an overarching framework or model in the NPD process, the benefits of using such frameworks, such as improved organisation, visibility, and decision-making, the challenges of implementing and adhering to frameworks, including the need for flexibility and adaptation, the importance of considering the entire product lifecycle, from conception to retirement, or the role of frameworks in managing complexity and identifying areas for improvement.
Example	"Most companies that develop software already have an implicit or explicit process in place. We also have a certain implicit process that we follow, but it is not based on a lifecycle model that takes a very overarching approach to new product development and also shows where a product reaches the end of its lifecycle" (Interviewee 9).
When not to use	If the text focuses solely on specific agile methodologies, team structures, or customer involvement without explicitly discussing the broader context of overarching frameworks or models in the NPD process, this code cannot be used.

Code	REASONS_FOR_USING
Level	2
Links to	IMPLEMENTATION_AND_USE_OF_OVERARCHING_FRAMEWORKS (Level 1)
Short definition	Reasons why to use an overarching framework for the new product development (NPD) process in the media companies
Full definition	Text that addresses the various reasons and motivations behind using overarching frameworks or models in the NPD process.
When to use	This code is applied when the texts mention the reasons for adopting or considering an overarching framework in NPD.
Example	"In theory it would help us to have a framework based on project management for our new product development process so that we are not getting lost and having a proper structure" (Interviewee 10).
When not to use	If the text focuses solely on the challenges or limitations of using frameworks without mentioning the reasons for their adoption, discusses specific agile methodologies or other project management approaches without explicitly linking them to the concept of an overarching framework, or describes the roles and responsibilities within a team or the technical aspects of product development without reference to the use of frameworks, this code cannot be used. For texts dealing with challenges or limitations regarding overarching frameworks, the subcode "CHALLENGES_OF_USE" is used.

Code	FOCUS_AREAS
Level	2
Links to	IMPLEMENTATION_AND_USE_OF_OVERARCHING_FRAMEWORKS (Level 1)
Short definition	Focus areas of an overarching framework in the new product development (NPD) process in the media companies
Full definition	Text that highlights the specific areas within the NPD process that an overarching framework or model should address.
When to use	This code is applied when the texts mention the specific aspects of the NPD process that an overarching framework or model should cover.
Example	“With an overarching model, we would be able to keep an eye on everything relating to operation” (Interviewee 6).
When not to use	If the text discusses focuses solely on the general challenges of using frameworks without mentioning specific areas of focus within the NPD process, discusses specific agile methodologies or other project management approaches without explicitly linking them to the concept of an overarching framework, or describes the roles and responsibilities within a team or the technical aspects of product development without reference to the specific areas that a framework should address, this code cannot be used. For texts dealing with challenges or limitations regarding overarching frameworks, the subcode “CHALLENGES_OF_USE” is used.

Code	CHALLENGES_OF_USE
Level	2
Links to	IMPLEMENTATION_AND_USE_OF_OVERARCHING_FRAMEWORKS (Level 1)
Short definition	Challenges for using an overarching framework in the new product development (NPD) process in the media companies
Full definition	Text that addresses the challenges and potential drawbacks associated with implementing and using overarching frameworks or models in the NPD process.
When to use	This code is applied when the texts mention the challenges of getting all employees or departments to work according to the same model or framework, the discrepancies and inconsistencies between different process models or approaches used within the organisation, the difficulties in applying theoretical models directly to real-world product development scenarios, the need for flexibility and adaptability in the use of frameworks to accommodate different project needs and organisational contexts, or the potential negative consequences of rigidly adhering to frameworks, such as stifling creativity and hindering innovation.
Example	“The biggest challenge here would be for all employees to work according to the same model” (Interviewee 7).
When not to use	If the text focuses solely on the benefits or advantages of using overarching frameworks without acknowledging the potential challenges or limitations, discusses the specific steps or stages within a framework without addressing the broader issues of implementation and adaptation, or mentions the roles and responsibilities of individuals or teams without explicitly linking them to the challenges of using frameworks, this code cannot be used.

Code	RAPID_FEEDBACK_CYCLES_AND_MVP
Level	1 (Primary code)
Short definition	Use of rapid feedback cycles and a most viable product (MVP) in the new product development (NPD) process of the media companies
Full definition	Text that addresses the use of rapid feedback cycles and MVPs in the NPD process to gather user insights, validate assumptions, and iterate on product features.
When to use	This code is applied when the texts describe the use of rapid feedback cycles and MVPs in the NPD process, the benefits of gathering early and continuous user feedback, the importance of iterating on product features based on user insights, the challenges of

	balancing speed and quality in the development process, or the use of beta testing and other methods to gather user feedback before launch.
Example	“It is important to have identified the biggest risks and the biggest assumptions of the idea to be developed and to have them validated as quickly as possible. This allows you to determine whether you want to continue with the process or not” (Interviewee 9).
When not to use	If the text focuses solely on the technical aspects of product development, team structures, or project management methodologies without explicitly mentioning the use of rapid feedback cycles or MVPs, this code cannot be used.

Code	USE_AND_WISH_OF_USING_RAPID_FEEDBACK_CYCLES
Level	2
Links to	RAPID_FEEDBACK_CYCLES_AND_MVP (Level 1)
Short definition	Use of rapid feedback cycles and wish of using rapid feedback cycles more in the new product development (NPD) process of the media companies
Full definition	Text that addresses a desire to adopt a more iterative approach in future product development, emphasising the use of rapid feedback cycles and prototyping to validate assumptions, gather user insights, and make quick adjustments throughout the NPD process.
When to use	This code is applied when the texts mention the intention or desire to implement rapid feedback cycles and prototyping in the NPD process, the benefits of these approaches, such as faster development, increased flexibility, and improved user-centricity, the use of iterative processes to validate assumptions and make data-driven decisions, or the importance of gathering and incorporating user feedback throughout the development lifecycle.
Example	“Personally, I would work much more with rapid approaches such as prototyping or the build-measure-learn cycle. Also to get features live quickly” (Interviewee 6).
When not to use	If the text focuses solely on other aspects of agile development or customer involvement without explicitly mentioning rapid feedback cycles or prototyping, discusses the challenges or limitations of iterative development or user feedback without highlighting the desire to implement these approaches, or mentions the use of prototypes or feedback loops without emphasising their role in facilitating rapid iteration and adaptation, this code cannot be used.

Code	CHALLENGES_USING_RAPID_FEEDBACK_CYCLES
Level	2
Links to	RAPID_FEEDBACK_CYCLES_AND_MVP (Level 1)
Short definition	Challenges of using rapid feedback cycles in the new product development (NPD) process of the media companies
Full definition	Text that addresses challenges and concerns related to the implementation of rapid feedback cycles and agile practices.
When to use	This code is applied when the texts mention concerns or challenges related to the implementation of rapid feedback cycles, such as the fear of reputational damage from releasing early-stage prototypes, or the tendency to prioritise rigid planning over iterative development and feedback-driven adjustments.
Example	“In our company, however, there is a direct fear of reputational damage with rapid prototyping” (Interviewee 6).
When not to use	If the text focuses solely on the benefits of rapid feedback cycles without acknowledging the potential challenges or limitations, this code cannot be used. Furthermore, this code cannot be used when the text discusses general challenges in product development or project management without specifically referencing the difficulties associated with implementing rapid feedback cycles.

Code	CHALLENGES_AND_LIMITATIONS_MVP
Level	2
Links to	RAPID_FEEDBACK_CYCLES_AND_MVP (Level 1)
Short definition	Challenges and limitations of a most viable product (MVP) in the new product development (NPD) process in the media companies
Full definition	Text that addresses the limitations and considerations associated with using a MVP approach, particularly for business-critical functions or products where downtime is not acceptable.
When to use	This code is applied when the texts mention the limitations or challenges of using an MVP approach, especially for business-critical products or features, the need for thorough testing and quality assurance, even with an MVP; the use of beta versions as a way to gather user feedback and identify potential issues before launch, the potential conflict between the desire for rapid iteration and the need for comprehensive testing, or the impact of customer co-creation on the necessity of an MVP.
Example	"An MVP is great if it is not exclusively about business-critical functions. If it is purely business-critical functions, then something has to be fully developed" (Interviewee 8).
When not to use	If the text focuses solely on the benefits of MVPs or the general principles of agile development without addressing the potential challenges or limitations associated with their use, this code cannot be used.

1.4 Declaration of Consent of Interviewees

This section shows the declaration of consent of all interviewees.

1.4.1 First Interview Phase

This section shows the declaration of consent of the interviewees of the first interview phase.



Declaration of consent

Thank you for participating in the interview, which is designed to support scientific research. It is not anticipated that there are any risks associated with your participation, but you have the right to stop the interview or withdraw from the research at any time.

This consent form is necessary to ensure that the purpose of your participation is understood and that you agree to be interviewed. Listed below are some of the points to which you will be asked to sign as consent:

1.	I understand that taking part in this project is voluntary and that I am free to withdraw at any time without giving any reason and that this will not affect my medical care or legal rights in any way. Nor will I be questioned on why I have withdrawn.
2.	I understand that my name and any other data that may identify me, will be removed from interview notes and surveys and that I will be known only by a number.
3.	I understand that information from interviews and surveys may be used as extracts in publications but that all data will be made anonymous (that is your name and any information that may identify you will be removed)
4.	I understand that all of my information will be stored securely and in agreement with the Data Protection Act 1998 (2018) and the General Data Protection Regulation 2018.
5.	I understand that my personal, identifiable data will NOT be shared with anyone outside of University of Gloucestershire unless we receive information that leads us to believe that your safety or the safety of others may be at risk.
6.	I voluntarily agree to take part in one interview/focus group.
7.	I agree to have the interview/focus group recorded. Access to the interview transcript or recordings will be limited to Eric Le Cunff and academic colleagues and researchers with whom he might collaborate as part of the research process.

Participants Name

[Redacted]

05.01.2023

Participants Signature

[Redacted]

Date

05.01.2023

Researcher Signature

Date

Contact Information of the researcher

Eric Le Cunff

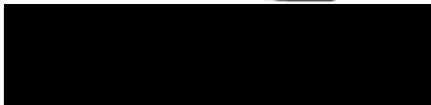
Declaration of consent

Thank you for participating in the interview, which is designed to support scientific research. It is not anticipated that there are any risks associated with your participation, but you have the right to stop the interview or withdraw from the research at any time.

This consent form is necessary to ensure that the purpose of your participation is understood and that you agree to be interviewed. Listed below are some of the points to which you will be asked to sign as consent:

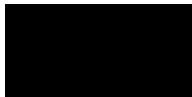
1.	I understand that taking part in this project is voluntary and that I am free to withdraw at any time without giving any reason and that this will not affect my medical care or legal rights in any way. Nor will I be questioned on why I have withdrawn.
2.	I understand that my name and any other data that may identify me, will be removed from interview notes and surveys and that I will be known only by a number.
3.	I understand that information from interviews and surveys may be used as extracts in publications but that all data will be made anonymous (that is your name and any information that may identify you will be removed)
4.	I understand that all of my information will be stored securely and in agreement with the Data Protection Act 1998 (2018) and the General Data Protection Regulation 2018.
5.	I understand that my personal, identifiable data will NOT be shared with anyone outside of University of Gloucestershire unless we receive information that leads us to believe that your safety or the safety of others may be at risk.
6.	I voluntarily agree to take part in one interview/focus group.
7.	I agree to have the interview/focus group recorded. Access to the interview transcript or recordings will be limited to Eric Le Cunff and academic colleagues and researchers with whom he might collaborate as part of the research process.

Participants Name



10.01.2023

Participants Signature



Date

10.01.2023

Researcher Signature

Date

Contact Information of the researcher

Eric Le Cunff

Declaration of consent

Thank you for participating in the interview, which is designed to support scientific research. It is not anticipated that there are any risks associated with your participation, but you have the right to stop the interview or withdraw from the research at any time.

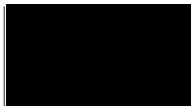
This consent form is necessary to ensure that the purpose of your participation is understood and that you agree to be interviewed. Listed below are some of the points to which you will be asked to sign as consent:

1.	I understand that taking part in this project is voluntary and that I am free to withdraw at any time without giving any reason and that this will not affect my medical care or legal rights in any way. Nor will I be questioned on why I have withdrawn.
2.	I understand that my name and any other data that may identify me, will be removed from interview notes and surveys and that I will be known only by a number.
3.	I understand that information from interviews and surveys may be used as extracts in publications but that all data will be made anonymous (that is your name and any information that may identify you will be removed)
4.	I understand that all of my information will be stored securely and in agreement with the Data Protection Act 1998 (2018) and the General Data Protection Regulation 2018.
5.	I understand that my personal, identifiable data will NOT be shared with anyone outside of University of Gloucestershire unless we receive information that leads us to believe that your safety or the safety of others may be at risk.
6.	I voluntarily agree to take part in one interview/focus group.
7.	I agree to have the interview/focus group recorded. Access to the interview transcript or recordings will be limited to Eric Le Cunff and academic colleagues and researchers with whom he might collaborate as part of the research process.

Participants Name: 

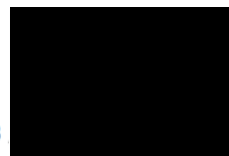
09.01.2023

Participants Signature



Date

09.01.2023



Researcher Signature

Date

Contact Information of the researcher

Eric Le Cunff

1.4.2 Second Interview Phase

This section shows the declaration of consent of the interviewees of the second interview phase.



Declaration of consent

Thank you for participating in the interview, which is designed to support scientific research. It is not anticipated that there are any risks associated with your participation, but you have the right to stop the interview or withdraw from the research at any time.

This consent form is necessary to ensure that the purpose of your participation is understood and that you agree to be interviewed. Listed below are some of the points to which you will be asked to sign as consent:

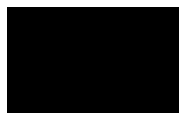
1.	I understand that taking part in this project is voluntary and that I am free to withdraw at any time without giving any reason and that this will not affect my medical care or legal rights in any way. Nor will I be questioned on why I have withdrawn.
2.	I understand that my name and any other data that may identify me, will be removed from interview notes and surveys and that I will be known only by a number.
3.	I understand that information from interviews and surveys may be used as extracts in publications but that all data will be made anonymous (that is your name and any information that may identify you will be removed)
4.	I understand that all of my information will be stored securely and in agreement with the Data Protection Act 1998 (2018) and the General Data Protection Regulation 2018.
5.	I understand that my personal, identifiable data will NOT be shared with anyone outside of University of Gloucestershire unless we receive information that leads us to believe that your safety or the safety of others may be at risk.
6.	I voluntarily agree to take part in one interview/focus group.
7.	I agree to have the interview/focus group recorded. Access to the interview transcript or recordings will be limited to Eric Le Cunff and academic colleagues and researchers with whom he might collaborate as part of the research process.

Participants name : 



15.01.2024

Participants Signature



Date

15.01.2024

Researcher Signature

Date

Contact Information of the researcher

Eric Le Cunff

Declaration of consent

Thank you for participating in the interview, which is designed to support scientific research. It is not anticipated that there are any risks associated with your participation, but you have the right to stop the interview or withdraw from the research at any time.

This consent form is necessary to ensure that the purpose of your participation is understood and that you agree to be interviewed. Listed below are some of the points to which you will be asked to sign as consent:

1.	I understand that taking part in this project is voluntary and that I am free to withdraw at any time without giving any reason and that this will not affect my medical care or legal rights in any way. Nor will I be questioned on why I have withdrawn.
2.	I understand that my name and any other data that may identify me, will be removed from interview notes and surveys and that I will be known only by a number.
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4.	I understand that all of my information will be stored securely and in agreement with the Data Protection Act 1998 (2018) and the General Data Protection Regulation 2018.
5.	I understand that my personal, identifiable data will NOT be shared with anyone outside of University of Gloucestershire unless we receive information that leads us to believe that your safety or the safety of others may be at risk.
6.	I voluntarily agree to take part in one interview/focus group.
7.	I agree to have the interview/focus group recorded. Access to the interview transcript or recordings will be limited to Eric Le Cunff and academic colleagues and researchers with whom he might collaborate as part of the research process.

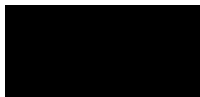
Participants name : 



Participants Signature

26.01.2024

Date



05.01.2024

Date

Researcher Signature

Contact Information of the researcher

Eric Le Cunff

1.4.3 Third Interview Phase

This section shows the declaration of consent of the interviewees of the third interview phase.



Declaration of consent

Thank you for participating in the interview, which is designed to support scientific research. It is not anticipated that there are any risks associated with your participation, but you have the right to stop the interview or withdraw from the research at any time.

This consent form is necessary to ensure that the purpose of your participation is understood and that you agree to be interviewed. Listed below are some of the points to which you will be asked to sign as consent:

1.	I understand that taking part in this project is voluntary and that I am free to withdraw at any time without giving any reason and that this will not affect my medical care or legal rights in any way. Nor will I be questioned on why I have withdrawn.
2.	I understand that my name and any other data that may identify me, will be removed from interview notes and surveys and that I will be known only by a number.
3.	I understand that information from interviews and surveys may be used as extracts in publications but that all data will be made anonymous (that is your name and any information that may identify you will be removed)
4.	I understand that all of my information will be stored securely and in agreement with the Data Protection Act 1998 (2018) and the General Data Protection Regulation 2018.
5.	I understand that my personal, identifiable data will NOT be shared with anyone outside of University of Gloucestershire unless we receive information that leads us to believe that your safety or the safety of others may be at risk.
6.	I voluntarily agree to take part in one interview/focus group.
7.	I agree to have the interview/focus group recorded. Access to the interview transcript or recordings will be limited to Eric Le Cunff and academic colleagues and researchers with whom he might collaborate as part of the research process.

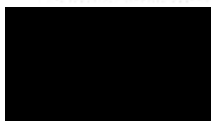
Participants Name: 



Participants Signature

21.4.2024

Date



Researcher Signature

16.04.2024

Date

Contact Information of the researcher

Eric Le Cunff

Declaration of consent

Thank you for participating in the interview, which is designed to support scientific research. It is not anticipated that there are any risks associated with your participation, but you have the right to stop the interview or withdraw from the research at any time.

This consent form is necessary to ensure that the purpose of your participation is understood and that you agree to be interviewed. Listed below are some of the points to which you will be asked to sign as consent:

1.	I understand that taking part in this project is voluntary and that I am free to withdraw at any time without giving any reason and that this will not affect my medical care or legal rights in any way. Nor will I be questioned on why I have withdrawn.
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6.	I voluntarily agree to take part in one interview/focus group.
7.	I agree to have the interview/focus group recorded. Access to the interview transcript or recordings will be limited to Eric Le Cunff and academic colleagues and researchers with whom he might collaborate as part of the research process.

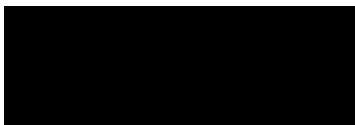
Participants name: 



02.05.2024

Participants Signature

Date



16.04.2024

Researcher Signature

Date

Contact Information of the researcher

Eric Le Cunff

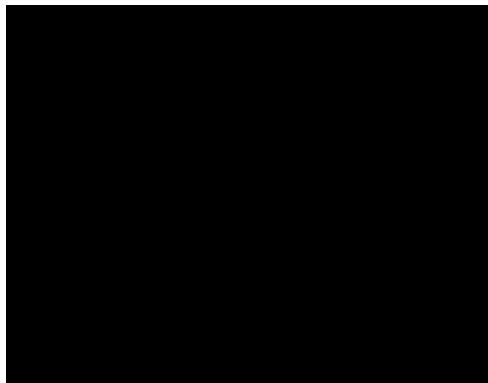
Declaration of consent

Thank you for participating in the interview, which is designed to support scientific research. It is not anticipated that there are any risks associated with your participation, but you have the right to stop the interview or withdraw from the research at any time.

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4.	I understand that all of my information will be stored securely and in agreement with the Data Protection Act 1998 (2018) and the General Data Protection Regulation 2018.
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6.	I voluntarily agree to take part in one interview/focus group.
7.	I agree to have the interview/focus group recorded. Access to the interview transcript or recordings will be limited to Eric Le Cunff and academic colleagues and researchers with whom he might collaborate as part of the research process.

Participants Name: 



23. April 2024

Date

16.04.2024

Date

Contact Information of the researcher

Eric Le Cunff

Declaration of consent

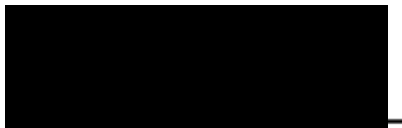
Thank you for participating in the interview, which is designed to support scientific research. It is not anticipated that there are any risks associated with your participation, but you have the right to stop the interview or withdraw from the research at any time.

This consent form is necessary to ensure that the purpose of your participation is understood and that you agree to be interviewed. Listed below are some of the points to which you will be asked to sign as consent:

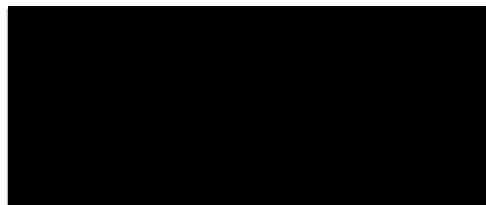
1.	I understand that taking part in this project is voluntary and that I am free to withdraw at any time without giving any reason and that this will not affect my medical care or legal rights in any way. Nor will I be questioned on why I have withdrawn.
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6.	I voluntarily agree to take part in one interview/focus group.
7.	I agree to have the interview/focus group recorded. Access to the interview transcript or recordings will be limited to Eric Le Cunff and academic colleagues and researchers with whom he might collaborate as part of the research process.

Participants Name: 

Participants Signature



Researcher Signature



Date

Contact Information of the researcher

Eric Le Cunff

Declaration of consent

Thank you for participating in the interview, which is designed to support scientific research. It is not anticipated that there are any risks associated with your participation, but you have the right to stop the interview or withdraw from the research at any time.

This consent form is necessary to ensure that the purpose of your participation is understood and that you agree to be interviewed. Listed below are some of the points to which you will be asked to sign as consent:

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5.	I understand that my personal, identifiable data will NOT be shared with anyone outside of University of Gloucestershire unless we receive information that leads us to believe that your safety or the safety of others may be at risk.
6.	I voluntarily agree to take part in one interview/focus group.
7.	I agree to have the interview/focus group recorded. Access to the interview transcript or recordings will be limited to Eric Le Cunff and academic colleagues and researchers with whom he might collaborate as part of the research process.

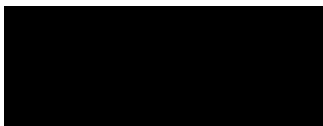
Participants name: 



Participants Signature

10/05/2024

Date



Researcher Signature

16.04.2024

Date

Contact Information of the researcher

Eric Le Cunff