A New Model for the Development and Implementation of Information Systems Strategy in Multi-national Group Companies

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ABSTRACT

This thesis explores how Information Systems (IS) strategy is developed and implemented in multi-subsidiary international Groups. The research objectives focus on the processes, mechanisms, and impacts of how IS strategy is developed and implemented in international Group companies comprising several subsidiaries. In addition, it puts forward a framework for the operational execution of IS strategy development and implementation in this context.

The research design is based on an inductive, qualitative, narrative research approach. The thesis assesses learnings from a literature review and 18 individual interviews of experts working in this research field. It discusses future challenges for those six multi-national enterprises where the experts are currently employed. Key issues distilled from the literature to develop the semi-structured questionnaire for the experts are identified and discussed, which provide data for constructing the framework for IS development and implementation.

The thesis concludes that the advent and uptake of new technologies in recent years has significantly impacted IS strategy within multi-national organizations. Furthermore, based on a pragmatic perspective, both IS development and implementation appear to be managerial solutions that large enterprises desire to implement to get the most alignment between the business processes and the IS. Hence, this thesis focuses on contributing to this challenge by putting forward a realistic framework for IS development and implementation.

The findings thus provide material for constructing a new framework for IS development and implementation. The framework consists of *change dimensions* and *process phases*. Six dimensions are identified that drive or impact the IS strategy – **C**ost & Benefits – **O**rganization & Processes – Human **C**apital – **P**roject & Services – **I**ntegration - **T**echnology, for which the acronym COCPIT is used. The definition of Integration encompasses the concepts of Business Alignment and Governance. Technology defines how the IT infrastructure is set up and covers the make or buy decision, such as using standard or custom applications. Developing and implementing an IS strategy is structured around five core process phases – **R**eview – **A**lign – **E**ngage – **E**xecute – **C**ontrol, for which the acronym RAEEC is used. The final framework is based on the interaction of these two concepts - the COCPIT dimensions and the RAEEC process phases. The framework adds to

existing IS development and IS implementation frameworks and is unique in combining IS development and implementation for multi-national enterprises.

AUTHOR'S 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 reference in the text. No part of the thesis has been submitted as part of any other academic award. The thesis has not been presented to any other education institution in the United Kingdom or overseas.

Any views expressed in the thesis are those of the author and in no way represent those of the University.

Signed …….. Date 30.11.21……

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ABBREVIATIONS

BSC	Balanced Scorecard
DP	Data Processing
ERP	Enterprise Resource Planning
GDPR	General Data Protection Regulation
IaaS	Infrastructure as a Service
IM	Information Management
IS	Information System or Information Systems
ISD	Information System Development
ISS	Information Systems Strategy
ISSP	Information System Strategic Planning
IT	Information Technology
ITIL	Information Technology Infrastructure Library
MIS	Management Information System
MNEs	Multi-National Enterprises
PaaS	Platform as a Service
PMO	Project Management Office
SAM	Strategic Alignment Model
SaP	Strategy-as-Practice
SaaS	Software as a Service
SISP	Strategic Information System Planning
SME	Small Medium Enterprise

1 INTRODUCTION AND OVERVIEW

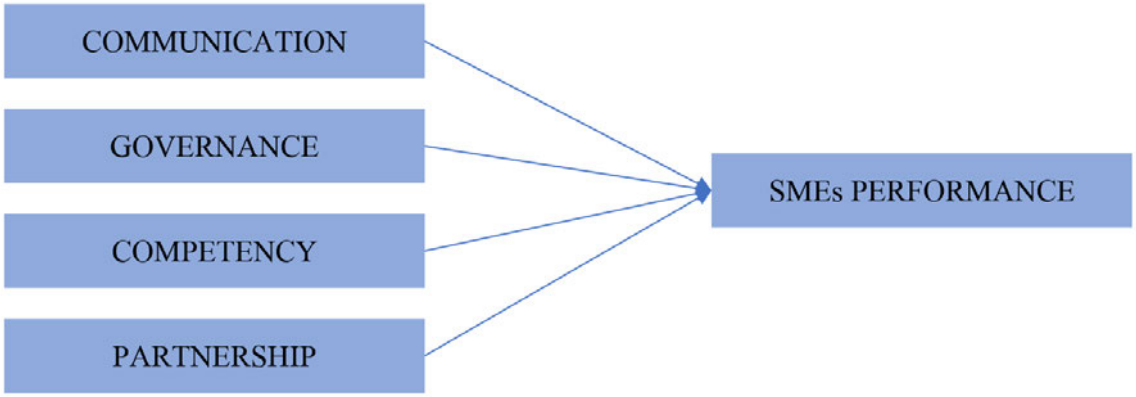
1.1 Introduction

This chapter provides the background to IS strategy development and implementation in multi-national Group companies. In the following section 1.2, the context and aim of the research are set out, and in section1.3, the research questions and objectives are introduced. Then, in section 1.4, the research methodology is briefly explained, and the research process is outlined. In section 1.5, the thesis structure is presented, and section 1.6 provides a summary of the chapter.

1.2 Contextualisation of this research

Information Technology (IT), Information Systems (IS) and Information Management (IM) strategies are important enablers of the transformation from industrial society towards a knowledge society (Marabelli & Galliers, 2017). This transformation influences most aspects of our lives. Many studies (Bartlett et al., 2013; Beer et al., 2005; Beynon-Davies, 2009b; Denford & Chan, 2009) have shown that misalignment, or lack of alignment, between IT, IS and IM strategies and overall business strategy is one of the main reasons why enterprises fail to exploit the full potential of their investment in information technology and systems. The problem is particularly complex when a company operates in an international context and has a multi-subsidiary business model (Fay et al., 2012; Mohdzain & Ward, 2007). Organizations that have accomplished a high degree of alignment are often associated with better business efficiency and performance (Slim et al., 2021). In the context of SMEs, Slim et al. (2021) tested four core alignment factors to find interactions between these factors. If properly aligned, these factors will impact the performance of an SME. The following figure shows their model of IT business alignment factors.

Figure 1: Model of IT business alignment factors (Slim et al., 2021)



The alignment of overall business strategy and IS strategy has consistently been one of the top concerns of the company Chief Information Officer (CIO) (Kuruppu, 2012). In the early 90s, Henderson and Venkatraman (1993) proposed a strategic alignment model (SAM), which is considered one of the most widespread and accepted models among the alignment community. Even in the early 80s some academics were writing about IS strategy and business alignment. Today many academic papers, journals, books and business cases exist on this topic (Beynon-Davies, 2009b, 2013; Chan & Reich, 2007; Fay et al., 2012; Kuruppu, 2012; Wahyuni, 2012), but individual studies on how IS strategy is developed and implemented in a multi- subsidiary international Group are rare indeed; and to the researchers' knowledge, there is no specific conceptual model or framework of how this can be achieved in an international company.

The IS strategy's primary concern is the aligning of IS development (Burn & Szeto, 2000; E. Chan & Reich, 2007) with business needs as described by Earl (1989). Wyatt-Haines (2007) views IS strategy today as evident everywhere in a business by the way people, systems and processes are operating in alignment with the organizational goals. Such significant changes in the current era are based on technology, and the question of what benefits people can derive from this is a matter of concern to business leaders everywhere. The fact that the most critical essential technologies differ considerably from each other does not make the task any easier. For example, cloud solutions (Weber, 2022), Internet of Things (IoT), artificial intelligence, augmented reality – each of these technologies are used in different fields of application and have other impacts on multiple industries. This leads to more complexity in companies, which may lead to inappropriate and expensive strategies, and increased risk of failure. Formulating an IS strategy is a fundamental

approach to integrate, coordinate, and prioritize the implementation of information systems.

The research will develop a conceptual framework that will consider some of the existing theories regarding IS strategy. According to Earl (1989), there are three ways of approaching IS strategy development and alignment: “Top-Down”, “Bottom-Up” and “Inside-Out”, and Wynn’s studies of SMEs (2009) showed that most companies use elements of all three approaches at different stages in their growth cycle. Galliers (2003) built on Earl’s earlier work to include “change management strategy” as a significant new aspect that encompasses process change as new systems are implemented. The Strategic Alignment Model (SAM) of Henderson and Venkatraman (1993) is also of relevance. It depicts four planning domains: Business Strategy, Organizational Infrastructure and Processes, IT/IS Strategy and IT Infrastructure and Processes. It combines the traditional notion of functional integration with the concept of strategic fit (Silva et al., 2006), and allows these different strategies to both respond to and shape each other. This research develops a new framework for multi-national Group companies which builds upon these existing concepts.

1.3 Research motivation aim, questions, and objectives

There is a dearth of information in the existing literature on how IS strategy is developed and implemented in multi-subsidiary international Groups, and how it can be aligned with overall business strategy to add value to the business as a whole. The development, implementation, and alignment of an IS strategy is at the core of this research study and is the researcher's motivation, having worked as an IT professional in multi-national industries over the past 25 years. This research will focus on how IS strategy is developed and implemented in international Group companies comprising several subsidiaries. It puts forward a framework for the operational execution of IS strategy in this context. Different frameworks exist in many areas to implement strategy and are common today, but no fully comprehensive framework addresses IS strategy in multi-subsidiary international Group companies. Therefore, the aim is to research how IS strategy is developed and implemented in multi-subsidiary international Group companies and develop a conceptual model of how this can best be achieved. The research aims to answer the following research questions (RQs):

RQ1 How is IS strategy developed in large international Group companies and how are the key decisions made?

RQ2 How is IS strategy implemented in large Group companies and what are the key human drivers, process mechanisms, and impacts that can ensure successful strategy implementation?

RQ3 What new framework can be developed for the implementation of IS strategy in an international Group company?

The research questions are an answerable inquiry into a specific concern or issue identified by the researcher's aim and motivation. It was the initial step in this research project.

After identifying the research questions, research objectives were defined based on the questions to indicate the intended achievements from this research. Therefore, the research objectives provided directions to the design of this research project.

Based on these RQs, the following objectives are to be addressed:

RO1 To systematically review all existing literature on IS strategy development and implementation in large multi-national Group companies to establish what case examples and conceptual models and frameworks exist.

RO2 To establish the existing processes, mechanisms, and impacts for IS strategy development and implementation in large multi-national Group companies.

RO3 To propose and develop a new framework for IS strategy development and implementation in multi-national corporations.

The research objectives are a statement of intent. That is what the researcher intends to achieve (desired outcomes) at the end of the study. These are derived from the research topic and the research questions. Therefore, some degree of consistency in content was expected. Hence, this research aimed to answer not a specific question or hypothesis, but rather the focus was on the desired outcome. This research addressed the objectives rather the questions, and thus the research questions are not further considered in the study.

To provide an insight into the overall research process derived from the research objectives, the following section provides a brief overview of the methodology used in this research.

1.4 Overview of methodology

The adopted research philosophy reflects certain assumptions held by the researcher. These assumptions where the basis for research strategy and development of the relationship between knowledge and data collection processes in this research. This research adopts an interpretivist stance, rather than a positivist or realist position, as the aim is to develop a model for IS strategy implementation for multinational Group companies, which involves people and their management and social interactions within an organizational context. This study was based on qualitative data rather than quantitative data.

The primary aim of the study was to research how IS strategy is developed and implemented in multi-subsidiary international Groups, and to address the research objectives defined in the previous section of this chapter. To properly address the research objectives, the narrative methodology has been chosen as many relevant academic papers are based on narrative methods within the same or similar area of research (Beynon-Davies, 2013). Many experts were interviewed from large multinational Groups companies to get the required information, thereby employing multiple interviews to strengthen the validity of the findings. Action research was not an appropriate approach for such a research project where many large multinational companies are involved. Primary data was used and collected from a number of experts affected by, or developing, IS strategy. The qualitative research method was applied as it seeks answers to a question, systematically uses a predefined set of procedures to address the objectives (Northeastern, 2006), collects evidence, and produces findings that were not determined in advance and are applicable beyond the immediate boundaries of the study (Pervez Ghauri, 2005). In-depth interviews and questionnaires where used. Unlike a positivist research approach, which uses frequencies and statistical generalization to relate the findings to a larger population, an interpretive narrative study focuses on analytical generalization to develop and extend theory (Wahyuni, 2012). Access to interview participants and internal documentation was granted once the board members from the addressed companies approved the research for their respective group or division. The expert interviews and questions were structured for board members and managers.

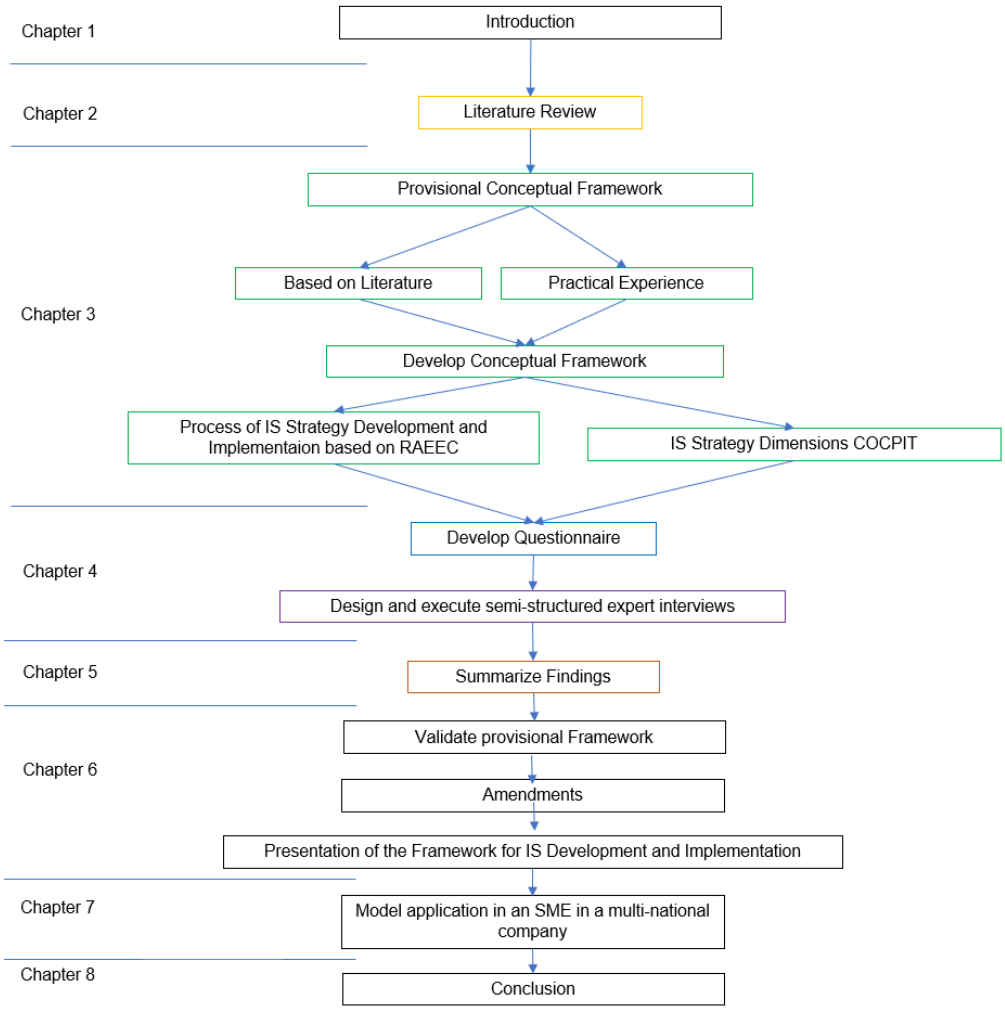
What makes a study qualitative is that it usually relies on inductive reasoning processes to interpret and structure the meanings that can be derived from data (Thorne, 2000). NVivo, which is a specialized tool for this kind of research method was used besides SPSS to collect and analyze the primary data gathered from

interviews and questionnaires to find and document the answers to address the research objectives. The data (transcripts, audio) gathered during the interviews were encrypted and stored anonymously and only used for the purpose they were collected for. Everything was anonymous and kept confidential. Neither the organization's full name nor the participant's names are mentioned in this research study. Furthermore, a non-disclosure agreement has been signed by the researcher for some companies because the researcher had access to very sensitive and confidential information. The researcher had prepared the data gathering process and the data analysis such as the interview questionnaire based on the literature review. Ethical considerations where particularly important for this study as the interviews took place in an international context and in cultures other than that of the researcher. Furthermore, the researcher had a role as observer and interpreter, trying to recognize and substantiate new meanings to connect to known theories and to contribute to new knowledge. Finally, the researcher was aware that he played a very important role during the interviews where trust was established between the researcher and the participants using a narrative approach.

1.5 Outline of the thesis chapters

The following figure provides a visual overview of the chapters from this thesis based on the research process.

Figure 2: Outline of the overall structure of this thesis



This introductory chapter provides an overview of this research project, and is followed by chapter two, which reviews a wide range of literature on IS strategy development and implementation. Chapter three presents the provisional conceptual framework based on the findings in chapter two. The provisional framework combines IS strategy development and implementation. In chapter four, the research methodology and design are set out and explained; the research paradigm and research methodology are justified. Chapter five presents the findings from the interviews and associated discussion. In chapter six, the provisional framework dimensions and steps are developed and validated, and amendments are made based on the findings of chapter five. Chapter seven provides the validated result of the final framework in a small multi-national company. Chapter

eight summarizes the results of this thesis and gives conclusions about the research objectives. The contribution to knowledge and practice based on the findings of the research are outlined. It addresses the limitations of this research and possible areas for further research are discussed.

1.6 Summary

This introduction chapter explained the context of this research project and its aim and motivation. Based on this, the research questions where concluded which derived the research objectives. One of the research's key objective was to develop a framework which is addressing the two parts; development and implementation in a single framework which can be used by experts, providing a practical structured rather a theoretical approach. The chosen methodology was explained, and the thesis outline and structure were presented. The next chapter reviews the literature based on the research objectives for IS strategy development and implementation in a multi-national context.

2 LITERATURE REVIEW

2.1 Introduction

This chapter will discuss the key literature relevant to the research aim and related objectives outlined in Chapter 1. This chapter includes detailed reviews of IS and IT literature, including current frameworks and models of relevance to the research aim.

The review was done in three overlapping stages. The first stage was to read the literature based on the research objectives in the initial research phase. The second stage was to read literature which explains the issues which emerged from the literature in stage one. The last stage was to read the necessary literature to find the gaps in the current literature for arguments and discussions.

Subtopics are defined based on the key elements from the review to build a logical structure to address the research objectives. Introduction to IS was discussed at the beginning, as this was fundamental to understand and to discuss the different frameworks and models which were adopted and further developed based on Earl (1989), a conceptual model of IS strategy where the key elements are conjectural, and Henderson and Venkatraman (1989), developing a research model for strategic business planning and IT planning. Karpovsky et al. (2014) put forward a framework for IS strategizing based on the developments in research on IS strategy and the process of strategizing. This framework addresses the impact in practice between academics and practitioners and discusses the cultural issues in implementation.

Over 200 books, articles, and journals were reviewed and analyzed. Only the relevant material was used and cited to identify and define the gaps in the literature within a multinational context, by comparing the current models and frameworks of practitioners and academic researchers for IS strategy development and implementation.

2.2 Information Systems in organizational context

2.2.1 Information Systems

According to Whitten (2004), an IS is an integrated web of people, processes, data, software, hardware and procedures that interact with each other in order to analyze and distribute collected and processed information, to create value and support the systems inside and outside an organization. This definition also concurs with Beynon-Davies (2009a) who sees IS as the source of information distribution in an

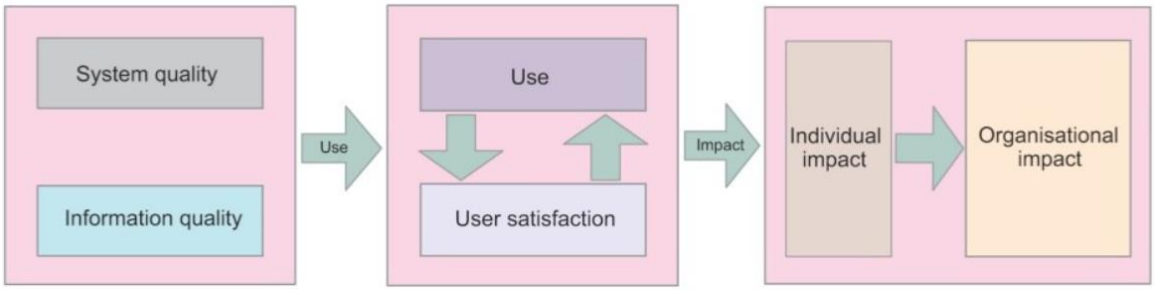
organization. Furthermore, IS is holistically defined by Ward and Peppard (2002) as a means of purposeful use of Information Technology (IT) through interrelated components interacting with each other in an organized structure. On the premise constructed by the above three definitions, IS is further elaborated with variations in its dimensions and scope in different industries.

In multinational organizations, the scope of IS is much wider and hence it encapsulates a greater range of system components. Kraemer and Dedrick (2001) and Jalava and Pohjola (2002) viewed IS as the enabler of intertwined enhanced market infrastructure, enhanced product development, risk controlling methods implementation, an extension to geographically diverse locations, and decentralized decision making in subsidiaries results in better returns on IT investments. However, Agarwal and Dhar (2014) noted that the IS had transitioned rapidly over the previous years which was mainly due to decrease in the cost of technology with enhanced processing capabilities, which has enabled IS to be the main source of value creation in an organization, having previously been an office support tool.

Traditionally the role of IS and its influence cycle in an organization is defined through the lens of the Delone and McLean (1992) model. Although the recent developments have diversified the components of IS, the characteristic features can arguably be established using the traditional model in Figure 3 which can be used as the basis for further discussions.

The technical quality is an essential feature of an IS and is defined in the model by two issues: system quality and information quality. Good quality of system and information lays the ground for the formation of a sound IS. The technical quality greatly influences the system usage which in turn defines satisfaction of the user. The system usage determines the value creation for the individuals and organization as a whole. The impact is extended to multiple stakeholders inside and outside the organization and their interconnection is also supported by the information system. The model can be simplified based on three essential components: functionality, usability and utility, based on the early work of Delone and McLean (1992).

Figure 3: Functionality, Usability, and Utility domains in the IS model (Delone and McLean, 1992)



The designing of IS requires the determination of the key features before their construction and implementation. Such key features are essential in constructing core ways defining the scope and dimensions of IS. This section depicts some holistic characteristics of IS which can form the basis for the following sections.

The functionality of IS can be determined after analyzing the requirements of an organization. This element defines the basic aim of the system and the service to be provided. The development of IS relies greatly on the specification of core functionality. The functionality of the system varies greatly depending on its application and the desired value to be created.

The IS is embedded in the activity through the usability component. The usability essentially enhances the ease with which the IS interacts with the individuals and systems for which value is to be created. Usability defines the point of interaction such as the human-computer interface in an IT system.

The utility of the IS defines the overall performance of the system in fulfilling the intended tasks. Utility defines the value added to the organization as a whole and is a performance-oriented specification.

2.2.2 Impact of Information Systems on organizations

The literature demonstrates that the impact of the introduction of an IS can be plagued by inherent paradoxes.

Vinekar and Teng (2012) initially questioned the impacts of IS over several years concerning its ability to increase the productivity and performance of an organization. Furthermore, Brynjolfsson (1993) found that four main reasons emerged for the productivity paradox, which can be instrumental for the current study, given that the focus is on determining factors to be considered when designing and implementing an IS strategy. These four reasons are:

- Malfunctions result from adjustments and learning. The adaptation of IT systems as the power behind the information systems deployed required unique expertise which was hard to find at that time. This problem persists to this day as well given that successful implementation and usage of IS require highly trained experts and the employees are to be trained for usage.
- Incorrectly measured inputs and outputs to the system. The consistency of performance measurement models for IT is questionable, as they do not provide coherent and dependable criteria. Most of the measures used traditionally tend to ignore value creation in terms of enhanced quality, customer satisfaction and agility of service.
- Changes in profit distribution strategies. It can be predicted that given that the introduction of IT for IS in some companies within the industry can benefit certain companies at the expense of other, hence, the impact of IS on the overall industry can be less prominent.
- Mismanagement of IT. The systematic planning for the introduction of IT is often lacking among companies going through the transition of IS introduction through IT; hence, improper handling and malfunctions can impact the end results.

The groups and individuals operating in an organization are also influenced by IS. The introduction of IS allows for a greater degree of control to the managerial groups and enables them to monitor operations more effectively. The day-to-day activities are translated into visual analytics using a large amount of data being produced throughout the organization. This allows the decision maker to make more informed and efficient decision while at the same time assess the effects of deployed strategies.

While IT offers tools and opportunities for a more centralized decision-making environment, at the same time it is used by a multinational organization to appropriately empower the employees for decision making by controlling the peripherals. IT systems can reduce the bottlenecks in the processes such as the administrative activities requiring documentation; this allows employees to concentrate on value creation and optimization of the processes. The introduction of IT systems supports customer service as the information required for informed decision making can be accessed by the front-line employees and they can be equipped for making instantaneous decisions based on data analytics. Coordination

and collaboration between the groups working towards a shared goal are greatly enhanced by the introduction of IS and IT systems provide ways of most efficient communication. New systems allow for a constant connection between the teams and across the organization giving each employee a sense to where the team is headed and what how their intervention can influence the overall process. Such transparency not only eliminates redundancies but allows for greater input from employees at each hierarchical level. One can conclude that employees feel highly motivated in such environments and can have a greater sense of purpose in an organization. Consequently, this increases opportunities for training within organizations where employees get a chance to learn from more skilled individuals and ask for help without the requirement of face-to-face meetings.

The design of an IS strategy plays an instrumental role in conferring the potential of the IT system and the introduction of IS can essentially decrease or increase the requirement for human resources in the organization. The employees can either be empowered or controlled depending on the IS strategy. Hence, the design of the IS strategy plays a crucial role in determining the impacts of its introduction in an organization. At the same time, the strategies of implementation allow the system to achieve intended objectives for the organization.

Although the impact of IS is potentially on the groups and individual within an organization, at the same time IS can influence individuals and groups outside an organization. As the customer services are going through a transition from retail to online, the IS is becoming a major determining factor in levels of customer satisfaction. However, the access to remote access channels in multinational organizations is much more complex. Channels to be exploited represent the social factor interactions.

The successful uptake of remote access channels comes with a variety of preconditions (Versteeg & Bouwman, 2006). It requires awareness in the stakeholders about the perks of the channels over the traditional means of transactions in an economy. The transition towards the remote access channel has its own transaction costs which must be minimized; the transition costs can be identified as cost of information search and analysis, cost of learning ways of inquiry, and cost of mistake correction. Studies suggest that the major obstacle in the transition of customers to electronic delivery systems is the up-front transaction costs. Hence, it is important that using the IS the benefits of electronic delivery

systems over traditional methods are both enhanced and translated for the customers (Versteeg & Bouwman, 2006).

The success of IS with customers and stakeholders outside organization further depends on the overall ecosystem of IT and the readiness and ease of accessibility of remote access channels for the customers, mainly including affordability of smart devices and quality of internet access (Peppard & Ward, 2016). Given that the effective accessibility and extraction of information online requires some skills, the level of customer exposure to the internet and intelligence also comes into play.

Furthermore, reliance on remote access channels in different areas of life plays an important role as well. The IS should be implemented such that it can reinforce customer access in routine everyday activities.

2.2.3 Levels of alignment

It is essential to ensure alignment at all the levels of an organization; such levels are indicated in the literature as system level (Campbell, 2005; Floyd & Wooldridge, 1990), the cognitive level (Tan & Gallupe, 2006), and project level (Chan & Reich, 2007). Misalignment can often explain system implementation difficulties. Although the formal strategies are a characteristic of the front line of organization, it is implemented at higher organizational levels. The focus of alignment at the lower levels of an organization involves translating business unit goals into personal goals (Campbell, 2005). Recognizing this problem, Bleistein et al. (2005) attempt to use requirements engineering to link higher-level strategic goals to lower level, explicit organizational processes. The authors propose a verification method for alignment in an organization which defines processes for explicit verification of requirements with organizational goals at subordinate and super-ordinate levels. Chan and Reich (2007) examine alignment at the project level. According to Chan and Reich (2007) IT project alignment can be defined as the degree to which an IT project's deliverables are congruent with the organization's IT strategy and the project's objectives.

Change triggers should be considered in strategy formulation as they can interfere with alignment processes. The literature mainly identifies change triggers under two categories: external (e.g., a change in the operating environment) and internal (e.g., a mid-term project evaluation) (Chan & Reich, 2007; Tan & Gallupe, 2006). Project misalignment is caused mainly due to the inability of the strategy to effectively respond to change triggers and due to the lack of resilience in the formulated

strategy. Project misalignment can trickle upwards, leading to overall IT strategic misalignment (Tan & Gallupe, 2006). Tan and Gallupe (2006) operationalize alignment, at its most micro-level, as shared cognition between the business and IT executives. Hence, it can be concluded that a higher degree of alignment in IT-business alignment is a product of a higher degree of commonality between IT and business executives. The level of alignment within an organization reduces when the difference in cognitive content and framework between the executives of IT and business increases. This perspective has strong parallels with the social dimension of alignment, based on shared domain knowledge (Reich & Benbasat, 2000). It also reflects a view of business–IT alignment in which IT mirrors (vs challenges) ongoing business activities (Reich & Benbasat, 2000).

IT strategy and infrastructure should be aligned with IS strategy (i.e., the applications and information) within an organization (Earl, 1989). Henderson and Venkatraman (1993) assert that alignment must be both internal and external to the organization. Literature shows that the alignment of IT and business strategy is instrumental both internally and externally; where external the strategy should be aligned with the market forces and the economy, on the other hand internally the strategy should be aligned with IT infrastructure and organizational processes. Sledgianowski and Luftman (2005) recommend as an alignment best practice that organizations should leverage IT assets on an enterprise-wide basis to extend the reach (the IT extra structure) of the organization into supply chains of customers and suppliers. Similarly, Galliers (2004) suggest that alignment is not just related to internal challenges, but should also influence and be influenced by relationships with crucial partner organizations such as customers and suppliers.

2.2.4 Strategic framework of an organization

Wyatt-Haines (2007) has defined strategy not as tools that carry names such as PEST Analysis, SWOT Analysis, Resource Analysis, Competitor Analysis, Five Forces Analysis or Scenario Analysis. Those are the tools that help business managers to handle the uncertainties inflicted by the external environment proactively and there are ongoing debates over these tools that remain appropriate in today's unpredictable business environment. Strategy is traditionally considered to be a medium or long-term issue because those plans were set for 5 or 10 year periods of time but this is in today's environment is no longer the case as a strategy is no longer time bound in that narrow sense (Wyatt-Haines, 2007). Strategy can now be as short as 12 months or as long as 10 years depending on the complexity

of a multi-national enterprise. An IS strategic plan is a long term directional plan which decides what to do with IT but in practice we see that the timescale become shorter over the last 5 years. Wyatt-Haines (2007) is seeing the key role of strategy is the one by which today's activities are linked to the development of tomorrow's capabilities and delivers results and performance. The IS strategy has over the time transitioned from being a standardized approach with bright lines into a process that can be referred to as muddling through the environment, and if working well, the key to organizational success. Furthermore, the key role of the top management is to clarify and communicate that identity when the foundation of the strategy is defined as a sense of organizational identity (Slim et al., 2021).

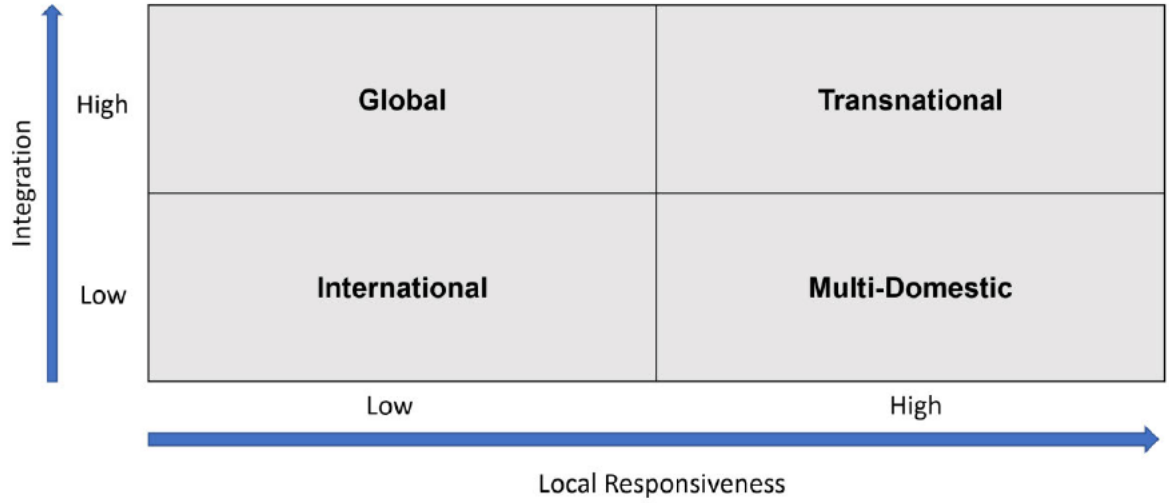
In respect of what strategy is trying to achieve (Markides, 2000), the following diagram provides an understanding of the key questions we are trying to answer.

Figure 4: A simple view of strategy (Markides, 2000)

Recognized by other researchers (Arif, 2008) is the understanding of the social complications by answering the key questions (Markides, 2000) that are associated with the formation and definition of Information Systems Strategies (ISS). This is crucial and organizations do not consider the consequences on the organization structure, business processes or IS functions when implementing strategies. In response to that are ISS - the need to plan and organize the IS requirements in firms (Galliers, 2003). The ISS development is an integral part of business planning and if it fails or it is not done it is likely that management information systems will be developed in a piecemeal fashion which is not contributing to business strategy nor enabling firms to respond to market changes (Levy, 2009). Multinational companies develop their business strategies based on either different levels of global integration and local responsiveness or on the global coordination and global configuration of different multinational units. The relationship between strategy and

mechanism of coordination and implementation must be studied at subsidiary level (Mohdzain & Ward, 2007). This can lead to a conflicting demand on multinational companies on these two countervailing forces, integration versus local responsiveness (Briscoe et al., 2012). These two forces form a framework that can be used to describe a multinational business strategy, which can be categorized into four strategy types, International, Multi-domestic, Global and Transnational.

Figure 5: Multinational business strategy (Briscoe et al., 2012)



The following table provides an overview of these strategy types for multinational companies according to Briscoe's Framework (Briscoe et al., 2012).

Table 1: Multinational business strategies (Briscoe et al., 2012)

Strategy	Description
International Business Strategy	This is the simplest business strategy, requiring quite limited local responsiveness as well as quite limited integration. This is the type of strategy that begins with export or import and may be limited to licensing or sub-contracting. It typically involves no overseas offices or operations, other than possibly small sales offices.
Multi-domestic Business Strategy	MNEs with this strategy use an approach that responds to the high needs, values, and demands of the local market. This strategy is mostly used by MNEs with a multi-domestic organizational structure. With subsidiaries in multiple countries, these subsidiaries typically operate independently within each country, independently of operations in other countries, and often independent, even, of the parent company headquarters. In this strategy, MNEs

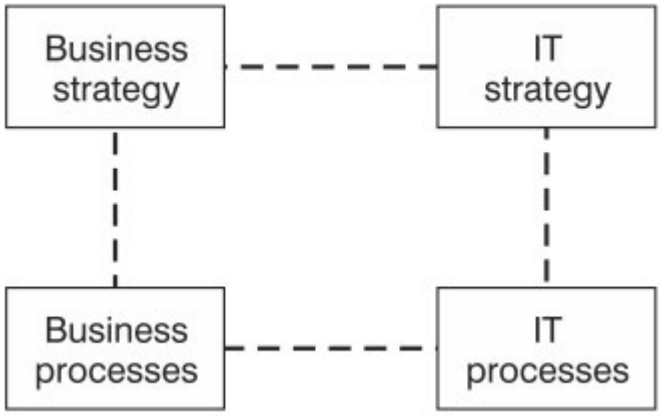
Strategy	Description
	generally view each national market as a specialized market for its subsidiaries' products and services.
Global Business Strategy	MNEs with this strategy adopt an approach that uses a unified strategy which is implemented for all countries regardless of their cultural and national differences. Thus, there is a high degree of centralization or integration. Products and services will be increasingly designed for and marketed to customers all over the world. This strategy is mostly implemented by MNEs through a global organizational structure. The subsidiaries are tightly connected to the headquarters, and are heavily dependent on resources, brand identities, ideas, policies, and know-how from the headquarters.
Transnational Business Strategy	MNEs with this strategy use an approach that attempts to maximize both responsiveness and integration. They are both global and multi-domestic at the same time. In the sense that the transnational firm has a global focus, it is like the global firm, but it differs from the global firm in that, rather than developing global products and services, the transnational works hard to localize, to be seen, not as a global firm, but as a local firm, albeit one that draws upon global expertise, technology, and resources. The transnational firm operates as a global network, with each subsidiary given responsibility related to its capabilities and strategic mission.

To succeed with one of these strategies or even a combination of them, the highest levels of management are needed as the managerial tasks become more complex because the nature of the required IS changes – from structured, routinized to ad hoc, unstructured and complex (Galliers, 2003). One of the reasons is that now different levels in the management hierarchy are now using information technology where once it was its sole domain at the operational level. This because it has become more powerful and cheaper over the past years and its use has spread through organizations at a rapid rate. Galliers conclusion about this current development is: "The aim now is not only to improve efficiency but also to improve business effectiveness and to manage organizations more strategically" (Galliers, 2003, p. 1). To achieve this necessity the domain's business strategy and IT strategy must be linked and aligned (Galliers, 2003). Henderson and Venkatraman (1989)

propose the strategic alignment model covering the linkages between four domains in an organization which is one of the key models for IT strategy alignment identified during the literature review:

- The business strategy domain (BS)
- The business processes domain (BP)
- The IT strategy domain (ITS)
- The IT processes domain (ITP)

Figure 6: Strategic alignment model (Henderson and Venkatraman, 1989)



A more detailed explanation of the different models and frameworks will be further discussed in this chapter. Some researchers argue (Avison et al., 2004) that the need for alignment does not arise as it should not be regarded separate from the business strategy because IS is pervasive in business. As the business changes more frequently today, this argument is no longer valid as the environmental threats and opportunities must match the organizational resources (including IS) so in its broadest sense is all about alignment. Avison's (Avison et al., 2004) discussion about alignment shows that alignment improves business performance and therefore business success and he concludes that there is a significant correlation between alignment and performance and alignment is the key to achieve profitability from information technology.

IS business and strategy alignment is subject to many different interpretations and discussed and researched in the dissertation of Orozco Vargas (2011) and he defines that the alignment of IS strategies is a matter of general strategy alignment within an organization. Therefore, each strategic problem should be understood by three interaction dimensions Process, Content and Context. The IS strategy and

implementation can be conceptualized through the prism of a three-dimensional approach promulgated by (Orozco Vargas, 2011).

Table 2: Strategy dimensions and challenges (Orozco Vargas, 2011)

Strategy dimensions	IS/business alignment challenges	Relation description
Process	Agreement of underlying constructors	The way underlying constructors of IS/business alignment shape how the business and IT strategies are and should be analyzed, formulated, implemented, changed, and controlled. How, who, when of the strategy?
Content	Definition of the organizational scope	The organizational structure or structure where the content and process of IT and business strategies are embedded. Where of the strategy?
Context	Practical implementation	The circumstances under which the content and process of the IT and business strategies are determined. What of the strategy?

Orozco defines the dimensions as (Orozco Vargas, 2011, p. 47) as strategy process dimension, that refers to the manner in which strategies come about and is a concern with how the strategy is involved, who is involved and when the strategy is involved. The strategy content is the product of the strategy process and concerned with what is and should be the strategy. The strategy context includes the environment created by the process and content dimensions and where this environment happens.

2.3 Information Systems strategy

2.3.1 Evolution of IS strategy

The definition of IS strategy has evolved over the recent decades and researchers have taken different approaches for its interpretation; hence, a clearly defined IS strategy concept is hard to realize (Chen et al., 2010; Karpovsky et al., 2014). Many loopholes are evident from the literature in resolving fundamental issues related to the subject. Such inconsistencies are mainly a product of radically transient business environment over the years, where the scope of operations of organizations has extended across borders and manufacturing is outsourced to different countries and the technology forefront has transformed (Martin, 2014). Earl

(1996) noted that he has resorted to “conjectural” approach to the key elements of the conceptual model. Over the years it is noticed that the terminology used to represent IS strategy has been inconsistent: IS strategy; Strategic IS Planning (SISP); IT planning, IS planning, etc. (Karpovsky et al., 2014; Peppard & Campbell, 2014).

Peppard et al. (2014) explain that IS strategy replaced the concept of IS plan from the 1960s and 1970s. Galliers (1987a) proclaims that a reactive planning process was used to define IS requirements in earlier decades. The strategic management literature had a significant effect on the research of IS in the post-industrial era. The concept of strategy in relation with information systems was introduced with the publication of two books in the mid-1970s: Strategic Planning for MIS (McLean & Soden, 1977) and Strategic Planning of Management Information Systems (Siegel, 1975). Following these books, multiple case studies proclaiming IS to be a competitive weapon came to the frontline of the research community and led to the wide-scale embrace of the concept (Galliers, 1993; McFarlane, 1984). Such developments gave way to the introduction of a coherent concept for IS and IT management, widely accepted as Strategic Information Systems Planning (SISP) (Galliers, 1988; Lederer & Gardiner, 1992).

SISP transformed the perception of IT management and the deployment of IT resources was conducted as an integral part of a business strategy; this gave way to the adaptation of various IT-driven tools, and techniques aimed at increasing competitive advantage for organizations (Rackoff et al., 1985). Earl (1989) defined IS strategy as a business management issue as opposed to a solely IT-oriented domain. These developments transformed the derivation of strategic intent and an increasing focus was put to achieving “strategic alignment” as a way to streamline strategies for value creation (Henderson & Venkatraman, 1993). Much of the research in the strategic management field before 2000 was driven from the resource-based view (RBV); which was the basis for IS research and gave way to a quest of sustainable competitive advantage (Mata et al., 1995).

Table 3 by Peppard and Campbell (2014) provides an overview of different IS strategy developments over the years, their practices and descriptions. The purpose here is to demonstrate some crucial dynamics associated with IS strategy research, while considering them in real organizational scenarios; such that real insights into the concept of IS strategy can be conducted for this study.

Table 3: IS strategy movements over the years (Peppard and Campell, 2014)

IS strategy	Description	Implementation	Research Studies
IS planning	Top-down planning criteria. Conducted as a reactive approach to business strategy with intent of alignment with business objectives.	A comprehensive planning based on key stakeholders (Earl, 1993) Tool: Anderson Consulting Method 1 critical success factors by IBM business systems planning (Rocart, 1979)	Zachman, 1978 King, 1978 Kind and Cleland, 1975 Macfarlan, 1971 Zani, 1970 Kriebel, 1978
IS strategizing	The use of perception through cognition and intellectual reasoning through use of communication and coordination of multiple domains in an organization.	IT strategies and business strategies coevolve. Tool: Intellectual reasoning	Galliers, 1999 Benbya and Mckelvey, 2006 Breu and Peppard, 2003 Bharadwaj et al., 2013
IS determination through ad hoc bottom up method	Bottom-up planning approach on adhoc basis driven by the IT requirements of an organization. Identification of individual operational application.	A greater level of focus is on the improving the system rather than defining the strategy for the system. Tool: system development methodologies.	Galliers and Sutherland, 1991
IS capability	Organization specific IS capability as an organic process.	The key ingredients for defining the strategy are the organizational culture and the organic process of information flow in an organization Tools: Organizational Culture Assessment	Peppared and Ward, 2004 Marchand etal., 2000
Strategic Planning for Information Systems (SPIS)	The strategy is defined after consulting all the stakeholders and is assessed through the rigorous process of feedback in terms of its effectiveness.	The defined strategy is reviewed through the feedbacks of stakeholders and is constantly rectified to adopt to environment. Main focus is on defining the themes Tools: Strategic Alignment Five Forces Analysis Value Chain Analysis Customer resource lifecycle Strategic Thrust Analysis	Galliers, 1987a Earl, 1993 Ives and Learmonth, 1984 Wiseman, 1985 Porter, 2001 Henderson and Venkatraman, 1993 Ward, 1988 McFarlan, 1984

2.3.2 Definition in the context of the study

IS strategy is defined by Issa-Salwe and Aloufi (2011) as an adaptation plan of information systems with the aim of satisfying organizational demands, such that the overall business strategy is supported by the use of systems and the gathered information. IS strategy can also be considered as a means to effectively determine and define the capabilities of an organization and then use this information to

support business objectives and goals (Ward & Peppard, 2002). Sabherwal et al. (2001) defined IS strategy as a catalyst for determining organizational goals, the required information to support the goals, and the effective implementation of IT to gather, process and distribute data to meet the demands of stakeholders. Furthermore, studies suggest that the major aim of IS strategy is to determine organizational capabilities and define ways for effectively utilizing those capabilities to achieve business objectives and goals (Earl, 1989; Ward, 2012).

Keeping in view the literature IS strategy in this study is approached through three strands, modified from Chen (2010):

- Information System and business strategy alignment (Chan et al., 1997; Chan & Reich, 2007)
- Identification of portfolios of systems through the planning of strategic information systems (Galliers, 2004; Ward & Peppard, 2002)
- The utilization of a combination of systems with a focus on functionality in order to have a competitive advantage (Melville et al., 2004; Piccoli & Ives, 2005; Wade & Hulland, 2004)

Literature shows ample evidence that regardless of the strand being focused upon the effectiveness of an IS strategy is highly dependent on the plan of implementation. Hence, the most crucial factor in defining IS strategy is the strategic intent of the organization, the de facto strategy and implementation criteria of IS strategy (Slim et al., 2021).

Research shows that building and maintaining strategic intent is the cornerstone of an effective IS strategy. The design and implementation criteria revolve around it. According to Hamel and Prahalad (2005) a strategic intent defines criteria of assessment for an envisioned leadership position in an organization; defining the success as perceived by the organizational strategy. Thompson and Martin (2010) entailed that consistency in strategic intent is instrumental in achieving success in terms of organizational performance and productivity as it acts as a guide for appropriate operations and resource allocation, which include choices regarding IT systems. Literature shows that selection of IS strategy for an organization goes together with the decision regarding selection of capabilities of IT and installment of such resources (Chan & Reich, 2007; Majchrzak et al., 2000). Hence, one of the most crucial issue to be handed in defining IS strategy is its alignment with a strategic intent which shall be consistent with organizational objectives; the issue is

that the IT infrastructure is to be deployed in accordance with the defined IS strategy (Mähring et al., 2004). The stated predicament is crucial to the success of IS strategy given that literature provides evidence of failure emanating from inappropriate allocation of IT resources, which cannot be changed afterward even in case of alignment of strategic intent with the IS (Orlikowski, 2000; Robey et al., 2002).

Given that an organization is a complex system with groups and individuals interacting with each other in a variable environment, restricting definition of IS strategy to a select few environmental and organizational variable that are causally related is a mistake (Jarzabkowski et al., 2007; Whittington, 2003). A better approach to the definition of IS strategy is through the perspective of Strategy-as-Practice taking into account the construction, implementation and realization of strategic intent by analyzing the role of each actor involved (Johnson, 2017). Literature shows evidence of investigations regarding the formulation of strategic intent by keeping in view actors' intent, motivations, emotions and social interactions (Jarzabkowski & Paul Spee, 2009; Whittington, 2006). The strategy-as-practice paradigm for IS has shown to enable complete embrace of IT in organizational practice and hence, can be considered as a new and enhanced perspective for IS strategy (Doherty & Terry, 2009; Galliers & Currie, 2011; Peppard & Ward, 2004).

IS strategy shall seek to embed IT systems into the organizational processes such that the value of IT can be fully realized (Chen, 2010). Grover and Kohli (2012) proclaimed that in order to realize value from the IT investments it is evident that IS strategy shall be aimed at reconfiguring organizational processes in such a way that IT systems can be most effectively and efficiently used in the realization of strategic intent. IS strategy works as a catalyst by aligning the IT systems with the strategic intent of an organization (Sara, 2012; Ward, 2012).

2.3.3 IS strategy

The essential purpose of an IS strategy is to define the role and function of IT infrastructure in an organization (Chen, 2010). Research studies conducted in the past depict that IT can create value only if it is strategically embedded into the local practices and performs the implementation of the strategic intent of the organization (Galliers & Currie, 2011; Peppard & Ward, 2004; Sambamurthy et al., 2003).

A further aspect in IS planning and IS strategy development in multinational companies is that many organizations focus on cost control as a key element for the integration of a firm's value-chain activities (Galliers, 2003). In addition, the focus is

on achieving better economy of scale by doing centralized - or moving towards centralized - IS planning and “as centralization increases IT tends to control the planning process and, as a result, IS planning becomes more tactical than strategic and is dominated by IT infrastructure planning” (Mohdzain & Ward, 2007). In their research (Mohdzain & Ward, 2007) the companies were initially grouped and classified according to the balance of centralization vs decentralization of IS planning based on the degree of the subsidiaries’ autonomy in deciding the overall IS strategy (Mohdzain & Ward, 2007).

Table 4 shows the analysis of the evidence with a focus on the perceived success. The conclusion is that when the subsidiary business is performing successful based on market and financial goals the IT department is also performing successfully on a subsidiary level when the IS planning and strategy development is decentralized. Centralized IS planning has an administrative approach and is not or less than satisfactory.

Table 4: Summary of cross-company analysis (Mohdzain & Ward, 2007)

Table 3
Summary of cross-company analysis

Company	Subsidiaries' business orientation		Responsibility for IS planning	Focus of IS planning	IS planning approach	Perceived success	
	Interdependency	Distinctiveness				Subsidiary IT	Subsidiary business
C1	Low	Low	Decentralised	Subsidiary initiative	Organisational	Successful	Successful
C7	Low	High	Decentralised	Subsidiary initiative	Organisational	Successful	More than satisfactory
C6	High	Low	Fairly decentralised	Global co-ordination	Business	Successful	More than satisfactory
C2	High	Low	Fairly centralised	Scale economies	Administrative	More than satisfactory	Satisfactory
C3	High	Low	Fairly centralised	Scale economies	Administrative	More than satisfactory	Satisfactory
C5	High	Low	Fairly centralised	Scale economies	Administrative	Satisfactory	Satisfactory
C8	High	Low	Centralised	Scale economies	Administrative	Less than satisfactory	Less than satisfactory
C9	Low	Low	Centralised	Scale economies	Administrative	Less than satisfactory	Less than satisfactory
C4	High	High	Centralised	Scale economies	Administrative	Less than satisfactory	Less than satisfactory

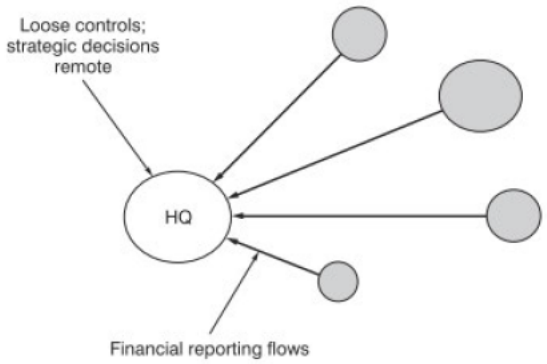
The reason for this contradiction in centralized IS planning is that subsidiaries continue or receive more autonomy in other areas of business planning, but the involvement of subsidiary business managers in IS planning and IS strategy definition reduces and the centralized IT management increasingly determine the IS strategy as this is the current management approach of managers. The evidence of the study (Mohdzain & Ward, 2007) was that local business requirements are not being adequately addressed because the subsidiaries are focused on the local market (Galliers, 2003) and this is the main reason why centralized IS planning is less satisfying than the decentralized approach. So the involvement of the subsidiary business managers to align any business organization is important and

the business strategy must be understood by both business and IT for either approach, centralized or decentralized IS strategy planning (Ullah & Lai, 2013) and the alignment of the business and IT strategy should be seen as interaction rather than the simple match of the two (Cragg et al., 2002). It makes no sense to support all strategies, therefore, the companies should aim to support their major strategies which the IS strategy supports (Cragg et al., 2002). It has been argued (Galliers, 2003) that the coordination and control of the IS strategy is primarily achieved through personal relationships between the corporate management and the subsidiary managers rather than by written rules, procedures or formal organizational structures and strategic decisions are decentralized and top management is involved mainly in monitoring the results of foreign operations. The following Tables and Figures explain the organizational strategies and structures according to Galliers (2003) for understanding the development of the IS strategy based on the business strategy structure.

Table 5: Multinational strategy with decentralized organizational structure (Galliers, 2003)

Business strategy/ structure	Strategic management processes	Tactical business processes	Coordination and control processes
Multinational/ decentralized – federation	Informal HQ-subsidiary relationships; strategic decisions are decentralized	Mainly financial flows; capital out and dividends back	Socialization; careful recruitment, development, and acculturation of key decision makers

Figure 7: Multinational strategy with decentralized organizational structure (Galliers, 2003)



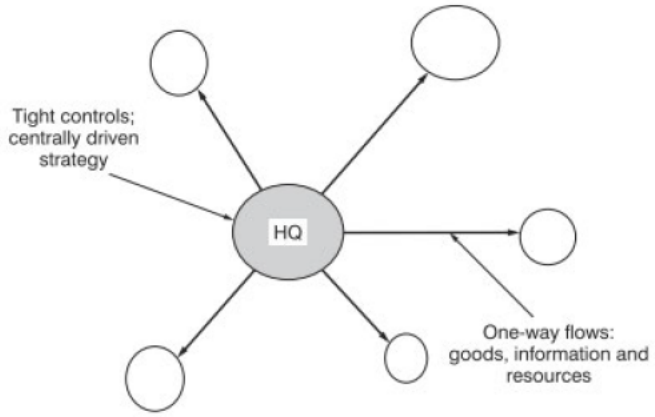
An enterprise might differentiate its products to meet local needs to respond to diverse interests under a multinational strategy. The enterprise might delegate considerable operating independence and strategic freedom to its foreign

subsidiaries in such an approach. Highly autonomous national companies are often managed offshore rather than as a single international business under this decentralized organizational structure. A subsidiary is focused on its local market, and coordination and control are achieved primarily through personal relationships between top corporate management and subsidiary managers than by written rules, procedures, or a formal organizational structure. Strategic decisions are decentralized, and top management is involved mainly in monitoring the results of foreign operations (Galliers, 2003, p. 92).

Table 6: Global strategy with centralized organizational structure (Galliers, 2003)

Business strategy/ structure	Strategic management processes	Tactical business processes	Coordination and control processes
Global/centralized federation	Tight central control of decisions, resources and information	One-way flows of goods, resources and information	Centralization; substantive decision making by senior management

Figure 8: Global strategy with centralized organizational structure (Galliers, 2003)

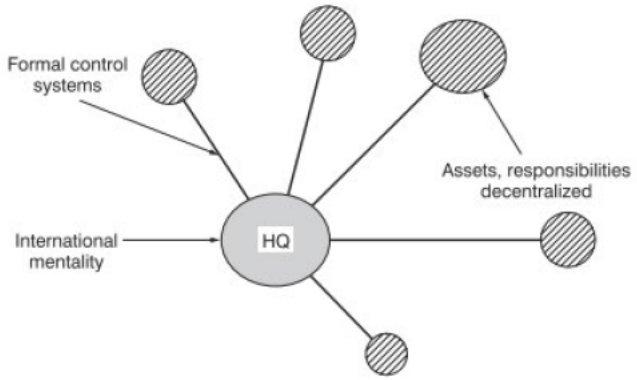


An enterprise may seek competitive advantage by capitalizing on the economies associated with standardized product design, global-scale manufacturing, and centralized control of worldwide operation under a pure global strategy. The enterprise's value-chain activities (typically product design or manufacturing) are geographically concentrated. They are either retained at the headquarter, or they are centrally controlled. There are primarily one-way flows of goods by this centralized organizational structure, information, and resources from headquarters to subsidiaries; key strategic decisions for worldwide operations are made centrally by senior management (Galliers, 2003, p. 94).

Table 7: International strategy with coordinated federation organizational structure (Galliers, 2003)

Business strategy/ structure	Strategic management processes	Tactical business processes	Coordination and control processes
International/ coordinated – federation	Formal management planning and control systems allow tighter HQ – subsidiary linkages	Assets, resources, responsibilities decentralized but controlled from HQ	Formalization; formal systems, policies and standards to guide choice

Figure 9: International strategy with coordinated federation organizational *structure* (Galliers, 2003)

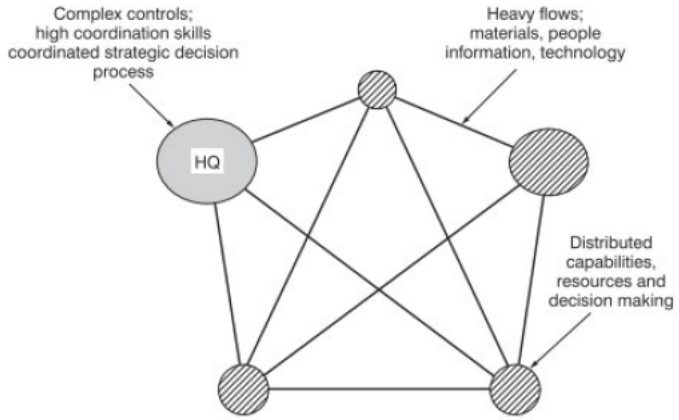


By an international strategy, an enterprise transfers knowledge and expertise to overseas environments that are less advanced in technology and market development. Local subsidiaries are often free to adapt new strategies, products, processes, and ideas. Under this coordinated federation organizational structure, the subsidiaries' dependence on the parent company for new processes and ideas requires a great deal more coordination and control by headquarters than under a classic multinational strategy (Galliers, 2003, p. 95).

Table 8: Transnational strategy with integrated-network organizational structure (Galliers, 2003)

Business strategy/ structure	Strategic management processes	Tactical business processes	Coordination and control processes
Transnational/ integrated – network	Complex process of coordination and cooperation in an environment of shared decision making	Large flows of technology, finances, people, and information among interdependent units	Co-opting; the entire portfolio of coordinating and control mechanisms

Figure 10: Transnational strategy with integrated-network organizational structure (Galliers, 2003)



As part of a transnational strategy, a company coordinates a number of national measures and at the same time reserves the ability to respond to national interests and preferences. National companies are no longer viewed as implementing centrally developed strategies. However, each is considered to be a source of ideas, skills, and knowledge that can be beneficial to the company as a whole. It is not uncommon for companies to coordinate product development, marketing approaches, and overall competitive strategy across interdependent national entities. Within this integrated network organizational structure, top managers are responsible for: (1) coordinating the development of strategic goals and operational guidelines, (2) coordinating logistics between the business units, and (3) coordinating the flow of information between the divisions (Galliers, 2003, p. 96).

Table 9: International strategy coordinated federation of business groups (Galliers, 2003)

Business strategy/ structure	Strategic management processes	Tactical business processes	Coordination and control processes
Interorganizational/ coordinated federation of business groups	Share activities and gain competitive advantage by lowering costs and raising differentiation	Vertical disaggregation of functions	Formalization; multiple and flexible coordination and control functions

Special situations relate to another form of the coordinated federation organizational structure, inter-organizational design, which is a particular form of the organizational framework. An inter-organizational design consists of two or more organizations that have chosen to cooperate by combining their strengths to overcome individual weaknesses. There are two modes of inter-organizational design: equity and non-equity collaboration. Equity collaborations are seen in joint ventures, minority equity investments, and franchises. Non-equity collaborations are seen in the forms of licensing arrangements, marketing and distribution agreements, and inter-organizational systems (Galliers, 2003, p. 97)

The development of the IS strategy based on the business strategy depends heavily on the organizational structures. Still, there are often more dimensions to consider, and there are wrong assumptions that the managers use structured, planning-oriented approaches to business objectives (Avison et al., 2004).

Another key fact is that managers claim that their business is different compared to other sectors or countries and they are right to be critical while planning the IS strategy as sector differences are significant. IT manager's beliefs and attitudes vary from country to country and the sectors within so they have to be distinguished by IT attributes not by conventional classifications (Earl, 1989). Besides the classification, the importance of IS in a sector plays an important role such as the speed in which technology supports the company to be competitive. When IS has no strategic impact yet, IS strategy formulation can be disregarded where independent, drive and delivery sectors IS strategy formulation must be appropriate to a company's sector (Earl, 1989). The best example can be seen in the delivery sectors such as telecommunication, banking, or airlines, where IS has become the principal means of delivering the service. The IT infrastructure and IS in those

sectors is mainly IT-based and without good infrastructure, the company is exposed to any risk. Continuous IT and IS investments are of importance and IS strategy is an integral part of staying in the business and can only lead to success when it is aligned with the corporate strategy.

It is the fact on more recent research with the increasing interest in competencies and capabilities that firms handle resources differently and focused firms achieve more alignment in IS strategy development than unfocussed firms as there are no clear goals for IT and managers hence resulting in an unclear IS strategy (Avison et al., 2004). Even in the late 1980s (Earl, 1989), managers agree that information technology is having a significant impact on business government and organizational behaviors. Even then, IS has become a strategic resource in different industry sectors, so it has to be used to be competitive and that organizations need to have their strategy structures to function correctly. Earl already defined nine statements about IT strategy in the late 80s and looked back even 30 years of evolution of data processing and tried to define some trends. Those trends are still valid today, even 35 years after he described them. His expressions are listed in the following table.

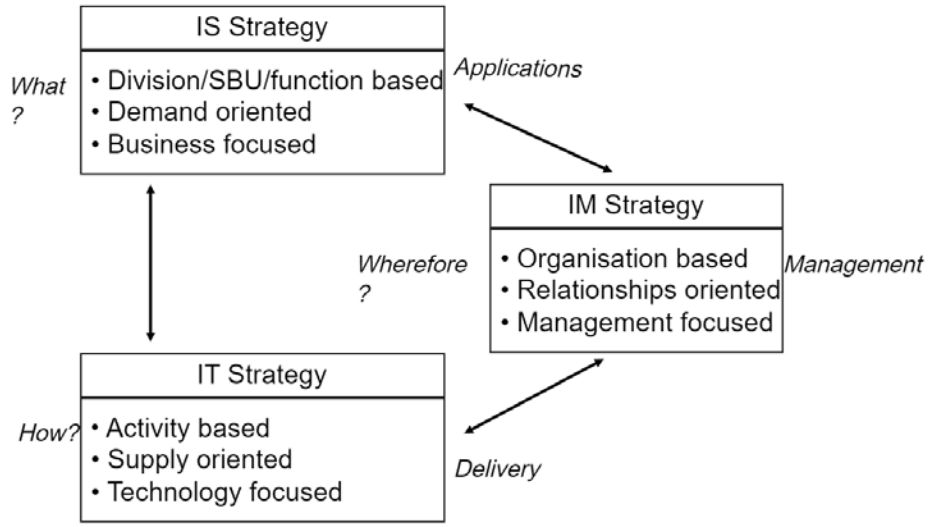
Table 10: Earl's statements about IT strategy (Earl, 1989)

No.	Statement
1	IT is a high-expenditure activity
2	IT is critical to many organizations
3	IT has become a strategic weapon
4	IT is needed by our economic context
5	IT is affecting all levels of management
6	IT may mean a revolution for management information systems
7	IT involves many stakeholders
8	IT matters do matter
9	IT management makes the difference

One of the listed key statements is to use of IT as a strategic weapon within the firm's sector and can give competitive advantage and improve productivity and performance. Furthermore, it can enable new ways of managing and organizing the IT department or even the organization, and it could help to develop new business (Earl, 1989, p. 8). With that in mind, the IT and its IS strategy is dealing primary questions with technology policies or technology strategies and it must answer questions of technical standards, architectures and risk management. Based on those questions the IT specialists must define the application framework they will

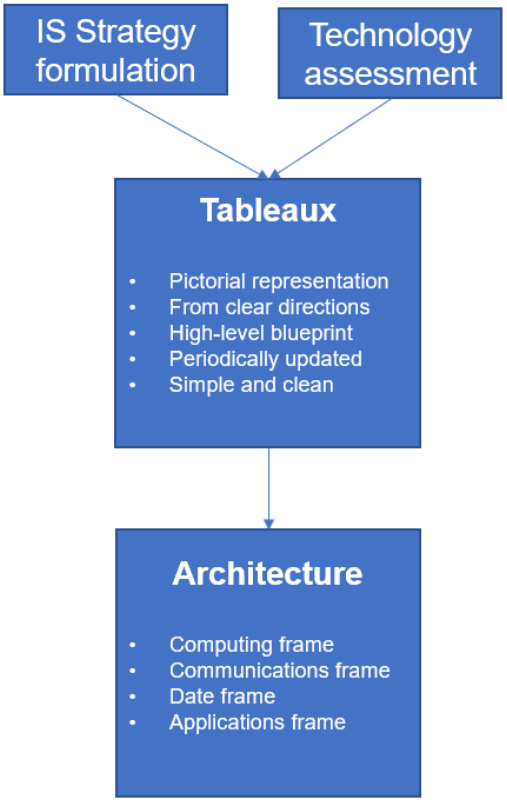
use. This framework is heavily influenced by the experience of the IT professionals within the company or external IT consultants. The involvement of the top management is also of key importance to ensure that the technology strategy is in line with the organization's needs, style, and structure. As the technology is continuously changing or developing it is more likely that there will be fewer IT strategies than IS strategies in large or complex organizations because technology lead times might be longer than many business cycles or business strategies and the technology trends are often slower than the change of business needs (Earl, 1989).

Figure 11: Earls three levels of strategy in IT (Earl, 1989)



Earl introduced a third level of strategy to align all levels within an organization as shown in Figure 11, the Information-Management (IM) strategy. This strategy will put the management into IT to compromise the policies, procedures, aims and actions to be identified. Thus IT strategy can be seen as the technology framework or architecture which drives, shapes and controls the IT infrastructure (Earl, 1989). To answer all questions from the development of the IT, IS and IM strategy it is likely to have an evolutionary approach as all those questions cannot be answered at once as much is influenced by technology availability and IS development. However, Earl's tableau for linking IS and IT strategy provides a framework for thinking about architecture and a reference point against which progress and variances can be assessed (Earl, 1989).

Figure 12: Tableaux linking IS and IT strategy (Earl, 1989)



During the process of the architecture definition and decisions, it will become more specific and detailed, and when applied as a permanent model or guidance for alignment, it will help all managers who become involved in the process of strategy definition.

2.3.4 IS strategy frameworks

Most of the reviewed literature on IS strategy was focused on designing frameworks, tools, methodologies, and techniques. However, Peppard et al. (2014) noted that not much work has been conducted focusing on IS strategy as a micro process and as a social process. Hence, in the frameworks existing in the literature not much has been done to address the complexity of today's real-life processes associated with the dynamics of multi-national organizations; nor has much been achieved in considering the processes and people engaged in the design of IS strategy and its implementation.

The IS literature does not present an organized, thoughtful, and coherent account of the subject based on definitive methods and prescriptions. There is a need for a generic IS strategy framework to reach to a theory for IS strategy for development and considering its implementation. The need for theory was emphasized in the by Lederer and Salmela (1996) as according to the researchers in order to conduct

organized and comprehensive findings on IS strategy framework, it is important to define a theory. A comprehensive theory of IS strategy was then presented which used seven constructs to devise an all-encompassing IS strategy theory. One needs to consider this early work from the researchers, even though it is more than twenty years old, as today's large multi-national enterprises were not built within the last 10 years. As some of those very large multi-national enterprises were founded more than twenty years ago, this early findings on IS strategy frameworks can still be considered to be a valid source.

Figure 13: IS theoretical strategy framework (Salmela et al., 1996)

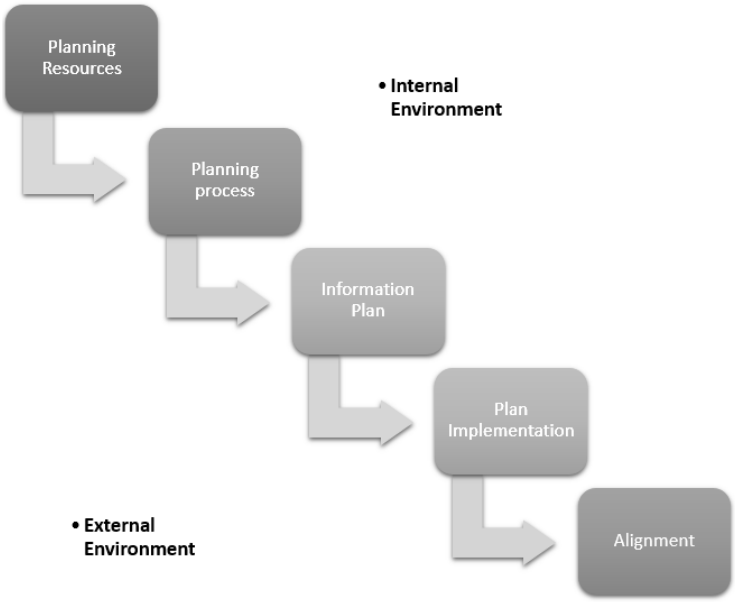
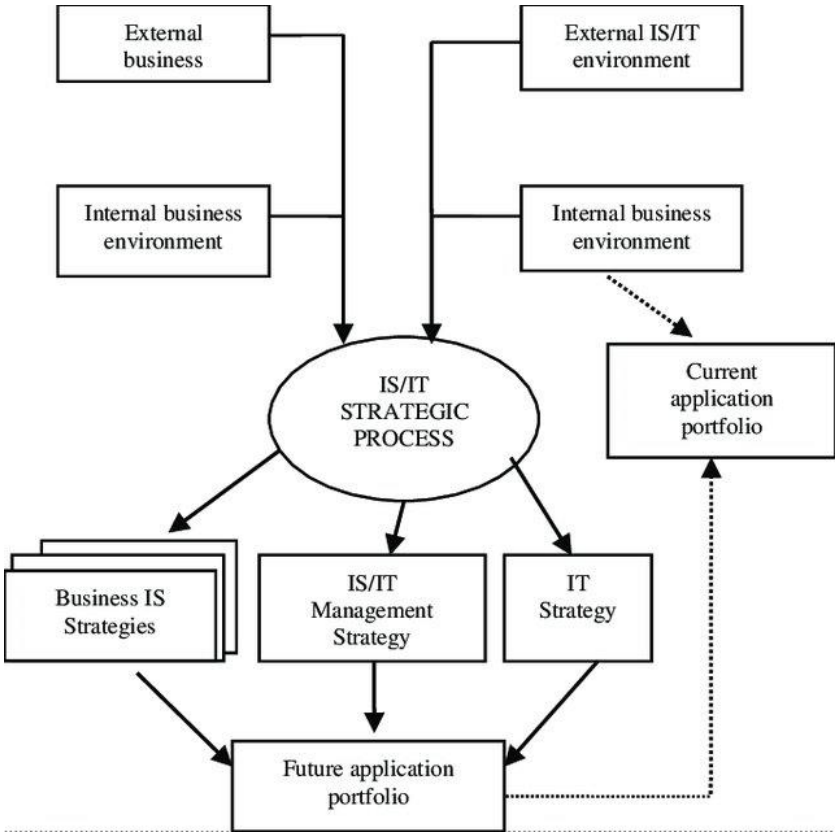


Figure 13 depicts the hypotheses constructed by the theory proposed by Salmela et al. (1996). The External environment hypothesis is established on the predicament that a stable external environment allows for a planning process which is effective and efficient. While according to the second hypothesis, a coherent internal environment is a determining factor behind an efficient and effective planning process. The third hypothesis presents that using better resources for higher quality and extensive planning can ensure a more efficient and effective planning process. The fourth hypothesis suggests that for a better formulation of IS strategy the planning process should be more comprehensive. According to the fifth hypothesis, a greater level of implementation of IS strategy is dependent upon a better IS strategy. Lastly, the sixth hypothesis assumes that with a better implementation of the IS strategy higher levels of business alignment can be achieved. This constructed theory was considered as important for this thesis and the upcoming chapter 2.3.5

Another important IS strategy formation framework was described by Ward and Peppard (2002), through the use of a comprehensive model for building blocks representation. Their framework consists of three major parts: Inputs, processes and outputs (Ward & Peppard, 2002). The input elements include the business environment both internal and external; also encapsulating IS/IT both externally and internally. The strategy formation process is inherent in the second part. While the third part encapsulates the process of strategy formation through its output elements including IT strategy, IS/IT management strategy, business strategy and future application portfolio. The figure below shows the framework for IS strategy Model proposed by Ward and Peppard (2002).

Figure 14: IS strategy framework (Ward and Peppard, 2002)



2.3.5 IS strategy development in multinationals

The development of IS strategy has been commonly referred in the literature as the information systems strategic planning (ISSP), which encapsulates all the essential elements of strategy development. An IS strategic plan, according to Earl (1989), refers to the ‘‘long term, the directional plan which decides what to do with IT’’ that is concerned primarily with ‘‘aligning IS development with business needs and seeking advantage from IT’’. As noted by Earl (1993, p. 7), an ISSP is made up of

elements such as ‘‘the underpinning philosophy, emphasis, and influence procedures, techniques, user-IS interactions, special analysis, and random discoveries’’. More recent conceptualizations of ISSP include ‘‘supporting and influencing the strategic direction of the firm through identification of value-adding computerized information systems, integrating and coordinating various organizational technologies through development of holistic information architectures, and developing general strategies for successful systems applications’’ (Segars et al., 1998, p. 306) and ‘‘thinking strategically and planning for the effective long-term management and optimal impact of information in all its forms: information systems (IS) and information technology (IT)’’ (Ward & Peppard, 2002). With the increasing diffusion of Internet-based applications and inter-organizational systems IS/IT decisions are not limited to the adopting organizations but are influenced by the actions of other organizations (Finnegan et al., 2003; Porter, 2001). To be able to plan in an environment that is increasingly influenced by the emergent nature of the inter-organizational business, organizations need to deal with various factors such as the different priorities and power of external stakeholders (Finnegan et al., 2003). Galliers (1999) suggested that ISSP frameworks need to be extended to include not only inter-organizational systems and e-commerce but also knowledge management.

McFarlan et al. (1983) were among the first to highlight the need to plan an IS portfolio based on its current and future strategic impact while Porter and Millar (1985) showed how IS/IT could shape the overall business strategy and suggested steps that organizations could follow to maximize the strategic benefits achievable from IT. The main emphasis of this approach is a two-way strategic business-IS alignment (McFarlan et al., 1983); IS/IT shapes the business strategy as well as being shaped by the business strategy (Henderson & Venkatraman, 1993). IS planning methods that have been used to align business requirements with IS/IT development include Output-driven Planning (Li & Chen, 2001) and Triple Loop Learning (Finnegan et al., 2003). More recently, however, many studies have found that these approaches are insufficient in ensuring that IS/IT plans can adapt to the increasingly rapid changes in both the business environment and capabilities of the technology (Doherty et al., 1999; Grover & Segars, 2005).

Ciborra and Lanzara (1994) and Earl (1993) argued that in order for business-IS integration to be effective, organizations need to employ less formal or less structured approaches to ISSP. Systematic, standardized and structured ISSP

approaches do not encourage innovation, learning or knowledge sharing and are unable to deal with the grey zones of work practices, beliefs, values, routines and cultures that are important in formulating the IS strategy (Ciborra & Lanzara, 1994). Nor can they create IS capabilities that enable the development of new business strategies (Peppard & Ward, 2004). Segars and Grover (1998) advocated a ‘‘rational adaptation’’ approach for ISSP by combining the need to have a formal structure in IT planning with the need to adapt to change and learning.

Limited number of studies consider the development process followed in multinationals for IS strategy. For example, Selig (1982) investigated 25 US-based multinational headquarters, Jarvenpaa and Ives (1993) surveyed 109 US-based multinational headquarters and (King & Sethi Jr, 1999) surveyed 143 US-based and 138 non-US-based multinational headquarters (Mohdzain & Ward, 2007). For multinationals, the focus has been on the harnessing the IT infrastructure with a disjointed IS strategic choices for its utilization. Although a recent study by Mirchandani and Lederer (2004) considered a number of factors affecting the degree of ISSP autonomy in US subsidiaries of multinationals, none of the previous multinational IS/IT studies attempted to establish a link between IS/IT related strategic choices or orientations in different types of IS planning approaches nor did they attempt to assess the actual or perceived success of the planning process. Finnegan and Longaigh (2002), based on a review of the literature, discussed several operational and environmental factors that explain the need for different approaches to ISSP in multinationals compared with single nationals.

It is suggested that those factors in Table 11 are particularly important when considering ISSP from the perspective of the subsidiaries (Mohdzain & Ward, 2007) since they are those that are frequently mentioned in other studies of multinational subsidiaries (Ghoshal & Nohria, 1989; Harzing, 2000; Martinez & Jarillo, 1991; Palvia et al., 2002).

Table 11: The operational and environmental factors of multinationals (Mohdzain & Ward, 2007)

The operational and environmental factors of multinationals
Operational
Numerous product lines being produced by complex processes
Dispersed or concentrated value chain activities, with subsidiaries usually focusing on parts of the value chain
The agency problem of balancing multinational interests with subsidiary interests
Subsidiary unaware or unwilling to follow corporate objectives
Need to minimize undesired duplication and overlap
Incongruent mindsets in relation to work and expectations
Need to have continual rapid learning throughout the corporation applied to dispersed activities
Environmental
Increased global competition
Geographical dispersion, linguistic differences and cultural diversity, which may shape subsidiary managers' decisions
Various host governments, inflicting different pressures
Instability of the international financial system
The need to be locally responsive and globally competitive
The need to be responsive to shifting comparative advantage

The dimensions which influence the relationship between the subsidiaries and the central body of a multinational must be carefully considered to examine the ISSP in multinational organizations. Following the work of Dunning (2013) much research in multinational subsidiaries has examined the extent of integration or coordination of global activities across subsidiaries (business interdependency) and degrees of localization, differentiation, responsiveness and the configuration of different subsidiaries (business distinctiveness).

The comparison of dependency of value-added activities between subsidiaries and central bodies is considered through business interdependency. Business distinctiveness considers how diverse are the activities of the local units in a multinational (Dunning, 2013) or how unique (or similar) are the value-added activities of a given subsidiary compared with the activities of other subsidiaries of the same multinational. In previous research, both these dimensions have been studied in terms of organizational processes, cognitive frameworks, flows of capital, products and knowledge, subsidiary autonomy (Edwards, 2002) and IS/IT configurations (Manwani & O'Keefe, 2003).

Literature shows that mainly the rights of decisions are transacted between business units and IT functions. Previous studies found that centralized IT decision-making negatively influenced the sharing of knowledge between the IT and business IT units

(Ranganathan & Sethi, 2002) and that a combination of centralized and decentralized responsibilities is a better-balanced approach. In this research, responsibility for IS planning refers to centralization (headquarters-led) or decentralization (subsidiarized) of major IS/IT decisions and roles of business and IT managers in those decisions. Interestingly, in their multinational strategy research, Ghoshal et al. (1994) found no relationship between decision centralization vs. decentralization and the quality of subsidiary- headquarters communication whereas Tsai (2002) identified that centralization has a significant negative impact on knowledge sharing in multinationals.

In their survey of over 100 US-based subsidiaries of multinationals, Mirchandani and Lederer (2004) tested nine hypotheses to explain the degree of ISSP autonomy (decentralization) enjoyed by the subsidiaries. The only hypothesis that was supported by the evidence was the extent of intercompany purchasing that reduced the ISSP autonomy of the subsidiaries (Mirchandani & Lederer, 2004). The evidence contradicted two other hypotheses, both relate to the degree of business distinctiveness that does not increase the subsidiary autonomy as might be expected (Mirchandani & Lederer, 2004). Other than the mentioned hypotheses, there were six others, but substantial data did not back them. The ISSP takes an approach of motivation through the utilization of driving forces for IS/IT planning within a multinational organization which in turn augments the initial stance taken in the ISSP. In the case of multinationals, examples of the motivation for ISSP include: to enable the transfer of IS/IT knowledge within the multinational group (Bresman et al., 1999), to encourage the subsidiaries' initiatives (Birkinshaw, 1999), to achieve economies of scale throughout the multinational corporation, and to increase the cooperation and synergy between the different business units and the corporate headquarters. The multinational strategy literature shows evidence of research conducted in the domain mentioned above. However, the core IS/IT field does not contain such empirical findings. Birkinshaw (1999), for example, found that the existence of distinctive subsidiary capabilities increased subsidiary initiative and suppressed by decision centralization and a low level of global coordination.

The approach to ISSP can be considered in terms of the relationship with business planning, the use of the specific IS planning techniques, and the role of managerial control and organizational coordination mechanisms (Doherty et al., 1999). Doherty et al. (1999) identified four different approaches, in an extensive survey built on the earlier empirically derived classification by Earl (1993). The systematic approach

emphasizes the use of planning methodologies and the production of models; the administrative approach focuses on financial and resource planning and allocation; the business-led approach is based on creating explicit links between ISSP and corporate plans and business initiatives; and the organizational approach emphasizes the importance of achieving a consensus on future plans through processes of socialization and learning (Doherty et al., 1999). The factors identified by (Doherty et al., 1999) were previously studied in the context of single organizational units; however, in terms of multinationals, such factors have not been utilized.

2.4 Business alignment

Literature shows that business alignment has been defined through the years in many different ways. Hence, reaching an all-encompassing definition is a complex task. Luftman et al. (1999) define the concept of alignment in a simplistic manner and note that alignment is merely doing the right things, i.e., effectiveness, and doing things right, i.e., efficiency. In a later study by Luftmann and Kempaiah (2008) he provides a practical definition of alignment by stating that alignment refers to using IS in a way that is appropriate to support business needs, strategies and objectives.

The definition by Henderson and Venkatraman (1993) positions alignment as the degree of fit and integration among the following four components: business and strategy, business and IS infrastructure. Chan et al. (2006), on the other hand, describe alignment as the fit between business and IS strategic orientation. Reich and Benbasat (2000) brought forward a practical definition by describing alignment as the extent to which the IS goals and objectives support and are supported by the business goals and objectives. In support of the preceding practical definition, Gartlan and Shanks (2007) agree that alignment of business and IS strategies involves the process of formulating both the business and IS strategies that are complementary to each other and also cohesive.

2.4.1 Importance of alignment

In order to ensure organizational success, according to the literature studied, it is essential to align the IS with the business intent of the organization. Studies have also shown that IS alignment and performance are connected (Almajali & Dahalin, 2011; Chan, 2002). Furthermore, according to Md Basir and Norzaidi (2009), alignment is crucial because it assists organizations in ensuring that the areas which

are needed for improved organizational performance are targeted by information systems (Das et al., 1991).

According to Newkirk and Lederer (2006), alignment enhances the understanding of business management about the importance of IS and at the same time, improving the understanding of business goals and objectives by IS managers. It also maximizes the return on investment for IS (Avison et al., 2004; Chung et al., 2003). Studies by Avison et al. (2004) and by Teo and King (1997) have also highlighted that through IS, a competitive advantage can be achieved as a result of alignment. It can be precipitated from a collective analysis of studies aimed at assessing the impacts of strategic alignment that business value can be created if the IS strategy is aimed at supporting the organizational activities and goals (Chan, 2002; Simonsen & Robbins, 1999; Teo & King, 1997). According to Lederer and Salmela (1996), critical success factors for an organization can be well established if the alignment is maintained. Through that identification, it is ensured that sufficient resources are allocated to those applications in order to provide direction as well as the flexibility to react to new opportunities (Avison et al., 2004).

In addition to the above, according to Teo and King (1997), alignment ensures that IS planning and business planning activities are in sync in order to ensure seamless integration so that organizational goals and objectives can be achieved. Alignment nurtures the backbone of an organization which further promulgates successful business operations and IS (Chan, 2002). Furthermore, studies on the topic of IS show that proper alignment in an organization can lead to a higher degree of business and product innovation (Avison et al., 2004; Bowman et al., 1983). According to the authors, IS forms the backbone for the innovative process given that a better flow of information is the key for successful business processes. Bowman et al. (1983) note that alignment can successfully speed up innovation processes to ensure that business is in sync with the competitive needs in the business environment and current trends. Others (Avison et al., 2004; Bleistein et al., 2005; Nickerson et al., 2003) conclude that aligned businesses should achieve more improved performance compared to those that are not aligned.

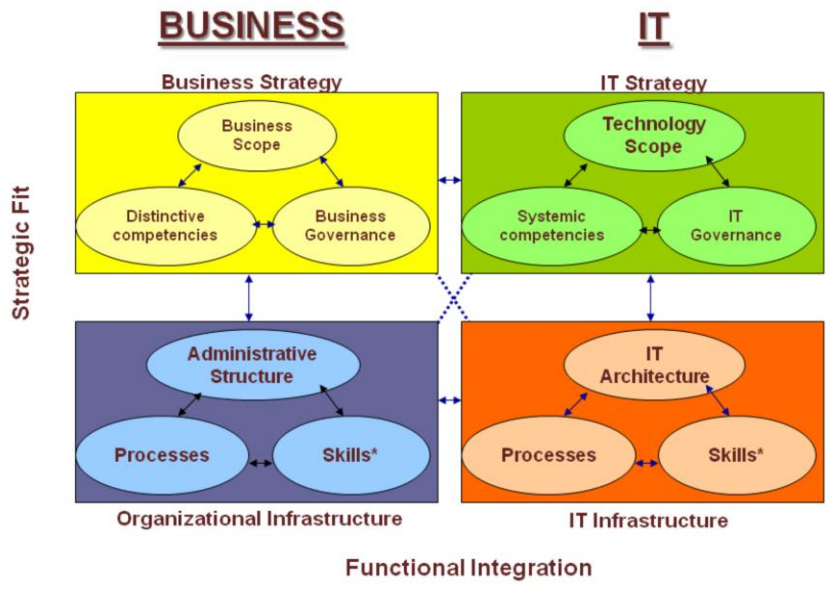
2.4.2 Strategic alignment models

This section discusses the Strategic Alignment Model (SAM) and compares it with other landmark models, to construct the underpinning of theory chosen for the study. In the early years, IT was restricted to serve soft-core purposes such as support for

the back office. The advancement over the years caused the innovation in the strategic process management through IT infrastructure and extended to performance enhancement measures. The intent of harnessing the real power of IT for organizations was primarily promulgated at MIT in 1980s (Scott Morton, 1991) which stresses upon the role of alignment in fetching the rewards expected from the IT investment. Such alignment is proposed between four key elements in an organization which include individuals and roles, management processes, structure and technology.

Henderson and Venkatraman (1993) were influenced by the MIT research in their creation of the Strategic Alignment Model (SAM), which is perhaps the most widely cited of all alignment models. Figure 15 demonstrates the four quadrants of the SAM model containing three components for each key element in an organization. In order to differentiate between the internal and external domain, a concept of strategic fit is added in the SAM model. The internal domain encapsulates the organization's administrative structure while the external domain covers the business environment of the organization. Secondly, there is an element of functional integration which separates business and IS, which means that as the business strategy changes, the IS strategy must also change in order to keep pace (Henderson & Venkatraman, 1993). Overall, the model defines four domains with the following components in each domain: scope, unique competencies, governance, infrastructure, processes and skills (Henderson & Venkatraman, 1993). The SAM framework suggests that the above components should be in harmony in order to improve alignment (Silvius et al., 2009).

Figure 15: Strategic alignment model (Henderson & Venkatraman, 1993)



In the SAM model, the concept of strategic alignment is distinct from bivariate fit (i.e., linking only two domains) and cross-domain alignment (i.e., linking any three domains) (Henderson & Venkatraman, 1993). The external perspective is dealt differently from the internal perspective in the SAM model. The potential of IT to both support and shape business policy is recognized (Henderson & Venkatraman, 1993).

The SAM model has received empirical support and has conceptual and practical value (Avison et al., 2004; Goedvolk et al., 1999). On the other hand, the literature has identified issues and limitation in the SAM model. For instance, depending on how IT-intensive an industry is, the model's applicability may vary, as the assumptions of the SAM model may not hold (Burn & Szeto, 2000). The Sam model has been extended keeping in view its limitations by several researchers (e.g.Luftman et al., 1993). Goedvolk et al. (1999) extend the SAM model by focusing on technical and architectural requirements. Avison et al. (2004) add to the SAM model, providing managers and researchers with additional practical ways to attain alignment. Their model includes projects worked on over a previous period, and in this way retrospectively determining alignment (Avison et al., 2004). The addition of project resources allows the strategic change management, monitoring of alignment process and implementation of alignment strategy.

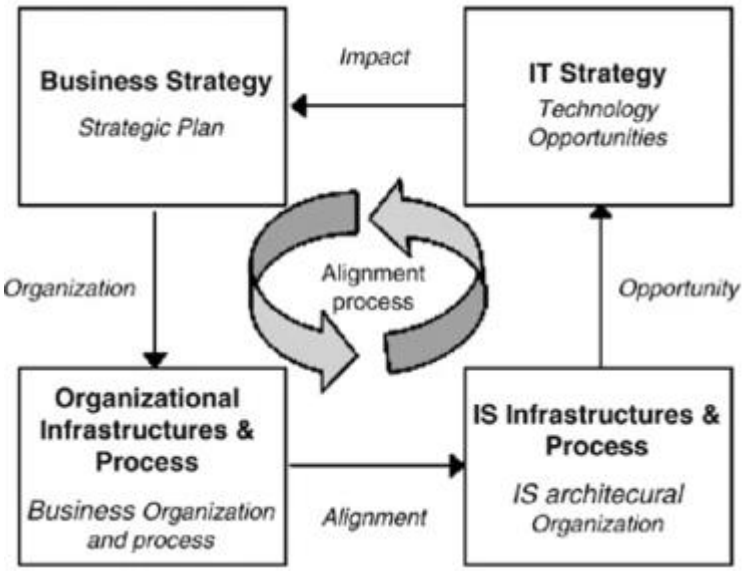
Maes (1999) and Maes et al. (2000) also extend the SAM model by producing a framework that incorporates additional functional and strategic layers. The systems providing information are secluded from the providers of information for better reliability. A new information domain represents the knowledge, communication and coordination of information (Maes et al., 2000). In order to house specific sub-architecture area, a third dimension is introduced in the model. The MacDonald (1991) model, building on MIT 1990s Framework also examines inter-relationships between business and IT strategy, infrastructure and processes. This model emphasized on the markets, suppliers and customers as the major stakeholders. MacDonald (1991) argues that in order to achieve alignment, various cycles must be run. In cycle 1, the stages include competitive potential, business value, service level, and technology potential. In cycle 2, the stages created in cycle 1 are reviewed (MacDonald, 1991).

Baets (1992) developed a model of alignment adapted from the alignment models of MacDonald (1991) and the enterprise-wide information model (Karimi, 1988). The

Baets model is similar in terms of its dimensions as to SAM model. It focuses on the interaction between business strategy, organizational infrastructure and processes, IS infrastructure and processes, and IT strategy (Baets, 1992). According to the Baets model alignment is mainly characteristic of a broader construct; which is constituted of competition, organizational change, human resource issues, the global IT platform, and IS implementation processes (Baets, 1992). Baets (1992) does challenge a SAM assumption of participant awareness of the economic environment and the corporate strategy. Baets further demonstrates that a single macro strategy is not realizable in organizational context hence, many micro strategies are required which shall further be aligned with each other in the light of the organizational goals.

It is not surprising that the Baets (1992), Henderson and Venkatraman (1993), and MacDonald (1991) models have strong similarities. Strategic IS planning integrated with the SAM model forms the roots of many research studies (e.g.Galliers, 1988). The figure below represents the Baets Model, to present its comparison with the SAM.

Figure 16: Baets model (Baets, 1992)

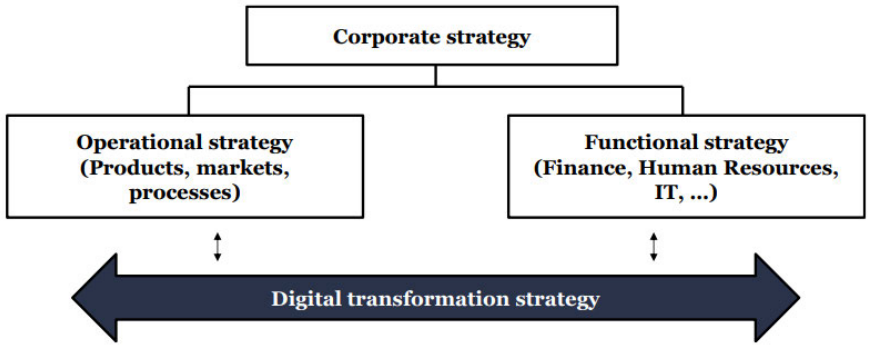


2.4.3 Digital transformation

Digital transformation is a combination of technology, people, innovation, disruption, offensive, and defense. Companies such as Uber and Airbnb have opened a new chapter in their industries with digital technologies and changing customer behaviors. And in the retail sector, e-commerce and online shopping has long been a real alternative to shopping in familiar stores. The significant changes in our

current time is based on technology. The question of what benefits people can derive from this is a matter of concern to business leaders everywhere. The fact that the most critical essential technologies differ considerably from each other does not make the task any easier. Internet of Things (IoT), artificial intelligence, augmented reality, various cloud solutions – each of these technologies are used in different fields of application and have other impacts on multiple industries. This leads to more complexity in companies, overburdening people, leading to wrong and expensive strategies, and increasing the risk of failing. There is no one-size-fits-all solution or strategy for creating a digital enterprise. Matt et al. (2015) suggest that companies should establish management practices to govern such complex transformation. Therefore, formulating a digital transformation strategy is a fundamental approach to defining a central concept to integrate the complete coordination, prioritization, and digital transformation implementation within an organization's operational and functional strategies. Hence, IS strategies usually focus on managing IS within an enterprise, with only a limited impact on driving innovations in business development. This will impact the product-centric and customer-centric opportunities that arise from new digital technologies, which often cross borders within an enterprise. Further, IS strategies should also present system-centric roadmaps for the future use of technologies in an enterprise that can support operational and functional digital transformation strategies, as illustrated in Figure 17. However, they do not necessarily account for transforming products, processes, and structural aspects that integrate technologies.

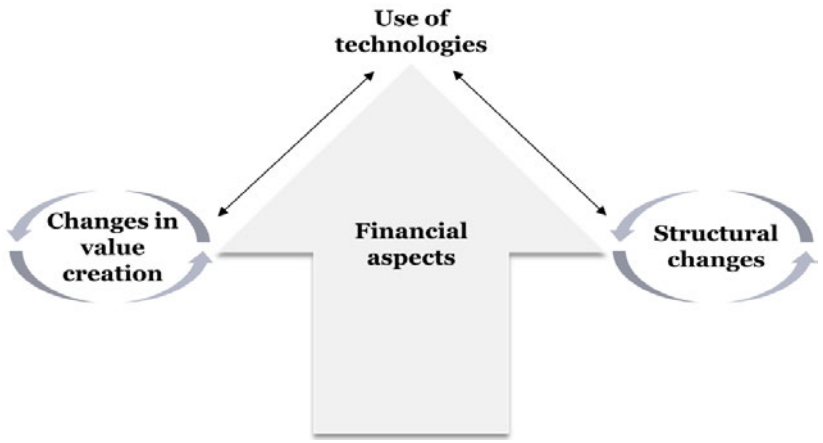
Figure 17: Relation between digital transformation strategy and other corporate strategies (Matt et al., 2015)



Each enterprise has its strategy in developing and implementing the critical factors. There are various concepts of IT and IS strategies that mostly define the current and future operational activities. Hence, IS strategies usually focus on managing information systems within an enterprise with only a limited impact on business development innovations. Another critical impact caused by digital transformation

strategies is making or buying decisions, which can lead to adopting the sourcing strategies for information systems (Hirschheim et al., 2020).

Figure 18: The digital transformation framework (Matt et al., 2015)



For decision-makers, such a framework is essential to keep track of confusing and challenging digitalization phases. The current pace of change is fast, no question. Nevertheless, it is probably slower than anything we will see in the future.

2.5 IS strategy implementation

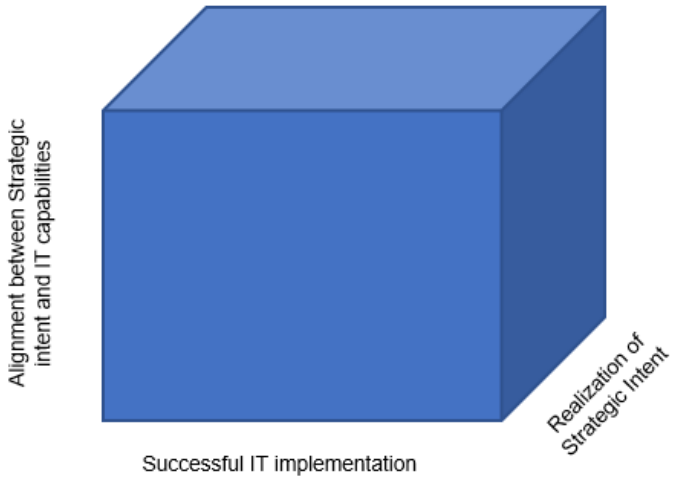
IS strategy implementation has been reported to be a complex task, especially in the multinational organizations (Boudreau & Robey, 2005). Boudreau and Robey (2005) established that strategy implementation proves to be challenging even if the strategic intent of the organization is perfectly aligned with the defined Information strategy. Regardless of other influencing factors which might hinder a smooth IS strategy implementation, the leading factor for implementation failure remains the misalignment between the strategic intent and system capabilities (Wagner & Newell, 2004). The IS strategy process is halted mainly because the strategically aligned system is not implemented. Literature shows that through a strategically defined process of IS strategy implementation one can achieve alignment in IS strategy and business intent while on the other hand, an incomplete implementation results into mutual failure as all the components of the strategy are interrelated(Boudreau & Robey, 2005; Orlikowski, 1996; Soh & Sia, 2004). The actual challenge here is to enable the capability to implement the system both on time and with acceptable risk, and in ways that fulfill the expectations of users (Silva & Hirschheim, 2007).

2.5.1 Challenges

According to Anderson and McGrath (2014) the three dimensions in IS strategy implementation include Realization of strategic intent, Alignment between strategic

intent and IT capabilities, and Successful IT implementation. Figure 19 shows the three dimensions in space. At its core is the traditional notion of strategic IS implementation as being successful only when the organization achieves intended benefits (Cooper & Zmud, 1990), which ultimately depends on how the implemented systems become embedded in new organizational practice (Doherty & Terry, 2009; Galliers & Currie, 2011; Markus, 2004; Peppard & Ward, 2004; Sambamurthy et al., 2003). Due to high levels of abstraction, however, extant accounts of IS implementation are often lump together, confound or even ignore the key challenges of strategic IS implementation outlined in the papers from Silva and Hirschheim (2007) and Markus (2004).

Figure 19: IS strategy implementation as a set of three critical dimensions (Arvidsson et al., 2014)



By making salient the constant trade-offs between system implementation risk and strategic realization risk, it elucidates how and why an imbalanced focus – here the one-sided accommodation strategy – may cause strategic IS implementation to fail (Arvidsson et al., 2014). As the root cause for failure can be found on either side, distinguishing between Successful IT implementation and Realization of Strategic intent is therefore necessary (Cooper, 2000; Markus, 2004; Robey et al., 2002). Arvidsson et al. (2014) defines critical success factors of IS strategy in the light of the critical dimensions which include: system is implemented on time, at reasonable cost and with acceptable risk (Markus, 2004) and is embedded in organizational routines and, thus, accepted by its users (Silva & Hirschheim, 2007). In contrast, the realization of strategic intent is considered successful only when organizational change necessary to realize the strategic intent underlying the implementation has occurred (Markus, 2004).

Arvidsson et al. (2014) elaborate on the reasons for IS strategy failure; they postulate that any uncertainty in the selection of capabilities of the system can cause the downfall (Mähring et al., 2004; Thompson & Martin, 2010). Arvidsson et al. (2014) further disintegrate the processes aimed at alignment and those concentrating on the realization of strategic intent. Building from constituents given in the literature, we can define Alignment between Strategic intent and IT capabilities as successful when selected system capabilities enable the strategic intent that the organization wishes to realize (Arvidsson et al., 2014).

According to the literature, the application criteria of an IS strategy greatly determines the probability of its success (Chan et al., 1997; E. Chan & Reich, 2007; Galliers, 2004; Melville et al., 2004; Piccoli & Ives, 2005; Silva & Hirschheim, 2007; Wade & Hulland, 2004; Ward & Peppard, 2002). According to Arvidsson et al. (2014) the IS strategy implementation processes are dependent on both the situated actors who implement them and the practices through which strategic change must ultimately be enacted. While assuming that in that strategy blindness – as a general IS strategy outcome– may be produced in many ways, three factors appear particularly salient to the production of strategy blindness (Arvidsson et al., 2014):

- failed specification, communication and translation of intent (Piccoli & Ives, 2005);
- IT artifact flexibility (Wade & Hulland, 2004)
- cognitive entrenchment (Ward & Peppard, 2002)

Results postulated by Arvidsson et al. (2014) lend support to prior literature that highlights the need for effective communication of the intent underlying change initiatives (Keil et al., 2000). According to Keil et al. (2000) there is more than mere communication failure occurring, in case of implementation failure in multinationals. Keil et al. (2000) further demonstrate through empirical evidence how the presence of multiple (albeit non-conflicting and overlapping) strategies can produce a legitimizing “ambiguity of intent”, which affects how change-recipients translate signaled intents during implementation and thus how strategic IS become implemented in use. The standardizing strategy enables the implementation team to justify and rationalize the view of the system as a replacement, in turn enabling their risk-minimizing, accommodation approach. By highlighting the salient role of the specification, communication and translation of intents within strategic IS implementations and affirming the important role of change-recipients as construers

and constructors of change (Balogun, 2006; Balogun & Johnson, 2005; Stensaker & Falkenberg, 2007).

Arvidsson et al. (2014) postulate that the flexibility of the IT artifact matters for the production of strategy blindness. Orlikowski (2000) demonstrates empirically that IT artifact flexibility affects its emergent use. However, the role of artifact flexibility during strategic IS implementation is little understood. The flexibility of an artifact not only affects its use but also determines which situated translations of strategic intent that are possible. According to Arvidsson et al. (2014) on the one hand, flexibility in IS strategy allowed the project team to treat the system as a technical replacement, enabling a disconnect between the strategic intent and its translation in practice through continuous adaptations; on the other hand, it proved incapable of imposing a new logic on practice and encourage or provoke change (Brynjolfsson, 1997).

Cognitive entrenchment is also an essential element in IS strategy implementation as it provides a salient source of strategy blindness. Entrenchment is viewed here as a condition in which fixed, stable frames make practices immune to changes in their environment by making situated actors ignore information that would permit or necessitate new forms of sense-making and understanding (Arvidsson et al., 2014). Entrenchment – and associated deep-rooted practices – may not only make actors blind to the opportunity afforded by new IT systems but also increase actors' perception of risk, providing grounds for disturbance-handling, accommodation approaches such as those observed here (Beaudry & Pinsonneault, 2005). Table 12 demonstrates some crucial factors which can affect the IS strategy implementation process:

Table 12: The factors influencing IS strategy Implementation

Factor	Reason	Source
Consideration of system implementation risk and strategic realization risk	In order to achieve a successful IS strategy implementation a fine balance is required in the accommodation of both these risks. If the balance is disturbed, then studies show that the implementation can fail.	Cooper, 2000; Markus, 2004; Robey et al., 2002
Embedding IS strategy in organizational routines	It is important for successful implementation that the IS strategy is coherent with the culture in an organization and does not execute alien processes.	Silva and Hirschheim, 2007

Factor	Reason	Source
Inappropriate selection of system capabilities	If the system capabilities are not selected appropriately and IS strategy is designed around them then there is a substantial chance of implementation failure as the IT capabilities might not serve the intended purpose for the flow of information.	Mähring et al., 2004; Thompson et al., 2010
The way IS strategy is enacted	The way of enactment of IS strategy plays a huge role. There are many dimensions to the enactment process which include: the participation from the higher management, the involvement of lower-level employees in planning and implementation, the amount of investment for augmenting the benefits and appropriate training for the employees.	Chan et al., 1997; Chan and Reich, 2007; Galliers, 2004; Melville et al., 2004; Piccoli and Ives, 2005; Silva and Hirschheim, 2007; Wade and Hulland, 2004; Ward and Peppard, 2002
Strategy blindness	• failed specification, communication and translation of intent • IT artifact flexibility • Cognitive entrenchment.	Arvidsson et al., 2014

2.5.2 IS strategy implementation frameworks

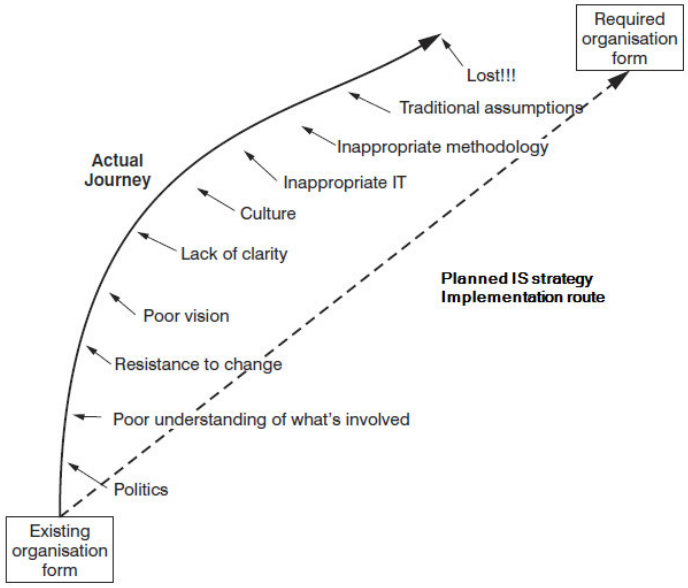
A recurring problem faced by any organization engaging in IS strategy implementation is determining an appropriate approach. Perhaps it is too ambitious to expect an existing method to be comprehensive enough to deal with all the issues involved. All organizations are different and changing an organization's form is more complex than simply identifying core processes and leveraging IT as many of the articles in the literature imply. The critical issue is to address broader themes such as culture, management development, IS/IT development, skills, reward systems, etc. These notions are complex, however, and do not subscribe to neat techniques but need to be managed carefully.

Literature shows that the traditional frameworks of IS strategy implementation have aligned IT with the business strategy, without much consideration to people issues or the organizational capability to deliver (Galliers, 1991). MacDonald (1991) provides a useful model highlighting interrelationships between the business strategy, IS/IT and organizational processes. While checking for alignment of these variables and identifying issues, he outlines the topography but fails to provide any help in reaching the required destination. It is much easier to embellish the

characteristics of the organization of the 1990s than to define clear frameworks to achieve these characteristics. What we do not have is a road map to translate these aspirations into a workable design. Additionally, the road map needs to identify potential hazards and obstacles that are likely to be encountered en route and how these are to be dealt with according to Galliers (2003).

Some essential problems a multinational organization can face in the implementation of IS strategy are illustrated in Figure 20 which might hinder the execution of the plans. The existing models for IS strategy implementation have continually failed to provide an integrating framework to help in coordinating change and uncertainty. This uncertainty requires continual learning on the part of the organization both in terms of its destination and how to get there. A new multifaceted approach which integrates business strategy IS/IT, organization design and human resources are needed.

Figure 20: The possible issues in the implementation of IS strategy by Lambert and Peppard (Galliers, 2003, p. 447)



2.5.2.1 Balanced Score Card

A recent study from Balafif and Haryanti (2020) used the balanced scorecard to test if IT can be re-engineered using this concept or framework. They changed the balanced scorecard dimensions to meet their research objectives. They used the new IT balanced scorecard (IT BSC) strategic framework for assessing the impacts of business strategic IT alignment.

The Balanced Scorecard (BSC) is a concept for implementing a corporate strategy. A BSC starts with the company's vision and strategy and defines critical success

factors (CSF), which are later mapped to the overall strategy. KPI's are defined and structured to support the objective and performance in critical areas of the strategy. Therefore, the BSC is a management system derived from vision and strategy, reflecting the essential aspects of an enterprise. The BSC concept supports strategic planning and implementation by bundling all units of a company based on a common understanding of its objectives and by easier access to the evaluation and updating of the strategy. Traditional management focused on financial accounting data with goal-related measures can no longer meet today's companies' requirements in the information age for effective planning. Kaplan and Norton (2007) introduced four different perspectives from which the activities of a company can be evaluated:

- **Financial perspective**

(How do our shareholders see us?)

- **Customer perspective**

(How do our customers see us?)

- **Process perspective**

(In which processes do we have to excel in order to be successful?)

- **Learning and innovation perspective**

(How do we strengthen our ability to change and improve?)

The benefits of introducing a Balanced Scorecard can be summarized as follows:

- A Balanced Scorecard helps to align critical success factors with a strategy at all levels of an enterprise
- A Balanced Scorecard gives management a comprehensive picture of the business
- The Balanced Scorecard method simplifies communication and understanding of business goals and strategies at all levels of an enterprise
- The Balanced Scorecard concept enables strategic feedback and learning

Martinsons et al. (1999) researched the balanced scorecard concept to validate if it can be adopted for information systems management. They developed a balanced

scorecard for information systems, measuring and evaluating information systems activities from the perspectives or dimensions: business value, user orientation, internal processes, and future-readiness. It proved that the initial balanced scorecard's dimensions could be modified to meet information systems development and implementation.

2.5.2.2 Implementation framework by Lambert and Peppard

Considering all the issues associated with the change management in a multinational organization, Lambert and Peppard (Galliers, 2003, pp. 427-459) presented a comprehensive framework for business transformation which has been used for IS strategy implementation (see Figure *21*). The framework is designed keeping in view the popular IS strategy models proposed by Earl (1989), Galliers (1991) and Ward (1990). The following framework considers the complexities associated with issues in the implementation and the organizational environment.

Figure 21: IS strategy implementation framework by Lambert and Peppard (Galliers, 2003, pp. 427-459)

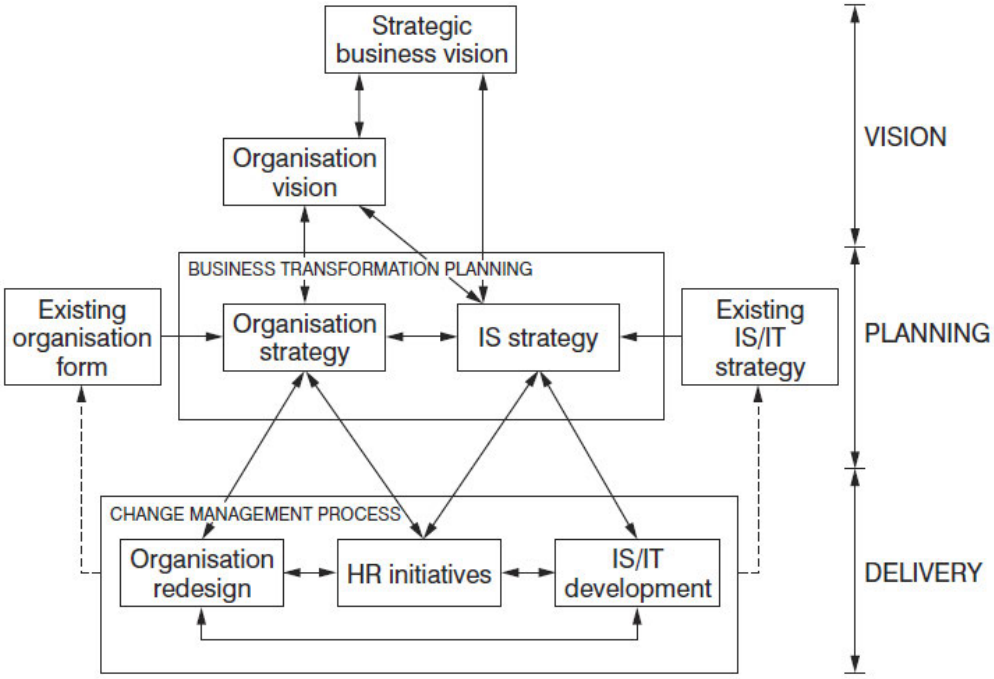


Figure 21 is based on three critical aspects: delivery, planning and vision. The underlying premise of this framework questions the traditional sequential IS/IT planning model where business strategy drives IS strategy which determines the organization's IT strategy. It incorporates an organization's ability to deliver fundamental business change, recognizing that increasingly this change is being enabled by IT (Galliers, 2003).

2.5.2.3 Hewlett-Packard business alignment model implementation

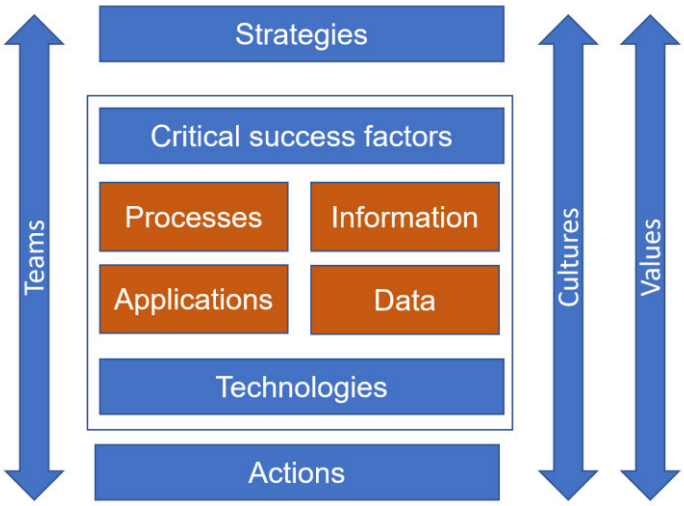
Hewlett-Packard has developed an approach where several standalone modules are defined which are exchangeable and can be easily integrated to other modules in order to provide a logical linkage between a given strategy and its corresponding actions (best practice approach). The framework used by Hewlett-Packard for this purpose is described as follows.

This framework builds a "middleware" to link strategy to actions. Strategies determine the critical success factors which in tum define the necessary business processes together with the information needs. On the other hand, the time limits, availability, cost, and flexibility of different technologies limit their selection. It is therefore necessary to translate business processes into feasible application models while translating the information requirements into feasible data models. This way, the gap between the ideal and feasible solutions can be minimized while ensuring a logical linkage between strategy and optimized actions (Peppard & Campbell, 2014). The framework focuses on two factors:

- Process changes can be made without being restricted or being limited to existing technology, applications and sub-optimal data structures.
- To demonstrate the changes in processes promulgated by the inclusion of new technologies.

According to Peppard and Campbell (2014) the business alignment framework takes into account the necessary process changes resulting from changes in the environment as well as potential advancements in technology. As any change in strategy and technology potentially results in a change in the value system, culture, and team structures, it is necessary to bring in the additional dimension of value system, team structures and culture within the overall framework, given that changes in it can be observed with the changes in the IS strategy.

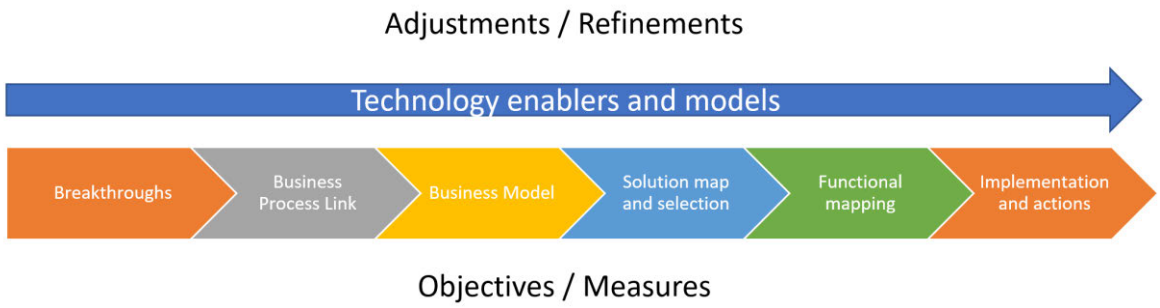
Figure 22: Business alignment framework (Peppard and Campell, 2014)



The Business Alignment framework is implemented in a structured way by cross-functional teams which include members from different organizational and functional units who have been given the charter by top-level management to initiate and implement major changes. In order to prevent tunnel vision, teams are sometimes supported by external consultants and a key role is assigned to management. According to the structure of the framework, business processes and information requirements are defined in parallel to technology enablers and models (Ward, 1990). The linkage is achieved by combining these throughout the alignment process. Objectives and measures are defined and reviewed in the light of the intended overall strategy, which may result in dynamic adjustments and refinements of existing results (Ward, 1990). The approach used in the development of the business alignment framework is summarized in Figure 23 and includes the following modules:

- Breakthrough
- Process links
- Business models
- Technology enablers and models
- Solution mapping and selection
- Functional mapping (Feurer & Chaharbaghi, 1995)

Figure 23: Implementation approach (Feurer & Chaharbaghi, 1995)

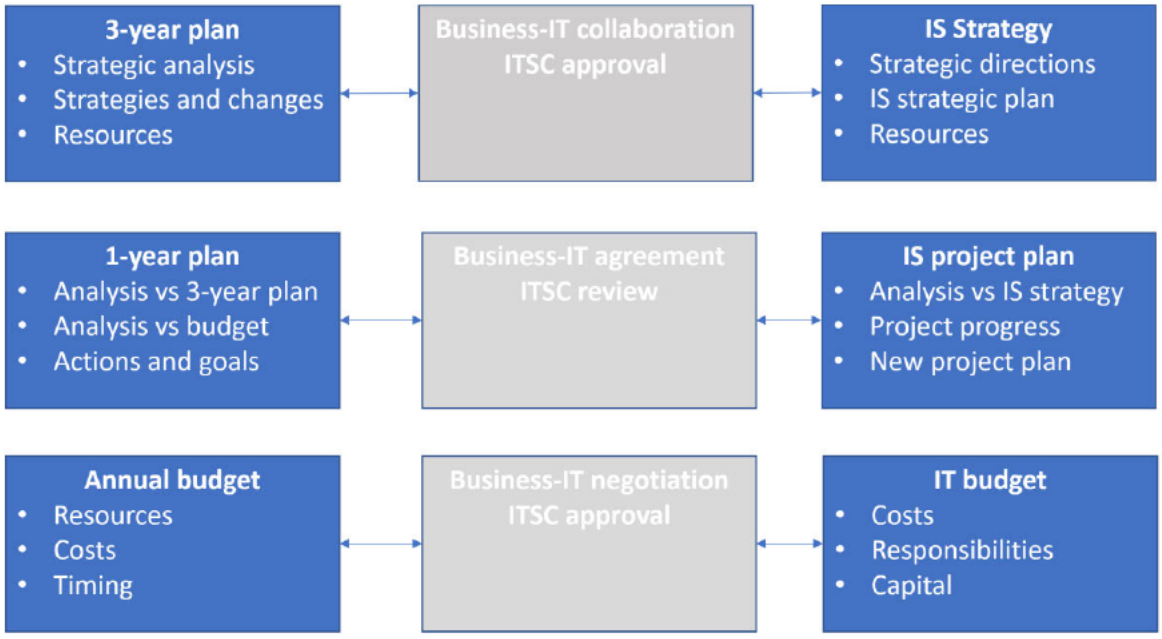


2.5.2.4 Earl's Review of IS strategy Implementation

According to Earl (1989) IS strategy formulation will not be accepted or understood and will not work unless it is practical. Therefore, the strategic application plan was described as 'a shopping list'; it must state clearly what systems need to be developed or studied. Reason for that is that a multiple methodology approach is required, as IS strategy formulation is tackling several goals at once; thus different approaches are being needed for different purposes. Portfolio planning is recommended to convert the strategically directed shopping list into a practicable plan which has a chance of succeeding only if proper alignment took place for implementation and planning in stages is recommended in order to manage expectations.

However, most organizations today have other planning procedures at work at the same time. So that IS strategic plans are globally accepted and properly considered, it is essential that they are connected with the company procedures; in other words, to use the IS strategy models discussed earlier in this chapter, IS strategy formulation must be "normalized". Thus, whereas IS strategy formulation is a complex matter the outputs and consequences must be linked with normal business planning procedures. Figure 24 demonstrates the framework of interlocking IS planning and business strategy proposed by Earl (1989) in order to successfully implement IS strategy.

Figure 24: IS and business planning interlocking framework for successful implementation (Earl, 1989)



2.5.2.5 McKinsey 7S model

The McKinsey 7S Model was developed in the early 1980s by Tom Peters and Robert Waterman, two consultants working at the McKinsey & Company consulting firm and have been analyzed more than 70 large organizations since back then (Hanafizadeh & Ravasan, 2011). The seven dimensions of the model are the key to the organizational framework: structure, strategy, systems, skills, style, staff, and shared values.

Table 13 summarizes the model dimensions.

Table 13: Mckinsey 7S model

Dimension	Definition
Strategy	Actions a company plans in response to changes in its external environment.
Structure	Basis of specialization and co-ordination influenced primarily by strategy, size, and diversity of the organization.
Systems	Formal and informal procedures that support the strategy and structure.
Style / Culture	Consisting of two components: Organizational culture: the dominant values, beliefs, and norms which develop over time and become relatively enduring features of organizational life. Management style: more a matter of what managers do than what they say; how do company managers spend their time; what are they focusing on.

Dimension	Definition
Staff	The people/human resource management- processes used to develop managers, socialization processes, and ways of introducing young recruits to the company.
Skills	The distinctive competences- what the company does best.
Shared Values	Guiding concepts, fundamental ideas around which a business is built must be simple, usually stated at abstract level, have great meaning inside the organization even though outsiders may not see or understand them

It is believed that for long-term benefit, these variables should be changed and adopted to become more congruent as a system (Hanafizadeh & Ravasan, 2011). An alignment between these seven elements presented in the model can define the probability of organizational success. These elements are categorized according to Hanafizadeh and Ravasan (2011) in so-called hard S's and soft S's. Strategy, systems, and structure form the three hard elements the others the soft elements style, staff, skills and shared values. The hard elements can also be subdivided into other key elements for each specific dimension. Regarding the high capability of the 7S model which gives a comprehensive view of every organization, Hanafizadeh and Ravasan (2011) have created their readiness model for ERP systems on this conceptual framework but it also used for IS strategy implementation. While the McKinsey 7S model can be used as the basis of the IS strategy implementation, McKinsey 7S questionnaires can also be used for discovering other associated factors in each dimension.

2.6 Gaps in the literature

From the review of the literature, it can be extrapolated that most of the extant research focuses on the techniques, tools, frameworks, and methodologies of IS strategy. Studies eliciting the micro-processes of IS strategy (or strategizing) are absent, with little research considering IS strategy as a social process. There is little or no research in more recent times reporting on the people engaged in the real work of IS strategy for multinational organizations, with the actual practice(s) of strategy similarly ignored, despite earlier interest (Galliers, 1987b). Given that multinational organizations require IS strategy to be defined meticulously considering the limit of literature in IS strategy, it is evident that there is a dire need for a comprehensive framework for strategy processes focused on the dynamics and needs for multinational organizations.

There is a need for future research to understand better the parameters for product, process, customer, and firm characteristics that impact the use of IT for globalization, and analytical research could model the relationships among these parameters. While the IT globalization mechanisms of value chain configuration, value chain coordination and local responsiveness have been separately articulated, there is a need for empirical research to identify and test relationships among the mechanisms (Schilke et al., 2009). For example, once firms configure their value chain activities, they must coordinate those activities, and the coordination includes activities that facilitate local responsiveness (Summers et al., 1999). While a multi-case study can support analytical generalization, empirical research using archival data will be required to support statistical generalization to the full population (Galliers, 1987b). Data for global firms can be collected on a cross-sectional basis to test relationships at a point in time, and on a panel basis to test the implementation of IS for globalization over a period of time (Teubner, 2007). There is also a need for future research to study the outcomes of IS and globalization, such as the extent to which the use of IS enables firms to increase foreign revenues and foreign profits (Law & Ngai, 2007).

Except for some very limited attempts (e.g. Earl, 1993; Galliers, 1987b; Pyburn, 1983), there has been little research that considers and reports on the real work of IS strategy. Teubner (2007) has presented a case study of SISP in a financial services company but failed to get a satisfying result of IS strategy and process.

From another perspective, it is noted that some limited research has focused on content (e.g., what is IS strategy) with the majority focusing on the context (e.g., success factors, barriers, value of, enablers, etc.) of IS strategy. According to Peppard et al. (2014) their understanding of the process is for the most part limited to prescriptive methodologies or means of evaluating that which the reported research considers ‘best’. From an early date, much of the research focuses on presenting prescriptions on ‘‘how to’’ undertake IS strategy – normative approaches in other words. Examples include, ‘‘systems planning in the information age’’ (Sullivan & Cornelius, 1985); ‘‘linking the MIS plan with corporate strategy’’ (Pyburn, 1983), and the ‘‘4 cycle’’ method introduced by Salmela and Spil (2002). Despite all the IS strategy research, however – and the above treatment is by no means comprehensive – it has been asserted ‘‘that practitioners largely ignore academic literature and do not use it in support of their SISP endeavors’’ (Teubner, 2007, p. 105). Indeed, research reveals that many projects defined as part of the IS strategy

have not been implemented (Gottschalk, 1999) and those that do go ahead have a high failure rate in achieving expected business outcomes.

The body of research that has highlighted the emergent nature of strategy cannot be ignored in an attempt to mechanize IS strategy framework. The peculiarities of IS require that it is given some guidance and direction, even if implicit. This raises a particular conundrum: in the absence of some guiding vision, it can be difficult if not impossible to determine what is to be achieved. Perhaps this is one explanation as to what investments in IS either fail or underachieve (Brynjolfsson & Hitt, 1998). Building and deploying systems could, and still can, take many months and even years, particularly in a global context. Even in a domestic market where legacy systems are being replaced, considerable time can be required. During this time, an organization's business environment can change drastically, as well might its strategy.

Case studies documented in the analyzed literature demonstrate that the manner in which global firms use IS will vary based on the type of product, type of process, and type of customer (Teubner, 2007). There is a need for a comprehensive IS strategy framework which can serve the needs for multinationals and enable managers to better align IS initiatives with their corporate strategies based on the products they sell and markets in which they operate (Mehregan et al., 2011). In an attempt to comprehensively define an information strategy framework, this study focuses on multi-case studies as they support analytical generalization rather than statistical generalization and addresses its limitation by discussing the historical context and plans with the experts from multi-national companies.

In light of the review of literature undertaken above, it is now appropriate to develop a provisional conceptual framework within which the research objectives set out in chapter 1 can be pursued.

3 PROVISIONAL CONCEPTUAL FRAMEWORK

3.1 Introduction

There is a need for a flexible yet focused and structured approach to IS strategy, that can put organizations in a better position to deal with setbacks and respond to new opportunities faster. However, it is nearly impossible to plan for every eventuality in today's complex and turbulent business and technology environments. IS strategy needs to be a more flexible and dynamic process that reflects a way of thinking strategically about the business operations and its global environment. Organizations still need to have a clear understanding of the marketplace and the strategic position in which they operate. Otherwise, the IS strategy might not provide the company's entire value due to misalignment and lack of systems knowledge.

Based on the literature review, no integrated model or framework for IS development and implementation in multi-national enterprises could be identified. Hence, in line with the researcher's aim and objectives outlined in Chapter 1, a new framework will be developed which interacts with, and links together, the two core topics of IS "Development" and "Implementation" based on the literature and the researcher's research into multinational companies. Most organizations follow a highly structured approach to strategy development, often under the banner of strategic planning. The conceptual framework combines IS development and IS implementation. This cannot be a totally independent process in multinational companies but needs to be part of the broader strategic planning process. As discussed in sub-section 2.3.3, the IS strategy explained the impacts on IS strategy planning process is affected by the business strategy structure. The outcome will vary if a company follows a Multi-National, Global, International, or Transnational strategy.

The process needs to consider a range of factors, which are classified here in the conceptual framework as follows: **C**osts & Benefits, **O**rganization & Processes, Human **C**apital, **P**rojects & Services, Systems **I**ntegration, and **T**echnology. These change dimensions, for which the anagram COCPIT is used here, are the first part of the new framework for developing and implementing the IS strategy. The second part of the framework sets out the processes for onward development and implementation of IS strategy and comprises five phases. Chapter 2.5.2 reviewed some of the IS strategy implementation frameworks often cited and referenced by other authors to find key success factors for a process framework. Most models describe the dependencies of tasks and the affected domains but do not provide a

structured, chronologically ordered process. Such structured processes can be defined in phases with executable actions. Based on the literature review, the phases **R**eview, **A**lign, **E**ngage, **E**xecute, and **C**ontrol emerged, for which the anagram RAEEC is used forthwith, as the process for IS development and implementation.

This chapter will provide details of the COCPIT **dimensions** and the RAEEC **phases** covering development and implementation. A combination of the COCPIT IS dimensions and the RAEEC phases constitute the main elements of the provisional conceptual framework for IS strategy development and implementation in this study. These are now considered in more detail below.

3.2 The dimensions of IS strategy development and implementation (COCPIT)

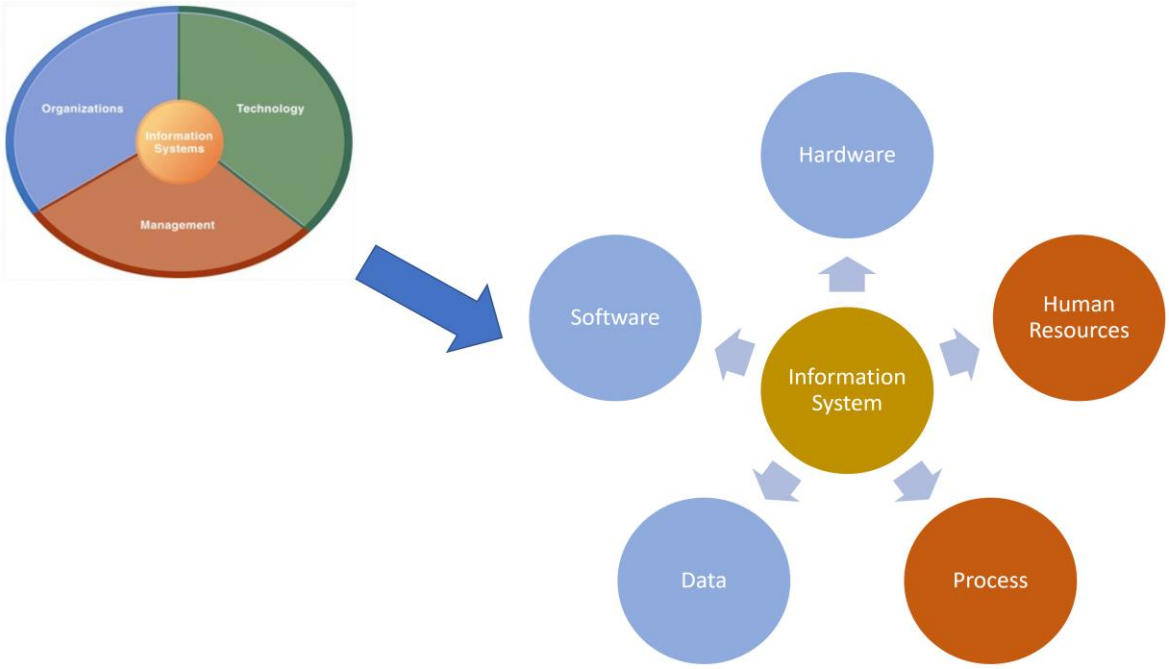
IS strategy frameworks often do not include any implementation considerations such as timing, detailed actions, deliverables, specific roles, and responsibilities as discussed in chapter 2.3.4 . Furthermore, according to Peppard et al. (2014), not much work has been conducted focusing on IS strategy as a micro process and as a social process providing any timing information on when to execute a step or a specific phase. It does not specify the deliverable(s) related to each step or phase, leading to a more generic approach. The provisional framework supports the three initial core IS dimensions (organization, management and technology), put forward by Laudon and Laudon (2015), to facilitate the development of an IS strategy that allows managers, project managers, process owners, and employees to use information systems more efficiently. The following Figure 25 visualizes the three initial IS dimension that drives the IS strategy based on Laudon and Laudon (2015).

Figure 25: IS strategy dimensions (Laudon and Laudon, 2015)

Whitten (2004) sees IS an integrated web of people, processes, data, software, hardware, and procedures that interact with each other to analyze and distribute

collected and processed information, to create value and support the systems inside and outside an organization. This definition also concurs with Beynon-Davies (2009a) who sees IS as the source of information distribution in an organization. This initial definition built the core to find and define new IS dimension for this provisional framework. A modified interpretation by the researcher emerged, an information system is a group of five components that interact to produce, collect, and distribute useful information which are, Hardware, Software, Data, Process, and Human Resources. Compared to Whitten (2004), his definition of procedures has been omitted and are integrated into the process dimension.

Figure 26: Modified view of an IS

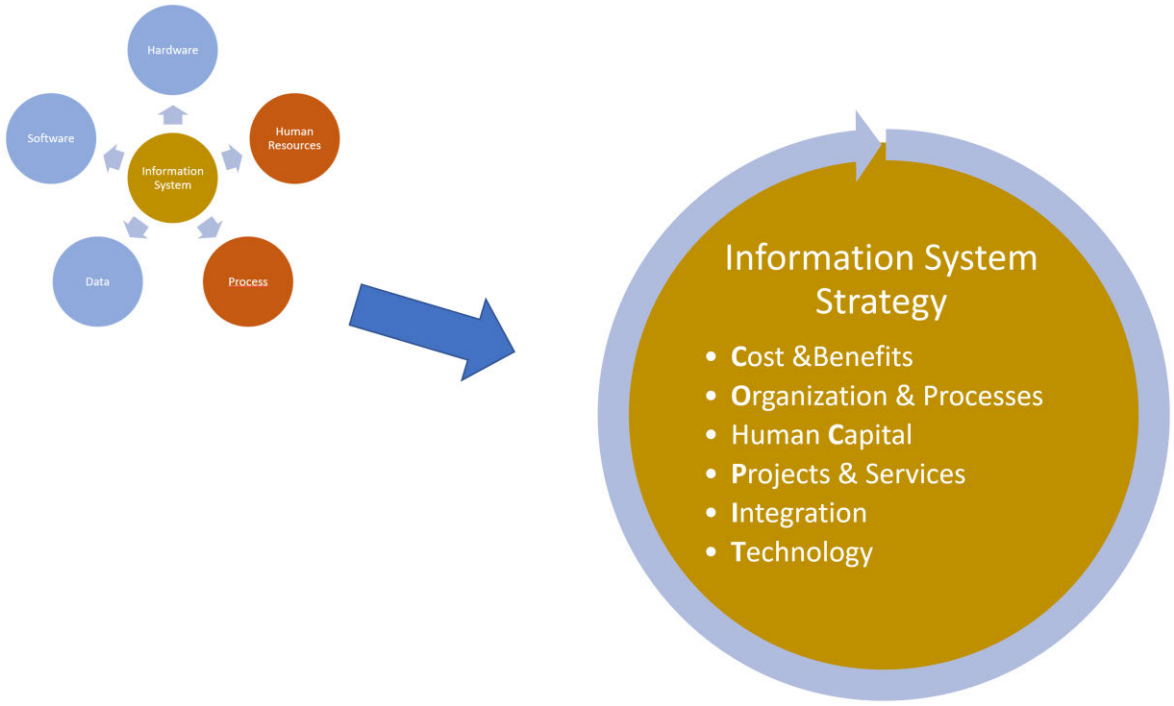


The latest work of Beynon-Davies (2019) covers the most recent analyses and descriptions on Business Information Systems. While it does not explicitly mention the IS strategy development, the chapters provide a solid contribution to new dimensions affecting an Information System, which should be considered when developing an IS strategy. Finally, the new six IS dimensions, based on Beynon-Davies (2019) work and the review in sub-section 2.2.1, are as follows:

- **C**ost & Benefits
- **O**rganization & Processes
- Human **C**apital
- **P**rojects & Services
- **I**ntegration
- **T**echnology

Figure 27 shows the new IS strategy core components based on the six identified dimensions, which cover IS strategy as a whole. Compared to the other model explained, each dimension will influence the IS. There might also be dependencies between the dimension that are not adequately addressed.

Figure 27: Dimensions for IS strategy development and implementation (COCPIT)



Finally, the new strategic IS dimensions are defined as COCPIT, the new essential elements for IS strategy development. The strategic set of questions are based on defining a new or updating an existing Information Systems strategy. The following sub-sections provide a more detailed explanation of each IS dimension.

3.2.1 Cost & Benefits

Costs can play an essential role in an IS. They must be correctly identified and estimated. Costs vary by type and consist of a variety of different elements. While cost-benefit analysis asks whether the economic benefits outweigh the economic costs of a given policy, cost-effectiveness analysis is focused on the question of how much it costs to get a certain amount of output from a policy. Hence, an IS's future organizational, management, and operating costs can be optimized when an appropriate cost-benefit methodology is applied within the enterprise. The benefits of changing service levels are those that improve system performance through new computer-based approaches. The improved information benefit is where the IS provides better information for decision-making. A matrix can present the costs and benefits associated with IS, according to Beynon-Davies (2013, p. 376).

Table 14: Types of costs and benefits examples associated with information systems

	Costs	Benefits
Tangible	Hardware and software costs	Staff savings
Intangible	Wider organizational costs	Increased customer satisfaction

The various costs associated with an IS can include expenses or losses incurred in developing and implementing an IS. Tangible or intangible costs and benefits refer to the ease of using a measure of cost or benefit. Costs that are known to exist but cannot accurately measure their financial value are called intangible costs. Estimates are only approximate. It is difficult to determine the exact intangible cost. It is often more challenging to account for benefits than costs accurately. Tangible benefits, such as completing work in less time or generating error-free reports, are quantifiable. A new IS does not easily quantify intangible benefits, such as more satisfied customers or improved corporate image. Tangible and intangible costs and benefits should be taken into account in the Review and Align phases. Direct costs and benefits are costs that are directly related to the system. Immediate benefits can also be explicitly attributed to a given project. Indirect costs are not directly related to specific activities in the system. They are often referred to as overheads. Indirect benefits are realized as a by-product of another system. Regardless of how the IS is used, some costs and benefits remain the same. Fixed costs are considered sunk costs. Once encountered, they will no longer occur.

3.2.2 Organization & Processes

Beynon-Davies (2019) defines an organization as an open system that cannot be seen as isolated. He further puts forward the view that systems have been applied to both hard and soft systems. Hard systems are those in which the goals of the systems are relatively unproblematic. Many technological systems are hard systems. A soft system is a social system designed to meet certain objectives. The objectives of a soft system may be problematic or open to interpretation. This dimension addresses the soft system of an organization, focusing on organizational impacts that emerged from structural challenges in multi-national enterprises and focusing mainly on IT departments. The complex and changeable external environment requires companies to improve their IS continuous. The process approach has been widely used to create effective business management systems; many companies around the world are transforming from a functional organization

of production to technological according to Sidorova et al. (2020). Furthermore, they have seen it as relevant to study the development and improvement of an enterprise's business process to address the impacts on IS. Improved business processes can also enhance the competitiveness of the business and make it more sustainable in times of crisis. The classification of business processes in an enterprise is essential. The management understands what processes are existent in the company and why they are needed. It is necessary to adjust all business processes in a flexible system to not overlap each other without covering any aspect of the enterprise. This dimension addresses all company business processes designed to create value for customers (goods, services), support their activities, and optimize performance on IS.

3.2.3 Human Capital

This dimension combines skills, culture, and human resources. According to Briscoe et al. (2012), any aspect of our business experience, beliefs, and understanding of culture impacts the outcome of a business enterprise. Without insight, we cannot expect to gain credibility, goodwill, motivate employees, or develop marketable products. These insights can be translated directly into bottom-line results. Culture influences the way we build and maintain relationships. It plays an essential role in determining the success of colleagues and partners. This dimension helps to understand how culture fundamentally affects how the company runs the business, what characteristics and skills are needed to look for when selecting people, how to develop global talent, how to hold efficient meetings, and how to manage our employees and work with local or decentralized teams.

3.2.4 Projects & Services

The dimension addresses how the IS are managed and how IS projects are executed. Stair and Reynolds (2020) summarize the successful implementation of an IS to be a difficult task. First, the implementation of an IS is a process of mutual transformation; the organization and the technology transform each other during the implementation process. When this is foreseen, IS implementations can be planned strategically to help transform the organization as well. Hence, a proper change management must be established. Second, such a process can only be successful when central management and future users are properly supported. Implementing a top-down framework is crucial to turn user input into a coherent steering force, creating a solid basis for organizational transformation. Finally, the management of IS implementation processes is a careful balancing act between initiating

organizational change, and drawing upon IS as a change, without attempting to pre-specify and control this process.

3.2.5 Integration

Integration encompasses the concepts of Business Alignment and Governance. It focuses on the general role of the IT departments in a global and local context and how IS should operate and be aligned with the overall business strategy, and which group policies need to be addressed. The concept of IT-business alignment entails IT and business working in communion as researched by Njanka et al. (2021). This paper defines the alignment between business and IS as the degree of fit and integration between business strategy, IS strategy, organizational infrastructure, and IT infrastructure. More precisely, alignment is the degree to which business and IT depend on one another and share their domain knowledge to achieve a common goal. Chi-Hung et al. (2012) emphasize the importance of group level capability, that the organizational capability of businesses should not only address each individual function within an organization, but rather the coordination and integration of different functions. However, when selfish departmentalization begins to increase its hold across various departments, the organization can be harmed instead. As a result, coordinating and adjusting mechanisms to encourage cooperation between departments is even more important in the development of an IS strategy. When independent departments with mutual linkages are managed through coordination and cooperation mechanisms, this risk can be minimized. In addition to being able to control, integrate, and allocate organizational resources, organizations with better coordination capability would be able to use their resources appropriately in improving their organizational performance. By incorporating this dimension as part of IS strategy, those obstacles should be overcome.

3.2.6 Technology

The last dimension addresses the design of IT infrastructure and applications. It defines how the IT infrastructure is set up and covers the make or buy decision such as the degree of using standard applications or custom applications. The book of Stair and Reynolds (2020) provides insights to this technology dimension. It is recommended that the system development should take advantage of the latest developments in technology. Designing new systems should also reduce total costs. With the high cost of many commodities today, some systems development efforts should also focus on the communications layer to enable fast and secure access to applications. Beynon-Davies (2019) summarizes this dimension thus: An IT system

can be defined using either key components or key functionality. In terms of key components, modern IT consists of hardware, software, data management technology and data communication technology. In terms of functionality, an IT system comprises several interacting subsystems: an interface subsystem, business rules subsystem, transaction subsystem and data management subsystem. Processing is likely to be distributed using an n-tier client-server architecture, which separates out the layers of the IT system and distributes them at various points around the communication network.

These new strategic IS COCPIT dimensions are the essential elements for IS strategy development, on which the strategic set of questions are based in chapter 4 to define a new or updating an existing Information Systems strategy.

3.3 The process of IS strategy development and implementation (RAEEC)

Chapter 2.5.1 discussed the processes and challenges in the implementation of IS strategy and covered five cited implementation frameworks by other researchers. The five discussed frameworks are the Balanced Score Card, Framework by Lambert and Peppard, Hewlett-Packard Business Alignment, Earl's Model, and the McKinsey 7s model. The implementation framework proposed by Lambert and Peppard covers the Vision, Planning, and Delivery and provides valuable inputs for a new framework. A critical perspective is the integration of the existing organization form and the IS/IT strategy.

The RAEEC phases build upon many of the concepts in the above noted frameworks. Based on elements evident in many of these frameworks, a process for analyzing the past IS strategy and decisions named Review emerged. The Hewlett-Packard model's core element builds a middleware to link strategy to action, which determines the critical success factors and defines the necessary business processes together with the information needs. This element provides the basis for defining an Align phase in the conceptual framework. Earl's IS model covers the strategic application plan with elements that clearly state what systems need to be developed or studied. This is seen as an Engagement phase. Finally, McKinsey's 7S Model consists of seven dimensions which can be seen as the key to the organizational framework: structure, strategy, systems, skills, style, staff, and shared values. Hanafizadeh and Ravasan (2011) have created their readiness model for ERP systems on the McKinsey's conceptual framework and also used it for IS strategy implementation. While the McKinsey 7S model can be used as the

basis of IS strategy implementation, McKinsey 7S questionnaires can also be used for discovering other associated factors in each dimension. Based on their validation to apply this framework of IS strategy implementation, the phase for Execution can be addressed. Finally, the provisional conceptual framework also takes some elements of the balanced scorecard model as described in chapter 2.5.2.1. This concept can also be used to implement a corporate strategy, or an IS strategy, according to Balafif and Haryanti (2020). They changed the balanced scorecard dimensions to meet their research objectives and used the new defined IT balanced scorecard also to measure the success. As one of the core elements of the IT balanced scorecard is to define goals or KPI's. Hence, this model seems to be appropriate to support the provision framework's implementation phases, including the final phase Control. As the objective of an IS is to provide relevant information to the user, to gather the data, processing of the data, and communicate information to the user, it is essential to address the todays and future challenges by extending and modifying the standard balanced scorecard to meet the needed process requirements to develop and implement an IS strategy.

The execution of IS strategy development and implementation considering the discussed implementation frameworks and models can be summarized in the following process phases:

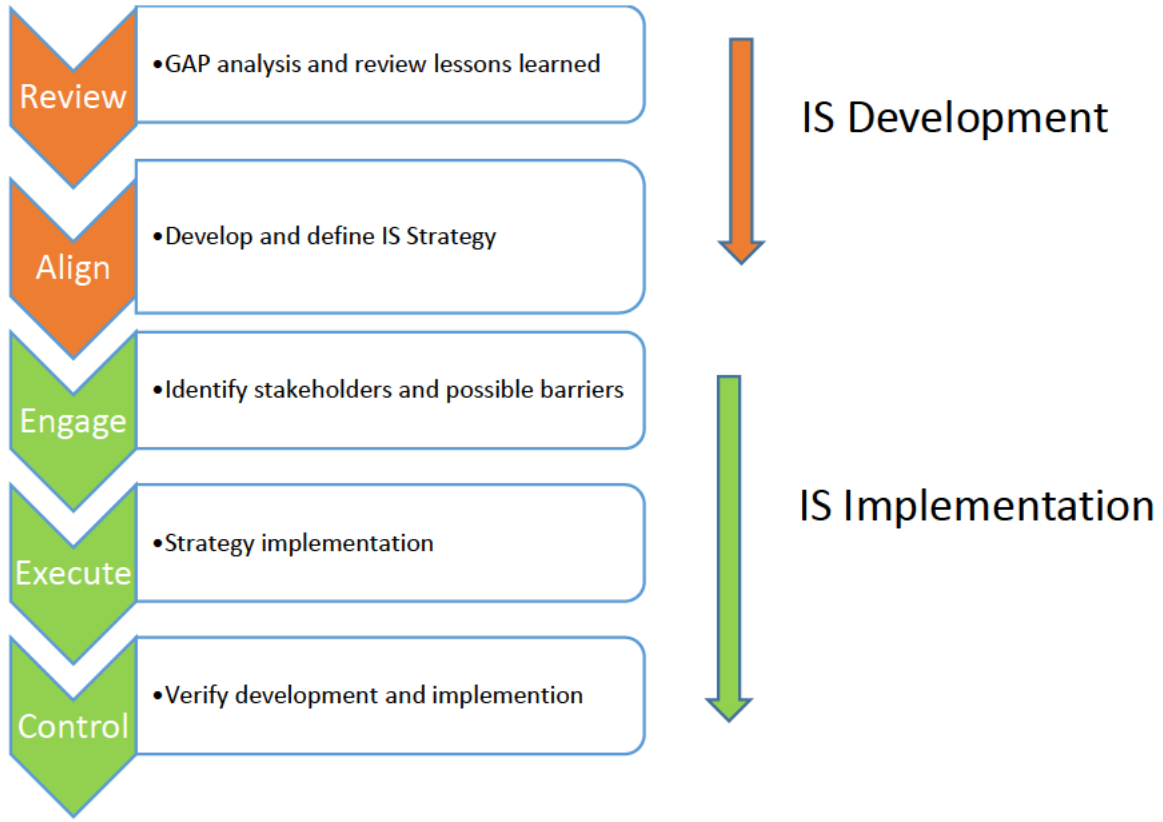
Table 15: Core elements of RAEEC

Process Phase	Contains core elements of
Review	Peppard and Ward
Align	Hewlett-Packard
Engage	Earl
Execute	McKinsey 7s
Control	Balanced Score Card

The provisional framework combines development and execution phases. It includes an additional control step before a completely new planning cycle starts again. It will ensure the quality and lead to lessons learned. Another essential step of the last phase is to check if all the agreed strategy projects were successfully implemented to avoid overlapping and confusion when developing the new IS Strategy in a new cycle. The whole process can be grouped into two core processes. The IS development consists of two phases, Review and Align. Once they are

completed, the IS Implementation follows with the phases Engage, Execute, and Control. The name of the five phases leads to the name of the processes, RAEEC. Depending on the size and complexity (structure) of a multi-national enterprise or company, each phase and its steps might need different times to complete based on the companies' planning cycles. Hence, a time frame or time horizon cannot be suggested or provided for how long it needs to complete the entire RAEEC cycle.

Figure 28: Five phases RAEEC processes



3.3.1 Development phases

For IS development in a multi-national company, the provisional framework builds on the two phases Review and Alignment. This framework can help prevent misalignment as a company only performs at its best when all the subsidiaries and the headquarter agree with the framework's steps within each phase. A disagreement or misunderstanding might result in failing to define an appropriate IS strategy for the organization or choosing inadequate technologies. This may result in higher costs, subsequent re-work and delays in the IS development process. Each phase can have multiple tasks that can be different and adjusted based on the company's global setup and the political, cultural environments from the subsidiaries.

The Review phase should provide information about the latest business strategy and consider both internal and external factors. It should also provide a summary of the effectiveness of the present IS strategy based on goals or project KPIs and list possible GAPs from the actual IS strategy. An important review is the analysis of the latest technology trends which were assumed when the current IS strategy was defined some years ago to understand how technology emerged and how it affected the actual IS. The second phase Align, should evaluate the current state of technology, and collect future business requirements based on the corporate strategy and other departments. A crucial element is to identify any cultural issues which might affect the future IS strategy. Finally, adjust IS strategy based on COCPIT dimensions and define the success measurements.

This new provisional framework's key argument is the contention that strategies based on productivity improvement and its information systems to support them will become the dominant paradigm in today's global environments. This framework will attempt to bring together the elements of strategy formulation, information systems, and the mechanisms by which the information systems function is managed. The core step or task in the IS development process is the "Adjust IS strategy based on strategic dimensions". In this task, a set of strategic questions need to be answered based on COCPIT, which will lead to a new IS strategy or lead to a change or update of the current IS strategy. The framework is based on three critical aspects: delivery, planning, and vision, and the underlying premise of this framework are modified to consider internal and external factors (Mohdzain & Ward, 2007) as suggested in Table 11 and the planning aspects and the premise that organization's vision drives organization strategy and IS strategy. The organization's vision triggers a top-down approach for organizational strategy and IS strategy and not a bottom-up.

3.3.2 Implementation phases

The review of the literature has identified how IS strategy is developed and implemented in multinational environments and supports a new conceptual framework for the IS strategy implementation. The provisional IS Implement process is based on the implementation frameworks by Earl, McKinsey, and the IT BSC, considering all the issues associated with the change management in a multinational company. Those frameworks are designed to keep in view the popular idea of strategy models and frameworks, and they consider the complexities associated with issues and implementation and the organizational environment. Pre-defined KPIs from the modified balanced scorecard approach can lead to a

Strategy as Practice approach within the organization. The IS Strategy implementation has the following three phases: Engage, Execute, and Control.

- The Engagement phase determines the performance level of the organization and identifies areas of concern and organizational barriers. This phase can be seen as a pre-launch for the projects and prepares the organization for the upcoming changes.
- The Execute phase is the core of the implementation process. Within this phase the implementation roadmap will be developed to bridge possible gaps and consider organizational policies for implementation. Furthermore, it defines a proper implementation and project methodology and initiates projects and change management processes which can be further defined into high-level tasks and milestones for the implementation. In addition, a list of KPIs and success criteria measurements are developed.
- The Control phase validates and verifies the successful implementation of the IS strategy based on the IS Strategy success criteria measurements defined in the previous phase. This can be done by internal or external audits or by the project management office (PMO).

3.4 The interaction matrix of dimensions and processes

The core of the provisional framework is the combination of the COCPIT dimensions defining the IS strategy development and implementation. The RAEEC phases define the processes for IS strategy development and implementation. In a sense, the matrix represents the What and How. The following table is the final provisional framework used for further validation in this thesis.

Table 16: Provisional COCPIT / RAEEC framework

Dimensions / Process	Review	Align	Engage	Execute	Control
Cost &Benefits					
Organization & Processes					
Human Capital					
Projects & Services					
Integration					
Technology					

The green interaction fields can be completed with the key contribution facts from the findings based on the expert's interviews. The matrix will be validated and

amended in chapter 6 and lead to the final framework and contribution to theory and practice.

3.5 Summary

This chapter has set out the provisional framework for IS development and implementation based on the literature review and the researcher's experience.

The main IS dimensions have been identified and have been described. The dimensions underpin the development of the IS strategy, and there are inevitably interactions between them. Hence, the IS strategy can be seen as a complex construct depending on the interactions and the systems used in an organization. Furthermore, the process phases for development and implementation were specified, these being Review and Align phases for strategy development and Engage, Execute and Control phases for strategy implementation.

The final provisional framework can be seen as a model based on structured process phases, based on existing frameworks and models for IS strategy development and implementation. It combines the IS dimensions (What) and the processes (How) by using the COCPIT-RAEEC matrix. The matrix may be applied to a very complex reality, depending on the details of its dimensions and processes in practice, reflecting the complexity and the organizational structure of a multi-national enterprise.

4 RESEARCH METHODOLOGY

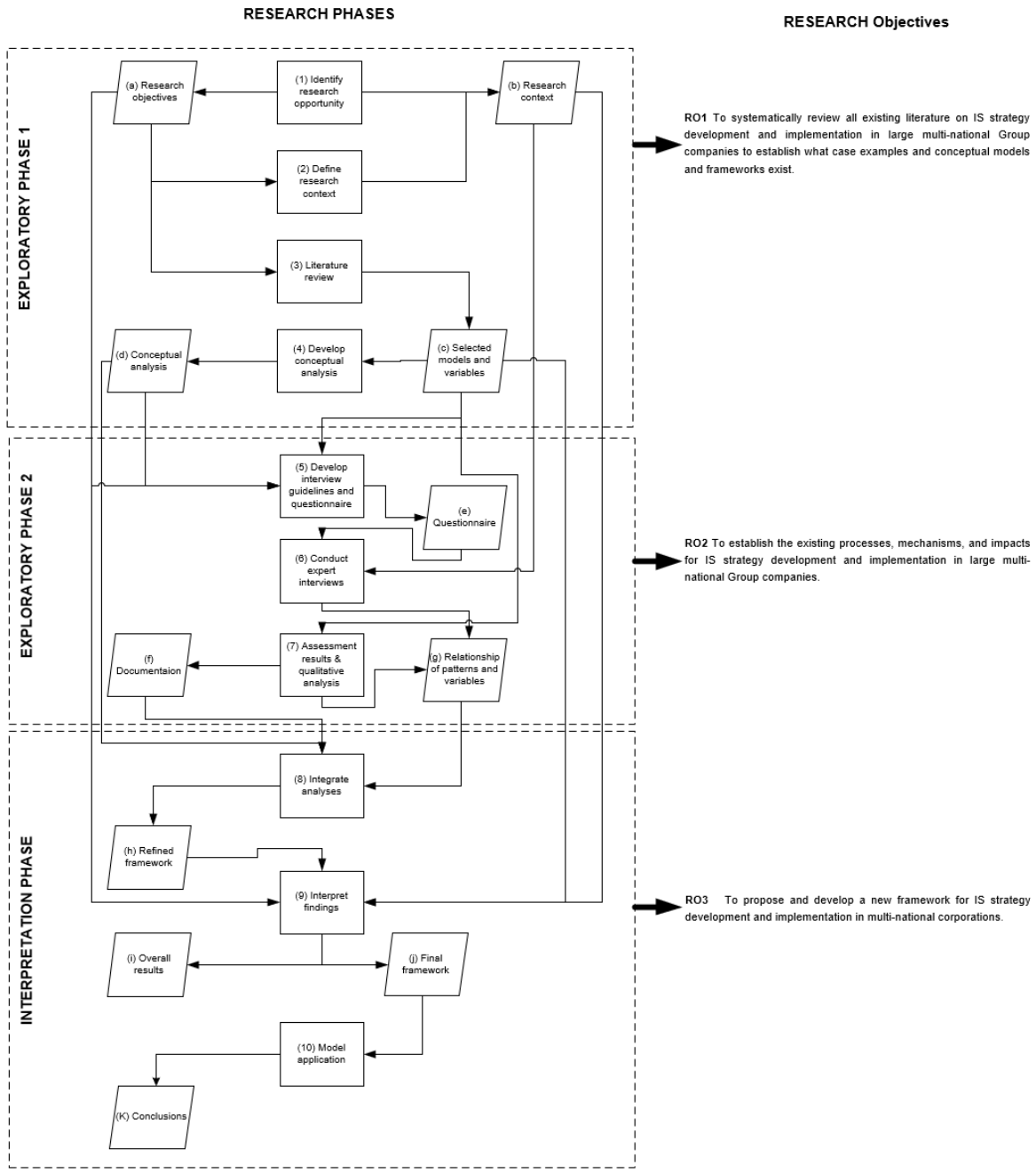
4.1 Introduction

This chapter is structured around five topics relating to research methodology. The first topic is the research process which is graphically illustrated. The research process consists of activities that provide outputs and outcomes relating to the conducted research. The three defined phases, exploratory 1, exploratory 2, and interpretation, are graphically represented and discussed in their objectives and related activities. Second, the theoretical support for the selected research approach is presented for data collection and analysis. Primary data were collected from several semi-structured expert interviews, both at headquarters and in subsidiary companies of multi-national Groups. The collected data was analyzed using coding into themes and topics, then translated into a formal framework for IS strategy to address development and implementation. The third topic that is addressed is the philosophical assumptions for the narrative strategy. The fourth topic is the ethical aspect of this research. Finally, the last topic summarizes this chapter.

4.2 Research process

The research process guides and explains how the aim and objectives of this research are related to each research phase and their respective activities. Figure 29 illustrates the overall methodological references applied in this research. Although a flow diagram is used to describe the research process in this research, the execution was not necessarily linearly applied. This research process involved several iterations which helped to refine and improve the outcomes of this research. These iterations are not indicated and illustrated, since a linear sequence can better exemplify a set of phases and their corresponding activities and outcomes. The main purpose of Figure 29 is to make clear in- and outputs along the research process.

Figure 29: Research process flow



The dotted lines (squares) representing the three phases: exploratory 1, exploratory 2, and interpretation. In each phase, square boxes represent the executed activities, and the rhomboids indicate their outcomes. The **exploratory phase 1** generates two main outputs (c) *selected models and variables* which provide theoretical support for the development of the semi-structured questionnaire in the exploratory phase 2 and by the (9) interpretation of the findings in the integration phase. The outcome (d) *conceptual analysis* identifies the important arguments in the rationale of IS strategy development and implementation. In the next phase, **exploratory phase 2**, there are two other main inputs from the previous phase, (a) the *research objectives* and (b) the *research content*. The preceding phase is providing the inputs

for the design element for the questionnaire and the interview guidelines. Moreover, three outputs are generated (e) *questionnaire*, (f) *documentation*, and (g) *relationships of patterns and variables* from this phase to serve as core input for the next interpretation phase. This final **integration phase** provides three outputs (i) *overall results*, which is presenting the content for this research, (j) *final framework*, adds to the body of knowledge and contribution to theory and practice and lastly, (k) *conclusions*, which is provides answers to the research objectives.

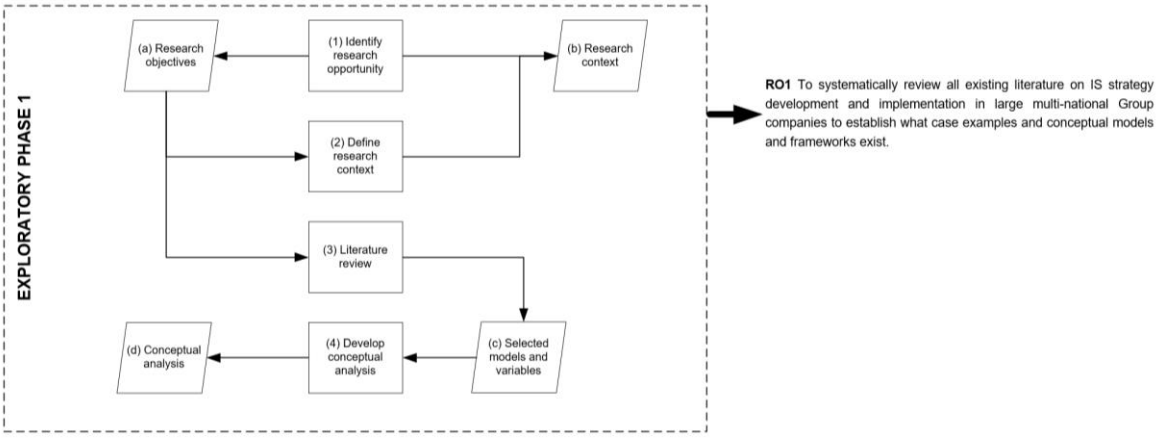
4.2.1 Exploratory phase 1 (conceptual constructors)

This phase was driven by three main activities in support of addressing research objective RO1.

- Search and compile relevant literature for IS development and implementation with focus on multi-national enterprises and its implications
- Examine and read through literature
- Develop the conceptual arguments for the analysis of the collected information

The main activity in this phase was the compilation of literature to identify and examine theoretical constructors for development and implementation of IS strategy. The rationale of selecting these constructors was based on available frameworks in this area. A selection process, which had many iterations, was conducted to identify representative journals, books, and conference papers, concerning the development and implementation of IS. Online resources for those materials were the primary use case. Many databases were used based on the university's access permissions.

Figure 30: Exploratory phase 1 flow



Selecting the useful articles, books, and various papers, permitted a drill down to other relevant sources. Although, this activity was performed mainly at this phase, additional searches along the whole research process allowed updates to

compilation of relevant articles. One of the main outcomes of this phase was analyzing the various theoretical models developed by other researchers which support the development and implementations IS strategies. Those results tended to provide the conceptual insights for proposing a new framework as well as a guidance for the future data collection process.

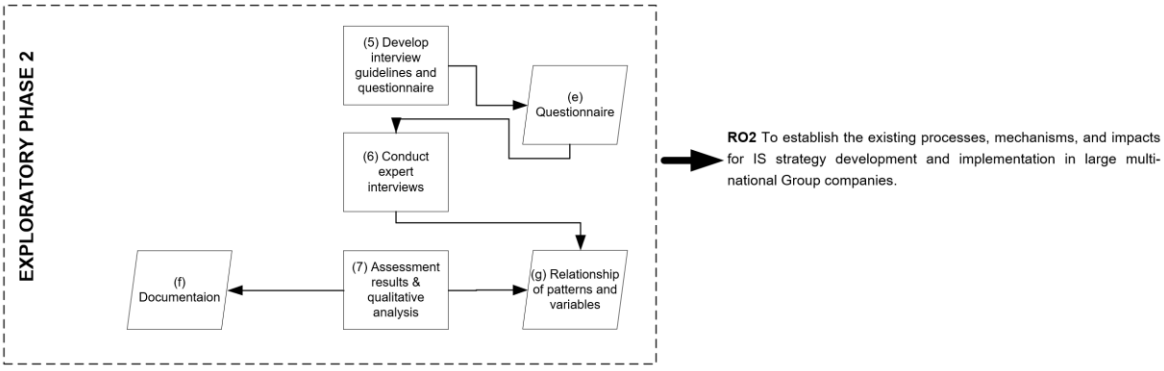
4.2.2 Exploratory phase 2 (interviews)

This phase entailed three activities to address RO2.

- Establish the existing IS development and implementation processes
- Determine how are they linked and what are the mechanisms behind them
- Assess what are the impacts

By choosing the narrative research strategy, semi-structured interviews were conducted with experts working in large multinational companies. In this sense, the study adheres to a qualitative approach utilizing the narrative research strategy. The qualitative research method will be employed as it seeks answers to a question, systematically uses a predefined set of procedures to answer the question (Rowley, 2012), collects evidence, and produces findings that were not determined in advance and are applicable beyond the immediate boundaries of the study (Ghauri & Grønhaug, 2005)

Figure 31: Exploratory phase 2 flow



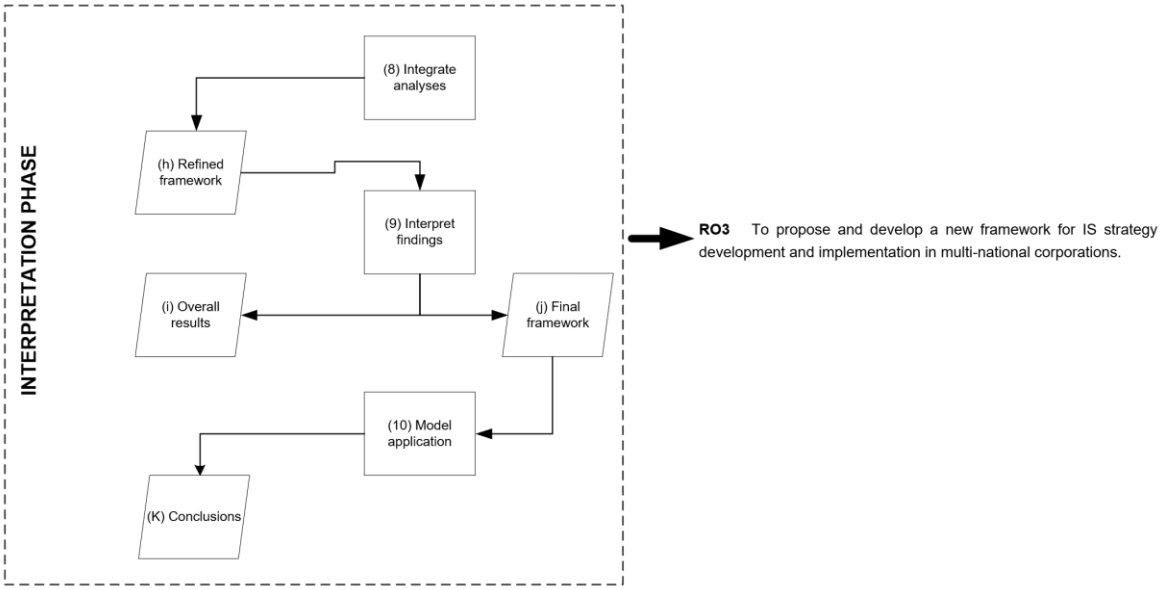
4.2.3 Interpretation phase (data interpretation)

This phase was driven by two objectives to address research objective RO3.

- Develop a new framework for IS development and implementation
- Put forward and present the framework for application and testing

The integration and reduction of the qualitative data was executed in this phase, where the main tasks were the interpretation and consolidation of the gathered information (data) and test the framework in a real case scenario. The aggregated analysis was based on the interpretation based on the previous phases exploratory phase 1 and exploratory phase 2. This final interpretation was the result of the previous phases which converged after an independent analysis within each phase to consolidate the final analysis and discussions. This research has proposed and a new framework for IS development and implementation that provides a set of management practices and cultural issues that reflect and reference to practical implementations. The generalization from this phase has drawn specific implications in particular domains of various actions. After the interpretation of the findings, the final framework was presented and applied.

Figure 32: Integration flow



4.3 Theoretical support for the research phase

4.3.1 Approach to theory development

The development, application, and dissemination of knowledge in the field of strategy formulation and implementation is in the domain of academia, consultants, and industrialists. However, each group is focused on relatively different approaches to research and goals. The issue in the IS strategy research for organizations is that most of the research is carried out by academia, who are restricted to external environment considerations and have shown the tendency to ignore complications that arise internally, which are essentially unique to different organizations. Several disadvantages can be associated with this freedom of academia, which relate to the

use of incomplete information and the existence of potential goal conflicts between researchers and users. The information used by academia for analysis purposes is usually acquired through surveys, secondary studies, interviews, or short industry visits. The developed knowledge is hard to be categorized in the form of its social, cultural, and political standing which makes the acquired information haphazardly fragmented. The difference between the objectives of users and researcher give way to conflicts of goals. Academic researchers are interested in knowledge acquisition, while organizations aim to maximize their performance. This often results in a lack of co-operation as the research objectives of academia do not correspond directly with organization goals. This lack of co-operation culminates in the generation of partial knowledge (Chen & Hirschheim, 2004).

Table 17: Interpretivism philosophy (Saunders et al.,2019)

Ontological assumption (nature of reality)	Epistemological assumption (what constitutes acceptable knowledge)	Axiological assumption (role of values)	What methods do you follow to undertake such a study?
• The reality is complex; it has multiple meanings, • Culture and language construct the reality • There is no one true reality • Reality is having diverse interpretations, experiences and practices • For instance, a reality "attitude towards GM crops" is not the same for all the farmers; it varies on the temporal, spatial, situation and personal aspects.	• Simple theories and concepts • What a respondent farmers narrate, his /her stories (success or failure), perception and interpretations constitute knowledge • New understanding or a worldview either expressed by a respondent farmer or interpreted by the researcher constitute knowledge	• Values of the respondents and the researcher is an important aspect required in the research – value-bound research • A researcher is a part of what is researched • Subjectivity is the essence of research • Researcher reflexive, which means as a researcher we examine ourselves that, how our assumptions, perceptions and conceptual understanding affect various decisions in the research process	• • The inductive research approach is followed (Theory building) • Research strategies like case studies, ethnography, grounded theory are adopted • Small sample size • In-depth interviews, focused group discussions • Qualitative methods of analysis – qualitative content analysis, thematic analysis • Range of data (number, text, visuals, artefacts etc.) can be interpreted

Based on the previous table from Saunders et al. (2019), the inductive approach has been chosen rather than the deductive approach, as this research is about to build a new theory and uses premises to draw untested solutions. Furthermore, the inductive approach was appropriate to answer the research objectives. This research uses an inductive research approach since the interpretivism philosophy has been chosen as it is a new theory and addresses the "Why" something is happening (Saunders et al., 2019).

Table 18: Comparison of research approaches

	Induction Approach	Deduction Approach	Abduction Approach
Logic	A researcher use premises developed from observations to draw untested conclusions	When premises based on an existing theory are true then the conclusions are also true	A known premises are used to generate testable conclusions
Generalization Process	From specific to general	From general to specific	Interaction between the specific and general
Generalizability	The findings cannot be generalized to the research setting or the context the theory is applied	The findings can be generalized to the research setting or the context the theory is applied	The findings can be generalized to the research setting or the context the theory is applied
Use of data	Research collects data to identify patterns, themes, and come up with a conceptual framework as conclusion	Data is collected to test hypothesis related to an existing theory	Researcher collects data to identify patterns, themes, and come up with a conceptual framework and to test hypothesis
Theory	Theory is built (it cannot be verified)	Theory is falsified or verified	Theory is generated or modified; mixing existing theories to build new theory or modify existing theory
When to apply ?	When you research questions is to answer; why something happens? Lack of theory to explain the phenomena	When your research question is to describe; What is happening?	When you research question is to describe and test some surprising or incomplete conclusions

4.3.2 Typology of selected research method

The methodological choice selection is based on using a quantitative, qualitative, or mixed-method research design. The mono method uses a single data collection technique followed by a qualitative or quantitative analysis method. The multiple-method design uses more than one data acquisition method and analysis method (Collis & Hussey, 2013). Alternatively, a mixed process approach, also qualitative and quantitative data collection techniques and analysis methods (Creswell, 2013). This study is using a qualitative mono method to gain specific insights with semi-structured interviews.

4.3.3 Data collection

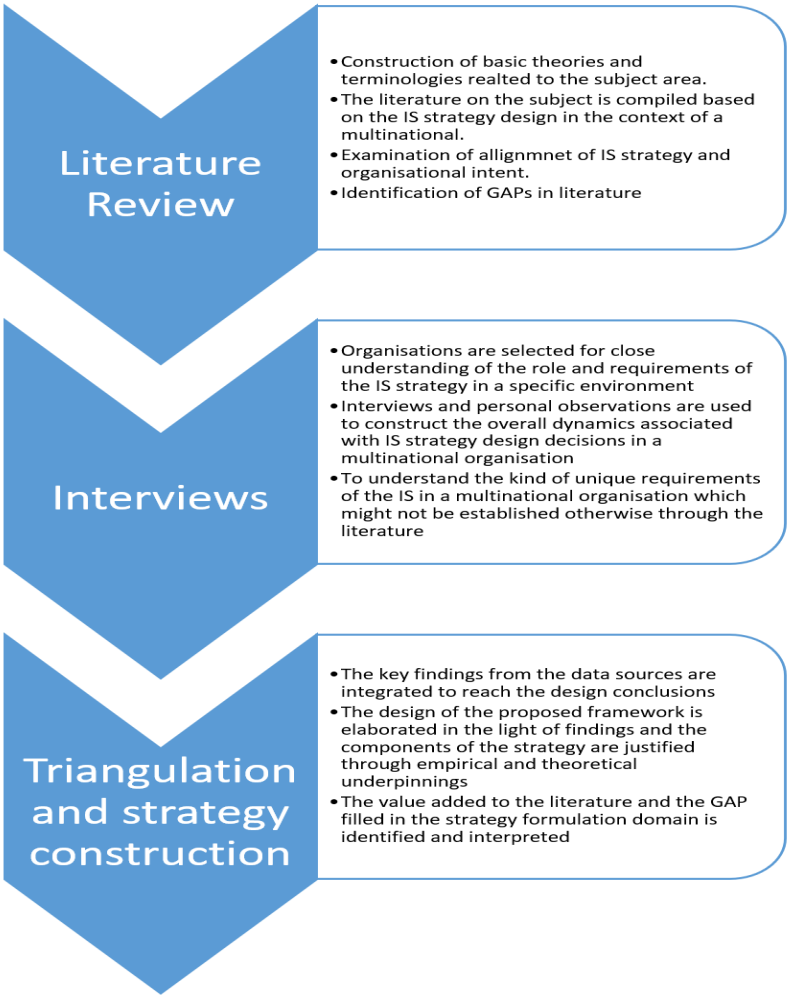
The date collection process was divided into two parts. The first part focuses on collecting the information through different perspectives and using multiple tools. In contrast, the second part focused on codifying the information and validating the constructed predicaments through a cyclic application of the created knowledge. Therefore, the research achieves a comprehensive IS strategy formulation and implementation framework theoretically supported. Given that this research is based on developing and implementing IS strategy for multi-national organizations, a research framework was established based on the literature.

To develop a comprehensive IS strategy, the approach for the development of knowledge in different phases was taken, which was validated through empirical evaluation and feedbacks from the experts. In the first part, knowledge was collected through various channels for empowering the researcher to make fully informed and

impartial decisions for developing the framework. In the second part of the data collection process, the established knowledge was validated through the constructs of design experiments. Then a consensus was reached on the implementation methods for the developed framework.

The first part has three distinct stages and is constructed based on a modification of the work of Orozco Vargas (2011) and utilizes multiple channels of data collection. This phase is dedicated to the design of the IS strategy and does not involve the validation of the defined design. The validation of the design was conducted in a later phase, where the implementation dynamics of the designed strategy are considered in a real organizational construct.

Figure 33: Research framework for strategic phase 1



The interviews were recorded sequentially through voice recorders, and the permission of such action was taken before the start of the discussions from the interviewees. Transcription of recorded voices was carried out, and QSR NVivo was used to analyze and code the transcribed interview texts. To resolve the issues

related to corporate confidentiality, specialized documents were obtained from the organizations to study their policies deeply so that any ambiguities in the minds of the interviewees could be clarified. Building from the generated specialized knowledge on the policies of the company and general conduct of the interview, a structured interview guide in the form of a Project Information Sheet as in Appendix 10.1 was constituted and was presented to the interviewees a few days before the interview with the following question sets addressing the COCPIT IS dimensions based on the definitions set out in Chapter 3:

1. Cost & Benefits
2. Organization & Processes
3. Human Capital
4. Projects & Services
5. Integration
6. Technology

The following questionnaire was developed to gather the required information based on the outputs of the exploratory phase 1 and the knowledge acquired by the data collection process. The questionnaire consists of six sections. Respondent Details, to analyze the relevant and weights on codes based on the expert's experience and positions. Then followed by main topics Business Planning Process, IS Development, IS Implementation, Review of strategies, and varia.

#	Questions	Dimension ID
Q10	**Respondent Details**	
Q11	• Can you outline your role in the organization please?	3
Q12	• How many years' experience do you have in this role and in the company?	3
Q13	• How many years do you have in a management position?	3
Q14	• Have you ever been part of IS strategy development and/or implementation?	3
Q20	**The Business Planning Process and IS Strategy**	
Q21	• How is business strategy developed and implemented? (Especially regarding the role of headquarters and subsidiaries in this process)	2
Q22	• How is IS strategy linked to the overall business strategy?	5
Q23	• Which departments are involved at the headquarters and subsidiaries in both the development and the implementation of IS?	2
Q30	**IS Strategy Development**	
Q31	• How is IS strategy developed? (Especially regarding the role of headquarters and subsidiaries in this process)	5
Q32	• Who is defining the IS strategy and who is leading the process?	2
Q33	• How are cultural issues (e.g., know-how, skills) considered in IS strategy development?	3

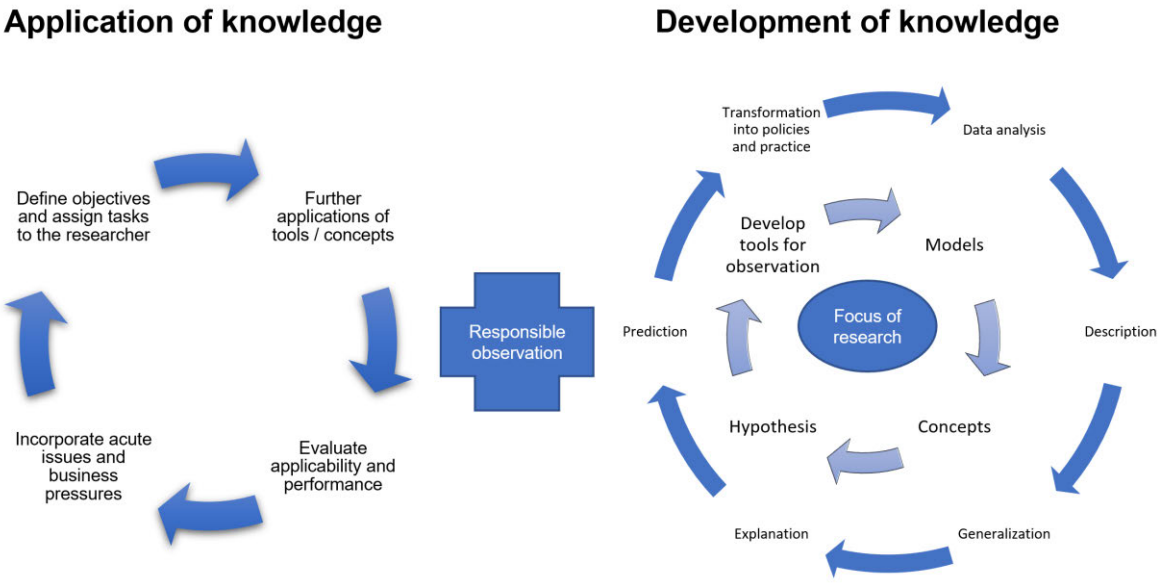
#	Questions	Dimension ID
Q34	• How are internal and external factors considered in IS strategy development?	5
Q35	• What is the IS strategy? What is the software policy for personal productivity tools (e.g., MSOffice) and for main business systems (e.g., SAP)?	6
Q40	**IS Strategy Implementation**	
Q41	• How is IS strategy implemented? (Especially regarding the role of headquarters and subsidiaries in this process)	2, 4
Q42	• Is a particular project management methodology used (e.g., PRINCE2 or PMI)?	4
Q43	• Is there a clear business case for IS strategy implementation: Is there a cost-benefit analysis prior to implementing a particular software product?	1
Q44	• Can you identify any key issues which are driven from IS strategy implementation?	4
Q45	• What has been implemented in the past 5 years?	6
Q46	• What is planned to be implemented in the next 5 years?	6
Q50	**IS Strategy Review**	
Q51	• How is the success of IS strategy development measured? Are the benefits clearly identified?	2,1,4
Q52	• How is this strategy reviewed? Is there a process for amending the IS strategy if necessary?	2
Q60	**Varia**	
Q61	• Is there other information you can provide related to IS strategy development and implementation in your company?	1-6
Q62	• Anything else you would like to add?	1-6

Both the experts from the headquarters and subsidiaries of the organization used the same interview guidebook to ensure coherence. The foreign subsidiaries were given a special consideration given that the complexity of the environment leading to the IS strategy increases. Through the interviews, it was confirmed that the responses to problems presented to the interviewees were different for general applicability and their specific subsidiary. Such an approach allowed for easy recognition of knowledge generation and generalization. Some activities were kept limited due to time scale, such as the interview of all managers in subsidiaries was not conducted.

The second part of the questionnaire focused on the formulation of a framework for the implementation of the IS strategy previously designed. There are two interlinked cycles created for the second strategic phase of the study. This process of research is based upon the work of Feurer (1995). The two cycles are the following: Development of knowledge and application of knowledge. The knowledge generation process encapsulates the generation and realization of models, hypotheses, and concepts. These generalized concepts were analyzed in the light

of the multi-nationals if they can be appropriately tested. The applicability of knowledge being created for the multi-national focus was ensured by the link which is maintained throughout the research between the two cycles. The knowledge application is instrumental in inducing new issues in the multi-nationals of the future and has not been highlighted in the past. Hence, such an approach will add tremendously to the body of knowledge in the discipline of IS strategy and will also, in the process, ensure multiple advantages for the multi-nationals being studied for this research.

Figure 34: Dynamics of strategy implementation framework (Feurer, 1995)



The dynamics of the external and internal environment of the multi-national will depict the way in which knowledge is generated in the research. Due to its contingency, this approach allows for knowledge generation in highly uncertain and dynamic environments that are characteristic of multi-national organizations. However, if it was observed during the research that the environment is static instead of dynamic, then the focus would be shifted towards the generalization cycle. Hence, it was the responsibility of the researcher to monitor the environment closely and speculate through decision-making instruments if certain information shall be utilized in knowledge generation or generalization. The framework presented above differs from traditional research approaches in that the development and advancement of knowledge are isolated from organization constraints, while responsible observation ensures relevant and integrated understanding (Feurer, 1995).

4.3.4 Data analysis

Data analysis comprised three stages.

The first stage, the initial concept for the implementation of the developed strategy was realized. This is a reconstruction of the exploratory phase 1, it is directed towards IS strategy development and implementation in a multi-national organization. In this stage, a literature review for strategy development and implementation and its challenges were used such that all the theoretical constructs could be considered. The aim of this stage was the development of an initial conceptual framework for dynamic strategy formulation and implementation. This required the acquisition and synthesis of information from various sources. Selected information sources included secondary sources such as the literature in the field of strategy and documentation relating to approaches used for strategy development by consultants and corporations.

The second stage focused on the rectification process of the developed implementation framework, keeping in view the organizational settings and feedback from experts on the implementation plan. As this research project aimed to develop new conceptual knowledge, it was necessary to analyze the issues relating to strategy formulation and implementation in a holistic way. Primary research over a long timeframe in a highly successful and dynamic organization was identified as the means which would lead to a deep insight while overcoming the shortcomings related to narrow focus and neglecting the dynamics of change. To ensure relevance of the research results, the selection of a suitable competitive environments and organizations for conducting the primary research activities was regarded as crucial. To gain a holistic understanding concerning the issues relating to strategy formulation and implementation, the research activities were designed in such a way to analyze the process of strategy formulation and implementation within the selected multinational organizations:

- High level versus operational issues
- Existing and ongoing activities versus newly created activities
- Large business units versus small business units
- Internal perspectives versus interfaces to other organizations
- Long time frame versus short time frame

The third stage uses the triangulation of key findings also related to literature to validate and generalize the constructed framework. The validation and generalization phase aimed to validate the concept developed in phase one and two and examine how the concept would be generally applicable. To test and validate the various elements of the conceptual framework, a content analysis of the 18 semi-structured expert interviews was executed. Continual synthesis of the data, thematic analysis, data reduction, consolidation, and coding where applied techniques to the transcripts. This resulted in 270 codes in NVivo grouped by questions and responses.

Interview participants were carefully selected to provide access to data and information relevant to the research questions. Unlike positivist research that uses frequencies and statistical generalization to relate the findings to a larger population, an interpretive narrative study focuses on analytical generalization to develop and extend theory (Wahyuni, 2012). The researcher has focused on experts working in multi-national group companies. The researcher has an established business relationship with the top managers at the Swiss subsidiaries and company headquarters. Access to interview participants and internal documentation was granted once the board members approved the case study for their respective group and division. The company name and the participant's names were anonymized for confidentiality. Company names were coded with alphabetical letters, and participants coded with numbers. The following table provides an overview of the companies.

Table 19: Analyzed multinational companies

Company	Industry[1]	Subsidiaries	Employees	Strategy Type[2]
A	Machinery	140	13000	Global
B	Semiconductors & Semiconductor Equipment	5	1700	Global
C	• Building Products • Construction & Engineering • Electrical Equipment • Industrial Conglomerates • Machinery • Trading Companies & Distributors	400	77000	Mutli-Domestic
D	Containers & Packaging	10	800	Global
E	Software	77	4000	Transnational
F	Energy Equipment & Services	60	4000	Global

[1] Based on the Global Industry Classification Standard (GICS)
[2] Based on the definition in Table *1*

Table 20 provides the details from the participants, including their current position and years of experience. The overall Mean in management positions of large multinational enterprises from the participants is 12 years.

Table 20: List of participants

Company Code	Participant ID	Position	Years in Management Position	Years in Company	Years in Current Position	Been Part in IS Development
A	1	CIO	20	20	14	1
A	2	Global Head Digital Supply Chain Management	10	10	2	1
A	4	General Manager IT	14	24	14	1
A	5	Head of Information Security	5	12	1	0
A	6	Head of Projects & Processes	15	15	1	1
A	7	Group Manager IT	20	20	20	1
A	10	Head of IT Operations	6	9	1	1
A	12	Head of Customer Experience Applications	5	9	2	1
A	13	Head of IT Basis & Client Services	10	15	10	1
A	16	Head of Data Management	25	8	5	1
A	20	Head of Business Processes & Applications	10	20	4	1
B	3	CIO	15	14	11	1
C	8	IT Manager	2	4	1	0
C	11	Head Treasury Operations	7	5	5	0
C	19	Head IT Business Development	2	4	4	0
D	15	Operations Manager	25	25	20	1
E	17	CFO	15	4	4	1
F	18	Operations Manager	13	13	8	1

The data collected were used in a number of different ways throughout the study. As discussed, the study was divided into different phases, and each phase had multiple stages. The collected data were integrated in each phase, and the triangulation of crucial findings was conducted to define the major themes. For this purpose, the collected data was coded into schemes based on topics from the questionnaire, which were used through software in NVivo and SPSS for further analysis. The constructs for IS strategy for both design and implementation were covered with complete data-based evidence. Qualitative outcomes can provide more effective interpretations of IS professionals' findings and results. The analysis integration of qualitative data collection took place at the interpretation stage. It was assumed that the results from qualitative approaches would converge into a single

whole. This was conducted through the triangulation of key findings where different findings from each strategic phase are combined to make a conclusive and binding argument for the study. This argument was then further studied, considering the theory. The table below demonstrates the processes used for coding and identification of themes from the collected data:

Table 21: The coding and trend identification process

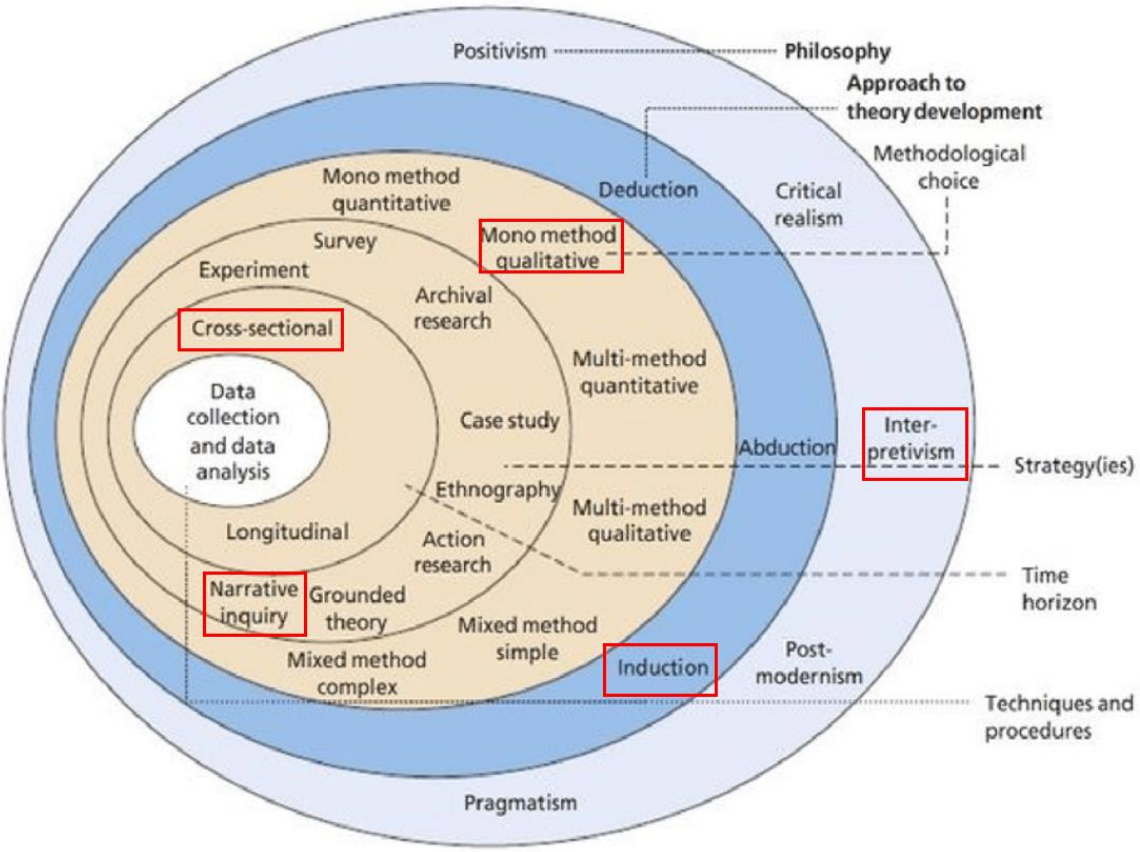
Steps	Tasks
Coding	1: The questionnaire was logically structured and the questions were labeled starting with "Q-" 2: The entire data material is coded to develop descriptive concepts. The answers were labeled starting with "R-" 3: Reduce the number of descriptive concepts by a rigorous scheme of merging and eliminating duplicates after data collection 4: Clustering of the concepts
Identification of sub-communities	Using initial data analysis and informant information identify the sub-communities which are an important part of a multinational organization. Use tracing to identify actor groups using descriptive concepts.
Contextualization of the research setting	Trace the historical events to contextualize the research setting such as using informal discussions and through publications on the company website. Establish a timeline for the cases to validate the findings. Verify the potential of the strategy with the informants

4.4 Philosophical assumption in this research

4.4.1 Research paradigm

In research, most researchers make a number of assumptions and have different perspectives on ways of viewing how things work (Roth, 2015). Such research patterns are apparent in the vast amount of literature studied for IS strategy. There are, however, certain principles and rules that can be followed to guide the actions and beliefs of researchers in their research. These guiding principles are referred to as a paradigm (Fang et al., 2010). According to them, a paradigm is a model on which research theories are built and can be graphically explained as the research onion (Saunders et al., 2019).

Figure 35: Research onion (Saunders et al., 2019)



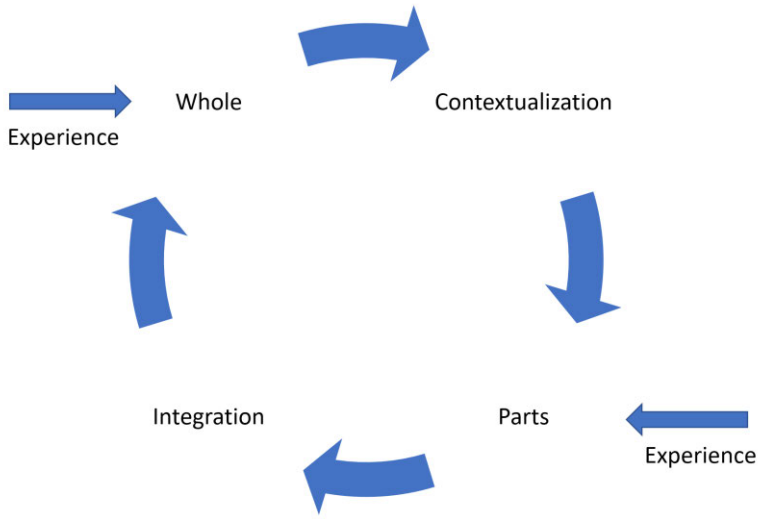
Research paradigms can be divided into different categories and layers (Melnikovas, 2018). The adopted research philosophy reflects certain assumptions held by the researcher. These assumptions are the basis for research strategy and develop the relationship between knowledge and data collection processes in research. This research adopts an interpretivist stance, rather than a positivist or realist position, as the aim is to develop a model for the IS strategy implementation for multinational Group companies, which involves people and their management and social interactions within an organizational context. This study is based on qualitative data rather than quantitative data.

For the purpose of this study, an interpretive paradigm is selected as a central philosophy for carrying out the research. The research method adopted in the study focuses on precipitating and interpreting the individual approaches on the subject based on understanding, shared meaning, attitudes, and beliefs of the phenomenon rather than focusing on hard facts. The aim of conducting the research and using the interpretive paradigm is to understand and augment the complex process of IS strategy framework formulation and implementation in multinational companies; given that for multinational facts cannot be generalized and both internal and external environments pose complex challenges for the stakeholders which can only

be realized through an in-depth interpretation of cognitive perspectives of individuals.

The main motivation that informs the researcher's decision for choosing an interpretive research approach in IS is the belief that knowledge about our reality is acquired through language, shared meaning, what we perceive and consciousness. Hermeneutics mode was used as a guiding principle for the interpretive stance taken in the research. Boell and Cecez-Kecmanovic (2010) state that hermeneutics examines how the understanding of parts relates to the understanding of a larger whole and again how the understanding of a larger whole relates to the understanding of parts as shown on the Figure 36.

Figure 36: Hermeneutic circle (Boell and Cecez-Kecmanovic, 2010)



Using the hermeneutic circle the researcher was able to put his interpretation on the data being analyzed as a foundation for further research and in-depth understanding of a phenomenon rather than concentrating on the determination of textual meaning such as semiotics and narrative stories (Bargiela-Chiappini, 2010). Cole and Avison (2007) and Hayles (2003) further state that, as a result of this approach, new research streams have emerged and can be immediately studied in ways that would not be possible if other research approaches were used. The researcher has collected information in different forms and clarified their meanings to make inferences related to the defined topics. Such a technique aligns with the hermeneutics approach. This is complemented by the approach taken for clarification and the addition of knowledge from the literature to the collected texts to make it appropriate for use in constituting the desired frameworks.

4.4.2 Research philosophy

Through an extensive study of the literature, the current trends in the IS research methodology can be categorized as follows:

1: A reinvigoration of IS discipline in terms of its understanding and required funding to be deployed in organizations

2: An interdisciplinary approach taken for IS with other associated disciplines which can further rectify its efficacy in an organization and demarcate issues related to organizational alignment

3: IS consumable research being affected by different organizational issues

Given the complexity of the IS disciplines, research studies show that many different subcategories of the domain are evolving, which opens an array of choices for research topics directed specifically to issues faced in organizations. Keeping the view, the body of knowledge of IS, literature shows evidence of usage of inappropriate research methods borrowed from other disciplines. Hence, special care was taken in this research to consider only the research methods which can add to the body of knowledge of IS, while at the same time allowing the researcher to capture the complexity of the organizational planning and implementation processes. The table below illustrates a comparison between the positivist and interpretivist paradigms according to philosophical assumptions.

Table 22: A comparison of philosophical assumptions of interpretive and positivist paradigms

Philosophical assumptions or beliefs	Positivist	Interpretivist
Physical and social reality Ontology (Nature of reality)	Physical and social reality exists independent of humans Based on facts	Subjective meanings are used to construct and reconstruct reality while at the same time using symbolic actions
Knowledge Epistemology (nature of knowledge)	Based on subjective constructions Causal relationship and tight coupling among control, prediction and explanation is used for generalized knowledge basis formation	The acquired knowledge is through the inside view of the acquired social process
Theory and practice	Primarily detached from the interest phenomena and technical in nature	A value judgment exists without a value neutral stance

The research efforts in the IS strategy formulation changed from non-empirical forms, based on conceptual investigations, which were dominant before the 1980s to the empirical research methods primarily focusing on constructing theories backed with practical observations (Alavi & Carlson, 1992). Alavi and Carlson (1992) further noted that the dominating orientation of the empirical research after the mid-1980s was characterized by positivism and the approaches to research used were traditional.

Choi and Lee (2002) noted that the dominant research approach taken in the IS strategy research was qualitative and it was accepted as the new standard of research in the field in the 1990s. The researchers noted that such a one-sided approach could add limitations in terms of the level of penetration into the stratum of the subject, and hence a radical new approach can be instrumental to the progress in the IS strategy field. An extensive study was followed by Chen and Hirschheim (2004), who analyzed a staggering 1893 articles based on the IS in reputable journals. The selected articles were published between 1991 and 2001. The researchers concluded that in the period selected, a majority of empirical research adopted the positivist stance (81%). The researchers further presented a distinction based on the region of publications where they established that the publications in USA are predominantly positivist, survey oriented, quantitative, and cross-sectional as compared to European publications. In terms of research design and approach, survey research is the most preferred technique. This claim from Chen and Hirschheim (2004) can be validated today as the review of the literature shows coherent trends. According to the researchers, the most widely used method is the survey-based research method which is inherited in 41% of the published articles. The trends at the time indicated that many articles are readily adopting a case study approach as well and a total of 36% of the articles published within the time period adopted a case study approach. Further trends suggested an increase in the adoption of the three methods of research: qualitative (33%), empirical (61%) and longitudinal (33%).

Consultants, by and large focus their activities on the business issues that need to be addressed by their clients while aiming to maximize the use and span of their knowledge-base for other business opportunities (Chen & Hirschheim, 2004). This has implications for research studies as most researchers focus on adhering to areas that have commercial standing rather than those focused on creating maximum value for the stakeholders. The determination of applications of research

findings is also limited in the body of knowledge considered in the literature review; hence, in this research, the findings are generally applicable in a practical setting by adding testing and rectification phases in the research.

The third approach taken by industrialists is the action-based approach. In the case of action research, the dependency on the specific organization being studied is much higher, which restricts the researcher's understanding and, hence, can be considered a shortcoming of such an approach. Such excessive monolithic dependence means that it is often not possible to perform experiments without due consideration to factors such as disruptions to the organization’s operations. Organizational goals in such an approach act as impediments for the spectrum of understanding, which are not primarily concerned, restricting the inferences to be generalized for a wider audience and has limited implications for the research community.

Building from the issues discussed above, it can be concluded that none of the research methods can be utilized as standalone instruments for IS strategy design and implementation. Hence, for this research, an all-encompassing alternative research approach is designed in which multiple techniques are used in conjunction depending on the complexity involved in the domain. This study constructs the decisions regarding the research methods based on the literature review and adopts the most appropriate methods, which can enable the researcher to add value to the current literature and develop a comprehensive IS strategy for multinationals. The study adopts the interpretivism philosophy for the research as it is highly recommended by Chen and Hirschheim (2004), who established that such research orientations are instrumental for the growth in the subject area. Building from the exploratory analysis of the literature, the selected method for the research is the inductive approach.

4.4.3 Research approach

A narrative approach was utilized for this research. The complexity in multinationals could be adequately captured, and a clear distinction was made between the knowledge that can be considered generalization or generation. Narrative methods can be regarded as real-world measures that are appropriate when real-life problems are investigated. According to Myers (2009), in-depth investigation of phenomena cannot be studied independently from the context in which they occur. Multiple interviews offer experimentation in diverse settings, which allows for an

adequate amount of evidence and increases the robustness and dependability of the findings. In order to provide consistency, it is essential to consider cases in a universal context that simultaneously allows for better contrast and controllability of varying factors. This approach provides for analytical generalization for the entire population rather than generalization based on statistics.

In line with the typical interpretive narrative study (Myers, 2009), the field research involved multiple data sources, including semi-structured interviews, participant observation, and archival data. The researcher organized and recorded this data in a single research database for transcriptions and for qualitative analysis. The semi-structured interviews were the primary basis for analytical efforts. The two other data sources were primarily used to provide the contextual background and achieve close involvement in characterizing the relationship between the researcher and research subjects in interpretive research (Walsham, 2006).

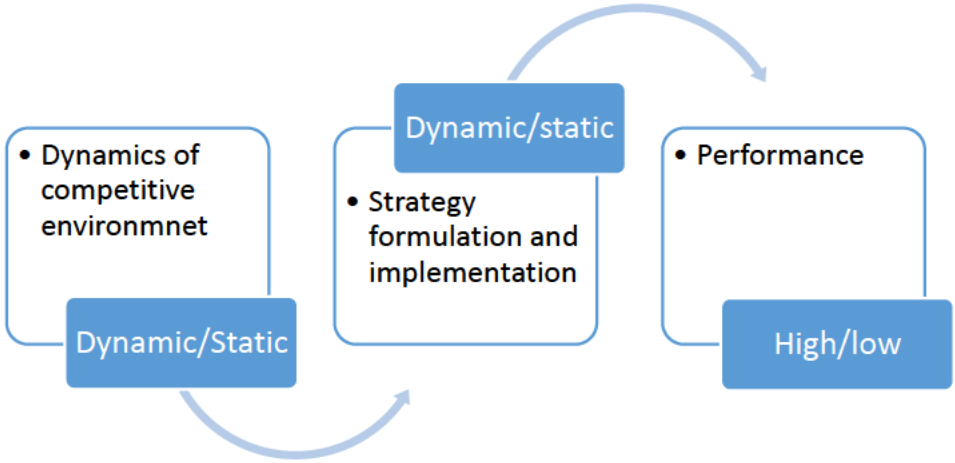
The research was conducted using field study methods (Finnegan & Longaigh, 2002; Galliers, 1992), and the main instrument used for collecting the evidence was semi-structured interviews. The strengths of this approach are that it focuses directly on the research topic, provides perceived causal inferences (Yin, 1994), and allows the researchers to probe deeply to uncover new dimensions based on respondents' personal experiences. The questionnaire was designed keeping in view the review of the literature and the researcher's experience working in the field of this study. The questions in the semi-structured interviews were based on defining a more substantial knowledge base for the current practices being followed in the multinational organizations and finding strategic questions based on the IS dimensions set out in Chapter 3. Each interview question is mapped to an IS COCPIT dimension which was defined in the provisional conceptual framework. This was done keeping in view the pace of transformation such that the new IS strategy framework was based on state-of-the-art concepts, and the outdated concepts could be omitted from the analysis.

Besides validating the concepts developed throughout the research process, the interview questions were also used to examine the relationship between the dynamics of business environments, the dynamics of strategy formulation and implementation, and business performance. In doing so, the questionnaire addressed three distinct issues:

- The level of dynamics in a given competitive environment
- The level of dynamics in strategy formulation and implementation of a given organization
- The performance of an organization in financial and non-financial terms

The underlying factors considered in the questionnaire are defined in the following diagram:

Figure 37: Factors to focus upon in questionnaire design



Finally, this research is using a cross-sectional time horizon (Bryman & Bell, 2015). A cross-sectional study is a 'snap-shot' study, which means a phenomenon, or a cross-section of the population is studied once, where a longitudinal study refers to analyzing a phenomenon or a population over a period of time.

4.5 Ethical considerations

Ethical considerations were particularly important for this study as the interviews took place in an international context by interviewing experts from other cultures. Furthermore, the researcher had a role as observer and interpreter, trying to recognize and substantiate new meaning to connect to known theories. The data (transcripts, audio) gathered during the interviews were encrypted and stored anonymously on a secured drive at the server of the University of Gloucestershire and only used for the purpose they have been collected for. According to Smythe and Murray (2000), the narrative study of phenomena is a growing, multidisciplinary tradition of research based on the in-depth interviewing of research participants. Hence, the information gathered must be handled very carefully. The information

collected was based under the “Research Ethic Handbook” of the University of Gloucestershire with the following core principles:

- Respects the integrity and dignity of persons (that this intrinsic worth protects them from being used for greater perceived benefits)
- It follows the “Do no harm” principle. Any risks must be clearly communicated to subjects involved
- Recognizes the rights of individuals to privacy, personal data protection, and freedom of movement
- Honors the requirement of informed consent and continuous dialogue with research subjects
- Respects the principle of proportionality: not imposing more than is necessary on your subjects or going beyond stated objectives (mission creep)
- Treats societal concerns seriously – a researcher’s first obligation is to listen to the public and engage with them in constructive dialogue, transparently, honestly and with integrity
- Recognizes the wholeness of an individual and that any modification (genetic or technological) does not interfere with this principle
- Builds on the understanding that any benefits are for the good of society, and any widely shared expressions of concern about threats from your research must be considered (with the acceptance that perhaps certain research practices might have to be abandoned).

4.6 Summary

This chapter presented the applied research methodology and strategy and discussed the research processes to answer the research objectives. The exploratory phase 1 developed the conceptual constructors, and exploratory phase 2 developed the interview questionnaire followed by the interpretation phase for the data analysis and interpretation.

Furthermore, the research design has been discussed, and the appropriate research technique has been presented. The inductive research approach has been explained with justification on how this fits in scientific inquiry. Considering the critical factors of methodology in this research, such as narrative inquiry conditions, epistemology contribution, and the complexity of subjective factors, the researcher

concluded to take an interpretive stance. In discussing alternatives to research design and strategies, the researcher presented that a qualitative mono methodological design with a narrative strategy approach is appropriate for addressing the research objectives. The insights on how the required data must be collected, validated and analyzed have been explained, such as the process for knowledge generation.

This research has followed the ethical principles and practices of the University of Gloucestershire.

5 RESEARCH FINDINGS

5.1 Introduction

The data collected from the 18 in-depth expert interviews were analyzed, coded, and classified to get the critical findings regarding each question from the questionnaire. After coding and classification were completed, similar responses were grouped together to eliminate the duplicates based on the dynamics of the strategy implementation framework, as discussed in sub-section 4.3.3. The following Table *23* provides the summary of the coded response for each question from the interviews.

Table 23: Questionaire responses summary

Questionnaire (Total responses n=18)	Responses coded
Q10-Respondent Details	
Q11-Outline role	16
Q12-Years' experience do you have in this role in the company	9
Q13-Years do you have in a management position	10
Q14-Been part of IS strategy development and or implementation	2
Q15-Years in the company	12
Q20-Business Planning Process and IS Strategy	
Q21-How is business strategy developed and implemented	15
Q22-How is IS strategy linked to the overall business strategy	14
Q23-Which departments are involved at the headquarters and subsidiaries in both	11
Q30-IS Strategy Development	
Q31-How is IS strategy developed	7
Q32-Who is defining the IS strategy and who is leading the process	7
Q33-How are cultural issues (e.g., know-how, skills) considered in IS strategy	16
Q34-How are internal and external factors considered in IS strategy development	13
Q35-What is the IS strategy	6
Q40-IS Strategy Implementation	
Q41-How is IS strategy implemented	17
Q42-Is a particular project management methodology used	6
Q43-Is there a clear business case for IS strategy implementation	6
Q44-Can you identify any key issues which are driven from IS strategy	16
Q45-What has been implemented in the past 5 years	2
Q46-What is planned to be implemented in the next 5 years	6
Q50-IS Strategy Review	
Q51-How is the success of IS strategy development measured	14
Q52-How is this strategy reviewed	13
Q60-Varia	
Q61-Is there other information you can provide related to IS strategy development	16
Q62-Anything else you would like to add	7

The complete list with all the coded responses from the interviews can be found in Appendix 2: Responses summary.

All the responses from the experts gained in question number Q10 about the participant's details such as position, years in their current working fields, and total overall management experience was summarized in Table *24*.

Table 24: Participants summary

Position	Years in Management Position	Years in Company	Years in Current Position	Been Part in IS Development	Strategy Type[3]
Operations Manager	25	25	20	1	Global
Head of Data Management	25	8	5	1	Global
Group Manager IT	20	20	20	1	Global
CIO	20	20	14	1	Global
Head of Projects & Processes	15	15	1	1	Global
CIO	15	14	11	1	Global
CFO	15	4	4	1	Transnational
General Manager IT	14	24	14	1	Global
Operations Manager	13	13	8	1	Global
Head of Business Processes & Applications	10	20	4	1	Global
Head of IT Basis & Client Services	10	15	10	1	Global
Global Head Digital Supply Chain Management	10	10	2	1	Global
Head Treasury Operations	7	5	5	0	Mutli-Domestic
Head of IT Operations	6	9	1	1	Global
Head of Information Security	5	12	1	0	Global
Head of Customer Experience Applications	5	9	2	1	Global
Head IT Business Development	2	4	4	0	Mutli-Domestic
IT Manager	2	4	1	0	Mutli-Domestic

There were no significant findings concerning any relationship between the positions and years worked based on statistical variables, as presented in Figure *38*.

[3] Based on the definition in Table *1*

Figure 38: Participants descriptive statistics

Statistics

Variable	Total Count	N	N*	CumN	Percent	CumPct	Mean	SE Mean	StDev
Years in Management Position	18	18	0	18	100	100	12.17	1.68	7.15
Years in Company	18	18	0	18	100	100	12.83	1.61	6.84
Years in Current Position	18	18	0	18	100	100	7.06	1.50	6.38

Variable	Variance	CoefVar	Sum	Minimum	Q1	Median	Q3	Maximum
Years in Management Position	51.09	58.75	219.00	2.00	5.75	11.50	16.25	25.00
Years in Company	46.74	53.27	231.00	4.00	7.25	12.50	20.00	25.00
Years in Current Position	40.64	90.36	127.00	1.00	1.75	4.50	11.75	20.00

Variable	Range
Years in Management Position	23.00
Years in Company	21.00
Years in Current Position	19.00

A descriptive data analysis was undertaken to check if any statistical significance or correlations from the respondents in terms of “years of experience”, “years in a management position”, or “had an active role in IS strategy development and IS strategy implementation”, that needs to be considered when analyzing the responses. Based on the analysis, a judgment cannot be made by the provided responses regarding that a manager with more years’ experience provided preferable answers or solutions than the other managers with fewer years of experience in IS strategy development or implementation. This concludes that all the participants and responses have the same weight about the insights they provided. Hence, each response was considered as a single valid statement in the analysis within the current enterprise. Furthermore, the selected enterprises work with different strategy types, as discussed in 2.3.3, or have a diverse global strategy setup that needs to be considered.

The following sub-sections present the findings from the questionnaire responses. Each question was numbered with the abbreviation Q = Question followed by a number according to the outlined questionnaire in sub-section 4.3.3. The responses to each question were coded with the abbreviation R = Response. For example, response R21 belongs to questions Q21. The responses to one question were not limited. Hence, many responses to one question were possible. Each of the sub-section begins with a table that contains the key responses to each of the questions. The key responses were distilled from the transcripts of the interviews using QSR NVivo by applying word frequency and cluster analysis. The researcher made the final judgment with the gained knowledge from the interviews and iterative learning cycle as described in sub-section 4.3.3.

The following sub-section present the findings based on the structure of the questionnaire. Sub-section 5.1 outlined the respondent details according to the question group Q10. Sub-section 5.2 presents the findings of the question group Q20 about the overall business planning process and alignment to the IS strategy. Discussions about IS strategy development according to question group Q30 are set out in sub-section 5.3. The following sub- section 5.4 discussed the IS strategy implementation according to question group Q40, and Q50 discusses IS strategy review in sub-section 5.5. Finally, the last sub-section presents the findings from the open questions in question group Q60.

5.2 Business planning process and IS strategy

This section gathered insights on how business planning processes in a larger multi-national group are developed and implemented. Furthermore, it discusses how the IS strategy is linked and aligned to the overall business strategy and which departments are involved in development and implementation.

Q21-How is business strategy developed and implemented

Table 25: Key responses R21

• *Agreement between Business Owners and IT Dept* • *Based on the HQ Mission, breakdown into business objectives and goals* • *Business Executives Meetings*	• *By key processes* • *By M&A Projects* • *Centrally defined with feedbacks from subsidiaries* • *Decentralized approach due to highly diversified companies*	• *Driven by the moves from the different departments* • *Focus Point trigger a Project* • *Yearly executive board strategy meeting -set focus points*

All companies have established general mid-and long-term planning cycles for three to five years. In today's fast-changing economy and ongoing regulation restrictions, the need for faster planning cycles emerged as a key issue for most managers. Still, they understand it is very challenging in such big organizations to achieve shorter cycles at the group level. Business executive meetings are in all companies well established, which take place on a quarterly and in some organizations, even a monthly basis to exchange information and provide feedback on the ongoing projects. Group targets are defined in the mid and long-term planning but are reviewed and adjusted in the yearly executive meeting. One organization uses the term “focus points”. This is a term used to define a clear direction rather than a KPI, which is based on a defined set of measurements. The focus points will then trigger a project which is then further measured by KPIs. The overall business strategy is

aligned to the organization's essential processes. One organization is mainly driven by Mergers and Acquisition projects, which drive business strategy development and implementation based on those requirements. Once the business strategy has been developed by the executive boards of directors, the Head of IT or CIO is engaged in working with the various business owners to find an agreement for the new IS strategy or how the new business strategy would affect the current IS Strategy. In the multi-domestic organization from company C, the business strategy follows a decentralized approach due to the highly diversified companies. In contrast, the others follow a top-down process, meaning the business strategy is essentially defined at the headquarters and then broken down to business objectives and goals or focus points. Subsidiaries can still provide feedback for the business strategy and how the implementation is planned regarding the time and methodology.

Q22-How is IS strategy linked to the overall business strategy

Table 26: Key responses R22

• *Align requirements bottom up then top down, but process and result driven to measure success KPIs* • *Central Team which is managing all the needs from the countries* • *CIO aligns with the business process owners*	• *Collect End users Feedback, not only internal departments for linking & aligning* • *Focus points from exec board meeting* • *Global Business Owner to decide central, considering decentralized needs together with the IT Project Managers* • *KPIs from the Business Strategy Projects*	• *Role of the Project Managers* • *Top-down from the board* • *Centrally top down otherwise to many kingdoms to talk to*

IS strategy links to the overall business strategy cannot be defined by a straightforward process, system, or methodology. To achieve a proper alignment of the IS strategy's business goals, the only procedures established are the bottom up and top town alignment approach in defining the KPI measures from the approved business projects. The approved projects and their KPIs are the targets that the IS Strategy must meet. The key to a successful linking from the overall business strategy to the IS strategy is an excellent relationship between the managers from the business units and the headquarter's IT managers, as emphasized by company A's CIO. When it comes to a final decision in the alignment process, the headquarter will have the final decision to decide. Otherwise, many solutions or strategies may

be developed, which cannot be managed and handled in the subsidiaries. The result will lead to a miss alignment with the global strategy. The global and transnational companies have global business owners who decide at the headquarter but consider the local needs of the local business managers or local IT project managers in the subsidiaries. Once the linking to the business strategy is complete, the operative management from the departments at the headquarter and the local subsidiaries will begin an alignment process which ensures a successful linking between the global business strategy and the IS strategy.

Q23-Which departments are involved at the headquarters and subsidiaries in both

Table 27: Key responses R23

• *All Dept and Subsidiaries can provide inputs and all projects resulting from Feedbacks approved by the business excellent committees* • *All Dept in the HQ*	• *Centrally managed, all regions' subsidiaries involved and coordinated by the business excellence committees* • *CIO at HQ with all BU areas owners*	• *Strong exchange between HQ and Subsidiaries* • *BU Areas due strong own competencies*

No common or standardized approach has been identified from the responses that strategically involve headquarters or subsidiaries in the business planning process. In the business planning process, headquarters and subsidiaries are involved. The way and the engagement of the involvement vary between the companies. The who, what, and when are more based on a company culture rather than a systematic approach to how the involvement takes place. The majority of managers interviewed have a long working relationship with the company, which is more than 12 years on average. Hence, they have an excellent internal network and know which departments or subsidiaries need to be involved in case they would be affected by the new business plan or IS strategy.

5.3 IS Strategy development

In this section, the IS strategy development will be discussed of the six enterprises. It presents the findings according to the key responses, how an IS strategy is developed, and who defines the strategy and leads the process. Furthermore, cultural issues and internal and external factors that influence an IS strategy are addressed. Finally, the six enterprises provide insights into their current IS strategy and its applications.

Q31-How is strategy developed

Table 28: Key responses R31

• *Based on Business strategy*	• *Centrally driven by the CIO*	• *Goals and KPIs from the Business Strategy*
• *Current document review to outline key systems and technologies*	• *Considering technology changes and current architecture drives development*	• *CEO (Company Owner) has an active role* • *By the CIO with Head of IT Departments*

In some companies, the IS strategy development follows the global business strategy and is developed based on the goals and KPI's of the overall business strategy. In the multinational company, the IS strategy is created on the key systems and technologies' actual documentation as there are various IT systems and subsystems within the organization. This is the only method for the local IT Manager and the IT Team to build and align the IS strategy for its subsidiary since the enterprise follows a decentralized approach. All enterprises consider current technology changes and upcoming trends and assess their current planning and IS strategy development trends. In one company, the CEO plays an active role in the IS strategy development. He also leads his managers and the team and follows technology trends. The CIO drives the IS strategy development and his IT Managers, local in the headquarter, or together with the subsidiaries in the other companies.

Q32-Who is defining the IS strategy and who is leading the process

Table 29: Key responses R32

• *Business Executive Committee*	• *CTO*
• *Company Owner*	• *CIO*
• *Defined by CIO with Head of IT Departments, centrally managed by IT Project Managers*	• *Executive Board, executed by the CIO*

The IS strategy is initiated by an executive business committee with members from the divisions or subsidiaries, depending on the IS strategy's impact. During the initial meetings, the IS strategy's scope and impact might change, and the committee participants might also change over time. The IS development process is under the supervision of the CIO's who is also a key member of the committee.

Q33-How are cultural issues (e.g. know-how, skills) considered in IS strategy

Table 30: Key responses R33

• *On a high level but not in details*	• *Active engagements of local teams*	• *Know-how and Skills is a challenge, CIO Role act as mentor*
• *Particular training for local employees*	• *Actively considered when creating solutions*	• *Don't build a process around people. People have to follow the process*
• *Culture is part of the strategy development*	• *Aware but not managed*	

Only a few companies consider an active process addressing the cultural issues as the key topic for a successful IS strategy definition. Dynamic and open company culture was only found in one company where the cultural issues are actively addressed when creating various IS solutions. Another company that defines the IS strategy based on the SAP framework considers the feedback from the different subsidiaries of the regions to define a global template based on the skills and know-how of the end-users. The top-down approach in multinationals where the IS strategy is developed centrally at the headquarters has a strong focus on the business processes. Cultural issues like skills and know-how are only considered for the implementation but not for the IS Strategy development. The cultural awareness and its impact on IS strategy development exist in all the companies interviewed and each participant. All the participants agreed to the importance and consideration of cultural effects, leading to success in the implementation rather than the development part of IS strategy. The main point mentioned was the skills and know-how and how to address an appropriate learning curve for each employee who is affected by using one of the IS systems. While addressing the cultural issues in a big multinational enterprise, it should be seen as a process rather than an employee's philosophy. Active engagement of local teams in various subsidiaries was found to work closely with the headquarters in addressing local know-how. One of the challenges faced was the different understanding of a topic due to cultural behaviors within distributed teams like India, North America, China, and Europe. In this case, the CIO had to act as a mentor to bring all the various global teams together to achieve an aligned global IS strategy that can be executed individually in smaller groups. Nevertheless, all the participants agreed that a centrally developed IS strategy without considering affected regions and their subsidiaries would not lead to a successful IS strategy due to the differences in understanding and knowledge of the specific strategy.

Knowledge is also complex and usually difficult to imitate, so it has the potential to generate long-term and sustainable competitive advantage. When organizations lose personnel with significant amounts of knowledge due to the retirement of relevant managers or the company changes, it is a significant loss. It is less so if their knowledge remains in the organization, so there has been much emphasis on capturing, storing, and sharing knowledge according to the CIO from Company A (Participant #1).

Q34-How are internal and external factors considered in IS strategy development

Table 31: Key responses R34

• *Responsibility of the business owners* • *Role of the CIO or Exec Board when factors arise or change*	• *Current trends and risks are discussed with business units heads* • *Country specific rules and regulations actively considered and monitored*	• *Governance board is monitoring changes on internal and external factors* • *Regions report changes on laws and regulations to the HQ*

Managing internal and external factors and trends, including megatrends, which may affect the current or future IS strategy, are considered in all companies by various processes. Some use external partners, which reports technology trends every six months. One company has a governance board established which monitors changes in general for internal and external factors regularly. The significant advantage of such a governance board is that internal change is also covered and dressed for developing the IS strategy. Country-specific rules and regulations are considered while developing the IS strategy in all companies. The subsidiaries play an active role in providing information and changes regarding local laws and regulations, which will be addressed in the IS strategy development process. Another interesting finding was that the IS strategy development is triggered when trends arise, leading to a faster and better position of the company or increased revenue with the new technology. This also includes new modules and features from the ERP providers. Regardless of which process exists in the companies, the internal and external factors are managed centrally. The decentralized company does not consider internal and external factors on a larger scale because its focus is on the local region, country, or market. In general, detecting trends, influencing internal and external factors are the responsibilities of the business owners. The CIO will report technologies or changes to a committee

or executive board to be discussed and analyzed for their impact before considering it for the IS strategy. To get earlier and better information about influencing factors for the IS strategy, some departments will get various training to understand upcoming trends better. They learn how it could affect their business, either increasing their revenue or leading to a better market position or detecting any threats and risks.

Q35-What is the IS strategy

Table 32: Key responses R35

• *Navision Dynamics*	• *ISO 27001*	• *SAP*
• *O365*	• *Jaggaer*	• *Siebel*

In today's multinational enterprises, there is not just one single IS strategy in place. Due to the complex multinational setups, some companies operate with a few core systems that need to consider the local legal requirements and provide full transparency on near real-time intercompany transactions. The most common system mentioned was SAP due to its wide acceptance in large enterprises, followed by Navision Dynamics, today is known as Dynamics 365, and Business Central as the core system. Siebel had the focus more on CRM transactions rather than a complex global ERP setup. Jagger is used in addition to SAP to optimize the global supply chain processes. One response was the ISO 27001, which is not per definition, an Information System. The ISO 27001 can be used in addition to any existing Information System and strategy as the framework for the CSO's to define the content and boundaries of an IS system. Another subject in regard to the Information Systems was the use of a proper Information Management strategy (IM). The IM strategy acts as the primary control input into the information management process. IM management is also constrained by the current IT and IS infrastructure. Hence, this is also a key control input into the management process. Each element of IS and IT management takes responsibility for different aspects of both strategy and infrastructure. There are two significant aspects of management: controlling the IT infrastructure and defining the IS strategy. Control essentially means managing the current information, IM, and IT in a regulatory process. The strategy mainly consists of managing the development of future information, IS and IT as an adaptive process. Ideally, information management should drive information systems management, which in turn drives IT management. An organization needs to identify its information needs first, then decide on the

information systems that will supply those needs, and finally, decide on appropriate IT infrastructure to support the IS. In the broader sense, data management encompasses all the issues of data storage, integration, sharing and security, as well as others essential for the effective management of the data resource, such as data definition, data integrity, and data control. In this sense, effective data administration inherently assumes an interest in both the physical and electronic records of organizations. Data management plays a vital role in data sharing across organizations, and it is particularly crucial to practical B2B eCommerce and key innovations, such as eProcurement.

IS strategy is also concerned with the management of information handling applications, both computerized and non-computerized. Its activities include management of the current IS infrastructure, which involves maintaining an inventory of it and ensuring its effective operation and maintenance. It also comprises managing the development of IS planned in the IS strategy.

5.4 IS Strategy implementation

The IS strategy implementation discusses how the strategy is implemented and if specific project management methodologies are used. It addresses some key strategy implementation issues and provides an outlook of the planned systems for the upcoming years of the enterprises.

Q41-How is IS strategy implemented

Table 33: Key responses R41

• *Roadmap, reviewed once a year, set new Project priorities on most important projects*	• *Clear Targets breakdown in region*	• *Breakdown into different Projects*
• *Centralized Global Rollouts*	• *Traditional Project Management*	• *Blueprint Phases*

Once the IS strategy has been defined and approved, the average strategy life cycle based on the responses is between 3 to 5 years. A strategy roadmap will be established, which is split into smaller projects. The strategy roadmap will be reviewed once a year, and the executive committee or the CEO will set priorities. Once the project is defined, strategic initiatives and KPIs are designed to measure a later success and ensure proper alignment to the overall business strategy. Depending on the project type, scope, and complexity, various methodologies for

implementation are used. The most common implementation method is traditional project management, which is led by a PMO, which also has a role in managing the project portfolio and setting proper priorities, and address risks and especially resource limitations at an early stage. If the company does not have a PMO established, separate departments will get the lead of the different projects and are responsible for successful execution. It is not solely the IT department's responsibility to implement the IS strategy. Without the ownership of global or local department owners, a successful implementation is not possible. If the company relies on traditional SAP methodology, a so-called blueprint phase will be established, and standard templates will be defined and implemented accordingly. Another key to a successful IS strategy implementation are the users. One traditional method is the superuser concept or external consultants who assist in implementation.

Q42-Is a particular project management methodology used

Table 34: Key responses R42

• *SAP Implementation Model*	• *Phase model*	• *Train the Trainer*
• *SCRUM*	• *PMO*	• *Waterfall*

Regardless of the ERP system in place, companies work with one or even multiple methodologies like scrum, phase model, and waterfall model. There is not a standard methodology applied. The method is decided or suggested by the PMO based on the project type and complexity. If the implementation is based on SAP, then the SAP implementation model is used. For smaller projects, the “train the trainer” methodology is applied.

Q43-Is there a clear business case for IS strategy implementation

Table 35: Key responses R43

• *Lack of transparency due to matrix organization where people can hide and play games to look good*	• *No, not existing or not aware (missing transparency)*	• *Yearly Salary Bonus depends on the project success*
• *Could be improved*	• *High-Level ROI Calculation*	• *Yes, defined business case*

There was no clear and transparent business case found for the IS strategy implementation. Only one case was properly defined and communicated to the stakeholders. But this was not a general approach. It was just random by a specific

project. Since all companies have a complex matrix organization, it is challenging to get the resources and transparency to measure or even to establish a business case. In one company department, a yearly salary bonus based on successful project implementation based on its KPIs leads to a better quality of the project because business cases were defined before starting with the projects.

Q44-Can you identify any key issues which are driven from IS strategy

Table 36: Key responses R44

• *Decision taking too long* • *Driven by matrix organization fight for best resources* • *Finding right balance implementing new technologies and organization readiness*	• *Missing business ownership* • *People are engaged into many parallel projects* • *People resistance to new systems and processes* • *too many systems and processes not aligning resulting in island solution. Breaking this up takes CEO or EXEC Board actions*	• *Projects are initiated every week but only a few are fulfilled, approx. 250 big IT projects per year*

One of the key issues identified was moving from the theory or the project design into real implementation. One of the reasons is that decisions generally take a long time due to the matrix organization, which was fighting for the best resources for the project team members. Another critical finding was misaligned expectation management in most of the companies. The goals or the scope of the projects were not adequately defined, which results in frustration. Finding the right balance between implementing new technologies described in the IS strategy and existing know-how and resources, which are most of the time working in parallel projects causing frustration and the dependencies on other projects a delay. The frustration results in resistance, and some projects had failed or stopped before they were finished. In large enterprises, projects are initiated every week, but only a few are completed in time. Due to the missing time, project details were missed, and assumptions were taken rather than collecting facts for the projects. Once a project has been successfully implemented, the training for the end-users was lacking, resulting in another frustration. Most of the respondents agreed that proper project risk management should be taken seriously, which, in most cases, did not happen.

Q45-What has been implemented in the past 5 years

Table 37: Key responses R45

• *SAP Rollout in more countries* • *General shift to cloud*	• *See strategy from CIO PPTX*

The participants' companies had slightly different setups reflecting varying business legal requirements and overall internal IT strategy. Company A uses Infrastructure as a Service (IaaS) and Software as a Service (SaaS) - a hybrid environment for their mail and collaboration applications. Company B uses Infrastructure as a Service (IaaS) in their private cloud, so as Company C. Companies D, E, and F use all a private cloud approach but with a combination of the stacks Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). The primary usage is to host the ERP application and its related services. The cloud deployment model they are using becomes less about the "place" of the cloud and concerns more "who" the cloud is shared with and "how" the data in the cloud is processed and stored at "rest". Data at rest defines data that is not actively moving or processed over the network or from device to device, also seen as cold data. There are a variety of models and combinations used to deliver cloud services, but companies A-F are considering cloud services in their IS strategy. None of the six companies had a similar approach to use the cloud, and the services used are more based on the complexity of the current IT architecture. Not all services are "cloud-ready." All companies started with the services like email and office migration to the public cloud rather than hosting and managing those services on their private cloud. Due to the company's size and the small number of subsidiaries, companies B and D were able to shift to a cloud-only approach for their office applications. The other companies are using a hybrid or a private cloud approach due to their internal organization's complexity or the companies' strategy. For example, Company B uses a multi-domestic strategy, meaning each subsidiary can define its own IS strategy to some extent. This provides the company the local flexibility and agility but complicates implementation of other elements of global IS strategy. Companies A, D, and E, are considering public cloud services in their IS Strategy and their development departments focusing on IoT devices and machine management services. The public cloud solutions provide them the flexibility to run more complex worldwide setups, and they benefit from cost control. Unlike public cloud computing, a private cloud is typically hosted in a company's firewalls. Alternatively, some

companies host their private cloud with an external third-party provider, allowing them to leverage on-demand external computing resources. The managers interviewed in Company C is a subsidiary of a large multi-national enterprise group company. This specific subsidiary provides financing and treasury services for the whole group and is based in Switzerland, and they call it the “internal bank”. Hence, even the group’s IS strategy allows public cloud services, and the company must follow the Swiss banking regulations. This affects mainly the security strategy and the use of various financial applications. Company C uses a private cloud with Infrastructure as a Service and is managing the self-hosted software applications.

The most common cloud strategy from all companies is a hybrid cloud. It connects public and private clouds with an encrypted connection and technology that makes data portable. The key here is that both clouds remain separate, independent entities, while they also have one or more touchpoints in common. A hybrid cloud is not the same as simply relying on cloud services for some features and a private cloud for others. All companies started with a hybrid cloud is an intermediate step between their old on-premises data storage and processing settings, and the transition to the public cloud entirely. The hybrid cloud approach enabled them to leverage cloud computing's scalability while maintaining the integrity of data and ensuring compliance with regulatory requirements and compliance standards. Multi-cloud is a deployment model that involves the use of multiple cloud services from multiple public cloud hosting providers, often in combination with a local physical, virtual, and private cloud infrastructure. This setup is also present in companies A, C, E, and F. The core IS strategy from all companies is to use the private cloud for their ERP systems such as SAP, Siebel, and Microsoft Dynamics (formerly Navision) with an Infrastructure as a Service approach. All core applications are hosted at the headquarter, and subsidiaries are connected by MPLS lines or VPN access. The introduction of the cloud for enterprises enables an incredible amount of innovation and an overwhelming range of options for them.

The core ERP or IT systems did not change significantly in recent years, as evidenced in the responses to Question 35.

Q46-What is planned to be implemented in the next 5 years

Table 38: Key responses R46

• *More Business com tool like S4b of Teams*	• *Optimization of current processes and templates*	• *SAP Rollout in more countries*
• *More cloud services*	• *Rollout more functions in O365*	• *See CIO PPTX for 2025*

The trend from all CIOs is to focus or evaluate more cloud features like productivity and business applications from Microsoft 365 and infrastructure as a service from Azure, Amazon Cloud Services, or other local cloud providers which can meet the company's policies. Continuous updates and upgrades of the core Information Systems are as essential and planned, like further SAP rollouts in more countries of some companies.

Cloud services can usually be broken down into three service models: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). Each of them has a similar stack of components. The difference is which parts of the stack are managed by the provider and which are handled by the end-user. There are also four different ways in which cloud services can be accessed and utilized – generally termed, public cloud, private cloud, hybrid cloud and multi cloud.

Public Cloud

Public cloud solutions are available from Google, Amazon, Microsoft, and others. Public cloud services provide infrastructure and services to the public, and the companies can secure a piece of this infrastructure. If environments are partitioned and distributed across multiple tenants, they are considered as public clouds. The IT infrastructure hardware used by public cloud providers can also be abstracted and sold as IaaS or developed as a cloud platform and distributed as PaaS. These environments are typically created from non-end-user IT infrastructures.

Private Cloud

If cloud environments run behind a user's firewall which are allocated to only one end-user or a group of users, they are defined as a private cloud. The underlying IT infrastructure is assigned to a single customer with completely isolated access. Arguments such as location and ownership lose their importance because private

clouds no longer need to build on local IT infrastructures. Nowadays, organizations are developing such clouds in rented, off-premises data centers owned by a vendor.

Hybrid Cloud

A hybrid cloud is a single IT environment built from multiple environments connected through various internal and external networks and Application Programming Interfaces (APIs). A hybrid cloud can be very complex, and its requirements vary based on the company's needs and strategy. However, IT systems automatically become part of the hybrid cloud when data and applications can communicate freely between several separate but interconnected environments and can also be moved between the clouds. Large companies mainly use such hybrid cloud approaches for backup and business continuity scenarios. Some of these environments need to build on consolidated IT resources that can scale as needed.

Multi Cloud

A multi-cloud environment is a combination of at least two cloud variations of the same type such as private, public or hybrid. Such a combination is used strategically to separate, for example, the internal infrastructure services like Windows Servers and database applications running on Microsoft Azure from the customer facing applications like Webservers on Amazon Web Services.

The material from the interviews revealed a number of relevant issues regarding the repercussions of cloud strategy on software choice. At first glance, a cloud computing application seems to be much cheaper than a specific software solution that is installed and run internally. However, it is challenging to compare all SaaS, as each application works differently in the cloud, and also, the license models are different from on-premise installations. SaaS cloud applications do not require significant capital investments for licenses or support infrastructure, but do the cloud applications have all the features that the locally installed software has? If not, are the missing features essential for the business? This complexity is usually underestimated, as identified by the companies E, F and D. They confirmed that if the business requirements raise a need to customize the cloud-based software to suit the company's needs, the cost can significantly increase. If custom in-house software is in place, it may not be possible to move it to the cloud without an expensive re-write. This is a disadvantage. To save money, one needs to take a

close look at the pricing plans and details for each application, taking into account a possible future expansion.

All participants agreed that the companies' IS strategy needs to be verified if a company needs the latest software every year. Desktop software can be cheaper in the long run. For example, buying the Microsoft Office desktop version and use it for several years, one pays a one-time fee and owns the software forever instead of paying an annual fee to use the cloud-based version of Office 365. Other types of business applications, such as ERP systems, Accounting, and tax preparation software, require annual updates and are ideal for the cloud. If the company is transferring large amounts of data, data transfer to the cloud (incoming data) is free. Outgoing data transfers are charged via the basic monthly supplement per GB. If the business regularly needs to download large amounts of data from the cloud applications or data stores, the additional costs can add up. This has been a clear disadvantage for companies A, B, C, D and F, as they are using complex CAD and other design applications which are connected to the ERP system, and this has caused them high costs due to the data transfer. Fortunately, cloud computing is a very competitive business, and costs generally fall, so check the current prices. Multi-national enterprises have other options to scale and use subscription models in less expensive regions. This can be beneficial to store backups or host other services and applications. Company E uses this multi-regional cloud setup to scale their applications and provide better services and performance to their customers.

The inflexibility of some cloud applications can be another severe drawback of cloud computing. Caution should be observed if a cloud computing provider decides that their applications or data formats do not allow the easy transfer/conversion of information to other systems. Some vendors intentionally try to "lock in" customers with proprietary software, making it impossible or very expensive to migrate to another cloud provider. Company E, a software business, provides enterprise applications solutions to its customers within their own cloud, and they use this vendor lock in as part of their strategy. Furthermore, all companies are aware that, if one is considering moving to the cloud, it must be ensured that the cloud provider agreement allows retaining ownership of the data and that provider offerings meet current standards. Based on the license agreement, user licenses and data stores must be flexible to scale up and down as the business grows. In the early days of cloud computing, poor customer service was a constant complaint from users. Most

cloud providers have made technical support enhancements in recent years, but this improved service comes at a price.

5.5 IS Strategy review

How the success of IS strategy development is measured and how it is reviewed will be discussed in this section. The questions aimed to find answers as to whether the benefits can be identified, and further, to find out if there are processes for amending an IS strategy.

Q51-How is the success of IS strategy development measured

Table 39: Key responses R51

• *Increased Sales by Channels and Segments*	• *Review by the Business Excellence Committee*	• *Proper Change, Validate and Testing Process no need to review success*
• *Feedback from individual countries*	• *Strict set of measurements*	• *Yearly Review*
• *KPIs*	• *No Systematic Process in place*	• *Internal Audit Team review KPIs*

The success of the IS strategy development and the outcome is measured by KPIs defined in earlier stages or by the financial numbers, such as increased sales by channels and segments. The IS strategy has not only the focus to increase market share or revenue. It will also drive cost optimization goals. The review cycle is defined with a set of strict measurements and is done regularly by board members or a committee that was designated for that particular project. However, the most valuable feedback was the feedback from the individual countries and end-users, which were affected by the IS strategy.

Q52-How is this strategy reviewed

Table 40: Key responses R52

• *No reviews decision was made no other questions*	• *No Review, no lesson learned*	• *Regular strategy meetings, starting with review and collect feedback from countries. 360-degree approach*
• *No review du to prior approval process*	• *Project Reviews*	• *Board of directors meeting*

Company B, based on the participant #3 feedback, has no review process in place because they have a rigorous approval process for each project, which is the outcome of the IS strategy. The company has the maturity and culture to define explicit scopes and implementation projects. The other companies use various meetings or channels to review the strategy or its ongoing process. A strategic review process is not in place in those companies with specific actions that should be triggered when issues occur.

5.6 Varia

This section summarizes the open based questions which were asked at the end of the interviews to gain even more insights from the enterprises and the experts' knowledge. Furthermore, it provided the experts the opportunity to contribute to the topic of IS strategy development and implementation based on their experience.

Q61-Is there other information you can provide related to IS strategy development

Table 41 Key responses R61

• *Common agreement of terms and definitions*	• *Clear definition of Key System or Module Owners*	• *Cultural teamwork*
• *Challenges due to different working behaviors and business models within holding companies*	• *Experienced Ownership lead to success*	• *Centralize processes increase efficiency and brings flexibility*
• *Considering Digital Natives and how they change or affect the IS strategy*	• *Consider low performance (latency, access speed) Subsidiaries in the strategy*	• *More Business alignment in Multinationals from top managers*

In a process-driven organization, the business or process owner needs more engagement primarily when processes are centralized driven and should increase the efficiency to bring flexibility. Even global operations are centrally managed. A typical agreement of terms and conditions would be needed between the different stakeholders, business owners, and IT departments. Even within the IT department, different time horizons for the IS strategy are requested. There is always a gap between long-range and long-life IS strategies, meaning more than five years compared to shorter and agile strategies. We can summarize some responses under cultural issues like better teamwork would be an essential part of building a project and being aware of the different working styles, behaviors, and business models when working together in international projects within the same company.

Some business- or IT departments need to split strategy development decisions local at the subsidiaries and part of it at the headquarter. With this approach, we could consider low-performance subsidiaries in terms of speed of execution due to the missing leadership to provide them more time. The digital natives are also causing a shift and a re-thinking of the current development process since the end-users' general know-how has increased over the past years. This can cause, with the appropriate implementation model and training, better use of the systems in place.

Q62-Anything else you would like to add

Table 42: Key responses R62

• *IS is the key to drive future actions* • *Better Change management for self measuring performance*	• *Good model is most important* • *Knowing Why, Where to go and how to use tools*	• *Need for Speed*

The participants' overall response was the need for speed in developing and implementing the IS strategy. While developing the new IS strategy, some projects from the old or current strategy are still in the implementation status or do not even have been started. This, according to some respondents, could be solved by a better implementation model or framework together with better exceptions management. Good change management can also lead to better success because the project participants and the end-user know why we are doing this, where we go and how to use the new functionalities or features from the systems.

5.7 Summary findings

This chapter has summarized the findings from the 18 in-depth semi-structured interviews from multi-national companies' IS strategy development – and implementation experts. More than 18 hours of interviews were transcripted and analyzed, which resulted in 241 codes or statements. Those statements were grouped together, reflecting the questionnaire structure which was based on the COCPIT dimensions from the provisional framework, set out in chapter 3.

All enterprises had well established planning cycles with a planning range covering the next three to five years. Regardless of the size of the enterprise, business executive meetings are held every month or on a quarterly basis, with the main focus on the companies' operation and current projects. The meeting agendas are not

about a discussion about IS, and if so, this is covered through the project update status meetings. An important finding to point out is that company A uses a term called “focus points” to define a clear direction rather than a KPI or a set of various measurements. This was a unique finding compared to the other companies that used standard terms like project milestones that exist in traditional project management methodologies. The focus points are the outcome of a strategy and are well known within the whole group and is used to give clear direction regardless of the strategy type. Another enterprise is mainly driven by merger and acquisition projects. Hence, the planning and the various action items are different between projects, making it sometimes difficult to integrate the acquired enterprise or company into the buying company.

One conclusion is that business strategy planning is unique within each enterprise as they follow their own methodology established over the past decades. This makes the linkage from the overall business strategy to the IS strategy also unique, and it is thus difficult to develop an overall standardized methodology or process. IS strategy development can be done in various ways depending on the size, the complexity, and the maturity of a multinational enterprise. This includes a known top-down approach where the IS strategy is linked or aligned with the overall business strategy by using its goals, focus points, and KPIs. Another approach is that technology drives the IS strategy and the need coming from architectural challenges is forcing a change or an update in the current IS strategy. Regardless of the approach, the global CIO is always leading this process and should have the support of the top management. The implementation process of a new or updated IS strategy is executed through various projects. The identified challenge was to find the right balance between the size of the projects and the allocation of the skilled resources. Especially in a matrix driven organization, this is causing some conflicts. Furthermore, a clear business case or justification for an IS strategy and its content could not be found. The summary of each response from this chapter provides the fundamental basis for the following chapter 6, to validate the provisional framework against the COCPIT Dimensions and the RAEEC Processes to make amendments to the final framework for IS Strategy development and implementation.

6 MODEL DEVELOPMENT AND AMENDMENT

6.1 Introduction

This chapter discusses the interview responses in the context of the COCPIT and RAEEC based framework outlined in chapter 3. The aim is to validate the identified codes and nodes from the interviews against the provisional COCPIT IS dimensions, which are used in the alignment phase to develop and establish the IS strategy. Furthermore, validation against the RAEEC phases aims to test the applicability of the framework. The provisional framework must be tested for validity and relevance. Evidence needs to be given for correspondence between the researcher's findings and the understandings of the participants of the assessments. This chapter will pursue the chosen methodology described in chapter 4, thereby facilitating an adequate response to the research objectives in chapter 8.

Following this introduction, section 6.2 explains the response validation based on the coding and mapping process. Section 6.3 makes the critical reasoning and amendments to the provisional framework. Section 6.4 provides the final framework for IS development and implementation, followed by discussions in section 6.5, and the summary section 6.6

6.2 Validation and mapping of findings

This section maps the coded key responses from the expert's interviews against the provisional COCPIT / RAEEC framework from section 3.4 to assess if responses support the COCPIT IS dimensions for the IS strategy development and the RAEEC processes for the implementation. Table 43 indicates questionnaire responses as they relate to the COCPIT / RAEEC matrix. The matrix could be entirely coded against the responses from each participant. The data analyzed responded to 23 questions, comprising 241 responses from the 18 experts, as explained in section 5.1. The questions Q11-Q15 were about the respondent details and are excluded from further analysis. Those questions were important in the previous chapter 5 to find and validate the key responses based on the expert's role and experience. This led to a final response set of 192 codes.

The previous chapter 5 presented the findings by each of the questionnaire topics. In this chapter, the responses were further validated and grouped against the COCPIT IS dimensions and the RAEEC processes.

Table 43: Coded COCPIT / RAEEC framework

	RAEEC					
COCPIT	**1. Review**	**2. Align**	**3. Engage**	**4. Execute**	**5. Control**	**Total**
1. Cost & Benefits	1	4		4	6	15
2. Organization & Processes	12	38	3	10	4	67
3. Human Capital			16	6		22
4. Projects & Services	3	1	3	27	7	41
5. Integration		7	5	4	1	17
6. Technology	2	25		1	2	30
Total	**18**	**75**	**27**	**52**	**20**	**192**

The coded COCPIT / RAEEC Framework provides relevant insights to the IS development and implementation processes. One can conclude, based on the number of codes, that the dimension “Organization & Processes” is the most significant, followed by “Projects & Services” and then “Technology”, in the context of IS strategy. This suggests that it is not technology that is the core of an IS, but instead, it is the organization with its processes which the IS needs to support. This can be seen as a shift from a technology based IS strategy to an organizational and process driven IS strategy. In addition, based on the expert’s responses to the strategy implementation, the “Project & Services” dimensions had a high number of codes. This concludes that the methodology gains more importance in complex enterprises. The IS development and implementation processes RAEEC resulted in an expected outcome with a high number of codes in the “Align” and “Execute” phases. The “Align” covers the IS strategy development process and the “Execute” the implementation according to the definition chapter 3.3.2.

The following sub-sections will describe the findings for each COCPIT and RAEEC element of the framework.

6.2.1 COCPIT dimensions

This sub-section discusses the findings of the coded COCPIT / RAEEC framework’s row label COCPIT. Each of the six COCPIT dimensions will be discussed according to the summarized responses.

Cost & Benefit

Table 44: Coded Cost & Benefits dimension

Row Labels	1. Review	2. Align	4. Execute	5. Control	Total
1. Cost & Benefits	1	4	4	6	15
Total	**1**	**4**	**4**	**6**	**15**

Cost & Benefits were also classified with the synonym of the value chain by the experts. Hence, IS enables the enterprise to globalize its operations and achieve more revenues and profits by properly aligning this dimension.

First, value chain coordination refers to coordinating similar value chain activities (such as procurement or production) across different geographic locations by centralized processes that increase efficiency and bring flexibility. This involves the management of IS to make decisions related to the activities and the management of knowledge and resources necessary to perform the activities to gain a benefit. IS facilitates value chain coordination, and knowledge flows through the provision of various transmission channels and knowledge management systems to transfer and absorb knowledge by headquarters and subsidiaries at lower costs. Therefore, IS contributes to expanding the type, frequency, speed, and volume with which the enterprise can input, store, extract and exchange structured information and unstructured knowledge. The proper use of IS enables the enterprises to communicate knowledge to headquarters or subsidiaries that have the best experience and capabilities to make specific decisions and provide infrastructure to share, distribute, and absorb knowledge across geographic and functional boundaries to coordinate activities and develop strategic opportunities. Challenges due to different working behaviors and business models within holding companies should be addressed accordingly.

Second, the value chain configuration refers to how the enterprises build the capacity to perform value chain activities globally and disperse those activities across different geographic locations and subsidiaries. By optimizing its value chain activities, an enterprise can achieve efficiencies through centralized administrative coordination, control of resources, performance measurement. It can further produce and innovate in low-cost markets and sell in high return markets. This also leads to a more significant benefit by using IS to extract information and knowledge components of production inputs and business processes and move those

components around the world to perform each value chain activity in the location where it can be best accomplished.

Finally, the successful measurement of the value chain activities was measured by the business processes' efficiency increase. The alignment of the various costs and benefits or value chain activities is facing some challenges due to the different working behaviors and the different business models within the group companies. Defined business cases could measure some costs and benefits. A challenge to execute or implement this Cost and Benefit dimension is the lack of transparency by some matrix organizations within group companies. This led to the effect that people could not be responsible for their actions and caused a lack of in-transparency, making it impossible to measure the benefits. One possible solution to validate a proper Cost and Benefit dimension was to measure if sales and revenue have increased to overcome this situation.

Organization & Processes

Table 45: Coded Organization & Processes dimension

Row Labels	1. Review	2. Align	3. Engage	4. Execute	5. Control	Total
2. Organization & Processes	12	38	3	10	4	67
Total	**12**	**38**	**3**	**10**	**4**	**67**

Given that a multinational organization is operational in different countries simultaneously, it is essential to consider the legal and economic environment around the world to understand the IS strategy design and implementation requirements. The primary purpose of this dimension is to add flexibility based on IT and business processes to the IS strategy. It can be adopted throughout the subsidiaries of the organization and be aligned with the overall strategic intent of the headquarter of the enterprise. Regular mid-and long-term planning meetings can achieve this. The need for shorter planning cycles was a key argument for many enterprises by defining a standardized review process, which led to new internal methodologies.

Multi-national enterprises can be classified based on whether the end users of their products are industrial customers, individual consumers, or internal holding companies. Each of them requires different processes which affect the IS. According to the responses, the market for industrial customers is more concentrated than the

market for individual consumers. Industrial customers have larger transaction volumes per customer, while individual consumers have intermittent transactions with lower values per transaction. Industrial products are generally more standardized because the technical specifications do not necessarily vary across countries unless the products and services are highly customizable. Consumer products are less standardized because consumer preferences are more idiosyncratic to local markets and cultures. This requires a flexible setup of IS considering a centralized or decentralized approach. Relationships with industrial customers are more prevalent, complex, balanced, and long-standing than relationships with individual consumers. The operations of an enterprise can be viewed as two sets of business processes, front- and back-office processes. Front-office processes are those through which the company interacts directly with the customer and include marketing, sales, and service. While back-office processes are operational processes, they do not interact directly with the customer. However, those processes can get be very complex due to the structure of the enterprise and the degree between a centralized and decentralized approach and the lack of ownership by the CEOs and CIOs.

The extent of customer contact, internal or external, influences the challenges inherent in each set of processes and the resulting focus of the company. Front-office processes must cope with uncertainty resulting from customer involvement and unique requests, which create inefficiencies and increase operating costs. The company must align its front-office processes to address customer contact's human relations aspect and be agile enough to customize products and services to customer requirements. This requires in all subsidiaries or business units strong competencies. Because customers do not directly interact with back-office processes, customers may not perceive back-office processes as part of the company’s value proposition. This places pressure on enterprises to standardize and automate to enhance the efficiency and effectiveness of back-office processes by using an appropriate IS strategy.

Back-office processes are more amenable to global coordination because unique front-office processes are required to tailor products for different markets. While industrial specifications have limited differences across markets, consumer preferences are more subject to local culture. Consumer Products companies currently allow each subsidiary to define its own IS processes but coordinated by the central headquarter. The enterprises generally make larger capital investments

related to back-office processes compared with front-office processes, with the objective to reduce the long-term cost of back-office processes. This investment also addresses the “need for speed” which impacts the IS strategy.

Human Capital

Table 46: Coded Human Capital dimension

Row Labels	3. Engage	4. Execute	Total
3. Human Capital	16	6	22
Total	**16**	**6**	**22**

The fast changes in global environments and continuous demand for new technology drives internal activities for many enterprises. This requires a lot of resources, and an organization with less capacity to develop, maintain and sustain the human resource competencies, especially from the local subsidiaries, are likely to be confronted with challenges. Hence, an IS strategy must consider the available resources such as people, skills, and know how in a multi-national enterprise. One of the more considerable challenges is to be aware of cultural influences within an IS strategy. One should not build processes around people; people should follow the processes. In a multi-national enterprise, this could be a difficult task to be aware of the skills and know how within the whole enterprise when new teams are formed. In some enterprises, the CIO act as a mentor to force cultural teamwork and engage team members from many regional subsidiaries to work together. Culture is a core part of the IS strategy and is considered as one of the drivers within this Human Capital dimension. Culture is difficult to understand for some managers, but they should be aware of the importance and take ownership. National culture comprises the values, beliefs, and behavior patterns dominant in a country and strongly influences institutional and organizational patterns of behavior. Based on the responses and codes and the emerging literature on international and cross-cultural IS, it is reasonable to argue that national culture would impact IS priorities.

Furthermore, the use and impacts of IS differ based on the nature of products and services produced by an enterprise affected by the end users’ skills and know how. Systemic resistance results from passive incompetence of the enterprise in support of the strategy. It arises whenever the development of capacity lags behind strategy development. This may further hinder implementation, especially where strategic and operational control systems do not detect and cause an adjustment to the changing internal environment. Behavioral resistance, on the other hand, maybe

manifest on an individual or group level. Parochial self-interest, misunderstanding and lack of trust, different assessments and views from managers, and low tolerance to change are some of the reasons behind behavioral resistance within a large enterprise. The behavioral challenge in addressing the social system (people) is creating a shared understanding of the different perspectives all the people in an organization hold as a preamble to the commitment to searching for solutions. The compatibility of organizational culture to new strategic changes is an essential measure in overcoming this challenge.

Lack of synergy between strategy and culture may obstruct the smooth implementation of strategy by creating resistance to change. The culture of an organization must be compatible with the strategy being implemented in case strategy and culture are incompatible. Otherwise, it can lead to high organizational resistance to change and de-motivation, which in turn can frustrate the strategy implementation effort. This can be related to the Engage phase of the RAEEC processes. However, when culture influences the employees' actions to support the current strategy, implementation is strengthened. Maximizing synergy while focusing on reinforcing culture, managing around culture, and reformulating a new organizational culture. The process of institutionalization relies heavily on the organization configuration that consists of the structures, processes, relationships, and boundaries through which the organization operates. The relationships consist of interactions, influence, communication, and other elements that occur systematically or in a structured manner. While the strategy should be chosen in a way that it fits the organization structure, the process of matching the structure to strategy is complex should be driven by the top-level board members.

Finally, the biggest challenge in leadership is in determining the “right things”, especially at a time where industries are mature or declining. Such challenges are even more acute in strategy implementation. A leader also faces all kinds of barriers, such as conflicting objectives, organizational discrepancies, political rivalries, and organizational inertia. Such happenings impede the strategy implementation process and require excellent skills and know how to overcome this challenge.

Projects & Services

Table 47: Coded Project & Services dimension

Row Labels	1. Review	2. Align	3. Engage	4. Execute	5. Control	Total
4. Projects & Services	3	1	3	27	7	41
Total	**3**	**1**	**3**	**27**	**7**	**41**

Based on the coded distributions on RAAEC within this dimension (Table *47*), the focus is on the execution and implementation of an IS strategy with 27 responses. Those responses conclude that a proper model and methodology must be considered in IS implementation. IS implementation using recognized project methodologies in a multi-national context was the most frequent code identified in the Execute phase on RAEEC. On the other hand, there was just one code that can be linked to the align phase which is questioning the long-range life strategy versus shorter and agile strategies. This decision has the most significant impact on the chosen methodologies, required skills for project team members, and a well-defined change management process. Some of the key elements of the Project & Services dimension are to address local country or subsidiaries issues, culture, practical implications, and project organization and management.

An appropriate project methodology should be chosen based on the IS strategy type, such as long or short term, to develop and validate proper methodologies that seek to address the country issues. Elements that can influence the projects could be economic growth, national culture, and political system as causal factors, among others. A necessary action is a review to gather feedback from other projects by project review meetings to evaluate the predictive capability applied methodologies. However, if the determinants of the key issues are known, then a preliminary estimation of the issues will be easier to make to address this in the IS strategy adequately. If culture is identified as one of the factors influencing IS needs, then it can be explored in more detail, both in terms of culture components and IS components that are influenced by it. Furthermore, enterprises force the development of a comprehensive internal universal instrument and methodology which can be applied globally or in specific business units or subsidiaries to identify the key IS issues. Developing a methodology or project management process to cover specific practical implications that can be incorporated into the formulation of

national policy, corporate policy, or IS policies within an organization is also an essential part of this dimension.

Integration

Table 48: Codes Integration dimension

	2. Align	3. Engage	4. Execute	5. Control	Total
5. Integration	7	5	4	1	17
Total	**7**	**5**	**4**	**1**	**17**

This dimension focuses on business alignment and corporate governance, which are also significant in ensuring a successful and effective IS strategy. Political system and government policies have an impact on the IS of a local subsidiary. Local government, inspired by its political beliefs, may take a hands-off approach towards IS developments. Despite all good intentions, the government may impose a wide array of overly restrictive policies. As another alternative, the government may pursue an aggressive policy of rapid technology growth and provide necessary incentives and infrastructure to enterprises. This covers the alignment with the corporate governance to which degree the enterprise or a subsidiary can or will follow such regulation. These issues can most appropriately be addressed in this dimension to consider the growing technology adoption such as cloud services. In a sense, the adoption of global cloud services posited the need for a control stage to contain and manage the proliferation of IS activities in an enterprise. Such a control stage, also coded as compliance audits, can be internal or external. Many reasons were mentioned why an external auditor should do such an audit to guarantee that full independence is granted. Recognizing that there are limitations and other elements may be necessary for a deeper understanding of the global IS environment alignment or the governance from the environment of any subsidiary.

Finally, to adequately address this dimension in an IS strategy, a good understanding of the global IS environment will be a crucial factor in the development of a suitable IS strategy of a global enterprise. Further key concerns should be adequately considered by a strong aligning between the global business owners. The results should be discussed with the CIO for aligning with the other local IT teams to avoid local cultural issues. A central top-down approach can achieve the best results. Otherwise, the respondents confirmed that many tiny “kingdoms” would emerge, which are then hard to convince for a new IS strategy.

Technology

Table 49: Coded Technology dimension

	1. Review	2. Align	4. Execute	5. Control	Total
6. Technology	2	25	1	2	30
Total	**2**	**25**	**1**	**2**	**30**

This dimension was initially considered as the most critical affecting an IS strategy by looking for the latest technology trends and validating them against the current IS. Therefore, this validation is detailed by providing company insights (Table 19: Analyzed multinational companies) of their current technology. The responses could be grouped into three technology topics. They were using and adopting cloud technologies and their impacts on IS strategy, software choices, and trends, finally the legal impacts by combining the cloud technologies with the software applications leading to adequate management of data.

In all six companies, cloud services are considered a central part of their IS strategies. They all differ somewhat from each other in their use of the cloud, and the services used reflect the complexity of their current IT architectures. All companies started migrating core services such as email to the public cloud rather than hosting and managing this service on their private cloud. Due to company size and the small number of subsidiaries, companies B and D were able to adopt a cloud-only approach for their office applications. The other companies are using a hybrid or a private cloud approach because of the complexity of their internal organization. Company B uses a multi-domestic strategy, meaning each subsidiary can define its own IS strategy to some extent. This provides the company with local flexibility and agility but complicates the implementation of other elements of global IS strategy and means different cloud deployment models are utilized.

Companies A, D, and E, are considering public cloud services in their IS strategy, as their software development departments are focusing on IoT devices and machine management services. The public cloud solutions provide them the necessary flexibility and cost control benefits when running complex setups worldwide, accessing globally available datacenters. Unlike public cloud computing, a private cloud is typically hosted behind the company's own local firewalls, which provides them less flexibility. Alternatively, some companies host their private cloud with an external third-party provider, allowing them to leverage on-demand external

computing resources. The managers interviewed in Company C are employed in a subsidiary of a large multi-national enterprise group company. This specific subsidiary provides financing and treasury services for the whole group and is based in Switzerland and is known as the “internal bank”. Even though the group IS strategy allows the use of public cloud in its subsidiaries, this subsidiary company has to follow the Swiss banking regulations. These include consideration of security strategy and the use of various financial applications, and thus Company C uses a private cloud approach to host and manage the IaaS stack to run the self-hosted software applications.

The most adopted deployment model in all companies is a hybrid cloud. It connects public and private clouds with an encrypted connection and technology that makes data portable. The key here is that both clouds remain separate, independent entities, while they also have one or more connections in common. A hybrid cloud is not the same as simply relying on public cloud services for some features and a private cloud for others. All companies started with a hybrid cloud as an intermediate step between their old on-premises data storage and processing settings, and a fuller transition to a public cloud environment. The hybrid cloud approach enabled them to leverage cloud computing's scalability, while maintaining the integrity of data and ensuring compliance with regulatory requirements and compliance standards. A multi-cloud setup is also present in companies A, E, and F. The core IS strategy from all companies is to use the private cloud for their ERP systems such as SAP, Siebel, and Microsoft Dynamics (formerly Navision) with an IaaS stack. All core applications are hosted at the headquarters, and subsidiaries are connected by multi-protocol label switching (MPLS) lines or virtual private network (VPN) access. The introduction of the cloud for these companies has enabled innovation initiatives and a wide range of technology service options.

The material from the interviews revealed several relevant issues regarding the repercussions of a cloud-based strategy on software choice. At first glance, a cloud computing application seems to be cheaper than a specific software solution that is installed and run internally on premises. However, a more detailed assessment of a range of SaaS options indicates that cloud-based applications may be somewhat different from on-premise versions regarding their functionality, and the license models are also different from on-premise installations. SaaS cloud applications do not require significant capital investments for licenses or support infrastructure, but do the cloud applications have all the features that the locally installed software has?

If not, are the missing features essential for the business? This complexity is usually underestimated, as identified by companies E, F, and D. They confirmed that if the business requirements raise a need to customize the cloud-based software to suit the company's needs, the cost can significantly increase. Further, if customized in-house software is in place on-premises, it may not be possible to move it to the cloud without an expensive re-write. This is a disadvantage. One needs to take a close look at the pricing plans and details for each application, considering a possible future expansion.

The experts confirmed that IS strategy needs to be reviewed annually if it is to keep abreast of new software available in the cloud. This indicates some cross linking to other COCPIT dimensions. Cloud-based desktop software may be more expensive than on-premise equivalents in the long run. Other types of business applications, such as ERP and accounting systems, which require annual updates, are ideal for the cloud. If the company transfers large amounts of data, data transfer to the cloud (incoming data) is free. Outgoing data transfers (from the cloud) are charged via a basic monthly supplement per gigabyte. If the business regularly needs to download large amounts of data from the cloud applications or data stores, these additional costs can add up. This has been a clear disadvantage for companies A, B, C, D, and F, as they are using complex CAD and other design applications which are connected to the ERP system, and this has caused them high costs due to the data transfer. Fortunately, cloud computing is a very competitive business, and costs generally fall. Multi-national enterprises have other options to scale and use subscription models in less expensive regions. This can be beneficial for backup storage or hosting other services and applications. Company E uses this multi-regional cloud setup to scale their applications and provide better services and performance to their customers.

The inflexibility of some cloud applications can be another severe drawback of cloud computing. Caution should be observed if a cloud computing provider decides that their applications or data formats do not allow the easy transfer/conversion of information to other systems. Some vendors intentionally try to “lock-in” customers with proprietary software, making it impossible or very expensive to migrate to another cloud provider. Company E, a software business, provides enterprise application solutions to its customers within their own cloud, and they use this vendor lock-in as part of their strategy. Furthermore, all companies are aware that, if one is considering moving to the cloud, it must be ensured that the cloud provider

agreement allows retaining ownership of the data, and that provider services adhere to current standards. Based on the license agreement, the number of user licenses and data storage capacity must be flexible, to allow scaling up and down as the business grows. In the early days of cloud computing, poor customer service was a constant complaint from users. Most cloud providers have made technical support enhancements in recent years, but this improved service comes at a price.

Cloud solutions must be considered in the context of managing corporate data and information as an important element of IS strategy. Multi-national companies providing financial services, such as company C, and other highly regulated industries, face a range of significant challenges in this regard. Just as compliance and e-discovery rules tighten and require more oversight, the underlying and supporting technology is in a constant state of change, with computing acting as a catalyst for paradigm shifts and new business models. GDPR requirements also need careful management when transitioning to new cloud environments. Companies A and E, for example, run their own independent IT infrastructures on-premises as well as utilizing IaaS and PaaS. In such circumstances, moving from an on-premises setup to a public cloud solution to meet the global GDPR requirements can be a complicated, expensive, and complex transition.

Changes in corporate cloud strategy can be an opportunity for systems migration, as was the case with the SAP ERP system in the Swiss subsidiary of company C. The cloud makes the transition much easier and less costly and provides a long-term solution that is much easier to manage and scale. It has been suggested that the inherent benefits of the cloud are why it is one of the driving forces behind this next computing paradigm (Shetty & Panda, 2021). With the appropriate cloud solution, organizations can address all the key issues they face in transforming their information management technologies and policies, such as the management of information governance for new data formats as evidenced in social media, mobile, and voice. This is especially beneficial for multi-nationals like companies A, C, and F. It can provide an enterprise information management solution for data retention, storage, archiving, access, analytics, and reporting. Therefore, companies such as A, C, and F, need to ensure that their global IS deployments meets the local data protection requirements within the business areas they operate in, and data is secure when moving to the cloud and working with a cloud partner with the necessary domain expertise, experience, and stability.

A main challenge in deploying cloud-based solutions involving company data is trust. This was identified by the senior executives from the interviewed companies. Data is an organization's most important asset and delegating the management of that data to a cloud supplier requires absolute confidence in that provider's technology solution, underlying infrastructure, expertise, security, and credibility in delivering bulletproof mission-critical solutions in highly regulated industries. Finding a vendor worthy of this trust has been an obstacle to broader cloud adoption to address today's data management challenges.

6.2.2 RAEEC processes

This sub-section discusses the findings of the coded COCPIT / RAEEC framework's column label RAEEC. Each of the five RAEEC processes will be discussed according to the summarized responses.

Review

Table 50: Coded Review process

	1. Cost & Benefits	2. Organization & Processes	4. Projects & Services	6. Technology	Total
1. Review	1	12	3	2	18
Total	**1**	**12**	**3**	**2**	**18**

Company B has a straightforward strategy based on the CIO's statement. They follow a strict process based on the SAP methodology. Once a strategic project is defined and implemented, a review of the effectiveness of the defined strategy or project is not done. Company D holds a regular strategy meeting, and they collect feedback from the subsidiaries to get a 360-degree perspective, while in company F, no review takes place. Company A had the most variety of key responses, but all responses were based process driven. The company has a yearly planning process with quarterly reviews. All strategy-related projects, which are on average between 150 and 200 per year, are presented to all global users on a so-called "Project Cockpit". Hence, the participants confirmed this visibility of the strategy and the current state of the projects. However, they said that the review process itself

needs an improvement, and a review process methodology is missing. The final statement from participant #6 was "*No proper review, no lesson learned*". Based on the responses, the tasks in the Review phase could be confirmed as follows:

Current business strategy -> CONFIRMED

- Effectiveness of the present IS Strategy -> CONFIRMED
- ~~Internal and external factors~~ -> REMOVED
- ~~Technology trends~~ >REMOVED

Two tasks assumed in the Review process - the defined technology trends and internal and external factors based on the past year's assumptions - were considered as too complex and time consuming and finally removed from this phase.

Align

Table 51: Coded Align process

	1. Cost & Benefits	2. Organization & Processes	4. Projects & Services	5. Integration	6. Technology	Total
2. Align	4	38	1	7	25	75
Total	**4**	**38**	**1**	**7**	**25**	**75**

The alignment phase is considered as a core phase of the IS strategy development process. Participant #1 confirmed that the current trends and risks are discussed with the various business units and their subsidiaries to collect future business requirements. Within this phase, the researcher developed a generic set of strategic questions in chapter 6.3.1 based on the expert's responses and the researcher's knowledge gained from the interviews as a guide within this new framework. The strategic questionnaire will provide more details to the COCPIT dimension. The researcher's assumption was that the cultural issues were addressed when companies plan their IS strategy in this current phase. This could not be fully confirmed for this phase based on Question #33. For example, participant #4 confirmed that they consider cultural issues and skills in the IS development and

participant #5 confirmed "*It's just more important than the culture of choice is explicitly mentioned in the strategy."* However, other responses, like participant #3 *"Don't build a process around people. People must follow the process."* and the researcher's beliefs and expertise in IS development, supported the transfer of this task to the Engagement phase of the framework, as it is more crucial to address the cultural issues there due to the fact, that in the Engage phase of the framework, stakeholders are identified, and possible barriers should be addressed. Hence, the following tasks are confirmed.

Evaluate current state of technology -> Confirmed

- Collect future business requirements -> Confirmed
- Identify cultural issues -> Move to Engage
- Adjust IS strategy based strategic dimensions -> Confirmed
- Define success measurements -> Confirmed

IS strategy can be seen as a process involving actors from multiple sub-communities, as in the case of multinational organizations. Viewing IS development as an activity system, the dynamics of subsidiaries have also to be considered.

IS strategizing can be noted as a process of goal-directed activity intended to realize a strategy for using information systems in an organization. A sub-community's contribution to such strategy realization can be understood by considering its technology-mediated practices in the context of the broader organizational community and the emerging strategy. First, the local actors of an organizational sub-community shape and are shaped by the emergent strategy. In shaping the strategy, the actors draw on a set of routines, institutionalized norms and beliefs, and technological resources in taking action. Among these, and of particular importance here, is the technology-mediated practice through which actors in sub-communities shape the emerging strategy. As actors in an organizational sub-community become committed to contributing to strategy content, they bring their unique practices as to appreciate and shape the emerging strategy. Second, the practices of the sub-community enable interaction with the broader organizational community to which it belongs. The organizational community holds the collective structures shared by different actors in the organization. These collective structures serve as contextual conditions within which the IS strategy is conceived and brought

forth. Still, it should be recognized that sub-communities are heterogeneous, each drawing on their technology-mediated practices to shape the emergent strategy.

Finally, the emergent IS strategy, that refers to a pattern of goal-oriented activity that was unintended at the inception of the IS strategy. It may be seen as a result of a nexus of pluralistic and loosely coupled technology-mediated practices. Each organizational sub-community will bring their technology-mediated practices in their efforts to transform the familiar past through strategizing. In other words, the organizational sub-community contributing specific strategy contents should be prepared that other sub-communities may just as well resist the path enacted through such strategizing as it would support it. Furthermore, a good fit between the values embedded in the software development process and the overall organization's values will lead to a more successful implementation and cultural assumptions built into the process methodologies could conflict with the cultural assumptions of developers, leading to difficulties in implementing the process improvements. With the expanding use of offshore development practices, it will become increasingly important to understand how value differences in culturally diverse software development teams may influence the systems development process and subsequent developmental outcomes.

Engage

Table 52: Coded Engage process

	2. Organization & Processes	3. Human Capital	4. Projects & Services	5. Integration	Total
3. Engage	3	16	3	5	27
Total	**3**	**16**	**3**	**5**	**27**

The Engage phase can be seen as a preliminary step before executing the IS strategy projects. The primary goal within this phase is to address any concerns by pre-discussing the new or updated IS strategy with the affected business units and their managers to get their commitment before the projects are released. All three steps within this phase were existent in company A's strategy process; therefore, the proposed steps are confirmed and used in the final framework.

- Determine performance level of the organization -> Confirmed
- Identify areas of concern -> Confirmed
- Identify organizational barriers -> Confirmed

Organizational change is the major influencing factor for IS strategy implementation. Organizations resist change even at the expense of expected returns. Resistance to change is a multifaceted phenomenon, which introduces delays, additional costs, and instabilities into the process of introducing change. People working in an organization sometimes resist change proposals and make strategies challenging to implement. This may take the form of procrastination and delays in triggering the process of change, unforeseen implementation delays, and inefficiencies, which slow down the change and make it cost more than was initially anticipated, lack of commitment, slowdowns, absenteeism, disrespect of deadlines, poor performance, and strikes. To overcome those issues, the Engage process plays an essential role in a successful IS implementation.

Execute

Table 53: Codes Execute process

	1. Cost & Benefits	2. Organization & Processes	3. Human Capital	4. Projects & Services	5. Integration	6. Technology	Total
4. Execute	4	10	6	27	4	1	52
Total	**4**	**10**	**6**	**27**	**4**	**1**	**52**

This is the core phase in the IS strategy implementation process. All companies confirmed that the identified GAPs in the IS strategy were leading to various projects. In company A, those projects are managed by a large project management office that defines the methodologies for each of the projects. Some projects are reorganizing a whole business unit or just enabling a new feature in the core ERP system. In the past, most technology implementations followed a classic project management approach. Current projects tend to follow an agile, or at least hybrid, approach. Research question Q40 “IS Strategy Implementation“ addresses the implementation question, and the researcher gained many valuable insights during

the interviews and the challenges. Hence, the researcher considered all the steps as confirmed.

- Develop implementation roadmap to bridge gaps -> Confirmed
- Consider organizational policies for implementation -> Confirmed
- Define proper implementation and project methodology -> Confirmed
- Initiate projects and change management process -> Confirmed
- Deliver high-level tasks and milestones for implementation -> Confirmed

Strategy implementation challenges are also found in sources external to the organization. The challenges will emanate from the changes in the macro-environment context, namely economic, politico-legal, social, technological, and environmental. Since the purchasing power depends on current income, savings, prices, and credit availability, any change in the direction of the economies in the corporation's regional, national, and international market is likely to present changes in the purchasing power and hence the overall financial performance of an organization. In the rapidly changing social environment of the highly interdependent spaceship earth, businesses feel tremendous pressure to respond to society's expectations more effectively. Therefore, any changes in social values, behaviors, and attitudes regarding childbearing, marriage, lifestyle, work, ethics, sex roles, racial equality, and social responsibilities will affect firms' development. Unanticipated changes in the government policies regarding taxation, industry cooperation, environmental protection, education policies, among other factors, will impact on strategy implementation. A new administration may also bring about changes to the board of directors and leadership in an organization.

One major shortcoming of strategic implementation in enterprises is a failure to translate statements of strategic purpose, such as gain in market share, into the identification of those critical factors to achieving the objectives and the resources/competencies to ensure success. The intangible resources may also lead to unique challenges associated with external accountability imposed by the authorizing environment. Inadequacy of any form of resources, such as inadequate funds, equipment and facilities, and human resources skills and experience, is often a big challenge during strategy implementation. Furthermore, the challenge for the management is that it might need to recruit, select, train, discipline, transfer, promote, and possibly even lay off employees to achieve the organizational strategic

objectives. More enterprises are using project teams. The ability to build and manage effective teams is an essential part of implementing strategies. The significant finding was that an adequate change implementation in the enterprise was mainly ignored, such as the use of proper communication among the teams. Labor relations were another resource related challenge that may hinder strategy implementation.

Control

Table 54: Coded Control process

	1. Cost & Benefits	2. Organization & Processes	4. Projects & Services	5. Integration	6. Technology	Total
5. Control	6	4	7	1	2	20
Total	**6**	**4**	**7**	**1**	**2**	**20**

The analysis of this phase is based upon the responses from the primary question Q50 “IS Strategy Review”. Company A uses a wide range and a solid process of defining clear goals and KPIs for the initiatives and projects. Company B, which is following the SAP implementation process, are not goal driven. Their success criteria are by reviewing the change in the validation and testing phase. Company D gets feedback from the individual countries but more in an informal way. Success measurement is not possible. Another finding by company E was that they are mainly measured by sales increase in the various sales channels and had an internal audit team that was measuring the KPIs and providing the report to the management. In summary, all companies have in one way or the other an interest in knowing if their defined IS strategy, its projects, and initiatives were successful, and so the validation and verification steps are confirmed and used in the final framework,

- Validate and analyze IS Strategy success criteria measurements -> Confirmed
- Verify implementation success -> Confirmed

Finally, a bonus system for managers tied up to KPIs prevents line managers from using financial compensation as a strategic tool. It can be suggested that for the reward system to be closely linked to the strategic performance of an organization, the system should be a dual bonus system based on both annual objectives and long-term strategic objectives, profit sharing, and gain sharing.

6.3 Amendments to the provisional framework

Following the validation process, as discussed in section 6.2, this section discusses if amendments are necessary to the provisional COCPIT / RAEEC Framework based on the iterative learning cycle during the interview phases.

Each step in the analysis and validation phase have contributed with insights to explore, confirm, and explain the strong relationship between IS development and implementation. The relevance of IS development and implementation were indicated as the main arguments in the rationale of this study. Current literature that recognizes the strong relationship between IS development and implementation was also discussed in chapter 2.

Arguments relating to IS development and implementation practice were examined to confirm their practical implications and indicate their fundamental relationship towards IS alignment by linking or combining the COCPIT dimensions and RAEEC processes. The analysis was focused on knowing what relevant management practices enable tight alignment between IS and business given an adopted IS development and implementation strategy. The findings confirmed that organization and its processes, project methodologies, culture, and technology factors are significantly related to the process of IS development and implementation. Interestingly, when enterprises evolve over more sophisticated planning integrations, they tend to rank higher IS development and implementation majority. The following table presents the number of codes (total 192) mapped to the provisional COCPIT / RAEEC Framework developed in chapter 3. Based on this table, possible amendments will be discussed in the following sub- section 6.3.1 and 6.3.2.

Table 55: Mapped codes

Dimensions / Processes	Review 9%	Align 39%	Engage 14%	Execute 27%	Control 10%
Cost &Benefits 8%	1	4		4	6
Organization & Processes 35%	12	38	3	10	4
Human Capital 11%			16	6	
Projects & Services 21%	3	1	3	27	7
Integration 9%		7	5	4	1
Technology 16%	2	25		1	2

6.3.1 COCPIT

With only 8% of the codes, the Cost & Benefits dimension was considered as valid but did not show the expected significance. It can be concluded that the costs are not so relevant in developing an IS strategy. Hence, it does not drive the development or can be seen as a trigger for a new strategy. The enterprises have a complex international setup that can provide a cost-benefit by addressing an international sourcing strategy for the various software and systems. On the other hand, this complexity makes it very difficult to measure the benefits of an IS. The Organization & Processes dimension achieved with 35% codes the highest ranking. The results mainly came from the strong process-oriented enterprises, which concludes that an IS strategy must support the global business processes. The Human Capital as described in sub-section 3.2.3 with 11% of the codes primarily addressed culture and know-how. Even the proper skills and know-how of the employees were essential but in an IS strategy, the enterprises were addressing the use of IS by considering the local behaviors and human resources regulations within the subsidiaries. It can be seen as a soft fact of an IS strategy, but adequately addressing this dimension can lead to success and high customer/employee satisfaction. Projects & Services was also considered as a significant dimension with 21% of the codes. This dimension follows the Organization & Process dimension in importance, as the awareness was very high in all enterprises that new processes must follow a structured project methodology. A proper project portfolio and service catalog is a crucial requirement to manage the various tasks of an IS. The Integration dimension adequately addressed business alignment and governance, but 9% of the codes like the Costs & Benefits dimension are not considered a core dimension. The reason for the lower ranking was that mainly external factors influence this dimension. Finally, the Technology dimension with 16% of the codes covered the use of current and future planned systems and

application. It could also be confirmed that this dimension does not specify a specific system or application product name. It defines the whole system as such.

Conclusion: There were no main reasons or findings to change or amend the suggested COCPIT dimension. They have a higher-level character as each of the six enterprises might define or group the strategic questions differently. This results in the validity of the COCPIT definition of chapter 3.2 which is used in the final framework.

To better understand the strategic content of each COCPIT dimension, a set of possible questions were developed which emerged from the responses from the interviews and the researcher's knowledge in the areas of IS development and implementation.

Strategic Dimension	Strategy Topic	Responses from Interviews	Strategic Questions
1. Cost & Benefits	Budget sovereignty	R43,R61	If each company or business unit has an independent IT budget, is the budget coordinated with the group IT or approved by them?
	Cost development	R43,R61	Should the IT costs be kept as low as possible, or should the best possible cost/benefit ratio be sought, or maximum IT services (at corresponding costs) be provided?
	Cost efficiency	R43,R61	Should the cost efficiency be proven with an annual benchmark, both within the group and with other companies?
	Billing	R43,R61	Should the IT services be billed to the business units based on effective usage, or are IT costs allocated according to a pre-defined key?
	Discounts	R43,R61	Do all business units pay the same price for the same service or are different prices (volume discounts, individual discounts) possible?
	Central billing	R43,R61	Does each IT department bill the company units individually for its services or is there a centralized and standardized billing of all IT services?
	Controlling	R43,R61	Does each IT department have its own controlling (within the company units) or is there a central IT controlling for all IT departments?
	Financial leadership	R43,R61	Is IT run as a cost center or as a service center or even a profit center?
2. Organization & Processes	Engineering	R31,R61	Does every company have independent hard- and software engineering or does an engineering per competence center exist? Is there a common engineering for the entire group?
	Operations	R31,R61	Does every company or business unit have an independent IT operation? Is there an IT operation per competence center or is there a common operation for the entire group?

Strategic Dimension	Strategy Topic	Responses from Interviews	Strategic Questions
	IT security	R61	Does every company or business unit have an independent IT security operation? Is there an IT security operation per competence center or is there a common security operation for the entire group?
	Outsourcing	R61	Are the systems operated in-house or hosted and managed by a vendor? If by a vendor, to what extent?
	Processes	R21,R22,R61	Should all IT departments work according to the same IT processes and standards? If not, to what degree?
	Quality standard	R61	Are lower costs more important than quality or should the highest possible quality be achieved at the appropriate cost?
3. Human Capital	Skills of the internal employees	R33	Are you relying on the cheapest possible employees or on the best-trained (and more expensive) employees?
	Education	R33	Each company or business unit provides its own training for IT staff or does a coordinated or even centralized training plan exist?
	Employment conditions & Salary level	R33,R61	Should the conditions of employment and the salary level for IT employees be standardized across the entire group?
	External employees	R33,R61	In which degree should external employees be hired? Only selectively in the event to gain the missing know-how and overcome a resource bottleneck or should external employees be a key element of IT resource management ?
4. Projects & Services	Performance transparency	R41,R41,R61	Do you strive to define all services that are offered and to record them in service descriptions (SLA) or are the services provided ad hoc (best effort) ?
	Service portfolio	R42,R61	Does each company unit have an independent service portfolio, is there a service portfolio for each competence center or is there a common service portfolio for the entire group?
	Service reporting	R42,R61	Are the quality parameters recorded in the SLA of all the services offered measured and reported?
	Service prices	R42,R61	Are the service prices decoupled from the costs or are costs passed on? Are “political prices” (control via higher or lower prices) within the group possible?
	Availability	R42,R61	Should the IT systems have maximum availability (with corresponding costs) or the lowest possible costs (with corresponding availability) ?
	Project portfolio	R42	Does each company or business unit have an independent project portfolio, is there a project portfolio per competence center, or is there a joint project portfolio for the entire group?
	Project approval	R42	Do IT projects of a certain size have to be approved by the CIO or a committee?
5. Integration	Role of the IT department	R21	Does the IT department only have a supporting function or is IT an active business driver and enabler?

Strategic Dimension	Strategy Topic	Responses from Interviews	Strategic Questions
	Steering mandate	R23,R42	Does the IT department have a steering mandate for the business units or does the IT department carry out all the requirements of the business units?
	Application paradigm	R22	Do the applications adapt to the business processes or do the business processes adapt to the applications?
	General contractor role	R61	Can the various business units of the corporate units also sign contracts with providers and suppliers or is the central IT department?
	ERP systems	R31,R35	Are the ERP systems of the different companies isolated (independent), connected, integrated or together (same)?
	CAx systems	R31,R35	Are the CAx systems of the different companies isolated (independent), connected, integrated or together (same)?
	Applications	R31,R32,R35	Is every company autonomous and independent with regard to the applications used, are only the strategic applications common or are all applications?
	Infrastructure	R31,R32,R35	If every company is autonomous and independent in regard to the IT infrastructure, are only the strategic elements of the infrastructure common or the entire infrastructure?
	Governance	R22,R32,R42	How is the IT department controlled by the business units (project committees, operational status meetings) ?
	Prioritization	R32,R41	Does the IT prioritize independently, is the prioritization carried out by an IT committee or by management?
	Budget	R43	Is the IT budget centralized by the IT department or do individual business units also have an IT budget?
6. Technology	Innovation speed IT infrastructure	R61,R62	First mover, early adapter, or slow mover?
	Innovation speed Applications	R61.R62	First mover, early adapter, or slow mover?
	Degree of self-developments	R31,R35,R45,R46	Only standard systems, only in-house developments or mixed?
	Architecture	R31,R45,R61	Does a common / comprehensive architecture exist for all the systems, does each company or business unit define its own architecture or is there a common architecture for all or for certain systems?
	Standards	R31,R45,R61	Are there standards for the entire group that are binding? How are deviations from the standards dealt with ?
	Unification	R31,R45,R46,R61	Is there only one system at a time or are parallel / similar systems and applications allowed (not in the context of redundancy) ?
	Suppliers decisions	R35,R45,R46	Free choice of suppliers for companies and / or subsidiaries or are suppliers specified by the IT Headquarter?

Based on these strategic questions, the final COCPIT / RAEEC Framework will be extended by addressing strategic questions to provide better guidance when developing an IS strategy.

6.3.2 RAEEC

The most significant changes which affect the final framework are as follows: Moving the identified cultural issues from the initially proposed Align process to the Engage process. Furthermore, the two steps in the Review phase to review the technology trends and see how they really emerged, and the internal and external factors are not necessary. This will lead to a final definition for all the RAEEC processes used in the final COCPIT / RAEEC Framework.

The Review phase should provide information about the latest business strategy and IS strategy. It should also provide a summary of the effectiveness of the present IS strategy based on goals or project KPIs and list possible GAPs from the actual IS strategy. The second phase Align evaluates the current state of technology and collects future business requirements based on the overall business strategy and other departments. Adjust the IS strategy based on COCPIT dimensions and define the success measurements. This task intends to list the current IS strategy and the future IS strategy to define the project and change management initiatives based on the GAPs. The Engagement phase determines the performance level of the organization and identifies areas of concern and organizational barriers. This phase considers the pre-launch for the IS projects. A crucial element is to identify any cultural issues which might affect the future IS strategy. The Execute phase is the primary process in the IS implementation. It will develop the implementation roadmap to bridge gaps and consider organizational policies for implementation. Furthermore, it defines a proper implementation and project methodology and initiates projects and change management processes which can be further defined into high-level tasks and milestones for the implementation. The Control phase validates the IS strategy based on the defined IS Strategy success criteria measurements to verify successful implementation in this last phase.

6.4 Presentation of the final Framework

This section presents the final COCIPT / RAEEC Framework. The previous section 6.3 identified minor amendments based on the provisional assumptions from chapter 3 and the changes to the final framework based on the validation in section 6.2. All those amendments and insights have been combined into the presentation

of the final framework for IS strategy development and implementation after refinement and modifications. Table *56* represents the structure of the framework.

Table 56: Extended COCPIT / RAEEC framework

Dimensions / Processes / Strategic Questions		Review	Align	Engage	Execute	Control
Cost &Benefits	See 6.3.1					
Organization & Processes	See 6.3.1					
Human Capital	See 6.3.1					
Projects & Services	See 6.3.1					
Integration	See 6.3.1					
Technology	See 6.3.1					

The framework's primary intention is to address and link the IS dimensions COCPIT IS dimensions with the RAEEC processes. The framework for IS development and Implementation can be summarized as follows to define an IS:

A framework that considers an IS by its costs of various types and elements and addresses the benefits by changing service levels that can improve system performance through new computer-based approaches supports the overall economic performance of an enterprise. It addresses the soft system of an organization, focusing on organizational impacts that emerged from structural challenges in multi-national enterprises, focusing mainly on IT departments. Skills, culture, and human resources are combined into human capital which fundamentally can change an IS. Appropriate project methodologies and services manage the IS. Furthermore, it encompasses the concepts of business alignment and governance. The technology addresses the design of IT infrastructure and applications. It defines how the IT infrastructure is set up and covers the make or buy decision, such as the degree of using standard or custom applications. Finally, the IS strategy development and implementation follow a structured process.

The IS development dimensions address a wide range of strategic areas. To better support the development process, a possible list of strategic questions was summarized in chapter 6.3.1. Table *56* is the extended version of the provisional framework as it now includes a third object, the Strategic Questions. Finally, the framework addresses three main objectives, IS Dimensions to define the strategy,

Strategic Questions to address the topic, and the processes to develop and implement the strategy.

The results can be presented in the following format, which also helps to document the new IS strategy based on an IS balanced scorecard approach as discussed in sub- section 2.5.2.1. The balanced scorecard approach provides tasks to identify the GAP from the current IS strategy, and the target IS strategy. Furthermore, it also defines a set of KPIs to measure the successful outcome of the topic.

Strategic Questions	Current strategy	Target strategy	GAP Tasks	KPI / Success Criteria

The final framework's structure has been explained and to gain the most value out of the framework, the intersections of the COCPIT / RAEEC matrix can now be completed with the key findings from the expert's responses. The practical usability of the framework was a key intention of this study. The intersections contain only one key statement, which is made up of the underlying codes from the interviews, and colors are assigned based on the number of codes from green (many) to red (least). This is to give an impression of the significance of each intersection point as reflected in the experts' comments.

Table 57: Final COCPIT / RAEEC framework

Dimensions / Processes / Strategic Questions		Review	Align	Engage	Execute	Control
Cost &Benefits	See 6.3.1	Efficiency Increase	Centralize processes		Cost transparency	Cost vs Budget
Organization & Processes	See 6.3.1	Review process definition	Processes drive development defined central executed local	Consider low performance subsidiaries by key processes	Ensure business ownership	Yearly reviews by committees
Human Capital	See 6.3.1			Address people resistance to new systems and processes by considering culture, know-how and Skills	Experienced ownership lead to success and end user training	
Projects & Services	See 6.3.1	Project Portfolio Review	Long range-life strategy vs shorter and agile	Moving from theory to practice	Use appropriate methodology for each implementation project	KPI reviews by internal or external audit committees
Integration	See 6.3.1		Focus on compliance and governance	Prepare higher management and business units for the changes	Clear definition of the affected key systems or modules	Internal vs External Strategy Audit
Technology	See 6.3.1	Usability of current systems which drives further innovations	Considering Digital Natives and how they change or affect the IS strategy by Finding the right balance of new technologies and organization readiness		Lack of user training lead to poor usage of IS	System performance

6.5 Discussion

This section discusses the significant findings presented in the matrix Table *57* and the importance of the 30 possible intersections. The final COCPIT / RAEEC framework does not consider the strategic questions in the presentation and summaries. They emerged during the analysis of the findings and are a set of suggested questions that might help better understand the topic of each strategic dimension of IS development. This further concludes that based on the applied strategic questions in a real-world framework application, the expected outcome

might differ from the experts' one. Furthermore, as previously explained at the end of chapter 6.4, the colors of the intersections are intended to show the significance of the most coded intersections to the reader. All the intersections are considered equally important regardless of the number of codes.

The framework consists of two core elements the development of an IS strategy and the implementation. One can conclude that if both elements are appropriately aligned, a successful IS strategy could be established and implemented. The information systems strategy is based on the six dimensions as discussed in chapter 3.2. According to the implementation processes, as discussed in chapter 3.3, the definition of the IS strategy is developed in the align process of the framework. As previously concluded, all responses from the experts were considered equally weighted. Hence, the number of codes grouped by the IS dimensions suggests the priorities and significance to which extent they need to be considered in the IS strategy.

A new IS strategy should consider that the processes within an organization drive development of an IS. It can be concluded that a business process review is necessary, or process alignment should be considered prior implementing a new strategy. In a multi-national enterprise, strategy definition should be defined centrally at the headquarters or wherever the central IT department resides. The IS strategy should address global and local IT and business processes within the enterprise but must consider local execution to gain the full benefits. On the other hand, attention needs to be drawn by considering the low performance subsidiaries. This means that some experts mentioned low performance subsidiaries as a risk that can delay the implementation projects, or they are not capable of using the defined systems and applications due to a lack of the required skills. This could lead to a significant misalignment between the IS and overall business strategy.

Another major factor influencing the technology dimension in developing an IS strategy is addressing the digital natives and how they are changing or affecting the IS strategy. Digital natives were born after 1980 and grew up when digital social technologies, such as bulletin boards systems and the first Usenet came online. Today, they all have access to networks of digital technologies and have the skills to use those technologies. According to some responses from the experts, the digital natives are challenging them by requesting the latest technologies and applications, which sometimes are not part of the IS strategy. Digital natives are more advanced,

curious, and learn much faster than a so-called standard end-user. Digital natives challenge the applications and the IT departments to enable more features or request more access permissions for specific functions within the application. Such requests affect the technology by choosing an appropriate application addressed to more skilled users, but on the other hand, it needs considering the average end-user too. Such decisions are seldom made by any cost and benefit analysis. It also has an organizational impact that certain functions or special applications were dedicated to special teams, departments, or end-users.

Nevertheless, exactly this opens an excellent opportunity for the IT department that certain functions and applications could be distributed and outsourced to the local business departments. An example mentioned by some of the experts was the use of business intelligence applications and analytics. In the past, the IT department had to prepare complex queries, define access permissions, and define styles and consider the appropriate distribution to the end-users. Today with the latest technology, such as clouds services or Microsoft Office 365, tasks from the IT department can be offset to the business units and departments but still be granularly controlled by the IT department. Finding the right balance between such new technologies and organizational readiness must be carefully addressed to avoid a future misalignment between the technologies and the organization, mainly the end-users.

Another aspect of IS strategy is to consider the appropriate project methodologies for the various implementation projects and defining service level agreement for the services within or connected to the IS. Furthermore, addressing the end-users know how, skills, and behaviors can avoid resistance from the end-users by implementing new applications or services of an application.

The definition of the integration within an IS considers the corporate governance and the business alignments. Corporate governance can be seen as an international boundary addressing external and internal factors. Within IS strategy definition in an international context, external factors primarily influence local subsidiaries by the emerging data protection laws that need to be addressed. Furthermore, a centrally defined system needs to work at the local subsidiaries considering their external rules and regulations which is affecting their operations. Following global corporate governance will directly impact the chosen technology that supports the local

operations with the appropriate applications and services to be compliant as possible.

Regardless of the global company structure, the experts mentioned and pointed out that the business processes or global processes must be well aligned. Only this will allow a multi-national enterprise to gain the full benefit of a well designed and implemented IS.

Based on the completed matrix and the intersections of the final COCPIT / RAEEC framework presented in Table *57*, an explanation that builds upon the coded interviews from the 18 experts is summarized for each intersection as follows:

Cost & Benefits / Review

Information source (Appendix 3: Matrix intersection Cost & Benefits)

There was just one code related to the Cost and Benefits / Review intersection which was mentioned by only one expert. This does not mean that the review of costs and benefits does not exist in the other enterprises, but only one of the six enterprises follows a structured process for the review of the benefits. The findings provided evidence that an IS's costs are generally reviewed yearly by the costs spending and budget allocations.

Cost & Benefits / Align

Information source (Appendix 3: Matrix intersection Cost & Benefits)

Business cases within an enterprise consider future costs and address the benefits. The main benefit is seen as an increase in efficiency and brings the required flexibility for the various business units. There are some challenges due to the different working behaviors within the enterprise and its various business models.

Cost & Benefits / Execute

Information source (Appendix 3: Matrix intersection Cost & Benefits)

One key issue addressed was the lack of transparency due to the matrix organization in which people can “hide” and seem to be very busy by working on various projects. Hence, a proper implementation to measure benefits can be a difficult task. To overcome this situation a yearly salary bonus could help to bring this needed transparency.

Cost & Benefits / Control

Information source (Appendix 3: Matrix intersection Cost & Benefits)

In some enterprises, this process is informal by getting feedbacks from the individual countries and subsidiaries. Another measure is based on the cost optimization off IS by comparing the spending over the last years. The increased sales by channels and segments are also measured by clear goals based on the overall business strategy.

Organization & Processes / Review

Information source (Appendix 4: Matrix intersection Organization & Processes)

The enterprises have various review cycles. They range from a five-year long-term planning up to a three-year midterm planning and yearly reviews of the organization and its processes. The feedback from the subsidiaries is collected which followed by a 360-degree approach. The challenge in a multi-national organization by following a five-year long-term planning it is very difficult to adjust the processes due to the continuous change of the global environment.

Organization & Processes / Align

Information source (Appendix 4: Matrix intersection Organization & Processes)

A key fact in the multi-national enterprises emerged that the various business processes are mainly defining an IS strategy. This is due to the strong alignment of the global business processes and the organization. The IS definition might be started with a subset of strategic initiatives defined by the executive board, the CEO, the CTO, or the CIO. Once the strategic initiatives are defined and aligned with the group CIO, they will be discussed between the headquarter of the enterprise and its subsidiaries. The key challenge is to define a global called centralized top down strategy for the strategic initiative or a decentralized strategy. This can lead in a multi-national setup and matrix organization to various conflicts in priorities and resources. Finally, an important step to achieve proper alignment between the organization and the business processes is that there should be an agreement between the business owners and the overall IT department, which is responsible for the IS.

Organization & Processes / Engage

Information source (Appendix 4: Matrix intersection Organization & Processes)

Low performance subsidiaries should be addressed accordingly by identifying their capabilities to execute projects and train the users. The key processes which are existent any local subsidiary should be analyzed based on the new IS strategy. For example, one enterprise uses the so-called BEC meetings, the business executive committee in which various key users and executive members are present to discuss the upcoming changes and prepare to analyze how the organization will be affected by the changes.

Organization & Processes / Execute

Information source (Appendix 4: Matrix intersection Organization & Processes)

One of the risks to be considered is that not too many committees are set up to manage all the tasks. This leads to inefficiency and missing business ownership. It is essential that each IT department, depending on the structure and organization, is well aligned with the overall IS strategy. The headquarter should drive the development and execution, choosing a top-down approach as this might overcome the challenge in a matrix organization's "fight" for the best resources during implementation.

Organization & Processes / Control

Information source (Appendix 4: Matrix intersection Organization & Processes)

Interestingly, the intersection "Organization & Processes / Align" was considered as highly important compared to the other intersections. The coding did not provide solid evidence to measure or control the implemented processes or changes in the organization. Some processes are controlled by a business excellence committee or in a standard review process. This intersection can be improved by addressing proper measurements in an earlier phase of the RAEEC processes.

Human Capital / Engage

Information source (Appendix 5: Matrix intersection Human Capital)

The focus should be to address cultural teamwork to overcome people's resistance to new systems and processes and wipe all uncertainties. The CIO might act as a mentor between the subsidiaries and the headquarter by addressing the importance

of the local cultures and know how in the various teams. The key message might be that processes should not be built around people; people must follow the processes. Hence, culture is part of the strategy development, and only centrally developed solutions might be hard to implement or will fail. Finally, active engagements of local teams working together on global processes are the key to success.

Human Capital / Execute

Information source (Appendix 5: Matrix intersection Human Capital)

External consultants might also be an option to include in an IS strategy. Experienced ownership, on the other hand, leads to better success by building a good core team with the required skills which can support particular training for local employees. This can only be achieved by a powerful support from the group CEO, the business unit managers, or the various board members and committees.

Projects & Services / Review

Information source (Appendix 6: Matrix intersection Project & Services)

There were three review types identified. The first is done by a traditional project cockpit, where all the ongoing projects are listed and reviewed quarterly. This project cockpit is available for all employees on the intranet. The owner of this project cockpit is the group CIO. The second is just a formal project review based on the chosen project methodologies available in the enterprise. The third has no project review in the sense of comparing the status against the defined measures. This type lists the completed projects or implemented services but does not systematically review them due to the prior approval process of the project. The enterprise considers an appropriate project methodology as enough, and once the project is defined, it will be executed according to the tasks, timelines, and costs. Hence, with this definition, a review is obsolete, but this requires solid project management skills.

Projects & Services / Align

Information source (Appendix 6: Matrix intersection Project & Services)

The findings based on responses address the current trend in moving from very big static projects to a more agile approach. Agile does not mean or imply very flexible, unstructured projects, but rather it just breaks down the big projects into smaller pieces. Furthermore, besides the methodology, the question about the life of an IS

needs to be defined as well. Hence, a different strategy or methodology might be chosen based on a long-term vs. short term IS lifecycle.

Projects & Services / Engage

Information source (Appendix 6: Matrix intersection Project & Services)

Once the IS strategy has been defined, an appropriate project methodology needs to be evaluated for each individual project. These individual projects could be triggered by the executive board meetings that define the so-called focus points that address a specific area on a new IS strategy. Another driver in this intersection could be merger and acquisition projects. Such projects can also trigger the definition of a new IS strategy enforced by this intersection and alignments within this engagement phase.

Projects & Services / Execute

Information source (Appendix 6: Matrix intersection Project & Services)

Many project methodologies exist, such as the waterfall model, agile and scrum, and a traditional phase model. All this is coordinated by a project management office where the global project managers belong to. This intersection also identified some weaknesses, such as better exception management should be established or a change management for the self-measuring of performance from the teams. One of the mentioned reasons was that there were too many projects in parallel where the people and specialists were engaged. To manage this challenge, highly skilled project managers should take care of such complex projects and manage centralized global rollouts to avoid personal conflicts.

Projects & Services / Control

Information source (Appendix 6: Matrix intersection Project & Services)

From all the six strategic dimensions, this seems to be the most straightforward approach by measuring the success by project KPIs or a set of strict process measurements. The measurements are controlled by an internal or external audit team that is reviewing the KPIs. This implies that measurable and achievable KPI’s are defined and discussed already in the engagement phase, which can be taken as hard facts during the project execution.

Integration / Align

Information source (Appendix 7: Matrix intersection Integration)

It is most common that the region's subsidiaries report changes on new laws and regulations to the headquarter. Another channel of information is external partners who also report changes on new laws which might affect the compliance from the enterprise. Such changes trigger very complex international organizational changes, which might enforce new alignment of the information systems. Furthermore, the feedback from the subsidiaries or very important in terms of the alignment after plans technologies. Not all technological decisions or systems are available in all countries. This can be addressed by regular meetings by the regional IT managers, which reports to the global CIO to discuss those current technology trends.

Integration / Engage

Information source (Appendix 7: Matrix intersection Integration)

The key element of this intersection is to bring more business alignments within multi-national enterprises, which should be addressed by the top managers. They should consider business alignments between teams, and most important, between other subsidiaries. This can also be seen as a cultural behavior. Furthermore, all departments from all the subsidiaries can provide inputs and feedbacks to all the planned projects to the business excellent committees to address their concerns or provide input for better execution.

Integration / Execute

Information source (Appendix 7: Matrix intersection Integration)

Global business process owners can decide the major impact and consider a proper alignment and address decentralized needs together with the IT project managers to pre discuss appropriate projects and methodologies. Furthermore, affected key systems should be defined when implementing a new IS strategy.

Integration / Control

Information source (Appendix 7: Matrix intersection Integration)

Like in the other strategic dimensions and the last control process, the discussion between the IT managers and the business process owners was, if the audit should

be made by an internal audit team or an external, to provide an independent view about the successful completion of the IS implementation. The key argument for an internal audit team was that only an internal team could appropriately measure the alignment and the benefits of a new information system.

Technology / Review

Information source (Appendix 8: Matrix intersection Technology)

The review of technology was identified as a difficult process by knowing or even remembering why this technology was chosen three or five years ago and what has been changed since then. One can conclude that IS is the key to driving further actions. Reviewing the history of IS within the enterprise was not considered as valuable time, and the resources should be used to develop a new IS.

Technology / Align

Information source (Appendix 8: Matrix intersection Technology)

A good technology strategy Should be well balanced between the various needs from the business units end the end users. Also driven by the overall business strategy to meet their requirements in terms of time to market, E-commerce solutions, or IoT integrations. The main driver was to focus on current cloud strategies cloud providers on the market. In a long-term technology planning, the consideration of megatrends is an essential step. This does not mean that this trend needs to be completely integrated or addressed, but when they are ready to use within the enterprise, the technology framework should be able to integrate such new trends.

Technology / Execute

Information source (Appendix 8: Matrix intersection Technology)

The execution of technology could be seen as an appropriate sourcing strategy due to the appropriate technology which was defined in the alignment process. Appropriate user training all new technologies should also be properly addressed, and this might be covered by the project and services dimension.

Technology / Control

Information source (Appendix 8: Matrix intersection Technology)

To define any measurement if the right technology has been chosen within an IS strategy is a complicated task. No precise measurements were provided from the experts, only that there is a need for speed in which the technology should help to gain a competitive advantage in a global environment.

This section has discussed the various intersections of the final framework and its importance and considered important aspects when defining a new IS strategy for multinational group companies. Although this discussion might be relevant and similar to prior and future studies, this discussion does not imply that these findings are generalizable to other industry sectors. It cannot be claimed that this research is generalizable by considering the relatively small sample size of multinational group companies. On the other hand, the outcome of the discussion is reasonable to assume that the descriptors provided about the context of this research which defined the framework for IS development and implementation, are strong enough to test the framework in a real-world application scenario.

6.6 Summary

This chapter has assessed, validated, and amended the findings from the previous chapter 5. The responses were analyzed and validated based on the coding from the interviews. The provisional conceptual framework for IS strategy development and implementation were modified with minor changes reflecting the responses from the interview participants. As the framework aims to provide individual companies and multi-national enterprises guidance for IS strategy development and implementation, a structured process approach and a set of strategic questions for developing the IS strategy were developed. The underlying codes defined the essential elements in the framework from the various interviews and from learnings from the experts. This framework combines IS development and implementation in one process. Various frameworks are mentioned in literature for both IS development and IS implementation, but none adopt a comprehensive approach. This study has successfully developed a new framework which is combining both elements. The next chapter will test the usability of the framework in a small multinational enterprise.

The interviews confirmed the enormous impact that an IS strategy has on the organizations studied. The application landscape in the six companies indicated a move from monolithic applications to more scalable applications and services, as well as a shift to greater end-user ownership and responsibility for applications. IS strategy must not only consider the six COCPIT IS dimensions but, more specifically, must address the skills and know-how required to develop and manage a successful IS strategy and give high priority to security and risk management. There are clear limitations to the findings discussed in this chapter. The companies studied constitute a minimal subset of a larger population, and the answers provided were specific to the companies' overall business and IS strategies. Rules, regulations, and evolving business requirements drive, and control IS developments within all companies. However, IS strategy is mainly driven by the CIOs and their staff members, mainly because of its complex and technical nature. This makes general conclusions for an industry or company size problematic. In addition, the level of IS usage and adoption depend on people's know-how, culture, and how much risk they are willing to take.

7 MODEL APPLICATION

7.1 Introduction

The new framework developed in chapter 6 was applied and tested in the mid-size multi-national group company where the researcher is currently employed. This has been chosen as a real-world case example. In multi-national enterprises, the planning cycle for strategy development ranges from three to five years. Hence, proper validation and feedback for an actual case application of the framework could not be achieved. Therefore, the researcher has chosen his company since there was a serious need to develop an IS strategy for the entire group, which required fast implementation of a new ERP system to connect and manage the company's new product range and IoT devices.

The complexity of the company's products has dramatically evolved during the last decade. From stand-alone air purifiers (local User Interface, no sensors, or communication interfaces, externally developed electronics, and Firmware), via Smart Phone controlled proprietary communication protocol over Bluetooth, to the full-featured state of the art IoT system based on off-the-shelf solutions (Amazon AWS IoT Services) using standard communication protocols via WiFi / Ethernet / USB / Bluetooth interfaces. The latest IoT purifiers are serially equipped with "standard" (on mainboard) and "optional" (extension module) sensors for local fan automatic control mode based on typical pollutants. Moreover, the devices could be coupled via IoT services with external IoT-capable sensor modules and provide so-called "remote sensor fan auto mode" operation in scenarios when locally placed sensors cannot be treated as a significant source for the control. Not only the noticed by the end-user "system" features – like remote control and monitoring of purifier operation – had been added, but also invisible internals of IoT purifiers family had dramatically improved. All this complexity will undoubtedly raise more end-user inquiries, which demands much better trained staff to cope with an increased number of support cases, devices, and systems installation complexity, - 24 hours over the globe. All those new products coming out within the next 2 years demand a highly scalable ERP system with various modules focusing on customer relationship management, customer inquiries (case management), and global supply chain coordination.

The IS development and implementation process was mainly driven, developed, and controlled by the Group's CEO and Corporate Finance Manager. The corporate finance manager leads the ERP team, the CEO the global teams for Supply Chain, Production, and Customer Support. The researcher took a supporting role not to influence the process directly.

7.2 Real-World framework application

7.2.1 Company profile

First, a brief description of the company's mission and technology statement is provided, which is also public on the company's website (IQAir, 2021)

Our mission

Every year, 7 million people die from air pollution, and billions suffer unnecessarily from the effects of poor air quality. Yet many of us don't have access to timely air quality information, and often, air pollution goes unnoticed. Our company is working to change this. Today, we operate the world's largest free real-time air quality information platform and engage an ever-growing number of global citizens, organizations, and governments.

Our technology solutions

As an air quality technology company, we are passionate about not only creating awareness but also providing practical solutions that help create living and working environments that are safe, healthy, and enjoyable.

We're in this together

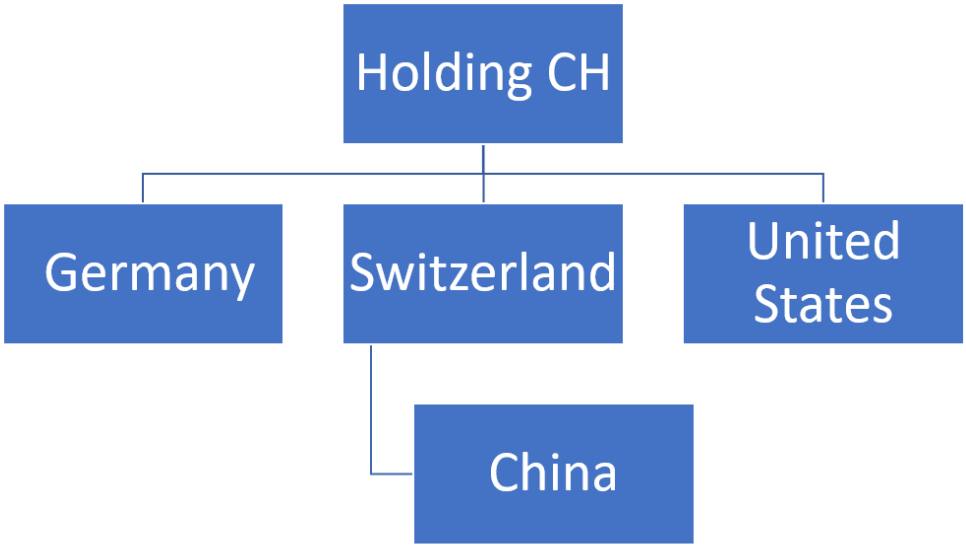
With the support of environmental agencies and private enterprise, we help schools to protect children from air toxins. Our work in the medical field helps protect patients and medical staff from infectious disease. Families around the world breathe healthier air with our home air purification solutions. We believe that information, collaboration, and technology solutions help create the perfect storm for better air, a better planet, and better lives.

Company Background

The company was founded in 1968 in Germany by the current CEO and owner's father. In 2000, the company moved from Germany to Switzerland, where the core business processes were set up and have operated since then - Research and Development, Production, Sales, and Product Management. IT was not considered

as a strategic component at that time. What was termed “Standard IT” was put in place i.e., local file and print server, on-premise mail server, no connection between the subsidiaries. Data and information exchange by mail. Later, in the year 2005, a US subsidiary was founded to function as a sales entity for the North American and Canadian markets. A further subsidiary was set up back in Germany in 2014 as an additional production plant and another retail subsidiary in China in 2015 for the Chinese market. The Swiss company retains responsibility for other world markets. The following organization chart shows the current legal structure.

Figure 39: Organization chart



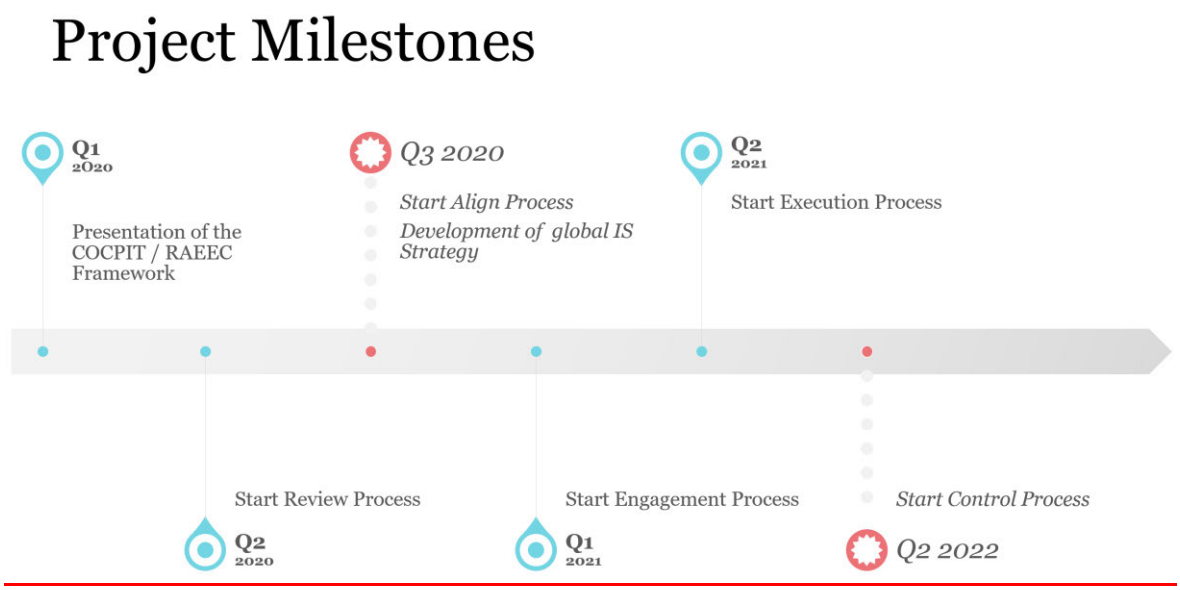
Current challenges

The company was expanding in Germany and China at the same time, and regarding IT there was no overall IT nor IS strategy present. Even there were no central or global roles defined, such as IT, Finance, Supply Chain, or in a more general term, global Corporate Services. Each entity had its own decision power, and the group’s setup was following a decentralized approach. Each entity had another ERP system. Back in 2016, when the CEO and the higher management realized the need for a centralized approach, initiatives were taken to move from a decentralized approach to a centralized business setup driven by the Swiss headquarter. The researcher proposed the framework as an alternative to the current IT and IS strategy, which was built on a day-to-day basis, to the management in Q1 2020.

7.2.2 Application of the framework

The researcher provided access to the framework developed in Chapter 6 without further explaining how IS strategy development and implementation are considered in other multi-national companies. A detailed introduction had been given to the managers on the COCPIT / RAEEC framework. The researcher guided and controlled the management team to control the application and usability of the framework's IS dimensions and processes. The following summarizes the outcome of the COCPIT / RAEEC framework based on the proposed structure defined in chapter 6. For confidentiality, the feedback was based on descriptive terms rather than detailed results.

Figure 40: Project milestone



The framework was presented in Q1 2020, and after agreement from the management, the Review process could be started in Q2 2020. This phase took approximately three months. As there was a joint agreement to change the IS and the organization drastically, the Review process was completed without many challenges. The development and definition of a new IS strategy started in Q3 2020 and overlapped with the start of the Engagement process, which began in Q1 2021. The Execution process was considered as the most time consuming and most challenging process. Implementing the new ERP systems is still ongoing and is scheduled to be completed for United Stated and China by the end of 2021. Switzerland and Germany by the end of Q1 2022. The Control process will start for all countries in Q2 2022. Each process was analyzed and summarized to provide an overview of the applied development and integration processes based on

RAEEC as outlined in sub-section 3.3. Each process provided an outcome based on the RAEECs definition.

Review Process

- Current business strategy

  The review of the current business strategy was primarily done by the owner and CEO of the group. There was no significant change to the business strategy as the strategy was aligned to meet the global challenges in 2019. The primary focus of the new business strategy was the integration of the IoT devices and the global customer service, which was not considered in the business strategy.

- Effectiveness of the present IS Strategy

  Various meetings identified significant GAPs with department managers and process owners, such as no standard global ERP system to meet and support the business strategy. Hence, the IS strategy was not satisfying nor effective in supporting the company's global processes. For internal data processing and services, the company moved already in 2017 from local on-premises infrastructure to the Azure Cloud with infrastructure as a service approach. At the same time, the office applications were migrated from Google Business Applications to M365 (former Office365). All customer facing applications and mobile app services were already on Amazon Web Services. The conclusion was, there was an urgent need to align the internal IT services better first and optimize the global IT organization.

Align Process

- Evaluate the current state of technology

  The feedback from the local IT managers was essential to collect technology trends and align with the current technology strategy defined by the headquarter. Important feedback from the Chinese IT manager was using WeChat Business integration into the ERP system to meet the CRM requirements from the China sales teams. The focus of the evaluation was on the internal IT rather than the customer facing applications. Moving from

on-premises servers and applications to centralized systems on Azure was already done, and there was no further need for a technology change.

- Collect future business requirements

  This step was essential and was seen by the IT managers as a logical approach by defining an IS strategy, but it turned out that it was the most difficult to collect the information from the business. The reason was that each local manager had their own view of the business and therefore was not aligned with an overall business strategy. This was discussed with the group CEO, and the team proposed a top-down business strategy approach with a structured process for the future. This was seen as the most challenging part. Therefore, it was a challenge for the IT team the define an IS strategy with vague business requirements.

- Adjust IS strategy based strategic dimensions

  The IT team used the standard strategic set of questions to address the new dimensions of an IS strategy. For information gathering and documentation, this simple format was accepted by all internal participants from the different business units. The feedback was that it is clear to understand even for non IT personnel. One can say the direction of the new IS strategy was given to move from decentralized systems to central core systems and applications. Centralizing the applications and services, the local data protection laws in China, Germany, Switzerland, and the USA had to be considered. Vendor and cost management was moved from the local entities to the headquarter in Switzerland. Furthermore, time to marked pushed the technology decision to focus as much as possible for standard applications with a certain degree of adoption to older legacy systems.

Table 58: Applied Strategic COCPIT questionnaire

Dimension	Strategic Topic	Current strategy	Target strategy	GAP Tasks	KPI / Success Criteria
Cost & Benefit	Cost Development	Focusing mainly on low-cost solutions	Best IT services are considered as highly important, hence high costs are accepted	Allocate Budget for better / more IT Services	Review target Budget
	Central Billing	Decentralized billing and sourcing	Centralize billing and sourcing coordination	Change organization and sourcing processes	Billing from Swiss Headquarter
Organization & Processes	Operations	Each of the four subsidiaries have a local IT operation	Move to a competence center approach where the users can be local but centrally / globally managed	Change IT Organization and align with Business Units	Competence Center must be setup at the Head Quarter based on the Business Units needs
	Processes	IT processes are based on ITIL	ITIL v4	Train Users and update IT processes	ITIL V4 Audit
Human Capital	Skills	Always hire skilled employees	Keep current strategy but invest more in specialized trainings	Analyze training requirements	Measure Certified employees Costs spending in Trainings
	External Know How	Mainly In-House development	External Know-How mandatory	Build global partner network	Partner list and quality measurements on new services
Projects & Services	Project Portfolio	No portfolios, focus mainly on task lists	Centralized Project portfolio	Build PMO and centralize projects	Portfolio dashboards and new IT Business Unit PMO
	Service Portfolio	Local Service Description, not aligned	Global Service Catalogue	Collect services and define SLAs	SLA for each service

Dimension	Strategic Topic	Current strategy	Target strategy	GAP Tasks	KPI / Success Criteria
	Methodology	No standard methodology, mainly SCRUM	Define methodology based on Project and Service type	Review methodologies and define project and service types	Types of projects and services
Integration	Governance	Matrix driven	Central global IT office	Reorganize and align IT departments	Organization chart
	ERP systems	No common strategy, four independent ERP system	Global ERP system	Migrate ERP systems	Implemented ERP systems
	Applications	Local applications, many duplicates	All applications are centrally controlled and managed	Merge application	Centralized Application portfolio
Technology	Innovation speed	Make driven	First Mover and Early Adapter	Change technology approach to latest or new technologies	Technology review by market analysis
	Architecture	Decentralized architectures and clouds	Centralized global architecture with two main cloud providers	Merge architectures and various cloud accounts	Cloud review by IT assessment
	Standards	Not addressed, each subsidiary has own standards based on employee skills	Unified and aligned standards for EPR and Cloud Services	Define group standards for each Business Unit	IT Audit

- Define success measurements

  This step was included during the process of the previous step, where the strategic IS dimensions were discussed. The best format was to include (adding a column) the success measurements (KPIs) in the same strategic table, so it was clear how each strategic goal or initiative would be measured

once completed. Defining a specific KPI was very difficult and took many discussions between the managers. Finally, hard facts or KPIs could not be established, but a measure of success criteria was defined.

Engage Process

- Determine the performance level of the organization

  There were questions from the managers about what precisely this process means. The researcher explained that this was “the ability to execute” for an organization or a team. This was a key question to consider in the execution phase to address the proper time for a task to complete. Otherwise, the project might be delayed.

- Identify areas of concern

  This was not really addressed, and it turned out that the issues or concerns related more to the next topic, the cultural issues.

- Identify cultural issues

  This step was considered as key to success as the core team knew the working habits of the Chinese managers and the US managers. To overcome this challenge, the CEO was leading this process by weekly meetings to achieve a common understanding of the upcoming implementation. Furthermore, the skills of the employees were reviewed, and some GAPs were identified. The result was that the company needed to hire some more experience employees in some areas of EPR and system integration.

- Identify organizational barriers

  This was also an important topic, but depending on who was asked, different potential barriers were mentioned. In the end, it was a very soft skill-based question that was useful for the ERP manager to meet one to one with the business unit managers to explain the project and how the new IS strategy will affect them. Some people do not like changes in real life and are afraid of any new technologies, systems, or processes.

Execute Process

- Develop implementation roadmap to bridge gaps

  Based on the COCPIT IS strategy documentation table, the GAPs were analyzed, and an implementation task was initiated. This was either a change request or a project depending on the complexity and the involvement of the key users.

- Consider organizational policies for implementation

  There were no policies and procedures in place. Therefore, this step was omitted.

- Define proper implementation and project methodology

  There was not a “one fits all” project methodology. For minor changes, a change management process based on ITIL was used. For more complex implementations like IoT applications, a traditional project methodology like the phase model was used. For the ERP and CRM implementation, an agile approach was used based on the ERP module.

- Initiate projects and change management process

  This is a very company specific process and could not be generalized depending on which departments were affected by the project owners, and members were assigned. The global IT department led the change management processes.

- Deliver high-level tasks and milestones for implementation

  This step was considered as redundant as the milestones and tasks were created in the previous step.

Control Process

- Validate and analyze IS Strategy success criteria measurements

  This step was done when a task or initiative from the strategic table was completed and not when the whole IS strategy was implemented. The conclusion was that the proposed steps did not imply a strict order or timing. The IT team reviewed the validation of the KPIs. This could be improved if a dedicated review team would exist or there are internal audits that are

controlling such project KPIs, like a project management office, for example. The judgment was not always considered as a neutral objective.

- Verify implementation success

  This turned out to be a more subjective matter rather than a logical approach. One task was the implementation of the CRM modules in Dynamics365, which was a sub project of the ERP integration. Such a validation based on KPIs was not possible. Hence, the verification process was if the core processes from lead to cash cloud be fulfilled.

7.3 Outcome of the COCPIT / RAEEC framework

Finally, the collected information of the applied COCPIT / RAEEC Framework was summarized and presented in the following table.

Table 59: Applied COCPIT / RAEEC framework

Dimensions / Processes / Strategic Topic		Review	Align	Engage	Execute	Control
Cost &Benefits	Cost Development	Focusing mainly on low-cost solutions	Best IT services are considered as highly important, high costs are accepted		Allocate Budget for better / more IT Services	Review target Budget
	Central Billing	Decentralized billing and sourcing	Centralize billing and sourcing coordination		Change organization and sourcing processes	Billing from Swiss Headquarter
Organization & Processes	Operation	Each of the four subsidiaries have a local IT operation	Move to a competence center approach where the users can be local but centrally / globally managed	On-board affected users and prepare them for the change	Change IT Organization and align with Business Units	Competence Center must be setup at the Head Quarter based on the Business Units needs
	Processes	IT processes are based on ITIL	ITIL v4	Address the ability to execute, address knowledge issues	Train Users and update IT processes	ITIL V4 Audit
Human Capital	Skills	Always hire skilled employees	Keep current strategy but invest more in specialized trainings	Identify employees for courses or trainings	Analyze training requirements	Measure Certified employees Costs spending in Trainings
	External Know How	Mainly In-House development	External Know-How mandatory	Explain the need to work with external partners to avoid	Build global partner network	Partner list and quality measurements on new services

Dimensions / Processes / Strategic Topic		Review	Align	Engage	Execute	Control
				internal resistance		
Projects & Services	Project Portfolio	No portfolios, focus mainly on task lists	Centralized Project portfolio	Work with HR to define new job description and update organization	Build PMO and centralize projects	Portfolio dashboards and new IT Business Unit PMO
	Service Portfolio	Local Service Description, not aligned	Global Service Catalogue	Address SLA impacts	Collect services and define SLAs	SLA for each service
	Methodology	No standard methodology, mainly SCRUM	Define methodology based on Project and Service type	Awareness training for Project Managers	Review methodologies and define project and service types	Types of projects and services
Integration	Governance	Matrix driven	Central global IT office	CIO drives change	Reorganize and align IT departments	Organizatio n chart
	ERP systems	No common strategy, four independent ERP system	Global ERP system	Group CEO imitated leadership training	Migrate ERP systems	Implemente d ERP systems
	Applications	Local applications, many duplicates	All applications are centrally controlled and managed		Merge application	Centralized Application portfolio
Technology	Innovation speed	Make driven	First Mover and Early Adapter		Change technology approach to latest or new technologies	Technology review by market analysis
	Architecture	Decentralized architectures and clouds	Centralized global architecture with two leading cloud providers		Merge architectures and various cloud accounts	Cloud review by IT assessment
	Standards	Not addressed, each subsidiary has own standards based on employee skills	Unified and aligned standards for EPR and Cloud Services		Define group standards for each Business Unit	IT Audit

Based on the applied COCPIT / RAEEC framework, a detailed summary can be provided by each of the completed intersections as follows:

Cost & Benefits / Review

The companies were mainly driven by low-cost solutions where each individual subsidiary has the authority to buy and implement software. This led to a widespread application landscape that was hard to maintain. The sourcing of the various applications was not aligned with the headquarter, leading to a decentralized billing and over licensing, as some subsidiaries were using the same applications and could not profit from licensing bundles.

Cost & Benefits / Align

There has been a radical change in the strategy from low-cost solutions to a global service-oriented architecture that provides the required services. Higher costs are accepted. Furthermore, the sourcing of the required licenses and applications was moved to the headquarter, such as the billing processes.

Cost & Benefits / Execute

Each subsidiary must provide an appropriate budget to the headquarter and the required licenses and applications list. The shift from localized sourcing and billing had an impact on the organization. Some IT members are now reporting to the global CIO instead of the local management to control the costs better. Processes for the intercompany billing had to be established.

Cost & Benefits / Control

Budget reviews are taking place every quarter. Future requirements are also addressed during this review process. The billing is now centrally managed from the Swiss headquarter who can benefit from the currency exchange rates when buying software on the global market.

Organization & Processes / Review

Each subsidiary had a local IT team that supported the local operation and was not aligned with an overall IT or IS strategy. The only standard process that the local IT departments had in common was using the ITIL framework.

Organization & Processes / Align

To shift from locally managed IT departments to a global managed center of competence was one of the main targets for the IS new strategy. This approach should combine all the local skills and know-how from the various employees within

the IT department and the key users from the different applications. This new center of competence should also follow the latest ITIL standard.

Organization & Processes / Engage

An important but challenging task within this phase was onboarding the affected users to the new organization. Proper management of this change was considered a key to a successful implementation. The CEO was aware that will be a delicate task, and it might need time to create this behavioral change. Another essential factor about this phase was to prepare the local management to identify the current skills and knowledge from the IT team members.

Organization & Processes / Execute

This change was mainly executed by the local CEOs and the local HR departments. The global CIO developed and implemented a detailed training plan for the new processes once the organization has changed.

Organization & Processes / Control

Finally, the implementation of this specific dimension could only be verified by the updated global organizational chart. There are still behavioral issues ongoing as not all IT members accept this change. An external audit did successful implementation of the latest ITIL standard.

Human Capital / Review

The local HR strategy was always to hire very skilled employees whenever possible. An issue identified during this review was that the hiring manager did sometimes not understand the skills required for a specific position. The hired employees were selected with the focus to provide in-house developed applications.

Human Capital / Align

There was no change made to the local HR strategy. Still, a training program was developed for managers to support the hiring process better, identify gaps in the employees' skills, and create a training program. Furthermore, it was agreed to work more with external partners or consultants from which the internal employees could learn.

Human Capital / Engage

A challenging task was to find the appropriate training or courses for the employees. Another difficult manager task was to explain the need to work with external partners or consultants as they were seen as competitors.

Human Capital / Execute

The HR department did the execution and organization for the required training and courses, and the setup of a global partner network was led by the CIO.

Human Capital / Control

The measurement was done by the completed training and courses and by the budget spending, which was defined quarterly.

Projects & Services / Review

IS development was mainly driven by an agile approach using sprints and task lists which had some challenges to support a long-term IS strategy. There was no project portfolio in place nor any dedicated project managers. The internal IT department was maintaining many IT services without any SLAs. Furthermore, no structured service portfolio defined the IT services and the required applications; even the IT department should follow the ITIL processes. Finally, there was no standard project methodology defined for the various internal IT projects.

Projects & Services / Align

The goal was to set up a centralized project portfolio with dedicated project managers capable of running complex projects. The focus was also to set up the global service catalog based on the ITIL standard to address the future requirements from the various business units.

Projects & Services / Engage

The local HR departments were also involved in hiring new project managers as there was no chance to train the existing agile project managers to the new project requirements. A fit gap analysis was made to identify the impact on the current IT services to align them correctly to the new standards.

Projects & Services / Execute

The headquarter established a project management office to coordinate the various IT projects from a central location and provide reports to the local management. Global SLAs for each service were defined, and proper methodologies for the various IT projects were established based on the required service.

Projects & Services / Control

A new project portfolio dashboard was built within the project management office department. SLAs for each service were defined based on the ITIL standard and documented in the global service desk. External consultants reviewed the proper definition for the project methodologies.

Integration / Review

In a global context and global point of view, the whole group is driven by a matrix organization. This provides the needed flexibility and access to highly skilled employees, but on the other hand, it gives some conflicts for proper resource allocations. Furthermore, each subsidiary has its own ERP system. The German production site uses Navision, the US uses NetSuite, in China, they use a subset from the US NetSuite, which is causing a lot of problems due to network latency caused by the great Chinese firewall. The Swiss entity is using a local software called MyFactory. Many local applications address the requirements of the local market that were not integrated into the ERP systems.

Integration / Align

Global corporate governance was previously not adequately addressed. During this alignment phase, it gained vital importance. Regardless of any other decisions the headquarter or a subsidiary makes, the global corporate governance board should always be consulted for any decisions affecting the group’s information systems.

Integration / Engage

The CIO implemented the definition from the previous align phase regarding the governance. Still, he could not drive the change from the various local ERP systems to one global integrated ERP system. Hence, the group CEO took the lead to explain the importance and started leadership training with the local CEOs and managers.

Integration / Execute

Due to the lean management of the group, there were not many conflicts or challenges to reorganize the IT departments and some parts of the finance departments to meet the global corporate governance. The board members were expecting some conflicts and challenges as organizational changes and reorganizations are usually considered difficult due to some resistance from its employees.

Integration / Control

The measurements for the strategic governance topic could not be adequately addressed. The only measure was the updated organizational chart which reflects the changes in the departments. During the application of the COCPIT / RAEEC framework, the implementation of a new global ERP system was the most challenging task and is still ongoing. This is planned to be finished by the middle of 2022. Therefore, an appropriate measurement or a successful measurement could not be applied or defined. The same goes for the centralized application portfolio. The existence of an application portfolio was verified, but the measure for a successful implementation and application management could not be established. This was considered as an area that needs improvement.

Technology / Review

The strategic review of the technology dimension for an IS strategy has brought valuable insights to the current technology situation, which was not expected. An overall strategic goal from the business strategy was that the technology must support the product's innovation strategy based on IoT. With the current make-driven approach, the internal research and development department could not meet the overall strategy. Also, the IT departments failed due to misalignment with other departments. The technology dimension emerged as a critical dimension to form an IS. The group already had various accounts from the two leading cloud providers AWS and Microsoft Azure. The challenge was that each country and different IT departments created their own accounts and did not align with other departments or business units because there was no global standard in place.

Technology / Align

Based on the overall business strategy, the direction was clear to move from and make driven innovation speed to a first mover and early adopter approach. This

could only be achieved by using the latest cloud technologies, addressing proper standards, and combining / merging the various cloud accounts. The innovation speed to reach a faster time to market approach for the new IoT products was a key driver for this phase.

Technology / Execute

The technology implementation was considered a straightforward approach and was not experiencing any significant challenges. Besides the organizational changes, this phase is still ongoing due to the many dependencies from the various applications and systems. Consolidation is very complex to merge or move the decentralized applications and technologies into one global system and architecture.

Technology / Control

Finally, this phase was only partially completed as the migration from the various applications is still ongoing. Based on the control measurements, some elements from the global ERP system and architecture could be tested for successful implementation. This turned out to be a more subjective measurement rather than based on hard facts. This area and KPIs would also need a detailed review once the complete technology change is implemented.

7.4 Summary and conclusion

The key to a successful IS strategy is an aligned business strategy to define an effective IS strategy that meets the future business requirements as described in the contextualization of this research in chapter 1.2. In this application of the COCPIT / RAEEC framework, this was seen as a significant issue, with major challenges being faced during the whole definition and implementation process. Due to the lean management structure of the enterprise and the Group CEO's open mindset, the framework's testing and application were made possible in a reasonable time frame for such a complex topic. The initial meeting was in spring 2020, and the CRM implementation started in August 2020, with Go Live of the US CRM on December 1st, 2020. In parallel, the global Business Central (formerly Navision) ERP migration started and is scheduled to be completed by the end of Q1 2022.

The practical approach of the COCPIT / RAEEC Framework could be tested and was successfully applied. It was essential to appreciate the background and history

of the larger enterprise with many business units or subsidiaries. Many challenges were identified in this enterprise, such as the absence of any clear overall business strategy, and subsidiaries were mainly considered independent entities. The planned global alignment could not be established between the group companies as intended. The management is at least aware of this significant issue and is working towards optimizing the processes and having more global meetings to exchange information about the business projects early.

In this configuration, the framework proved to be an effective model for developing an IS strategy and creating an implementation process to change the group from a decentralized to a central approach. The COCPIT dimensions were considered as an appropriate guide for many managers on how to develop an IS strategy and determine the key issues in forming and delivering the systems themselves. There were some discussions on why this or that dimension existed or was linked to this or that specific set of strategic questions. The RAEEC processes were addressed and appropriately followed as intended by the researcher. The main issues were defining the tasks within each process and finding or defining to which process they belonged. There were some overlapping tasks between the RAEEC processes which could be better addressed.

The final documented result for the company's IS strategy and development processes are presented in Table *59*. According to the definition of the RAAEC processes, the Align process is from where we could conclude the IS strategy. The following is the IS strategy summary for the applied real-world application based on all COCPIT dimensions and the Align process:

- We want to consider the best IT services and emphasize its priorities and accept reasonable costs. Furthermore, we want to achieve centralized billing, and purchasing of hard and software must be centrally coordinated.

- All local and global IT departments must shift to a global competence center approach to provide the best service to the end-users. This can be achieved by adopting the latest ITIL processes which support this transition.

- Our employees are essential in supporting the company's growth. Hence, we always tried to hire skilled employees whenever possible and available. As we operate in a global context, employees required, or missing know-how

and skills should be advertised in all our subsidiaries. Furthermore, investments in training and certifications are essential. To a certain degree, external know-how should be considered.

- A centralized project portfolio must be established to manage all global and local projects according to standardized methodologies. Also, the global service catalog describing each of the group's IT services has to be established according to the latest ITIL standard.

- The IT office in Switzerland was promoted to the central global IT office, which controls all global and local IT activities. The local IT departments are reporting to the Swiss IT headquarter. All IT applications within the group will be centrally controlled by the head of applications with his team.

- We want to be early adopters of new technologies that lead us against our competitors in a global market. We want to use as many cloud services as possible according to our global IT architecture and security policies, especially for our air quality data. All our future products must be connected to one ecosystem, which is linked to a global ERP.

The areas for improvement in both the COCPIT dimensions and RAEEC processes can be summarized as three items:

- Add some dependencies and timelines to the framework.
- Even for this enterprise, it was very difficult to keep the processes aligned. Consider working with more, but smaller projects or tasks was a major learning.
- Check framework readiness first for enterprises. Analyze the affected subsidiaries and / or business units first, which might be involved in the new IS definition to avoid areas of tension. In particular, consider the behavior of the managers and review whether they are willing or capable to effect such a change by adopting a new methodology for an IS development and implementation.

8 CONCLUSION

8.1 Introduction

In this final chapter, the conclusions of this research are presented, the research objectives are addressed, and limitations and further research opportunities are discussed. A new framework for IS strategy development and implementation was developed and tested in a small multi-national company. The research topic combined two aspects of development and implementation, which are generally addressed separately. One of the key objectives was to develop a framework that experts can use, providing a practical structured, rather than a theoretical, approach. Furthermore, contribution to theory has also been made by explaining the complexity of IS strategy development in large multi-national companies and the diverse execution and implementation processes.

The six companies where the 18 interviewed experts are working, and the tested multi-national company are currently undergoing some challenges related to the emergent global trends of the past two years. Globalization, the pressure to innovate, and the individuality and dynamics of the markets will have an impact on the CIOs' decisions when developing or reviewing the IS strategy (Howard, 2021). Through imaginative foresight, companies can succeed in recognizing future opportunities, adopting the appropriate technology, and managing threats to today's established business.

The knowledge gained from this research can be used as a basis for future oriented IS strategy development. Following the IS strategy development, further challenges must be overcome. An IS strategy can only have the desired effect if it is consistently implemented and adequately aligned with the overall business strategy. However, this research concluded that it was this step to address and link the IS strategy development process with the IS strategy implementation process, which causes major challenges for many companies. It was difficult for the companies to translate the holistic objective into concrete action steps. To support the derivation of goals and measures, the companies should provide short-term planning horizons in addition to the overall long-term horizon of the strategy planning cycles. In the sense of strategic fit, attention should always be drawn to the best possible coordination of goals and measures with the expected development of the external and environments. Therefore, it was considered as essential to close the gap between the IS strategy development and IS implementation within one structured

framework. Despite the various identified IS strategy development models and IS strategy implementation methodologies discussed in chapter 2, the experts did not confirm a properly defined and executed IS strategy. The experts considered poor or missing communication among the business units, too many projects in parallel, and not aligned goals and KPIs, as crucial contributing factors which have led to the current situation. This view from the experts has been confirmed by the real word application of the framework. The group's companies faced similar difficulties as described by the experts. A number of developments and trends of relevance to the research were identified:

- IS strategy development is continuously further developed. It emerged to be considered as a long-term strategy in the past decades based on the speed at which new technology was developed. Today's technology development is much faster, hence driving IS strategy developments to more short-term based cycles.
- IS strategy is changing from monolithic centralized applications and systems to distributed services driven by new technologies like cloud and micro services.
- No framework was found to address the IS strategy development and implementation processes in unison with suggested IS dimensions and development and implementation processes.
- The various frameworks discussed in the literature followed a theoretical approach

A major criticism from academics of the existing frameworks and implementation models has been their lack of consideration of context and contingencies from real world findings. This research has addressed this issue through the research design choice, based on a narrative approach using several data sources from different managers working in their respective fields of this research.

Furthermore, this research has applied the new framework for IS development and implementation in one small multi-national enterprise.

8.2 Conclusion regarding the research objectives

RO1 *To systematically review all existing literature on IS strategy development and implementation in large multi-national Group companies to establish what case examples and conceptual models and frameworks exist.*

The review of the current literature based on the exploratory phase 1 of the research project provided many sources and models of IS development in companies, but only a few included the multi-national dimension in the IS development process, which supports the need for further research such as this study. One of the critical elements to consider is the role of the external and internal influencing factors, which can be seen as environmental and operational in multinational companies, as explained by Mohdzain and Ward (2007).

The critical question in IS strategy development, especially for multi-nationals is the dependency of the value-added activities between its subsidiaries and central bodies, or headquarters. Focus on cost control is another critical element for the value chain activities and to achieve better economy of scale by centralizing IS planning. As a result, IS planning becomes more tactical rather than strategic and is more dominated by the IT infrastructure planning strategy.

Another significant implication is that the subsidiaries will only have the rights to define the internal transactions but cannot define the use of IS which could add more value to the global company and its value chain, to provide them the needed information at the right time at the required quality. Based on the literature review, there is no clear solution as to how to develop IS strategy at the corporate level or in its subsidiaries. Where the company has subsidiaries in less technology driven countries, the decisions should be made at the headquarters level since political systems are not stable or change often.

Another essential fact to consider is the balance of centralization versus decentralization based on the subsidiaries' autonomy to decide overall global IS strategy within an organization. If the subsidiaries business is performing successfully, based on financial and markets goals, the local IT department is also performing better at a subsidiary level when IS strategy development is decentralized. The reason that decentralized IS development is more efficient and adds more value to the company's business is that subsidiaries are focused on the local markets requirements, and this is the reason why centralized IS planning is less satisfying than the decentralized approach. The engagement of the local IT managers increases once they receive more autonomy in IS planning and this will reduce the centralized IT management.

RO2 *To establish the existing processes, mechanisms, and impacts for IS strategy development and implementation in large multi-national Group companies.*

This objective was addressed by the exploratory phase 2 which provided the basis for the analysis in Chapter 5 of the interviews' responses. A main outcome and finding was that this phase did not identify a unique or standardized IS strategy development process. One of the essential dimensions the companies had in common is the active consideration of internal and external factors, which influences or even drives the IS strategy. This leads more to a tactical approach, while finding the right balance between the headquarters and the subsidiaries' involvement. In centralized organizations, critical decisions are made at the headquarter, while in decentralized organizations, local managers make the essential decisions even they follow the global policies.

The results from the interviews identified that various project methodologies were used for the IS strategy implementation. Different methods were used depending on the specific nature of the strategy development project of the affected departments or subsidiaries. The centralized organization have a centralized PMO, or single project managers will control the projects. While in decentralized organizations, the projects are managed by different department managers or local IT managers. As identified in the literature review and confirmed by the experts, managers in more technology driven countries will better understand the implementation process, which leads to faster execution and better results. In less technology driven countries, the managers tend to delay projects and raise more questions about the projects, or the general IS implementation. The result is a misalignment in implementation as global projects are not completed due to resource allocation delays. To avoid such a misalignment, project managers have a crucial role in the implementation process. They should consider the know-how of the team members and the country-specific issues and local laws and regulations.

The literature discusses IS strategy implementation with different frameworks and models. All of them have in common the need to align the business units with the IS strategy. All models discussed in the review are not only applied by researchers but have also been used in the real world by practitioners. However, these models and frameworks can more be seen as providing general guidance for implementation rather than a blueprint for successful implementation. Application of these models becomes more complex in a multinational environment, especially when the company has subsidiaries in developed and developing countries. This raises the issue of cultural considerations during the implementation process. Lack of

consideration of these issues can lead to misalignment of the IS strategy and inconsistencies in the implementation process.

One solution is to develop and validate a new model for implementation (or adjust existing models) that consider the country issues. Some elements of a more comprehensive model may also include the economic growth consideration of the national culture and political systems as causal factors. One approach to successful implementation is to set up different communities at organizational level, department level and headquarter to engage them into the implementation process. This could be done by a global change management process as the implementation affects the global organization, the organization in the subsidiaries, and the employees. It is thus important to involve HR departments in this process if it is to be a success.

Global strategy implementation impacts the central organization and its dependent subsidiaries, as evidenced in the projects which emerged from the IS strategy development process. The impacts are not generally considered as unfavorable. If the implementation is well structured and communicated, it will enhance the business processes and increase the acceptance of the affected users. The interviews' results have not identified any particular or unique cost drivers used in a general framework. The benefits of proper implementation of the IS strategy depend on the project's type and the organization.

Furthermore, a successful IS strategy also needs to consider the impacts of effective implementation by addressing the cultural issues discussed, meaning the users' know-how and their behavior, and understanding in using information systems. This is affecting the headquarters and the subsidiaries in the same sense. Hence, excellent communication and leadership skills from the managers and executives can lead to a successful implementation. Whatever implementation model or framework will be chosen, the planned strategy must be clearly defined and communicated to all managers at the group and the individual subsidiaries otherwise there will be an impact during the implementation phase or the change management process which will lead to a misalignment causing costs in overhead and lost revenues.

There are no detailed studies in the review of the literature which has addressed in detail the impacts, the costs, benefits and cultural issues at group and subsidiary’s level. The identified impact by a new or changed/updated IS strategy is to change the organization form at all levels. To avoid delays in the implementation process

and its impacts it starts to engage the managers for the change. Another major impact is the poor understanding of what is involved which leads to a certain resistance to the change. This is caused by a poor vision and the lack of clarity and not considering the cultural issues. Inappropriate methodology and IT environment might lead to a big cost impact because it's mostly based on traditional assumptions. This will also lead in decreasing interest among managers in adopting the new information systems for the support in planning and decision-making.

RO3 *To propose and develop a new framework for IS strategy development and implementation in multi-national corporations.*

Inputs to the interpretation phase of the research project are the outputs from the exploratory phase 1 and exploratory phase 2, which address this research objective. The literature review in the exploratory phase 1 identified a need for a framework that combines IS strategy development and IS strategy implementation in one framework based on the research context. This need has been confirmed by practitioners working in multi-national companies which were interviewed. None of the interviewed experts of the six companies had a complete and global integrated process covering IS strategy development and implementation established. The experts further pointed out that a framework covering a structured approach with pre-defined phases would help to better coordinate their IT and IS planning cycles. This would overcome the current IS planning situation as this is primarily driven by the global CIOs or provided and pushed by the headquarters. It can be seen as a challenging process once the projects are released because there is no control step or coordinated review in place before the next IS planning cycle begins.

Company A has about 200-300 large IT Projects every year, some have a duration of over two years or more. Furthermore, it emerged from the findings that IS strategy implementation projects are not specially considered as highly important. The models identified in the literature review are based on long-term planning between three to five or even ten years and are confirmed by the interview participants as too long. During the review of the literature, there were five significant frameworks identified which were cited by many authors and further modified by other researchers in recent years. The problem identified in those frameworks is that it is mainly based on theoretical assumptions concerning how a company should work. Nevertheless, those frameworks served as the core element to define the RAEEC processes to cover the need to develop an implementation framework that contains

an IS strategy development cycle to adjust and implement new strategies much faster. This depends mainly on the organization's structure and the ability to change processes to meet faster planning cycles. Due to this unknown fact from the ability to execute for each enterprise, the framework will not include any predictions on how long a process of development or implementation phase might need. Some of the frameworks discussed by academia contain development cycles, but they do not consider the organization as a global system. Hence, they are missing some of the other critical dimensions like value and culture.

Another major impact that makes strategy implementation complex and time-consuming is that the alignment with all the different business units cannot be done in a cycle between one to three years. The current or new strategy might not have been fully implemented due to complex global alignments of internal and external factors and the different strategies which a multinational organization has. This is one of the key challenges, especially in multinational companies with many subsidiaries in different continents which raises the issue of cultural behaviors. The new framework should consider the aspect of cultural behaviors in strategy implementation and should allow a systematic continuous development cycle approach to measure, align and implement IS strategy much faster in a multinational company which can be achieved by a continuous change management program rather than traditional project management. The change management program needs to be set up and controlled by the headquarter and executed at subsidiary levels to align people, organization, and departments to maximize the output for a global company and addresses to local cultural issues which might not be seen or understood at the headquarters. One of the essential elements in the execution or implementation of IS strategy is, how flexible the whole organization and each subsidiary are in their respective change management processes. The identified key to success is a well-established change management program with strong leadership, which needs to be set up and controlled by the headquarter, executed locally at the subsidiary level.

The COCPIT / RAEEC Framework is based on the literature review, the views of experts, and the practical researchers' experience in multinational organizations, the identified six COCPIT dimensions which affect an IS strategy, and the five RAEEC key processes in developing and implementing IS strategy. Those are Review, Align, Engage, Execute and Control. Chapters 5 and 6 emphasized the need to consider the so-called soft facts or soft dimensions like cultural issues, barriers

caused by managers to defend their positions or other strategies, and other areas of concern. This is being addressed in the Engagement phase in the RAEEC framework. The researcher believes that this is the essential phase that builds the bridge from planning to implementation.

8.3 Contribution

8.3.1 To theory

The key contribution of this research is the new framework for IS strategy development and implementation based on the analysis of multi-national enterprises. The following are the key contributions to the existing theory.

- The framework combines strategy development and implementation as one process instead of two isolated and not properly aligned processes. The link between the development and the implementation processes is addressed through the critical “Engage” phase of the RAEEC framework. This phase combines the development and implementation processes but requires excellent communication and personal skills from the managers who are leading or are responsible for this phase. Typically, this is driven by the CIO.

- Equally crucial for the validity of the framework are the insights on individual skills, abilities, cultural issues, and expertise based on theoretical assumptions from the literature, and on evidence provided by the interviewed experts employed in relevant managing positions in how they affect IS development and implementation.

- The applied methodology and processes to develop this framework provide a path for other researchers who may be concerned with developing and testing IS strategy frameworks and models. The development process could potentially be applied in other industries.

- The development of the COCPIT dimensions used as the main elements to define a structured IS strategy is another significant contribution. By developing the framework, this research provided new knowledge on integrating multiple balanced scorecard elements into a structured approach to IS strategy development and implementation.

The analysis and discussion in chapter 6 contributes further to the research context defined in chapter 1. The findings and discussion of the framework based on the experts' responses support the view put forward by many academics that the IS strategy's primary concern is the aligning of IS development with the business needs. This was confirmed by the most significant intersections based on the number of codes of the COCPIT & RAEEC framework in chapter 6.5. The approach followed in this research for developing the COCPIT / RAEEC framework relies primarily on the expert's input, which ensures unique processes, expertise, and knowledge from multi-national industries. Other researchers might adopt this approach in other sectors or industries to make further contributions to the applied theory.

8.3.2 To practice

The aim of this research was to provide a new framework for managers and practitioners to have a structured process combining IS development and implementation. Today, many definitions for an IS strategy exist, and nearly every large enterprise follows a mid-term planning process, which has a range between three to five years on average. IS strategy development has become a challenge in today's fast changing environments and the constant emergence of new technologies or services provided by various cloud providers. Furthermore, the IS strategy implementation in large multi-national enterprises is mainly executed in projects of various sizes of cross-functional and global team members. This has been confirmed by the experts from this research and by the researcher. The key challenge is that some projects, especially ERP systems projects, are taking more time than planned and are still not finished or implemented when the next IS planning, or development cycle begins. The following are the key contributions to practice**.**

- The developed COCPIT / RAEEC framework can help in providing a structured process that can be executed by a yearly review and planning cycle to align and measure the development or implementation of the IS strategy. The identified challenge is changing the current strategy or implementation process in any large enterprise to shorter planning and implementation cycles. This can only be achieved by strong change management by top managers and executives.

- The applied, tested framework in the small multi-national enterprise had a different outcome as regards the intersections, compared to the intersections of the completed framework based on the experts' responses. The tested framework considered strategic questions which were not existent in the experts' framework. Hence, it proves the practical application of the COCPIT / RAEEC framework as a structured process even with different intersections defining an IS strategy.

- A major consideration of such a practical framework approach might be that the stakeholders or managers are resistant to changing their behaviors and habits from a well known process to a new approach for IS development and implementation. Strong communication and change management should be established prior to launching the new process to overcome this challenge.

- The core components are the COCPIT IS dimensions and the RAEEC process phases developed from this research. By completing the proposed structured format as described in section 6.4, the outcome can be presented to other stakeholders and managers. The presentation in a table format is easier to read and understand rather than writing the IS strategy in many pages.

8.4 Limitations of this study

During the research process using a narrative approach, the researcher gathered data from individuals to provide their perspectives and recount their current situation. These views, called field texts, provided the raw data for developing and validating the IS strategy and implementation framework. A unique feature of narrative research is that the interviewee's views and "stories" are analyzed, and the researcher rearranges them into a chronological order depending on the questionnaire. During the interview process, the researcher actively collaborates with the participants which might then lead to a misleading story of the researcher. In this research, the methodology is based on a narrative approach. In qualitative narrative inquiries - this one being an in-depth expert interview study - the researcher depends on the involved experts' experiences and their perspectives on a specific phenomenon and beliefs, which might lead to responses biased in one direction or the other. The response classifications from the interviews were developed based on the researchers experience and his understanding of

summarizing the participant's feedback and "stories" based on the narrative approach. More research could be done to explore the depth and complexity of each classification code and test if additional codes are needed.

Some responses from the experts might have been given after they had reviewed some literature or other sources, which may hinder their inclination and create disbelief, ultimately reflecting in their responses. According to Cavaye (1996) this may occur because of participants' reluctance to provide information that they may have perceived to expose their lack of knowledge on a particular subject. During the interviews, it was possible that some participants merely provided desirable answers to questions because the researcher probed more, and the participants could not back their claims, then this problem can be eliminated. The participants may have been reluctant to reveal information which they may deem disrespectful to their coworkers or by which they may get a feeling of dishonesty to their organization.

The researcher's prejudice is one of the popular claims against the narrative approach, which is thought to lead to a vague interpretation of reality. Another critical issue is the difficulty associated with the interpretation and usage of qualitative data analysis, and also, given that such an approach is very time-consuming (Cavaye, 1996). These problems could be eliminated as careful measures were taken and reputable data analysis and management methods were applied. For this purpose, the researcher utilizes software such as NVivo and SPSS for data management, transcription, coding, and analysis. The prejudices were kept aside by triangulating key findings and rigorous validation and generalization techniques described in the previous sections.

Another limitation related to the methodology is the role of the researcher being also an expert in the field of IS strategy development and implementation in multi-national enterprises. In-depth knowledge within this field and extensive project management experience cannot only be an opportunity, but it may also conversely lead to a preconceived and biased presentation of the findings. The researcher has been aware of this risk during the entire research process, notably in the interview phases. The scope of this research was limited to IS strategy development and implementation within the six enterprises where the experts are working. There is evidence that the feedback from the experts reflected not only the current company situation, but also their previous experiences and their learnings over time.

The chosen number of experts can also be a further limitation of this research. The analyzed data has been collected from eighteen participants from six companies. One can argue that this research could benefit from a more significant number of participants working in other large enterprises. However, considering the variety of functions and expertise of the interviewed individuals, the researcher views the sample size as appropriate to validate the newly created framework for IS strategy development and implementation.

8.5 Future research

The following suggestions for specific directions for further research areas are focused upon significant issues associated with the research findings.

A full real-world validation of the framework across a three and up to five year planning cycle was clearly not possible in this research project. The development and adjustment of a more tailored framework that addresses more small and medium-sized companies could be the subject of future research. This research concluded that the six large multi-national enterprises might be too complex to move to a standard and structured framework approach in a reasonable time. It seems the biggest challenge for such large multi-national enterprises is to use shorter planning cycles. This might be a future modification of the COCPIT / RAEEC framework to adjust the processes to meet the upcoming challenges.

Another possible area for further research could be a detailed study on IS strategy implementation methods based on various project methodologies discovered in this research. Following the strategy development, further challenges have to be overcome.

Knowledge building is another interesting area for further research. Ideas from other disciplines about knowledge management might be adopted to investigate the role of organizational knowledge in IS strategy development and implementation. Further research may investigate how experience in IS strategy development and implementation gradually accumulates. It could investigate how the established knowledge could then be used to address weaknesses in the process of IS strategy development and implementation.

For example, it may be found that improved understanding through knowledge building and better communication of perceptions, goals, and meanings can significantly assist in creating an organizational context where there is a more

coherent system of shared meaning. This, in turn, could improve the chances of IS strategy development and implementation success. Nevertheless, it is acknowledged that empirical data of this research provides only limited evidence in support of this argument. Thus, further research is undoubtedly required before valid statements can be made on the subject.

It is hoped that the essential findings and related discussion in this thesis will be of value to those engaged in such future research.

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10 APPENDICES

10.1 Appendix 1: Project information sheet

Project Information Sheet

UNIVERSITY OF GLOUCESTERSHIRE
at Cheltenham and Gloucester

Project Information

Research Title:

A new conceptual model for the development and implementation of Information Systems strategy in multi-national Group companies

Contact: Christian Weber
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Researcher and supervisors

Dr. Martin Wynn and Prof Shujun Zhang (University of Gloucestershire, United Kingdom) are the principal supervisors for the study who will oversee the work of the researcher. Christian Weber is the researcher on this project and will be conducting the research for the dissertation.

Findings

The findings of this research will be part of the doctoral dissertation. The research will be published in the form of academic papers in management journals and will be available on the University's research repository.

Funding

The research is part of a doctoral dissertation and is not funded. The research is fully financed by the researcher.

Research background

Information Systems (IS) are an integrated web of people, processes, data, software, hardware and procedures that interact with each other in order to analyze and distribute collected and processed information, to create value and support the systems inside and outside an organization. IS are specified to be the source of information distribution in an organization. Furthermore, IS are holistically defined as means of purposeful use of Information Technology (IT) through interrelated components interacting with each other in an organized structure. In multinational organizations, the scope of IS is much wider and hence, it encapsulates a greater range of system components.

Project Information Sheet

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Research objectives

Research Objectives:

RO1 To systematically review all existing literature on IS strategy development and implementation in large multi-national Group companies to establish what case examples and conceptual models and frameworks exist.

RO2 To establish the existing processes and mechanisms for IS strategy development and implementation in large multi-national Group companies.

RO3 To research the impacts of IS strategy implementation in large companies at both Group and subsidiary levels, focusing on costs, benefits and related key issues.

RO4 To propose and develop a new framework for IS strategy development and implementation in multi-national corporations.

Questionnaire

Respondent Details

- Can you outline your role in the organization please?
- How many years experience do you have in this role and in the company?
- How many years do you have in a management position?
- Have you ever been part of IS strategy development and/or implementation?

The Business Planning Process and IS Strategy

- How is business strategy developed and implemented? (especially regarding the role of headquarters and subsidiaries in this process)
- How is IS strategy linked to the overall business strategy?
- Which departments are involved at the headquarters and subsidiaries in both the development and the implementation of IS?

IS Strategy Development

- How is IS strategy developed? (especially regarding the role of headquarters and subsidiaries in this process)
- Who is defining the IS strategy and who is leading the process?
- How are cultural issues (e.g. know-how, skills) considered in IS strategy development?
- How are internal and external factors considered in IS strategy development?
- What is the IS strategy? What is the software policy for personal productivity tools (e.g. MSOffice) and for main business systems (e.g. SAP)?

IS Strategy Implementation

- How is IS strategy implemented? (especially regarding the role of headquarters and subsidiaries in this process)
- Is a particular project management methodology used (e.g. PRINCE2 or PMI)?
- Is there a clear business case for IS strategy implementation: Is there a cost-benefit analysis prior to implementing a particular software product?
- Can you identify any key issues which are driven from IS strategy implementation?
- What has been implemented in the past 5 years?
- What is planned to be implemented in the next 5 years?

IS Strategy Review

- How is the success of IS strategy development measured? Are the benefits clearly identified?
- How is this strategy reviewed? Is there a process for amending the IS strategy if necessary?

Varia

- Is there other information you can provide related to IS strategy development and implementation in your company?
- Anything else you would like to add?

Choice of participants

The research seeks a variety of perspectives from business leaders who have managed or have been part of IS decision or IS implementation projects in a multi-national company.

Expected benefits and risks

This research aims to create a new conceptual model for the development and implementation of Information Systems strategy in multi-national Group companies. It cannot be promised that the study will help you personally, but the findings might help improve how organizations manage IS development and implementation. Once the study is completed you will receive an executive summary made available electronically. There are no foreseen risks associated with the involvement in the study.

Audio Recording of Interviews

With your permission, the researcher would like to audio record the interview for better data capture.

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Your Involvement

Taking part in the research will involve talking to the researcher from University of Gloucestershire for up to 1 hour, at a time and location or by Skype that is convenient to you. All information will remain strictly confidential, and all names will be anonymized.

Confidentiality

The information that you provide is anonymous. The information will be stored using study numbers on a password-protected computer within a locked space. Your name will not be stored with your interview data. No information about any single individual will be made available to any other person. Only a company description might be given in any reports of the study with no indication of any participant's identity. When the research is completed and reported, all recording data will be destroyed and all the transcripts will be stored securely for a period 10 years to allow for checking the accuracy of the information if necessary during that period.

Further information

If you have any questions about this research, or require further information, please contact the study researcher indicated above. Please keep this information sheet for your information. Should you agree to participate in the research you will also be given a copy of the signed consent form for your records.

Thank you for your interest and participation!

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Participant consent form

Please complete the consent form after reading the project information and details about the study	Yes	No
I have read and understood this information sheet	☐	☐
I had the opportunity to discuss this study and ask questions related to this project	☐	☐
I had satisfactory answers to all my questions	☐	☐
I have received enough information about the study	☐	☐
I understand that the interviews will be all audio-recorded	☐	☐
I agree that all answers are I will provide will be stored anonymously on file and may be used in the final analysis of the data	☐	☐
I understand that my participation is voluntary	☐	☐
I understand that sections of any of my study notes may be looked at by responsible individuals from the University of Gloucestershire where it is relevant to my taking part in this research. I give permissions for these individuals to access my records that are relevant to this research.	☐	☐
I had enough time to come to my decision	☐	☐
I agree to participate in the study	☐	☐

Participant

Signed _____

Date _____

Name (Block Letters) _____

Researcher

Signed _____

Date _____

Name (Block Letters) _____

10.2 Appendix 2: Responses summary

Table 60: Coded responses summary

Name
Q10-Respondent Details
Q11-Outline role
R11-CFO
R11-CIO
R11-General Manager IT
R11-Global Head Digital Supply Chain Management
R11-Group Manager IT
R11-Head IT Business Development
R11-Head of Business Processes & Applications
R11-Head of Customer Experience Applications
R11-Head of Data Management
R11-Head of IT Basis & Client Services
R11-Head of IT Operations
R11-Head of Information Security
R11-Head of Projects & Processes
R11-Head Treasury Operations
R11-IT Manager
R11-Operations Manager
Q12-Years experience do you have in this role in the company
R12-1
R12-10
R12-11
R12-14
R12-2
R12-20
R12-4
R12-5
R12-8
Q13-Years do you have in a management position
R13-10
R13-13
R13-14
R13-15
R13-2
R13-20
R13-25
R13-5
R13-6
R13-7
Q14-Been part of IS strategy development and or implementation
R14-No
R14-Yes
Q15- Years in the company
R15-10
R15-12
R15-13
R15-14

Name
R15-15
R15-20
R15-24
R15-25
R15-4
R15-5
R15-8
R15-9
Q20-Business Planning Process and IS Strategy
Q21-How is business strategy developed and implemented
R21-3 years mid-term planning
R21-5 years long term planning
R21-Agreement between Business Owners and IT Dept
R21-Based from the HQ Mission, breakdown into business objectives and goals
R21-BEC Meetings -see pptx Bühler
R21-By key processes
R21-By M&A Projects
R21-Centrally defined
R21-Centrally defined with feedbacks from subsidiaries
R21-Decentralized approach due to highly diversified companies
R21-Defined group targets for all companies
R21-Driven by the moves from the different departments
R21-Focus Point trigger a Project
R21-Top Down
R21-Yearly executive board strategy meeting -set focus points
Q22-How is IS strategy linked to the overall business strategy
R22-Align requirements bottom up then top down, but process and result driven to measure success KPIs
R22-Aligned by the CTO considering country feedbacks
R22-Central Team which is managing all the needs from the countries
R22-Centrally top down otherwise to many kingdoms to talk to
R22-CIO aligns with the business process owners
R22-Collect End users Feedback, not only internal departments for linking & aligning
R22-Focus points from exec board meeting
R22-Global Business Owner to decide central, considering decentralized needs together with the IT Project Managers
R22-KPIs from the Business Strategy Projects
R22-Operative management breaks down business strategy targets
R22-Projects approved by the business
R22-Role of the Project Managers
R22-Top down from the board
R22-Workshops
Q23-Which departments are involved at the headquarters and subsidiaries in both
R23-All Dept and Subsidiaries can provide inputs and all projects resulting from Feedbacks approved by the business excellent committees
R23-All Dept in the HQ
R23-BU Areas due strong own competencies
R23-Center of Competence
R23-Centrally managed, all regions subsidiaries involved and coordinated by the business excellence committees
R23-Challenges in Multinational Setup - Matrix Organization -Conflicts in priorities and resources

Name
R23-CIO at HQ with all BU areas owners
R23-Decentralized global strategy, subsidiaries mostly independent from HQ
R23-HQ Dept defines central templates based on all feedbacks and requests, roll out globally
R23-Locally defined by all Dept. and globally executed
R23-Strong exchange between HQ and Subsidiaries
Q30-IS Strategy Development
Q31-How is strategy developed
R31- Based on Business strategy
R31-Current document review to outline key systems and technologies
R31-By the CIO with Head of IT Departments
R31-Centrally driven by the CIO
R31-CEO (Company Owner) has an active role
R31-Considering technology changes and current architecture drives development
R31-Goals and KPIs from the Business Strategy
Q32-Who is defining the IS strategy and who is leading the process
R32-Business Executive Committee
R32-CIO
R32-Company Owner
R32-CTO
R32-Defined by CIO with Head of IT Departments, centrally managed by IT Project Managers
R32-Execuitve Board , executed by the CIO
R32-Subsidiaries, decentralized
Q33-How are cultural issues (e.g. know-how, skills) considered in IS strategy
R33-Active engagements of local teams
R33-Actively considered when creating solutions
R33-Aware but not managed
R33-Branch Managers need to consider
R33-Centrally developed solution failed
R33-Culture is part of the strategy development
R33-Don't build process around people. People have to follow the process
R33-Engaging all regions team members to work together in a global template
R33-Governance
R33-Know How
R33-Know how and Skills is a challenge, CIO Role act as mentor
R33-Local culture
R33-On a high level but not in details
R33-Particular training for local employees
R33-Skills
R33-Uncertain
Q34-How are internal and external factors considered in IS strategy development
R34-Centrally managed
R34-Country specific rules and regulations actively considered and monitored
R34-Current trends and risks are discussed with business units heads
R34-Departments get awareness training on influencing strategy factors
R34-External partners report changes
R34-Finding megatrends and try integrating them into the strategy
R34-Functional Departments report changes
R34-Governance board is monitoring changes on internal and external factors
R34-In the long-term strategy planning
R34-Regions report changes on laws and regulations to the HQ

Name
R34-Responsiility of the business owners
R34-Role of the CIO or Exec Board when factors arise or change
R34-When trends arise it triggers a strategy review or change
Q35-What is the IS strategy
R35-ISO 27001
R35-Jaggaer
R35-Navision Dynamics
R35-O365
R35-SAP
R35-Siebel
Q40-IS Strategy Implementation
Q41-How is IS strategy implemented
R41-Assign initiatives to users
R41-Blueprint Phases
R41-Breakdown into different Projects
R41-Centralized Global Rollouts
R41-Choose Standard Templates
R41-Clear Targets breakdown in regions
R41-CoreTeam
R41-Definition of strategic Initiatives
R41-Driven from the HQ
R41-Each IT Department is aligned with the overall IS Strategy
R41-External Consultants
R41-Prioritized in the Project Portfolio
R41-Roadmap, reviewed once a year, set new Project priorities on most important projects
R41-Seperate Department for Project Management - PMO
R41-Super User Concept
R41-Traditional Project Management
R41-Workshops, define objectives and operationalize them
Q42-Is a particular project management methodology used
R42-Phase model
R42-PMO
R42-SAP Implementation Model
R42-SCRUM
R42-Train the Trainer
R42-Waterfall
Q43-Is there a clear business case for IS strategy implementation
R43-Could be improved
R43-High Level ROI Calculation
R43-Lack of transparency due to matrix organization where people can hide and play games to look good
R43-No, not existing or not aware (missing transparency)
R43-Yearly Salary Bonus depends on the project success
R43-Yes, defined business case
Q44-Can you identify any key issues which are driven from IS strategy
R44-Challenges moving from theory to practices
R44-Decision taking too long
R44-Driven by matrix organization fight for best resources
R44-Expectation management, goals or Project scope not well-defined resulting in frustration and delaying other projects due to allocated resources
R44-Finding right balance implementing new technologies and organization readiness

Name
R44-Less training resulting in poor system usage
R44-Missing business ownership
R44-Need for speed
R44-People are engaged into many parallel projects
R44-People resistance to new systems and processes
R44-Project risk management not taken serious enough
R44-Projects are initiated every week but only a few are fulfilled, approx. 250 big IT projects per year
R44-Taking assumptions and not facts resulting in project restart
R44-Too many committees
R44-Too many projects in parallel
R44-too many systems and processes not aligning resulting in island solution. Breaking this up takes CEO or EXEC Board actions
Q45-What has been implemented in the past 5 years
R45-SAP Rollout in more countries
R45-See strategy from CIO PPTX
Q46-What is planned to be implemented in the next 5 years
R46-More Business com tool like S4b of Teams
R46-More cloud services
R46-Optimnization of current processes and templates
R46-Rollout more functions in O365
R46-SAP Rollout in more countries
R46-See CIO PPTX for 2025
Q50-IS Strategy Review
Q51-How is the success of IS strategy development measured
R51- Increased Sales by Channels and Segments
R51-Benefit review
R51-Clear Goals
R51-Cost optimization
R51-Feedback from individual countries
R51-Informal
R51-Internal Audit Team review KPIs
R51-KPIs
R51-No Systematic Process in place
R51-Practical Processes
R51-Proper Change, Validate and Testing Process no need to review success
R51-Review by the Business Excellence Committee
R51-Strict set of measurements
R51-Yearly Review
Q52-How is this strategy reviewed
R52-Difficult to define a review process on a 5-year planning cycle
R52-Board of directors meeting
R52-By efficiency increase
R52-Monthly CEO Video Message on the intranet
R52-No review du to prior approval process
R52-No Review, no lesson learned
R52-No reviews decision was made no other questions
R52-Project Reviews
R52-Public Project Cockpit with Quarterly Updates
R52-Regular strategy meetings, starting with review and collect feedback from countries. 360-degree approach
R52-Review needs improvement

Name
R52-Seeks for review process methodology
R52-Yearly Review
Q60-Varia
Q61-Is there other information you can provide related to IS strategy development
R61-Common agreement of terms and definitions
R61-Processes defines IS Strategy or trigger a change
R61-Business or Process Owner need more engagement
R61-Centralization vs Decentralization
R61-Centralize processes increase efficiency and brings flexibility
R61-Challenges due to different working behaviors and business models within holding companies
R61-Clear definition of Key System or Module Owners
R61-Consider low performance (latency, access speed) Subsidiaries in the strategy
R61-Considering Digital Natives and how they change or affect the IS strategy
R61-Cultural teamwork
R61-Experienced Ownership lead to success
R61-Information sharing
R61-Internal vs External Strategy Audit
R61-Long range-life strategy vs shorter and agile
R61-More Business alignment in Multinationals from top managers
R61-Strong Support from CEO or Board Level needed
Q62-Anything else you would like to add
R62-IS is the key to drive future actions
R62-Better Change management for self-measuring performance
R62-Better Exceptions Management
R62-Good model is most important
R62-Knowing Why, Where to go and how to use tools
R62-Need for Speed
R62-Simple Strategy Documentation and Presentation

10.3 Appendix 3: Matrix intersection Cost & Benefits

Table 61: Matrix intersection Cost & Benefits

Name	Type	IS Dimensions	Process
R52-By efficiency increase	Response	1. Cost & Benefits	1. Review
R61-Challenges due to different working behaviours and business models within holding companies	Response	1. Cost & Benefits	2. Align
R61-Centralize processes increase efficiency and brings flexibility	Response	1. Cost & Benefits	2. Align
R43-Yes, defined business case	Response	1. Cost & Benefits	2. Align
R43-No, not existing or not aware (missing transparency)	Response	1. Cost & Benefits	2. Align
R43-Yearly Salary Bonus depends on the project success	Response	1. Cost & Benefits	4. Execute
R43-Lack of transparency due to matrix organisation where people can hide and play games to look good	Response	1. Cost & Benefits	4. Execute
R43-High Level ROI Calculation	Response	1. Cost & Benefits	4. Execute
R43- Could be improved	Response	1. Cost & Benefits	4. Execute
R51-Informal	Response	1. Cost & Benefits	5. Control
R51-Feedback from individual countries	Response	1. Cost & Benefits	5. Control
R51-Cost optimization	Response	1. Cost & Benefits	5. Control
R51-Clear Goals	Response	1. Cost & Benefits	5. Control
R51-Benefit review	Response	1. Cost & Benefits	5. Control
R51- Increased Sales by Channels and Segments	Response	1. Cost & Benefits	5. Control

10.4 Appendix 4: Matrix intersection Organization & Processes

Table 62: Matrix intersection Organization & Processes

Name	Type	IS Dimensions	Process
R52-Yearly Review	Response	2. Organization & Processes	1. Review
R52-Seeks for review process methodology	Response	2. Organization & Processes	1. Review
R52-Review needs improvement	Response	2. Organization & Processes	1. Review
R52-Regular strategy meetings, starting with review and collect feedback from countries. 360 degree approach	Response	2. Organization & Processes	1. Review
R52-No reviews decision was made no other questions	Response	2. Organization & Processes	1. Review
R52-No Review, no lesson learned	Response	2. Organization & Processes	1. Review
R52-Monthly CEO Video Message on the intranet	Response	2. Organization & Processes	1. Review
R52-Board of directors meeting	Response	2. Organization & Processes	1. Review
R52- Difficult to define a review process on a 5 year planning cycle	Response	2. Organization & Processes	1. Review
R21-Yearly executive board strategy meeting - define focus points	Response	2. Organization & Processes	1. Review
R21-3 years mid-term planning	Response	2. Organization & Processes	1. Review
R21-5 years long term planning	Response	2. Organization & Processes	1. Review
R61-Centralization vs Decentralisation	Response	2. Organization & Processes	2. Align
R61- Processes defines IS Strategy or trigger change	Response	2. Organization & Processes	2. Align
R44-Decision taking too long	Response	2. Organization & Processes	2. Align
R41-Definition of strategic Initiatives	Response	2. Organization & Processes	2. Align
R34-Role of the CIO or Exec Board when factors arise or change	Response	2. Organization & Processes	2. Align
R34-Responsiility of the business owners	Response	2. Organization & Processes	2. Align
R34-In the long term strategy planning	Response	2. Organization & Processes	2. Align

Name	Type	IS Dimensions	Process
R34-Governance board is monitoring changes on internal and external factors	Response	2. Organization & Processes	2. Align
R34-Functional Departments report changes	Response	2. Organization & Processes	2. Align
R34-Departments get awarnes training on influencing strategy factors	Response	2. Organization & Processes	2. Align
R34-Centrally managed	Response	2. Organization & Processes	2. Align
R32-Subsidiaries, decentralized	Response	2. Organization & Processes	2. Align
R32-Executive Board , executed by the CIO	Response	2. Organization & Processes	2. Align
R32-Defined by CIO with Head of IT Departments, centrally managed by IT Project Managers	Response	2. Organization & Processes	2. Align
R32-CTO	Response	2. Organization & Processes	2. Align
R32-Company Owner	Response	2. Organization & Processes	2. Align
R32-CIO	Response	2. Organization & Processes	2. Align
R32-Business Executive Committee	Response	2. Organization & Processes	2. Align
R31-CEO (Company Owner) has an active role	Response	2. Organization & Processes	2. Align
R31-Centrally driven by the CIO	Response	2. Organization & Processes	2. Align
R31-By the CIO with Head of IT Departments	Response	2. Organization & Processes	2. Align
R31- Based on Business strategy	Response	2. Organization & Processes	2. Align
R23-Strong exchange between HQ and Subsidiaries	Response	2. Organization & Processes	2. Align
R23-HQ Dept defines central templates based on all feedbacks and requests, roll out globally	Response	2. Organization & Processes	2. Align
R23-Decentralized global strategy , subsidiaries mostly independent from HQ	Response	2. Organization & Processes	2. Align
R23-CIO at HQ with all BU areas owners	Response	2. Organization & Processes	2. Align
R23-Challenges in Multi-National Setup - Matrix Organisation - Conflicts in priorities and ressources	Response	2. Organization & Processes	2. Align
R23-Centrally managed, all regions subsidiaries involved and coordinated by the business excellence committees	Response	2. Organization & Processes	2. Align
R23-Center of Competence	Response	2. Organization & Processes	2. Align
R23-BU Areas due strong own competencies	Response	2. Organization & Processes	2. Align
R23-All Dept in the HQ	Response	2. Organization & Processes	2. Align
R21-Driven by the moves from the different departments	Response	2. Organization & Processes	2. Align
R21-Agreement between Business Owners and IT Dept	Response	2. Organization & Processes	2. Align
R21-Based from the HQ Mission, breakdown into business objectives and goals	Response	2. Organization & Processes	2. Align
R21-Defined group targets for all companies	Response	2. Organization & Processes	2. Align
R21-Centrally defined	Response	2. Organization & Processes	2. Align
R21-Centrally defined with feedbacks from subsidiaries	Response	2. Organization & Processes	2. Align
R21-Decentralized approach due to highly diversified companies	Response	2. Organization & Processes	2. Align
R61-Consider low performance (latency, access speed) subsidiaries in the strategy	Response	2. Organization & Processes	3. Engage
R21-BEC Meetings -see pptx Bühler	Response	2. Organization & Processes	3. Engage
R21-By key processes	Response	2. Organization & Processes	3. Engage
R44-too many committees	Response	2. Organization & Processes	4. Execute
R44-Need for speed	Response	2. Organization & Processes	4. Execute
R44-Missing busines ownership	Response	2. Organization & Processes	4. Execute
R44-Driven by matrix organisation fight for best resources	Response	2. Organization & Processes	4. Execute

Name	Type	IS Dimensions	Process
R41-Each IT Department is aligned with the overall IS Strategy	Response	2. Organization & Processes	4. Execute
R41-Driven from the HQ	Response	2. Organization & Processes	4. Execute
R23-Locally defined by all Dept. and globally executed	Response	2. Organization & Processes	4. Execute
R22-Workshops	Response	2. Organization & Processes	4. Execute
R22-Top down from the board	Response	2. Organization & Processes	4. Execute
R21-Top Down	Response	2. Organization & Processes	4. Execute
R51-Yearly Review	Response	2. Organization & Processes	5. Control
R51-Review by the Business Excellence Committee	Response	2. Organization & Processes	5. Control
R51-Practical Processes	Response	2. Organization & Processes	5. Control
R51-No Systematic Process in place	Response	2. Organization & Processes	5. Control

10.5 Appendix 5: Matrix intersection Human Capital

Table 63: Matrix intersection Human Capital

Name	Type	IS Dimensions	Process
R61-Cultural teamwork	Response	3. Human Capital	3. Engage
R61-Business or Process Owner need more engagement	Response	3. Human Capital	3. Engage
R44-People resistance to new systems and processes	Response	3. Human Capital	3. Engage
R33-Uncertain	Response	3. Human Capital	3. Engage
R33-On a high level but not in details	Response	3. Human Capital	3. Engage
R33-local culture	Response	3. Human Capital	3. Engage
R33-Know how and Skills is a challenge, CIO Role act as mentor	Response	3. Human Capital	3. Engage
R33-Know How	Response	3. Human Capital	3. Engage
R33-Engaging all regions team members to work together in a global template	Response	3. Human Capital	3. Engage
R33-Don't build process around people. People must follow the process	Response	3. Human Capital	3. Engage
R33-Culture is part of the strategy development	Response	3. Human Capital	3. Engage
R33-Centrally developed solution failed	Response	3. Human Capital	3. Engage
R33-Branch Managers need to consider	Response	3. Human Capital	3. Engage
R33-Aware but not managed	Response	3. Human Capital	3. Engage
R33-Actively considered when creating solutions	Response	3. Human Capital	3. Engage
R33-Active engagements of local teams	Response	3. Human Capital	3. Engage
R61-Strong Support from CEO or Board Level needed	Response	3. Human Capital	4. Execute
R61-Experienced Ownership lead to success	Response	3. Human Capital	4. Execute
R41-External Consultants	Response	3. Human Capital	4. Execute
R41-CoreTeam	Response	3. Human Capital	4. Execute
R33-Skills	Response	3. Human Capital	4. Execute
R33-Particular training for local employees	Response	3. Human Capital	4. Execute

10.6 Appendix 6: Matrix intersection Project & Services

Table 64: Matrix intersection Project & Services

Name	Type	IS Dimensions	Process
R52-Public Project Cockpit with Quarterly Updates	Response	4. Projects & Services	1. Review
R52-Project Reviews	Response	4. Projects & Services	1. Review
R52-No review du to prior approval process	Response	4. Projects & Services	1. Review
R61-Long range-life strategy vs shorter and agile	Response	4. Projects & Services	2. Align
R44-Challenges moving from theory to practices	Response	4. Projects & Services	3. Engage
R22-Focus points from exec board meeting	Response	4. Projects & Services	3. Engage
R21-By M&A Projects	Response	4. Projects & Services	3. Engage
R62-Better exceptions management	Response	4. Projects & Services	4. Execute
R62-Better change management for self measuring performance	Response	4. Projects & Services	4. Execute
R44-Too many projects in parallel	Response	4. Projects & Services	4. Execute
R44-Project risk management not taken serious enough	Response	4. Projects & Services	4. Execute
R44-People are engaged in to many parallel projects	Response	4. Projects & Services	4. Execute
R44-Expectation management, goals or Project scope not well defined resulting in frustration and delaying other projects due to allocated ressources	Response	4. Projects & Services	4. Execute
R42-Waterfall	Response	4. Projects & Services	4. Execute
R42-Train the Trainer	Response	4. Projects & Services	4. Execute
R42-SCRUM	Response	4. Projects & Services	4. Execute
R42-SAP Implementation Model	Response	4. Projects & Services	4. Execute
R42-PMO	Response	4. Projects & Services	4. Execute
R42-Phase model	Response	4. Projects & Services	4. Execute
R41-Workshops, define objectives and operationalize them	Response	4. Projects & Services	4. Execute
R41-Traditional Project Management	Response	4. Projects & Services	4. Execute
R41-Super User Concept	Response	4. Projects & Services	4. Execute
R41-Seperate Department for Project Management - PMO	Response	4. Projects & Services	4. Execute
R41-Roadmap, reviewed once a year, set new Project priorities on most important projects	Response	4. Projects & Services	4. Execute
R41-Prioritized in the Project Portfolio	Response	4. Projects & Services	4. Execute
R41-Clear Targets breakdown in Regions	Response	4. Projects & Services	4. Execute
R41-Choose Standard Templates	Response	4. Projects & Services	4. Execute
R41-Centralized Global Rollouts	Response	4. Projects & Services	4. Execute
R41-Breakdown into different Projects	Response	4. Projects & Services	4. Execute
R41-Blueprint Phases	Response	4. Projects & Services	4. Execute
R41-Assign initiatives to users	Response	4. Projects & Services	4. Execute
R22-Role of the Project Managers	Response	4. Projects & Services	4. Execute
R22-Projects approved by the business	Response	4. Projects & Services	4. Execute
R21-Focus Point trigger a Project	Response	4. Projects & Services	4. Execute
R51-Strict set of measurements	Response	4. Projects & Services	5. Control

Name	Type	IS Dimensions	Process
R51-Proper Change , Validate and Testing Process no need to review success	Response	4. Projects & Services	5. Control
R51-KPIs	Response	4. Projects & Services	5. Control
R51-Internal Audit Team review KPIs	Response	4. Projects & Services	5. Control
R44-Projects are initated every week but only a few are fulfilled, approx. 250 big IT projects per year	Response	4. Projects & Services	5. Control
R31-Goals and KPIs from the Business Strategy	Response	4. Projects & Services	5. Control
R22-KPIs from the Business Strategy Projects	Response	4. Projects & Services	5. Control

10.7 Appendix 7: Matrix intersection Integration

Table 65: Matrix intersection Integration

Name	Type	IS Dimensions	Process
R34-Regions report changes on laws and regulations to the HQ	Response	5. Integration	2. Align
R34-External partners report changes	Response	5. Integration	2. Align
R34-Current trends and risks are discussed with business units heads	Response	5. Integration	2. Align
R34-Country specific rules and regulations actively considered and monitored	Response	5. Integration	2. Align
R33-Governance	Response	5. Integration	2. Align
R22-Aligned by the CTO considering country feedbacks	Response	5. Integration	2. Align
R22-Align requirements bottom up then top down, but process and result driven to measure success KPIs	Response	5. Integration	2. Align
R61-More business alignment in Multinationals from top managers	Response	5. Integration	3. Engage
R23-All Dept and Subsidiaries can provide inputs and all projects resulting from Feedbacks approved by the business excellent committees	Response	5. Integration	3. Engage
R22-Operative management breaks down business strategy targets	Response	5. Integration	3. Engage
R22-Collect End users Feedback, not only internal departments for linking & aligning	Response	5. Integration	3. Engage
R22-CIO aligns with the business process owners	Response	5. Integration	3. Engage
R61-Clear definition of Key System or Module Owners	Response	5. Integration	4. Execute
R22-Global Business Owner to decide central, considering decentralized needs together with the IT Project Managers	Response	5. Integration	4. Execute
R22-Centrally top down otherwise to many kingdoms to talk to	Response	5. Integration	4. Execute
R22-Central Team which is managing all the needs from the countries	Response	5. Integration	4. Execute
R61-Internal vs External Strategy Audit	Response	5. Integration	5. Control

10.8 Appendix 8: Matrix intersection Technology

Table 66: Matrix intersection Technology

Name	Type	IS Dimensions	Process
R62-Knowing why and where to go and how to use tools	Response	6. Technology	1. Review
R62- IS is the key to drive future actions	Response	6. Technology	1. Review
R62-Simple Strategy Documentation and Presentation	Response	6. Technology	2. Align
R62-good model is most important	Response	6. Technology	2. Align
R61-Information sharing	Response	6. Technology	2. Align
R61-Considering Digital Natives and how they change or affect the IS strategy	Response	6. Technology	2. Align
R61- Common agreement of terms and definitions	Response	6. Technology	2. Align
R46-See CIO PPTX for 2025	Response	6. Technology	2. Align
R46-SAP Rollout in more countries	Response	6. Technology	2. Align
R46-Rollout more functions in O365	Response	6. Technology	2. Align
R46-Optimnization of current processes and templates	Response	6. Technology	2. Align
R46-More cloud services	Response	6. Technology	2. Align
R46-More Business com tool like S4b of Teams	Response	6. Technology	2. Align
R45-See strategy from CIO PPTX	Response	6. Technology	2. Align
R45-SAP Rollout in more countries	Response	6. Technology	2. Align
R44-too many systems and processes not aligning resulting in island solution. Breaking this up takes CEO or EXEC Board actions	Response	6. Technology	2. Align
R44-Finding right balance implementing new technologies and organization readiness	Response	6. Technology	2. Align
R35-Siebel	Response	6. Technology	2. Align
R35-SAP	Response	6. Technology	2. Align
R35-O365	Response	6. Technology	2. Align
R35-Navision Dynamics	Response	6. Technology	2. Align
R35-Jaggaer	Response	6. Technology	2. Align
R35-ISO 27001	Response	6. Technology	2. Align
R34-When trends arise it triggers a strategy review or change	Response	6. Technology	2. Align
R34-Finding megatrends and try integrate them into the strategy	Response	6. Technology	2. Align
R31-Considering technology changes and current architecture drives development	Response	6. Technology	2. Align
R31- Current Doc review to outline key systems and technologies	Response	6. Technology	2. Align
R44-Less training resulting in poor system usage	Response	6. Technology	4. Execute
R62-Need for Speed	Response	6. Technology	5. Control
R44-taking assumptions and not facts resulting in project restart	Response	6. Technology	5. Control