DECISION-MAKING AND SOCIAL MEDIA

The integration of social media technologies into collective judgment and decision-making processes in organizational business environments

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A thesis submitted to
The University of Gloucestershire
in accordance with the requirements of the degree of
Doctor of Philosophy
in the Faculty of Business, Education and Professional Studies

November 2017

Abstract

Organizations are continuously confronted with decision-making in their daily business practice. Information technology plays a key role, supporting and automating decision-making processes, enabling the flow and distribution of information and knowledge and enhancing collaboration and exchange across the entire organization. Both, decision-making and information technology combine social and technological aspects of collaboration and collective action within a socio-economic system. Social media technologies such as corporate social networks, collaborative projects, instant messengers, content sharing platforms, blogs, micro-blogs, rating and voting systems, influence how human beings collaborate, build communities, exchange information, and jointly create content.

This thesis combines aspects of social and behavioural science, collective decision-making and information technology into a qualitative research project. The main objective of this thesis was to explore and to gain a deep understanding of the implications of the integration of social media technologies to enhance collective judgement and the complex decision-making processes within corporate and less formal contexts. Therefore, this research identified real, potential and perceived benefits, disadvantages and barriers of social media integration in collective decision-making processes. The outcome focusses on evidence to establish whether social media technologies are capable of advancing the collective decision-making process.

This study applied an exploratory qualitative research approach, which incorporated semi-structured interviews, multiple case studies and documentary data. Three case studies built the foundation of the field research conducted over a period of nine months, resulting in thirty semi-structured interviews. For each investigated site, ten individuals from various departments and different roles participated in thirty to forty minutes, semi-structured interviews recorded at their premises. Documents shared by the interviewees such as internal presentations, videos, meeting minutes and communication notes added to the overall data set.

The key findings can be divided into three focus areas, (a) social media within a business environment and organizational readiness, (b) social media and collective action in business such as mass collaboration and problem solving and (c) social media integrated in collective decision-making derived from the benefits, disadvantages and barriers identified.

Real benefits surfaced in the area of communication, interaction, involvement, reproducibility, aggregation and the independence of physical presence. From a communication perspective, the decision-making process benefits from utilizing different channels to convey and present information. These communication channels facilitate synchronous and asynchronous interaction, engaging different

parties such as stakeholders, committees, experts, management and other participants in the process. Since the information created is continuously captured and stored, social media adds the benefit of reproducibility to the collective decision-making process. Rating and voting functions aggregate thoughts, opinions, and monitor, at an early stage of the process, tendencies and reflective developments in the group. Finally, rating and voting mechanisms build a collective choice acknowledged by a majority of a business collective. Social media relieves the requirement of physical presence in a collective decision-making process utilizing the corporate Intranet and the Internet. This adds flexibility to the selection of the participants and provides a basis of employee engagement from small to large-scale endeavours.

Potential benefits relate to some extent to the explored real benefits. They focus on motivation of social interaction and collaboration, building relationships, enhancing the flow of information and fostering a reflective culture capable of collectively solving problems. From an organizational behaviour perspective, these benefits are capable of stimulating employees to engage in organizational topics, and utilizing organizational intelligence by sharing knowledge and experience to support collective decision-making.

Perceived benefits include enhanced communication, interaction, involvement, and acceptance, variety of opinions, engaging employees in collective actions and integrating experts. Perceived disadvantages concentrated around social interaction. They manifested as distraction, losing focus on objectives, biased information, and loss of control, opinion manipulation, information overload and a less formal nature of the process. Barriers were identified in the area of abuse of personal information, additional workload in the daily business, unclear benefits, refusal to share knowledge, lack of trust about the information created and presented, manipulation of opinions, and continuous availability.

The results of the thesis provided the evidence that utilization and integration of social media in the collective decision-making process depend on organizational readiness, which relates to the context. Social media application differs from the application in the Internet since social conformity, cohesion and internal competition influence participation and outcome. This means, the ability to integrate employees in collective action and the utilization of social media requires, besides acceptance of the new technology, a culture of openness, and willingness to share, engage and contribute. Therefore, this research suggests, from a managerial perspective, focussing on collective action capabilities, utilizing social media as an enabler to connect employees, to stimulate interaction, participation, and capture and support the information flow during a decision-making process. Recommendations for future research suggest analysing organizations in longitudinal studies to explore how they gain advantage of collective action concerning aggregation of knowledge using social media as a platform.

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: 22/11/2017

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List of Abbreviations

AI　　　　**Artificial Intelligence**

BI　　　　**Business Intelligence**

CEO　　　**Chief Executive Officer**

EIS　　　　**Executive Information Systems**

EIM　　　**Enterprise Information Management**

ERP	**Enterprise Resource Planning**
DBMS	**Database Management Systems**
DSS	**Decision Support Systems**
DW	**Data Warehouse**
KMS	**Knowledge Management Systems**
KBS	**Knowledge-based Systems**
MIS	**Management Information Systems**
GDP	**Gross Domestic Product**
GDSS	**Group Decision Support Systems**
ICT	**Information and Communication Technology**
OLAP	**Online Analytical Processing Systems**
PDSS	**Personal Decision Support System**
ROI	**Return on Investment**
SNS	**Social Network Sites**
SWOT	**Strengths, Weaknesses, Opportunities, and Threats**
XML	**Extensible Markup Language**

1. Introduction

During the last decade advances of information and communication technology (ICT) emphasized aspects of computer technology as a medium of social interaction (Kling, 2007; McAfee, 2009). Social Media are claimed to be transforming organizations into a workplace of aggregated knowledge, and collective collaboration (Buhse & Stamer, 2008; McAfee, 2009). Social information technologies[1] emerge within organizational contexts, encourage collaboration beyond departmental and organizational boundaries and the flattening of hierarchical structures (McAfee, 2009). For instance, innovation may no longer be dominated by corporate research and development departments but research communities, building a collective body of knowledge (Sunstein, 2008; Tapscott & Williams, 2008). The impact of social media[2] such as social networks, communities, wikis, blogs, content sharing platforms on business and management practice is increasing (McAfee, 2009). Therefore, social media is about to change organizational communication, the exchange of ideas and knowledge, deliberation, participation, affiliation and collaboration (Koch & Richter, 2009). Hence, the understanding of social and organizational effects of social media are of interest to organizational and managerial research and professional practices (Kaplan & Haenlein, 2010b; Kling, Rosenbaum, & Sawyer, 2005). Consequently, the competitive advantages and benefits of social media integrated in business processes are being increasingly discussed in academic circles (Kietzmann, Hermkens, McCarthy, & Silvestre, 2011b; Merchant, 2012; Tapscott & Tapscott, 2010).

A specific phenomenon, which is the topic of this research, is the impact of social media on organizational behaviour and decision-making. This thesis follows a research tradition introduced in the late 1960s, when social scientists started to study how ICT changes the structure of organizations, how work is organised, and the impact of ICT on power distribution (Kling et al., 2005). According to Page (2007) diversity of knowledge and experience within groups of individuals increases the sources of information and solution strategies, which could exceed the decision capabilities of an individual. These two fields combined led to the focal point of this research to explore the impact of social media on collective judgement, and decision-making within an organizational business context. The combination of social theory, organizational behaviour,

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[1] Social information technologies are used in this study synonymous with the term social media with a focus on the integration in information and communication management systems

[2] Social Media following the definition of Kaplan and Haenlein (2010b) are groups of applications based on web-technology focussing on the exchange, interaction and the creation of user generated content.

information systems research, social informatics[3] and behavioural decision-making theory build the theoretical foundation of this study. The main areas of interest are how social software influences communication, collaboration, information exchange, knowledge sharing, deliberation, collective intelligence[4], and aggregation of opinions in an organizational decision-making context.

This research topic is still at an early stage from a theoretical and practical application perspective, which generates a need to understand the phenomenon and its implications (Bonabeau, 2009; Elragal & El-Telbany, 2012; Landemore, 2012; Tapscott & Tapscott, 2010). Thus, this thesis was an exploratory research project, which sought for evidence whether or not social media technologies are capable of advancing the corporate decision-making process, and, if so, to create a concept of integrating knowledge, technology and processes based on the findings. In order to answer the research questions, this study analysed theoretically and empirically possible areas of benefits and barriers to the utilization of social information technology in collective decision-making.

1.1 Aim of the Research

Organizations perceive the internal application of social technologies as an investment without clearly defined business value and returns (Bradley & McDonald, 2011; Kaplan & Haenlein, 2010; Martin, Reddington, Kneafsey, & Sloman, 2009). They worry about employees wasting time in social networks discussing mainly private matters, thus decreasing their productivity, or they fear the risk of information security if confidential information leaks to external social networks (Ferreira, 2010; van Zyl, 2009). Hence, a significant number of organizations are hesitant to integrate these technologies into corporate business processes or their experience about integration is still at a beginning stage (Bradley & McDonald, 2011). Organizations are aware of the capabilities of social media as an external communication channel and marketing tool to improve customer relationship management referred to as social marketing

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[3] Social informatics is a research field that is interested in how information and communication technology influence society, structure, culture, and human behaviour, and how the environment changes the information technology as well following Kling, Rosenbaum, and Sawyer (2005).

[4] According to Malone and Klein (2007) collective intelligence is a research field about how groups of individuals act together collaboratively to solve problems by aggregating their knowledge and intelligence. The meaning of intelligence in this context is the capability to solve problems. In addition, this research field investigates how computer technology is capable of facilitating collective intelligence. Following McAfee (2009) solutions built on dispersed groups utilizing collective intelligence might be more robust than those obtained by individuals.

(Keyes, 2013). Hence, social media is primarily utilized to engage customers in public social networks platforms with products and services and to learn about their habits and preferences (Tapscott & Williams, 2008). However, a significant number of organisations still do not believe in the positive effects of the internal application of social media, such as collective problem solving and knowledge sharing (Boateng, Mbarika, & Thomas, 2010; Bradley & McDonald, 2011). This suggests that organizations may require a better understanding of the corporate application of social information technologies and may need to develop specific competencies to utilize them (Chun, Arling, & McQuaid, 2010). Whether this is a matter of insufficient understanding of social media application and utilization or a disturbance of the daily business practice for organizations, is an important theme investigated in this thesis.

Other relevant areas for investigation therefore also include communication, collaboration, identity-, social network- and information management (Koch & Richter, 2009). A focus area of utilization emerges within collective decision-making processes involving employees from different levels and departments within formal and informal groups (McAfee, 2009). According to Nicolas (2004), the ability of an organization to make sound decisions and judgements has a positive impact on their competitive advantage. Hence, technology enhanced collective decision-making and judgement opens up an avenue for research combining social, behavioural, managerial and technological aspects. This proposition gave rise to the main purpose of this research, which is to explore the utilization of social media systems in a business context, and to advance social theory in the area of technology enhanced collaborative decision-making. This thesis aims to add to behavioural decision-making theory and knowledge within a socio-economic environment. Therefore, this qualitative research project incorporated a theoretical framework about collective decision-making, organizational behaviour and social informatics and an empirical inquiry to explore the social media application in real-life settings based on semi-structured interviews and multiple case studies.

1.2 Research Question

Formulating clear research questions is one of the most important milestones of a research project. They provide guidance and focus about the research topic and lead to the conclusions. Therefore, the formulation of the research question, this research is based on, followed a defined iterative refinement process with several stages (Bryman & Bell, 2011; Creswell, 2009; Flick, 2009; Remenyi, 2013). The first stage was to reflect on the research topic to focus on a specific area of interest and the unit of investigation, which are individuals in organizations and the collective decision-making process mediated by social media. This followed a personal discourse about the aim of the research and the analysis of what are the research questions to be answered to fulfil the scientific goals and add to the body of knowledge. Therefore, the available

previous research has been reviewed to make sure that the research question satisfies the scientific requirement of original and relevant research. After the first set of research questions was formulated, they have been explained and presented to the supervisor team and peers. With their feedback, the questions have been refined and simplified to gain clarity and focus. These refinement processes also assured that the set of research questions followed the aim of the research project and were feasible and manageable concerning the available timeframe, data collection and analysis.

This research aims to explore the extent to which social media technologies should be integrated into collective decision-making processes to enhance the business decision capabilities of organizations by utilizing collective judgement and knowledge.

In order to understand the impact of social media technologies on collective decision-making the research question has been divided into three sub-questions.

1. What are the real and potential benefits and disadvantages, if any, of social media integration in collective decision-making processes in organizational and less formal contexts such as interest groups?

2. What are the perceived benefits and disadvantages, if any, of utilizing social media in collective decision-making processes in organizational and less formal contexts?

3. How could any identified barriers to integrating and utilizing social media in the collective decision-making process be overcome?

1.3 Research Objectives

The main objective of this thesis is to explore the implications of the integration of social media technologies to enhance collective judgement and decision-making processes within corporate and less formal contexts. Therefore:

1. The focus of this study is to gain a deep understanding of the complex decision-making process that is influenced by social interaction of human communities enhanced by technology (such as social networks, blogs, wikis and voting-systems) within organizational and less formal contexts.

2. This research seeks to identify and investigate about real, potential and perceived benefits and disadvantages of social media integration in collective decision-making processes in organizational and less formal contexts.

3. This research seeks evidence to establish whether or not social media technologies are capable of advancing the collective decision-making process, and if so, to identify ways of integrating and utilizing, knowledge, technology and process, based on the findings and any elements, which may obstruct this.

1.4   Epistemological Position

The first results of an initial literature review showed that the phenomenon of social media and its integration in decision-making in a business context are relatively new topics in academia (Merchant, 2012). This suggested the application of a research methodology using an exploratory approach, suitable to contribute to research and theory (Bryman & Bell, 2011). Furthermore, to increase the body of knowledge about an emerging phenomenon rather than following a theory testing or falsification approach (Bryman & Bell, 2011). According to Creswell (2009) the researcher has to be clear about his or her philosophical worldview and assumptions, because it has a direct impact on the research paradigm and the methods applied for the inquiry. A constructionist typically follows a qualitative research strategy (Bryman & Bell, 2011; Creswell, 2009), which defines the methods of data collection, analysis and interpretation.

This thesis explored organizational behaviour and the decisions made within different real life social settings. In focus were individuals and their experience within a socio-economic environment. Hence, this study applied a constructionist qualitative research strategy based on multiple case studies to create empirical evidence and to gain an in-depth understanding about technology enabled decision-making processes. In other words, the focus of this study was to gain an understanding of how individuals perceive and apply social media and the implications of using social media as a means for collective decision-making.

A focus was set on behavioural change about views, attitudes and social interaction towards collective decision-making in order to utilize social media within an organizational context. Hence, to grasp how human beings utilize information technology to communicate and collaborate, required an understanding about their views, perceptions and experiences, how these might influence their contributions and their preferred choices within the decision-making process. This study also empirically investigated processes and events influenced by social media and integrated them with participants' subjective perceptions to provide case studies in this context. Therefore, this research followed a social constructionist position in line with Berger and Luckmann (1966) views.

1.5   Methodology and Data Sources

1.5.1   Qualitative Research Approach

In order to gain access to the experience of organizations and individuals confronted with social media in business context qualitative methods were applied to explore this relatively new phenomenon. Because the studied topic to some extent touches new scientific grounds where theories are not well established, this study was conducted as explorative research to add to the body of knowledge and to open avenues for future inquiries. In order to provide an insight into the application of social media, organizations from different industries were considered. This was established by choosing cases, which were sufficient for the understanding of the social phenomenon, for an exploratory study. According to Eisenhardt (1989) multiple-case studies carry the potential of theory building since they improve the replication criteria if applicable to the subject of study. This research followed a standardized process, which guided the research through the different phases of the project as recommended in the literature such as the approach to the research topic, selecting cases, using appropriate methods and analysing the data (Eisenhardt, 1989).

Yin (2009) emphasizes the importance of quality assurance considerations when conducting case studies, such as to test the construct, validity and reliability. Therefore, this research employed multiple sources of evidence, including qualitative interviews and documentary information from the different cases that demonstrate contrasting aspects of this socially constructed phenomenon. Hence, this research applied a triangulation technique between interviews and documentary information and followed rigorous documentation and reporting standards to increase the quality of the research output. Documentary information also focussed on documented past attempts of the research sites at implementing collective decision-making processes by using different approaches to understand the real and perceived benefits of using social media in this context. This documentary information was collected case by case to create an evolving history of social media integration in the different organizational scenarios.

1.5.2   Choice of Research Sites

The choice of the research sites was based on a purposive sampling method with the aim to focus on variations (Ritchie, Lewis, Nicholls, & Ormston, 2013). However, the choice of the sites was influenced by the availability and the willingness of the organizations to participate in this research. In other words, an ideal purposive sampling would ask for higher levels of contrasting sites as this research is based on. As described above the organizational structure or model of the company was examined first to make sure the phenomenon could be researched. Organizations need a culture that allows collective decision-

making. Transparency, openness, willingness to share, and less hierarchical structures, to allow information exchange and interaction between the different hierarchical levels and among departments, should be congruent with the objectives, values and visions of the organization. Therefore, in order to analyse the influence of social media on collective decision-making processes, the study investigates within different environments.

Multiple holistic case studies can provide the research with a better understanding about complex matters and allows recognizing patterns between them (Yin, 2009). Therefore, distinctive organizations were the empirical basis to find specific patterns of social media integration and their influences on the decision-making and judgement process. Candidates for this research were organizations in different industries, such as life science, high-tech, retail, communication technology, computer industry, education, transportation or engineering to identify common patterns of social media application. In addition, they should to some extent, utilize social media such as social networks, discussion forums, intranets, wikis, expert groups, voting and blogs. Furthermore, the selected sites should ideally show different levels of maturity, which allows developing a maturity model of capabilities needed to utilize social media and collective decision-making. This model could be used also to understand how technology and processes evolved since the integration of social media in areas such as communication, interaction, collaboration and knowledge exchange.

This research investigated three individual cases representing three different industries, the transportation, and retail and computer industry. All three organizations utilize social media in different areas mainly for internal and external communication, collaboration and information exchange. In addition, the chosen research sites started at different points in time with the integration of social media in business processes, which manifested in different levels of experience, dissemination and acceptance.

1.5.3 Data Collection and Analysis

Following Yin (2009) one of the most important sources of evidence in case studies are interviews, to provide the researcher with an in-depth understanding about how human beings interact in purposively selected cases. The type of interviews applied were semi-structured because they allow comparison between the different cases and still provide more flexibility if additional questions provide significant details during the interviews (Kvale & Brinkmann, 2015). The objective of the data collection and analysis was to examine the potential effects of integrating social media tools in collaborative decision-making from different perspectives. Therefore, the selection of the interviewees followed a purposive sampling method. The selection aimed to

cover various roles to investigate different perspectives in an organization such as different hierarchical levels and departments.

The first part of the interviews provided an insight into decision-making in organizations and their opinion about the involvement of larger groups. Questions focussed on the decision-making process, such as who is involved at what stage of the decision-making process. The interviews also sought to clarify the problems that limit the process and whether decision-making information systems are implemented. Furthermore, the interviews delivered data about the utilization of social information technologies, specifically benefits, disadvantages and barriers preventing further integration.

The analytical process used transcription and coding techniques to interpret the recorded data of the cases and a cross-case analysis to compare and contrast following Yin (2009) and Silverman (2011). The cross-case analysis enabled the identification of common patterns concerning the application of social media integration in the area of collective decision-making. The analysis continued until it reached theoretical saturation. According to Bryman and Bell (2011) theoretical saturation is reached, when the analysis of the data seems to add no additional or relevant information to understand and to develop the concepts for the theory and to answer of the research questions.

1.6   Assumption Statements and Limitations

This research followed the assumption that the integration of social media may influence the corporate decision-making process and provides the following benefits: Employees join expert decisions groups and actively collaborate on problem solutions, thereby increasing different views about a problem, which makes final decisions more robust. Furthermore, by utilizing internal social networks, blogs, wikis and voting systems, a larger number of employees could play a greater role in corporate decision-making processes. Therefore, employees maybe more likely to grasp and hence support corporate decisions. An important aspect is therefore to understand the expectations and the perceived utility of the individuals about collective decision-making.

The social media integration framework presented in this study is limited to the results of this research. The study provides a recommendation to advance managerial practice, but the testing of the concept will not be part of this investigation. Since the results are based on a limited number of cases, their applicability to different corporate settings is also limited. Other aspects such as how the culture of an organization changes when applying collective decision-making is part of a theoretical discussion in this study, but not empirically explored. This would open up avenues for future research, because the integration of new technologies and the approach of collective decision-making could require a process of organizational learning and cultural change. Concerning decision-making theory, the thesis follows the

descriptive and behavioural approach and not that of normative and prescriptive theories. The thesis focusses on the social behaviour during the decision-making process within a socio-economic environment with formal and less formal groups. It is clearly distinguished from prescriptive and normative rational choice theories about expected values and expected utility using probability theory and different models about regression.

1.7 Significance of the Research

From a theoretical perspective this thesis aimed to advance the body of knowledge in social theory about the utilization of social media systems within an organizational context focussing on information technology mediated collective judgement and decision-making. This study adds to the discussion about collective intelligence, emergence and participative decision-making. Finally, this research explored to what extent technology could act as an aid and an enabler, and to what extent an organization has to adapt its behaviour towards culture, values, knowledge sharing, collaboration and communication to allow effective integration of social media and collective decision-making.

1.8 Structure of the Thesis

Chapter 1 introduces the research context and the subject of investigation, and outlines the theories involved such as collective decision-making, organizational behaviour and social informatics. It explains why these theories are relevant for this thesis and how they build an integral part of the study about social media and collective decision-making. After the research context follows the motivation of this study, the definition of the research questions and the derived objectives. In addition, this chapter provides a brief overview about the methodology this study followed. Finally, the assumption statement, the limitations and the significance of the study finish the introduction chapter with the structure of the thesis.

Chapter 2 reviews in detail existing literature and research relating to the subject of investigation, which is mainly in the area of social perspectives about collective decision-making theory. This follows a discussion about organizational behaviour and decision-making, information systems research, social informatics and social media theory. The discussion and critical reflection on the revisited theories and the findings of available research and concepts identifies limitations, methodological weaknesses and knowledge gaps. This discussion provides the methodological foundation for the empirical inquiry.

Chapter 3 outlines the methodology and the methods applied, starting with the research paradigm, ontology and epistemology and emphasising the philosophical position of the researcher. The main differences between quantitative and qualitative research approach are discussed in the research

strategy and the qualitative approaches justified in the context of the constructionist worldview applied within the case studies. The following research design describes the choice of the research sites, data collection and analysis methods. Interviews, the development of the interview guide and quality assurance of the research project finish this chapter with ethical considerations about conducting the research in the field and following required standards of the institution.

Chapter 4 reports the findings of the empirical part of this inquiry describing the investigated cases and the results of the interviews performed within the examined organizations. The reporting follows a consistent structure based on the main topics of the interview guideline and the identified themes from the transcribed recorded data. Each theme addresses one or more areas of investigation, which are organizational behaviour (context or social setting), collective decision-making (process or social process) and social informatics (computing and the influence of information technology on human beings). This chapter provides the basis for the cross-case analysis for contrasting, interpretation and comparison of the findings following in chapter 5.

Chapter 5 analyses the reported results of the empirical research following a cross-case analysis approach. The analysis compares, contrasts, reflects and synthesises the results of all three case studies to uncover patterns, similarities, and differences following Stake (2005) and Yin (2009). After the analysis of organizational behaviour aspects follows a discussion about the real and potential benefits and disadvantages of social media integration in collective decision-making processes. For each step of the decision-making process, possibilities of application and integration for each social media type are identified. These findings lead into the conclusions chapter 6 including the identification of factors that influence the integration as well as theoretical contributions and managerial recommendations.

Chapter 6 presents the key findings of this thesis and describes the contributions to theory and practice. In addition, it discusses limitations of the research and provides suggestions for future research. This chapter embeds the findings into the broader research context of employee involvement in the collective decision-making and enabling technology as part of the decision-making process.

2. Literature Review

2.1 Introduction

The purpose of this literature review is to build the theoretical framework for this inquiry based on available findings, studies, concepts, theories, scientific discussions and published research. This follows the scientific method of the analysis and deliberation on existing and relevant scientific work that allows the researcher to grasp the subject of investigation by critically discussing what has been researched and what methodological and knowledge gaps or contradictions exist (Jesson, Matheson, & Lacey, 2011). The study of existing literature increases the level of expertise on the subject and provides new perspectives and interpretations of what is known and what findings could be combined and applied as basis for a body of knowledge expanding research project (Bryman & Bell, 2011; Creswell, 2009; Jesson et al., 2011). The applied review method for this research follows a narrative approach, since the primary goal is to gain an overview about relevant concepts, an understanding of the research topic and to justify the research questions (Bryman & Bell, 2011).

The following sections revisit and discuss three specific fields of social science relevant to this thesis: collective decision-making, organizational behaviour and social informatics following a theoretical discussion about existing literature concerning aspects of social media. These three research areas build the theoretical framework of this study based on the social process, the context and the aspect of computing. Figure 2-1 illustrates the combination of these theories and their intersection as the theoretical foundation of the research question. This is in line with the main objective of this study to analyse, interpret and conclude how computerization influences organizational behaviour in the realm of collective decision-making processes.

Social informatics is a research domain that investigates the relationship between human beings, their behaviour and the influence of computer systems (Kling, 2000b). Collective decision-making researches the complex process of collective choice, and the social and psychological factors of influence (Eden & Ackermann, 2010; Peterson, 2009; Silver, 2013). Organizational behaviour studies cultural, structural and social aspects such as management, hierarchies, diversity, values, motivation and interaction between individuals and groups within an organizational context (Robbins & Judge, 2014).

This leads to a theoretical discussion about the reciprocal interrelationship of social media and collective decision-making in an organizational context, focussing on formal and less formal groups. Concerning the relevance of the literature, which contains well-established and contemporary theories,

concepts and empirical studies, the institution the research origins, the citation frequency, the background of the individuals that cited the peer-reviewed articles and the publishing institution, were considered as quality indicators of this review (Jesson et al., 2011).

Figure 2-1: Theoretical Framework of Decision-Making and Social Media
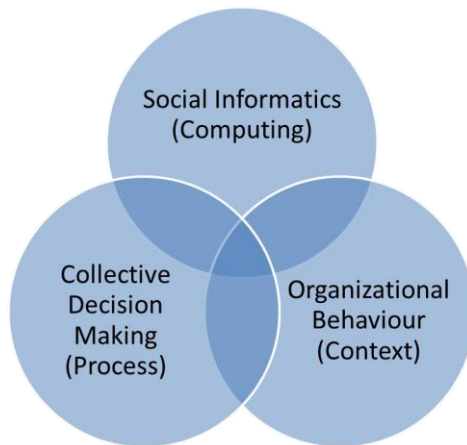
The first of the three major scientific fields this review discusses are different social perspectives of collective decision-making theories. The concepts of behavioural decision-making theory serve as a theoretical entry point to grasp social, psychological, emotional and cognitive factors that influence the decision-making process. This builds the bridge to a social perspective of collective decision-making processes influenced by individual and the group behaviour. The aim of this review about collective decision-making is to relate these findings and theories to social media to deduce whether and how, in theory social media could influence the decision-making process. For instance, by mitigating negative effects, mediating the process, supporting or enhancing specific areas of behavioural aspects and considering psychological, emotional and cognitive factors. This follows a discussion about the distinctions between individual and collective decision-making processes to build the foundation to comprehend decision-making in an organizational context

The second scientific field is about organizational behaviour and its relevance on decision-making. The theory about organizational intelligence provides a specific view of how organizations build a socio-economic system, capable of making collective decisions based on their intellectual capital such as shared knowledge and experience. This provides a holistic view of the key concepts organizational behaviour and organizational decision-making, combined to the umbrella term organizational intelligence. In addition, behavioural decision-making theories within organizational contexts were reviewed. Organizational characteristics such as centralized and decentralized structures, hierarchical and less hierarchical management approaches, self-organization,

communication capabilities and power distribution were examined to draw a connection between these characteristics and collective decision-making behaviour observed in organizational settings.

The third scientific field are concepts of social informatics, which emphasizes the reciprocal impact of information technology on individuals, groups, organizations and society and social computing, a derivative of social informatics, which focuses on the characteristic and design of information systems incorporating both, social and technological aspects. In this theoretical review, the influence of technology on human beings and vice versa built an integral part of understanding about human interaction and computer technology. Of specific interest was how socio-technological systems, such as the combination of information technology and human beings in organizations are defined. Socio-technological systems were analysed to understand how they influence interaction, communication and collaboration of individuals and groups within the social and technical framework of an organization. Decision-making is mainly based on knowledge, experience and available information. In other words, the availability of information and knowledge and its capture and preservation are important requirements of a decision-making system. In this context, social media could be a means of information management that aggregates the knowledge of individuals in collaborative projects such as wikis or open source[5] software.

The integration of information, knowledge and process leads to an examination of information technology based decision-making support systems. This review provided a topology of different categories, such as data- and information based, rule and case based, and group and collective decision-making support systems. The aim of this topology was to reflect how these systems aid the decision-makers and influence their behaviour to discuss the limitations of these systems and their relation to social media as a decision-making support system.

From the entry point of general theories of social informatics about information technology systems and their impact on social behaviour, the focus was set on social media. This part of the literature review defined social media and discussed findings about its application in detail. Topics such as collective intelligence, mass-collaboration and swarm-theory built the theoretical foundation to understand the phenomenon of social media and the relation to decision-making.

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[5] Open Source is a form of collaborative software development such as the Linux operating system by a global community of developers using the Internet to communicate and exchange code, mainly contributed without monetary incentives following Tapscott and Williams (2008).

This leads to the main research topic, the integration of social media and decision-making also called Decision-Making 2.0 following Tapscott and Tapscott (2010). The impact of social media in different areas, such as knowledge management, communication, deliberation and collaboration as the basis of collective decision-making processes within organizations combines the theories above into the theoretical framework of this thesis. Behavioural collective decision-making, the social impact of technology in organizations and existing concepts of the integration of social media in an organizational context concluded the literature review.

2.2 Collective Decision-Making: Behavioural Concepts and Theories

The social and behavioural dimension of a collective decision-making process is one of three foundations of the theoretical framework this study follows. The aim is to discuss the findings of studies and theories available in literature to bring them into the context of the subject of study in this thesis. If social media has an influence on decision-making, then behavioural theory could be a key to link these topics together, because both are defined in this thesis as social processes. Following the approach to apply existing theories to related topics and create new theories from there, behavioural decision theory could explain why social media could act as a means to support the decision process.

The main objective of behavioural decision-making theory is to examine and to explain the behaviour of individuals and groups of individuals in a decision-making process (Beach & Connolly, 2005). In contrast to normative decision theory, that creates the norms and guidelines aiming a rational decision process, this review investigate in behavioural aspects. For instance, about cognitive and rational limits of human beings and how they cope with it. This leads to the problem of irrationality of decision makers (Einhorn & Hogarth, 1981). Behavioural decision theory explains why in certain circumstances individuals act in the decision process irrational compared to the norm stated by normative decision theory.

An important topic of differentiation discussed in this section is the difference of an individual and a collective decision process. Obviously most decisions are not made in isolation, which means decision makers are normally influenced by their environment, biography, experience, their peers, consultants, co-workers or other influencers (Beach & Connolly, 2005). The main difference of individual and collective decision-making is the aggregation of ideas, opinions and beliefs of a group of individuals, the collective, instead of a single individual (Hansson, 2005). Both decision-making processes are analysed concerning social parameters to identify areas where social media could influence the decision process. However, in order to define the influence of social media it is important to investigate in the factors that influence

individuals and groups during the process of decision-making concerning social, cognitive, psychological and emotional dimensions. This means, areas could be identified to utilize social technologies to cope with cognitive limits of a single individual, enhancing social aspects of collaboration and joint action or implementing supporting methods and processes mediated by computer technology.

2.2.1 Social Dimensions of the Decision-Making Process

Behavioural decision-making theory provides the evidence and the concepts about factors that influence human beings from a social perspective in the decision-making process (Slovic, Fischhoff, & Lichtenstein, 1977). In other words, this research field aims to empirically explore and explain human behaviour in conjunction with decision-making (Beach & Connolly, 2005). One of the major subjects of this field is to understand how individuals conform to the normative standards of rational choice theory such as axioms about expected utility or probability theory (Einhorn & Hogarth, 1981; Jungermann, 2000; Kahneman, 1991). In order to understand, from a normative decision-making perspective, irrational behaviour, which is when a decision-maker violates the norm, research investigates these phenomena from a psychological, social, emotional and cognitive angle. The outcome of this research is a comprehensive catalogue of various factors that influence the decision maker and the decision process. With the awareness of how these factors influence the decision process, measures of mitigation and improvement could be derived as a basis of further research about supporting social technologies, which is in line with the research topic of this thesis.

According to March and Heath (1994) decision makers are confronted with the complexity of information processing concerning meaning, interpretation and comprehension. In order to cope with this complexity decision-makers use stereotypes or abstract parts of the problem. In addition, they simplify and use their own socially developed theories and scripts to interpret and construct the meaning of information (March & Heath, 1994). Thus, following a constructionist position in conjunction with decision-making, social and psychological aspects determine how decision makers construct meaning about the reality and therefore influence their choice. Concerning social and psychological aspects Einhorn and Hogarth (1981) found different influencing factors such as memory, representation, learning effects and feedback to understand the complex process of choice from a psychological and cognitive point of view. According to Einhorn and Hogarth (1981) decision-making is comparable to a learning process that takes place during the reflection about the decision problem, the search for solutions and the consequences of a choice. Learning from past decisions could help in some cases to solve similar decision problems. However, the adoption of the learned on current decision situation could be misleading. Due to imperfect information and the

interpretation of the current situation, the same solution could be inadequate. Therefore, learning from experience could generate different areas of bias in the decision process depending on feedback and outcome of actions. Einhorn and Hogarth (1981) explained this factor as the cognitive representation problem, which is the psychological process of perception, imagination or even illusions of the decision-maker about a decision problem. This means that the choice of a decision maker is influenced by the mental construction of the decision maker (Einhorn & Hogarth, 1981). Even if a solution for a decision problem is applicable to a similar problem, the decision maker could reject the application because the mental construction of the problem could change over time. Hence, this suggests that individuals should not rely only on their own experience, but compare them with the opinions of others. Collective decision-making could to some extent, mitigate this risk of bias since individuals with different backgrounds, experience and knowledge are involved. This could stimulate a critical analysis of the presented solutions and alternatives by the collective whether they are adequate, and lowering the risk to rely on past decisions only.

Another factor found by Einhorn and Hogarth (1981) is conflict. They described this factor as conflicting alternatives, which offer advantages and disadvantages from different perspectives. Hence, judgement about advantages and disadvantages becomes a difficult task for a decision maker, because not all information is available. If the conflict rises to a certain stage, avoidance of the decision or ending with a compromise instead of the optimal choice could be the result. Following methods of decision-making to classify, rate and select alternatives based on different dimensions could introduce additional differentiation factors to avoid such situations. However, for a single decision-maker the task to choose the optimum could become cumbersome because of imperfect information, cognitive limitations, norms, social factors and personal experience. A collective could reflect on different alternatives, grasp their advantages and disadvantages and identify the optimum for the group. This means limitations of a single individual could be mitigated.

Memory, which is the capability to recall information from experience, is another limiting factor for the decision-makers (Einhorn & Hogarth, 1981). This is what differentiates an experienced decision maker from a less experienced. The more decision situations a decision maker can recall the more alternatives he or she could apply to current decision problems. In other words, if similar decision problems occur frequently the decision maker can react based on experience. For rather unique decision problems, decision makers cannot recall from experience and therefore the application from memory is limited. Another factor that influences decision-making from a psychological perspective is the use of framing in order to focus on the problem and to allow simplifying its analysis (March & Heath, 1994). Tversky and Kahneman (1981)

investigated in this area to understand the impact of framing on preferences, perspectives and perceptions. Framing is the mental construction of events or objects influenced by experience, information and their relation to interests of the decision-maker (Beach & Connolly, 2005). For instance, the business decision to expand to a certain region could be influenced by framing it positive as cost reduction and margin increase or negative as additional cost and uncertain cultural effects. Another aspect Tversky and Kahneman (1974) describe is loss aversion concerning decision-making. This factor explains the asymmetry in the valuations of gains and losses. Studies have shown that decision-makers weigh losses higher than gains during the decision-making process. In other words, decision-makers react on possible losses stronger than on gains (Tversky & Kahneman, 1974).

Besides psychological and cognitive factors Nutt (1989) explains how social effects and emotions such as interpersonal conflict, ambiguity and uncertainty influence the decision maker. According to Nutt (1989) conflicts stem from disagreements among the stakeholders, which already exist prior to the beginning of the decision-making process. These disagreements are about the addressed decision problem itself, importance of the decision, available alternatives, outcomes and risks. Ambiguity arises if key factors of the decision are unknown or cannot be characterized, which increases the uncertainty and hinders the decision making concerning predictions of future outcomes (Nutt, 1989). Stress caused by time constraints or anxiety about failure disrupts the systematic analysis of the decision problem and the evaluation of appropriate solutions. These perceived threads increasing the level of arousal that can lead to irrational decisions (Nutt, 1989). Risk aversion is another factor that influences the decision-maker and is related to the perception of choosing the wrong alternative and the consequences (Robbins & Judge, 2014). In other words, decision makers judge the risk of a choice against gains or losses related to a probability of an outcome and hence prefer smaller risks (March & Zur Shapira, 1987).

Selective perception or confirmation bias can be observed if the decision maker searches for information supporting a choice that is known from past and information that does not conform with the past experience will be cancelled out or neglected (Robbins & Judge, 2014). Nutt (1989) adds other bias in decision-making that originate from sources such as addressing the wrong problem, overusing of intuition, failing to deal with values, making subjective estimates or being distracted by conspicuous options. The wrong problem means that the decision maker does not understand the nature or the source of the problem. Intuition is overused if the decision maker depends mostly on intuition even if it is not accurate for the decision problem. Decision makers are dependent on value systems that influence a choice (Nutt, 1989). For instance, a choice with ethical concerns is strongly dependent on values

of the decision maker and the cultural environment. Subjective estimates could lead to decisions that do not consider the bias of interpretation and distraction by conspicuous options. They put the focus on solutions that seem to be obvious but would need to be compared to others to judge independently. Furthermore Nutt (1989) mentioned errors in sizing up a situation, faulty reasoning and unconscious preference.

The above findings explain a fragment of influencing factors on decision-making and demonstrate the complexity of a decision-making process concerning psychological and social aspects. Most of these factors of influence point to the psychological aspects of behavioural decision-making and show how emotions, personality, the social environment, social norms of the decision maker create an impact on the choice as well as cognitive limits (Bermúdez, 2009). Decisions are influenced by the individual's perception and the interpretation based on sensory impressions. It relates to how individuals interpret meaning of their environment, which could significantly differ when compared to meanings interpreted by others (Robbins & Judge, 2014).

Research has provided evidence about the existence of these factors and the awareness about them (Nutt, 1989). Some decision-makers neglect these factors by relying entirely on their intuition. This becomes a common practice especially if uncertainty about an outcome challenges the decision maker (Nutt, 1989). However, as science has shown trusting entirely intuition could be a quite risky approach, because of the above explained influencing factors influence intuition as well (Nutt, 1989). Therefore, individuals use other approaches that guide or help them to mitigate negative effects on decisions. For instance, decision makers simplify the problem by dividing a complex problem into smaller, less complex tasks (Beach & Connolly, 2005). This method is not always applicable since not all complex problems can be decomposed into less complex parts. Hence, another approach is the utilization of guidelines or rules that allow simplifying a decision problem (Beach & Connolly, 2005).

Decision-makers use commonly known rules of thumb or more specifically heuristics, which they apply to a recognized, familiar problem pattern. Tversky and Kahneman (1974) stated that heuristics are more likely applied when individuals have to make decisions and judgments under uncertainty. They distinguish three types of heuristics that individuals employ for decision-making such as representativeness, availability and adjustment based on an anchor. According to Tversky and Kahneman (1974), even if these heuristics potentially support the decision-maker performing complex decisions they are subject to systematic errors. The representativeness effect occurs when individuals judge the probability of a stereotype object or event higher than the effective number of events occurring in a sample or a population. For instance, if the characterization of an individual uses common attributes that are similar

to a stereotype of a profession, the probability that they belong to this profession will be judged higher. However, there is no statistical evidence that this is true. Thus, if judgement about probability is based on stereotypes this could lead to systematic errors according to Tversky and Kahneman (1974). Availability means that the decision maker remembers immediate events or scenarios and judges the probability of those events much higher even if the probability is much lower (Tversky & Kahneman, 1974). For instance, if individuals witness an accident or the illness of a close person they judge the probability of the event much higher to happen again compared to an event that occurred a long time ago. Moreover, the judgement of probability could be prone to error since the probability is dependent on other factors than the immediate experience of an individual. Adjustment from an anchor explains the effect of fixating on initial information such as the starting price for an object. Individuals rely on this first price and do not further evaluate information properly if the price is really justified (Robbins & Judge, 2014). Understanding these problems about heuristics could lead to awareness and caution by the decision maker and shows areas of improvement of decisions and judgement (Tversky & Kahneman, 1974).

Even if findings about the application of heuristics are able to explain partly how and why individuals decide in a certain way from a cognitive perspective, other features of decision-making in the real-world situations are not reflected (Kahneman, 1991). For instance, emotions, motivations and wishful beliefs increasingly influence the choice, the higher the significance of a decision such as fear, regret, embarrassment or procrastination. For instance, unreasonable optimism and excitement about the future outcome and the consequences of actions are another effect that causes errors in decision-making. Therefore, Kahneman (1991) claims that social and emotional factors should not be segregated from cognitive and psychological factors to understand the behaviour of the decision maker. Hence, the study of behavioural decision-making should be a holistic approach that considers different factors to allow a broader understanding, reflect the issues and to develop measures and methods to enhance the decision process.

The literature review of the social dimensions of decision-making discussed different aspects of behaviour to provide an understanding about what kind of factors influence decision makers concerning social, psychological, cognitive and emotional perspectives. This section discussed selected factors of various others known today in the field of behavioural decision-making. The main objective of this section is to add to the awareness of the complexity of the decision-making process and an understanding about the topics of behavioural decision-making theory. The interesting part for this thesis is to categorize the described factors into social, psychological, cognitive and emotional effects and reflect about how to mitigate their negative influence on

decision-making. The gained knowledge of these factors contributes to the discussion about socio-technological decision-making systems to identify areas they could influence or mitigate. However, the findings in the literature review concerning the complexity of social effects and emotions such as interpersonal conflict, ambiguity, uncertainty, perception, emotions and motivations remain most likely in a computer mediated decision-making process. Therefore, the focus should be set on factors that could be influenced. For instance, computer systems could mitigate cognitive limitations of the decision-maker and provide structure, consistent systematics and control of the process.

Furthermore, this review provided an entry point into behavioural decision-making that relates to the behaviour of a decision-making collective, which will be the main topic of the next section. This means that behaviour of groups could be interpreted as a combination or aggregation of individual behaviour influenced by the factors above. Within groups, these factors have to be analysed differently because they could be amplified, mitigated or transformed, which manifests in the phenomena of group effects[6]. The following section reviews literature about the difference of individual and collective decision-making processes to understand the advantages and the disadvantages of collective decision-making and areas of possible enhancements.

2.2.2 Individual versus Collective Decision-Making Process

The objective of this thesis is to seek evidence whether social media technologies are capable of advancing the collective decision-making process in organizational and less formal groups. In order to identify real and potential benefits and disadvantages of social media integration in collective decision-making processes the understanding of the collective process and group effects are essential to identify areas that technology could influence. The term collective in the context of decision-making refers to a set of heterogeneous individuals with different backgrounds, knowledge, beliefs, preferences and opinions but with a common interest (Peterson, 2009). For instance, in a ballot about a political initiative, the common interest is its subject and the aim of the voters is to influence the final decision by voting for the preferred option. Thus, collective decision-making involves a group of individuals, which aggregates their opinions to derive a collective choice (Rodriguez et al., 2007). The motivation of collective decision-making is to engage groups in a joint problem solving process with the objective to produce solid and broader accepted

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[6] Group effects describe the social behaviour of individuals in groups to understand for instance the influence on decision-making. In this context groupthink is a group effect leading to cohesiveness, overestimations or pressure towards uniformity, which could influence the choice of a group following Janis (1982).

outcomes (Silver, 2013). This is because groups demonstrate capabilities to outperform single decision-makers, utilizing the groups' experience, opinions and expertise aggregated in a common result (Surowiecki, 2005). Hence, group decisions are based on aggregated opinions, perceptions and preferences concerning the characteristic and attributes of alternatives (Nutt, 1989). In order to capture and evaluate the different opinions, decision-making support systems emerged. They employ aggregation mechanisms to generate and elicit a collective decision (Watkins & Rodriguez, 2008). Therefore, the collective decision-making combined with decision-making support systems may be considered as socio-technological process.

Groups in organizational theory are segregated in formal groups, defined by organizational structure, designated for a specific purpose, and less formal groups primarily sharing common interests (Robbins & Judge, 2014). According to Nutt (1989) four key activities or functions characterize formal groups in organizations, such as exchanging information, influencing, discovering, evaluating and judging. They fulfil social and psychological needs such as participation, integration and increase the acceptance of the collective course of action (Nutt, 1989). Following Schermerhorn, Osborn, and Hunt (2000) groups are capable of accomplishing complex tasks with a higher rate as the sum of capabilities of each individual, because of synergy effects that multiply efficiency. In addition, groups are capable of building intragroup relations and stimulate trust towards the organization (Nutt, 1989). Due to these potential advantages, group deliberation, discussions, forums and meetings reflect common business practise in organizations to accomplish complex tasks (Schermerhorn et al., 2000). For instance, meetings are a substantial part of daily business in organizations, which illustrates the perceived importance of group activities. Decision-making in groups is therefore a common approach in organizational practice with specific aspects concerning the process and factors of influence. Groups in conjunction with decision-making share a common objective to solve a business decision problem, with different grades of influencing the final outcome dependent on expertise, experience and hierarchies (Schermerhorn et al., 2000).

Despite of perceived positive aspects, groups are prone to negative effects such as groupthink, which diminishes the efficiency of the group and the quality of the outcome (Nutt, 1989; Silver, 2013). Hence, a comprehensive understanding of how groups function requires considering negative and positive effects. For this thesis, effects that apply to larger groups connected by computer networks utilizing supporting technologies are of interest. Therefore, the theoretical discussion reviews literature that discusses relevant characteristics of decision-making within groups. The focus is set on group processes, negative and positive effects and features such as interaction,

information exchange, communication, deliberation, multiple perspectives, diversity and conflicts among the group members and the environment.

In an idealistic situation all members of a group exhibit consistent identities and preferences, which allows to treat the group equivalent to individuals (Nutt, 1989). This assumption decreases the complexity of group decision-making and avoids conflict, because all participants share the same preferences. As a consequence according to Nutt (1989) the problem about group decision-making reduces to coordination and communication. However, this is rarely observed in practice. In other words, the advantage of this theoretical point of view is the ability to isolate areas of influence (Nutt, 1989). Normally, collective decision-making involves a group of individuals in a complex decision-making process that combines multiple preferences, opinions, knowledge, and experience into an aggregated, collective choice (Hansson, 2005; Peterson, 2009).

The collective decision-making process follows similar steps as the individual decision-making process starting with (1) problem identification, followed by (2) problem analysis, (3) solution generation, (4) solution evaluation and (5) solution selection (Hansson, 2005; Kleindorfer, Kunreuther, & Schoemaker, P. J. H., 1993; Peterson, 2009). The first step of the collective decision-making process, the problem identification, requires from the group clarity about the problem, a common understanding and recognizing the problem to be solved. The outcome could be, remain at the status quo or the problem is real and needs to be addressed. After the problem is commonly understood and accepted the group enters the problem analysis. This second step involves the group in an information gathering exercise about the problem to analyse its cause, impact, consequences, dependencies and the objectives of the solution. The analysis of the problem leads to step three, the solution generation. The group utilizes the results of the problem analysis and derives alternative solutions. In the evaluation step the group attaches to each alternative a set of criteria such as expected costs, benefits, utility, risks, feasibility and constraints. The assessment and evaluation of the criteria leads to the final step, the solution selection. The group chooses the alternative based on the criteria, preferences and acceptance by their majority. The explained process could be straight forward or iterative, conducted in one or several group sessions, involving individuals in each step with different opinions, preferences, beliefs, expertise and experience.

In addition, groups cope with the same problem of risk and uncertainty concerning the course of action and the outcome as an individual decision-maker. The focus of methodical group decision-making research is besides the understanding of the process to take advantage of the group as decision-making entity (Silver, 2013). Therefore, literature describes different techniques and methods to facilitate and to perform a collective decision-

making process to cope with diversity in the group, to structure the process, increase efficiency and to mitigate negative impact of group effects (Robbins & Judge, 2014).

The purpose of the following discussion about these methods is to grasp how they handle group effects and their applicability to computer mediated collective decision-making. Prominent methods described in literature are the nominal group technique, brainstorming, the Delphi method, electronic meetings, voting and combinations of these methods. The following methods are mainly based on Robbins and Judge (2014), Schermerhorn et al. (2000) and Hirokawa and Poole (1996). Brainstorming and the nominal group technique are similar methods generating collectively ideas and solving problems. They differ mainly in the process of generating ideas. The brainstorming method invites a group to provide ideas about a topic or solutions of a problem during a session. The moderator writes down every idea, visible to the group. During the brainstorming session, the moderator and the group do not comment or judge on the input to make sure that the stream of ideas is not disturbed. At the end of the session, the group organizes, discusses and evaluates the ideas. In the nominal group technique, each group member generates ideas anonymously, writing them on a piece of paper or cards. At the end of the session, the moderator collects the ideas and presents them to the group for discussion and evaluation as in the brainstorming session. A similar technique is the electronic meeting that supports the decision-making process using information technology to provide and discuss anonymously ideas and opinions. The participants use a computer attached to a screen, which is visible to the group to convey their opinions during session. For all three methods, voting and rating methods are applicable to aggregate the most preferred alternative of the group. Another technique is the Delphi method in which a facilitator asks a panel of experts about their opinion and judgement concerning a specific topic, mostly about future events. After evaluating the question, the experts return their opinions and arguments to the facilitator. The facilitator consolidates the results, creates a statistical summary of the estimates and sends them back to the panel of experts to revise their opinion. This process is repeated and refined several times until, in the final step, the facilitator presents the results. These group decision-making methods are the basis of other methods following similar principles of idea generation by a collective. For instance, different options are presented to the group at the beginning of the decision-making process. The group deliberates about these options and chooses the most preferred by comparing different attributes relevant to the problem solution. For instance, a team applies for a project budget by presenting and arguing the calculations about the return on investment, advantages, benefits and timelines to a management team. According to the information and the arguments presented, they decide about the budget. Either the management team

deliberates about the project and utilizes group decision-making methods to make the final decision or the authority in the team makes it.

Group decision-making methods structure and guide the process of problem identification and analysis, solution generation, evaluation and selection to improve efficiency (Silver, 2013). In addition, methods such as brainstorming, nominal group technique and electronic meetings aim to reduce the influence of negative group effects, limiting the variety of ideas generated and opinions contributed (Hirokawa & Poole, 1996). Concerning the mitigation of group effects, methods that allow to contribute ideas and opinions anonymously seem to be less prone to these effects than methods that allow deliberation at the beginning of the process (Hirokawa & Poole, 1996). For instance, in interacting groups participants tend to start arguing and defending their opinions and others keep silent. Cohesiveness could be the reason other participants not mentioning their opinion, because they might conflict with the group (Janis, 1982). This reflects the different personalities such as extroverted or introverted characters, experience, preferences and power distributions in the group. According to Silver (2013), if unevenly distributed, the influence of power influences the outcome in group decision-making situations (Silver, 2013). This means, the advantage of groups to generate a variety of different opinions could decrease due to early deliberation and dominant characters (Hirokawa & Poole, 1996). Even if these methods, during the idea generating stages of the decision-making process, mitigate negative group effects, they could appear in later stages, if the process allows interaction among the participants instead of rating and voting. For instance, during the evaluation of the collected ideas participants start to argue about the ideas presented and influence each other. Hence, these methods and techniques cannot cancel out negative group effects completely if considering the entire decision-making process. In order to extend or advance these methods or combine them with other methods it is essential to reflect the negative effects that occur during a collective decision-making process more in detail.

Empirical research discovered different effects occurring in collective decision-making, which may influence the outcome depending on the participating individuals. The influence may start with the composition of the group concerning expertise. If relevant knowledge is missing in the group this could degrade the final choice or lead to average choices (Schank, Lyras, & Soloway, 2010). Connected with negative group effects, prominently mentioned in literature, are factors that belong to the psychological phenomenon of groupthink coined by Janis (1982). Groupthink occurs in groups within a high level of cohesion, which means consensus is more important than critically discuss and analyse a problem (Janis, 1982). This means that other opinions are not accepted and the group starts to become

too optimistic about their judgment, which could lead to extreme positions (Janis, 1982). Other effects are social pressures, conformity, polarization, leadership effects, hidden profiles and amplifying errors (Sunstein, 2008). Social pressure and conformity means that group members are more likely to follow the opinion of the group than the opposite, to be accepted and to avoid isolation (Schermerhorn et al., 2000). In addition, groups are prone to polarization, which means a group tends to extreme positions if amplified by deliberating about equal positions in the group (Sunstein, 2008). The leadership effect occurs if a person in the group holds more power compared to other members (Larson, Foster-Fishman, & Franz, 1998). Consequently, participants are more likely to follow the opinion of the leader instead of arguing against or defending other options (Larson et al., 1998). Hidden profiles means that not all group members share all information, because of either conformity, competition among the participants or the leadership effect, which degrade the efficacy of the group concerning diversity (Sunstein, 2008). Another effect is social loafing, which means that the performance of participants decreases because their contributions is less noticed and let other carry the workload (Schermerhorn et al., 2000). All these effects show that group members consciously or unconsciously influencing each other during the decision-making process. The nature of the effects does not necessarily to be negative in general, but they obviously prevent the group to get full advantage of their potential and efficiency. For instance, process structure, methods, guidance and team composition could be counter measures of mitigation.

Despite the negative effects that occur within group decision processes, it is a common approach of decision-making in organizations. Groups such as a board of directors, management groups, project and expert teams, departmental and interdepartmental teams, and committees perform all kinds of collective business decisions (Silver, 2013). The reason for this is that group and collective decision-making offers various advantages over an individual decision-making. Groups are under certain conditions capable to outperform individuals (Nutt, 1989; Page, 2008; Silver, 2013; Sunstein, 2008). For instance the group decision process allows supporting individuals to enter a learning process during the interaction and exchange of information and knowledge (Nitzan & Paroush, 1985). In other words, the discourse about options and solutions allows participants to extend their knowledge and learn from the experience of other participants. In addition, diversity in the group such as different perspectives, and interpretations could advance the problem solving capabilities and allow more accurate predictions (Page, 2008). In other words, deliberating groups evolving in the decision process (Nutt, 1989). Several measures can lead to improvement of group decision performance. Following Nutt (1989) groups should be homogenous with moderate status and members should not try to influence other judgement. He claims that the

group size defines if a group is suitable for a specific task or not. This means, small groups are suitable to solve complex problems and larger groups are good for information generation and for solution development.

Within organizational contexts, decisions are often delegated to groups to distribute the responsibility with different grades of participation concerning the final choice (Nutt, 1989). For instance, a manager asks a group of experts such as engineers or designers for their opinion of a new feature of a future product. If this manager listens to the advice of the experts and makes the decision, he or she takes the responsibility, but the decision process started collectively. A similar common practice in organizations is called dialectical inquiry (Schweiger, Sandberg, & Ragan, 1986). Different groups are requested to develop divergent ideas about a topic and afterwards defend them in front of the other group and the management. At the end of the process, the management chooses the most promising solution (Schweiger et al., 1986). The decision follows a collective process, which facilitates deliberation about the problem and different alternatives, but the management communicates at least the final choice. In this context, Nutt (1989) distinguishes different types of participation such as comprehensive participation, where the group has the authority to decide, and complete participation where the group has a representative role acting as advisors and provides recommendations to a proposed alternative. The complete participation has a disadvantage over the comprehensive participation since the group's authority is restricted according to Nutt (1989). Another type is delegated participation, which refers to decisions that are delegated by key stakeholders, which is less effective since the group has to pursue the interest of the stakeholders who are not part of the decision process and this decreases the acceptance of the decision (Nutt, 1989).

Group decision-making is a common approach in organizational context since it offers important advantages over an individual choice. Advantages are diversity, collectively generating and evaluating ideas, distribution of responsibility, exchanging knowledge and experience, a higher acceptance of the choice and learning. If the decision process is not structured and the required skills are missing, groups could perform worse than a single decision maker could. Different methods and counter measures help to mitigate negative group effects by avoiding interaction during the idea generation process, using advisory groups, stimulate opposite opinions, selecting the group members, moderate the process and learning to create a culture of accepted collective decision-making. However, time constraints and availability cause the negative effects to re-appear. Groups and virtual communities connected by computer networks are comparable to methods such as the nominal group technique, electronic meetings or the Delphi method. For instance, ideas could be posted for discussions in a forum or a

community could be asked about their opinion or advice. This could be interpreted how social media influences the decision-making process and in addition the role and possible advantages inferred from existing methods. Groups and teams are parts of organizations and therefore aspects of organizational behaviour such as culture, management, structure, power distribution, problem solving capabilities, learning and communication influence them and as a consequence their decision-making approach.

2.3   Organisational Behaviour: Theory and its Relevance on Decision-Making

Organizational behaviour theory studies individuals and groups in organizations to understand their behaviour and interaction within a socio-economic system (Robbins & Judge, 2014). Decision-making is an embedded process in this system and therefore different social factors of organizations influence the individuals or groups involved. Hence, the topics of organizational behaviour theory, such as management approach, structure, culture, motivation, communication, power and politics play an important role to understand organizational decision-making. This suggests, from a social sciences perspective, aspects of organizational behaviour theory are of relevance to understand decision-making in an organizational context.

Literature discusses different aspects of organizational decision-making theory from a normative, rational and behavioural perspective. The aim of this review is to identify relevant theories about organizational behaviour and decision-making to understand the complex processes of decision-making in conjunction with organizational aspects. One aspect, this review discusses, is organizational intelligence. This topic investigates on how an organization utilizes its intellectual capital, which relates to decision-making and problem solving capabilities (March, 1999). Furthermore, this review visits behavioural perspectives of decision-making theory within a socio-economic context and the relation of organizational models and characteristics. The organizational characteristic discusses hierarchical models and structures, power distribution and communication between the different hierarchical levels. This is of relevance for organizational collaboration, information and knowledge distribution since rigid hierarchical structures could create barriers on collective action (Hofstede, Hofstede, & Minkov, 2010). Hence, organizational characteristics and structures are of relevance for collective decision-making as well. These different factors need to be considered concerning the implementation of social technologies in organizations. This relates to the research question concerning the barriers and perceived benefits if any of social technologies integrated in organizational processes such as collective decision-making. This suggests that some organizational models and cultures

might be more likely to adapt social technologies than other models and cultures.

2.3.1 Organizational Intelligence

Organizational intelligence in context with decision-making aims to understand how organizations utilize their intellectual capital to perform business decisions. This could be of relevance for the implementation of supporting social technologies in the area of communication, knowledge exchange and opinion aggregation. For instance, according to March (1999) organizations have difficulties to balance between two major directions. One direction is to exploit, which means continuous refinement of existing procedures to increase the output of products and services. The other is exploration, which includes discovery, innovation, experimentation and variation. An organization has to invest more or less in both directions to adapt to a changing environment and demand. However, firms have to make strategic decisions how to invest into discovery, innovation, and the selection of new products, services or procedures, or invest in variations, refinement of the routines, and increasing efficiency (March, 1999). Finding the optimal mix is rather difficult due to the changing environment and constraints such as time, budget and focus of attention. Therefore, organizations need specific capabilities, tools and procedures to act in this context intelligently.

March (1999) describes intelligence within this context as collective knowledge and experience of an organization, and the accumulation in rules, procedures and best practices. Therefore, organizational intelligence embraces the capabilities of an organization to implement rational procedures to follow objectives consistently and achieve favourable outcome by utilizing collective knowledge and experience (March, 1999). According to March (1999) favourable outcomes means that a course of action leads to the highest expected value, referred to the alternatives available. Furthermore, organizational intelligence allows organizations to cope with competition and manage scarce resources by collecting and processing information, interpret the environment, accumulate experience, and learn (March, 1999). Hence, these capabilities build a basis of organizational decision-making, because they aggregate knowledge and experience of individuals and groups in the decision-making process.

On the other hand, organizations are socio-economic systems consisting of individuals and groups with different desires, beliefs, preferences, objectives and perspectives (Robbins & Judge, 2014). This is of relevance for the decision-making process and the utilization of organizational intelligence. March (1999) describes three problems organizations face in order to act intelligently. The first problem is about ignorance and uncertainty, which means that the future is more or less unknown. Application of probabilistic

methods could increase the accuracy of outcome estimates about alternatives. However, there are still different future outcomes possible, because of remaining uncertainty. In addition, individuals recall past experience with some grade of inaccuracy, which makes the past uncertain as well. The second problem March (1999) describes, stems from conflicts about different preferences, whereby individuals act in their view intelligently, but in the view of others not. For instance, not every individual follows the same overall entrepreneurial objectives of an organization to maximize profits since personal desires may conflict with these objectives. The third problem concerns, according to March (1999), ambiguity, which means individual preference could change over time. In other words, the same choice in one period could be perceived as less intelligent comparing with a changed set of preferences in another period. Hence, the basis of an action to achieve a certain outcome could become ambiguous since preferences could change over time.

In order to cope with these problems organizations implement rule-based actions and implement consistent procedures to avoid systematic errors (Nutt, 1989). These procedures are based on accumulated knowledge and experience and mature in conjunction with organizational learning (March, 1999). Never-the-less, from an empirical perspective, according to March (1999), for both, rule-based action and organizational learning, intelligent action cannot be claimed by evidence. In other words, it is not evident that learning and the accumulated knowledge in procedures lead to intelligent or favourable outcomes. For instance, an organization that bases learning on inaccurate information or misinterpreted results of past decisions could end up locked in repeating failures. An explanation for this behaviour is cognitive limitations of individuals, adaptive action and changing properties of the environment (March, 1999). A possible approach to learn about organization's intelligence is to observe how procedures and rules are established and applied. In organizational context actions occur often under time pressure, and therefore are based on incomplete information and knowledge. Hence, if organizations are not able to cope with these factors, the efficiency of rules and procedures decreases. Systematic errors persist or organizations discard rules and procedures and use instead intuition, heuristics or in the worst case irrational actions (Simon, 1997b).

This indicates that the capability to apply rules and procedures in conjunction with information, knowledge and experience, and continuously adapt them to the current situation, could reflect the intelligence of an organization. Hence, an organization requires methods evaluating, processing and integrating information, knowledge and experience intelligently and adapt them appropriately. On the other hand, organizational information, knowledge and experience relate to individuals and groups or are stored in information

systems. This suggests that organizations require methods in combination with information systems to assure the flow of information to integrate employees in business actions efficiently and to act intelligently. The umbrella term organizational intelligence applied in this thesis is the capability of an organization utilizing their intellectual capital referring to the information and knowledge exchanged between individuals and groups for organizational problem solving and decision-making. In dispersed groups, information technology that advances information and knowledge exchange could be a means that supports these capabilities and therefore could increase the level of organizational intelligence. This could relate collective intelligence to a phenomenological effect of social media. For instance, groups utilizing social media to collaboratively solving problems by aggregating their knowledge and intelligence. This suggests that social media could be a means to enhance organizational intelligence.

2.3.2 Behavioural Decision-Making Theory within organizational Business Environments

The core subject of investigation of behavioural decision-making research is to study individuals and the factors that influence them during the decision process (Ariely, 2009; Beach & Connolly, 2005; Peterson, 2009). Within organizations, decision-making research combines social, behavioural and rational factors with a focus on business and managerial aspects. March (1999) sets social and behavioural aspects in the centre of interest and investigates about the limits of rationality, inconsistencies of identities and preferences. He explains different social aspects that influence organizational decision-making and problems organizations face in different areas. During the decision-making process, according to March (1999), individuals construct meaning about a problem, the solution and an according action. This individual process of sense making influences the inputs and outputs of a decision-making process (March, 1999). In other words, the decision-making process depends on perception and cognitive capabilities of the individuals involved, which creates different perspectives. In addition, interpretation, personality, attitudes, values, motives, interests and experience are factors of influence on the decision maker (Robbins & Judge, 2014). For instance the perception of risk has a significant impact on the decision maker based on the different interpretations of estimating probabilities of outcomes (March, 1999). This is no different from decision-making processes outside of a business context, but has to be considered in conjunction with other factors that are typical for an organizational setting. For instance, March (1999) emphasizes the socio-economic aspect of organizational decision-making, that decisions are normally made or at least influenced by more than one individual either in an active or passive role in the process.

Generally speaking, from a behavioural point of view, decision-making is a social activity normally not made in isolation but integrating and influencing individuals and their environment (Beach & Connolly, 2005). These individuals are in parallel involved with other tasks, responsibilities, issues, opportunities in the organizational context, which interfere with their attention to the current decision problem. This comes along with time constraints that influence the final choice, because the decision maker has not enough time to gather all information to make a rational decision (Robbins & Judge, 2014). Hence, organizational decision-making could become highly complex and a matter of prioritization. Zur Shapira (1997) describes typical attributes of organizational decision-making such as ambiguity about information, and preferences and interpretation of past decisions. Decisions in organizational context could be categorized based on their importance and their impact (Meyer, 2000). A common distinction of decisions in organizations are routine or operational and those of strategic nature. Operational and routine decisions are part of the daily business, such as join a meeting, buying an office appliance, approve a contract, write a proposal or start a marketing campaign. Decisions of strategic nature, such as acquiring another company, expanding to other regions or entering a new market are decisions that come along with significant investments and high risks (Meyer, 2000). This means, the perception about the importance and the impact of a decision determines prioritization and who will be involved. For instance, upper management normally makes strategic decisions and lower levels routine decisions. The process of strategic decision is more likely to take longer than routine decisions.

Different motivational constraints in organizational decision-making such as performance evaluation and incentive systems play a role about a choice. For instance, the personal evaluation criterion of an individual has an impact on the decision maker. In this context Zur Shapira (1997) explains the influence of recognitions, incentives, and reward systems, which are typical for an organizational setting, particularly those which attract the attention of the management. For instance, if the decision maker is measured on margin only the decisions will be rather focused on lowering operational costs to increase the margin than to invest in new equipment or in long-term projects of innovation. On the other hand, if an individual is rewarded by revenue only, it could force the individual to decide on short-term goals, to maximize revenues and investing less in quality and long-term customer relationships.

Additional criteria that influence organizational decision-making are ethical considerations (Robbins & Judge, 2014). The concept of utilitarianism, which means in an organizational context to maximizing the total benefits, while decreasing negative effects, could cause conflicts in the decision-making process (Robbins & Judge, 2014). Organizations base their decisions mainly on financial performance, to maximize profits, efficiency and productivity.

However, following utilitarianism could cause ethical conflicts, since measures of maximizing profits could cause damage to the environment or lead to layoffs (Robbins & Judge, 2014). Justice is another point that influences decision-making from an ethical point of view (Robbins & Judge, 2014). This means, within the organization to treat individuals equally is challenging, concerning different opinions, preferences, goals, values, benefits, compensations and hierarchies.

This demonstrates the complexity of organizational decision-making and the different dependencies and constraints that influence the process and the individuals. Organizations are at least to some extent aware about the complexity and the problems that exist. Therefore, they implement rules, guidelines, policies, and base their acting on values to mitigate these effects. However, in many situations individuals are prone to irrational decisions. Simon (1997b) found an explanation for this phenomenon, which he based on the thesis that decision-makers are bound to cognitive limitations. He coined the term bounded rationality, which claims that individuals and organizations are not able to process all information, explore all alternatives and assign appropriate values or utilities to the outcomes, required for a rational choice. As a consequence individuals and organizations start to reduce the information demand, and the number of alternative to strive for a choice, which is not the optimum but satisficing (Beach & Connolly, 2005; March, 1999; Morgan, 2006; Simon, 1997b).

Another approach to cope with individual cognitive limitations is to combine knowledge from different sources and considering different views and opinions (K. Eisenhardt & Zbaracki, 1992). In an organizational context, these sources could be summarized in its intellectual capital, such as the body of knowledge and experience carried by the employees (Davenport & Prusak, 2000). However, as soon as the number of individuals involved in the decision-making process increases, another problem area appears. Aggregating different opinions to a common consensus and control of the deliberation process could become time consuming and elaborate (Schank et al., 2010; Sunstein, 2008). Empirical research has shown, if the complexity of the decision topic leading into lengthy and cumbersome discussions, the processes are closed down at an early stage because of time constraints and declining interest of the participants (Eden & Ackermann, 2010). In addition, behavioural decision-making effects such social pressure, conformity, polarization, leadership effects, hidden profiles, amplifying errors and groupthink enter the scene as soon as the number of participants increases (Eisenführ, Weber, & Langer, 2010; Sunstein, 2008). However, if negative effects are mitigated by using methods and supporting technologies collective choices could outperform the individual decision maker (McAfee, 2009). In other words, the combination of different opinions, diversity of knowledge, expertise and experience also in

organizational contexts could enhance the decision-making process leading into a higher acceptance level by the collective involved (Farrell, Sayama, Dionne, Yammarino, & Wilson, 2012; McAfee, 2009). Collective decision-making depends to some extent on the organizational model that is capable to support and accepts decentralized aggregation of opinions, beliefs, knowledge and experience.

Following Simon (1997a) decision-making in organisations is influenced by structures, norms and culture. Therefore behavioural decision-making research within an organizational environment could be contextualized with organizational behaviour research, which investigates in topics such as communication processes, power, structure, leadership, organizational culture, and change (Beach & Connolly, 2005; Robbins & Judge, 2014). In order to understand how decision-making relates to organizational characteristics and how social information technology fits into such organizations the next section discusses the characteristics of organizations and decision-making.

2.3.3 Characteristics of Organizations and Decision-Making

Business organizations in general are hierarchical organized socio-economic constructs, aiming to maximize profits and achieve collective objectives (Morgan, 2006). However, they differ concerning specific characteristics such as structure, hierarchical model, management approach, culture, size and specialization. Different schools of thought developed models of the firm based on theories such as division of labour, transaction costs, optimization, efficiency and social and behavioural theories (Coase, 2012). During the industrial age, optimization was paramount, following the principles of division of labour. Hierarchical structures strictly divided workers and managers and elected the power of decisions to upper management or the owners of the organization.

The common picture of an organization was a centrally controlled system based on an order and command management approach. Such organizations reflected hierarchical structures close to the structures found in military (Morgan, 2006). In order to characterize organizations Morgan (2006) uses different metaphors. He characterizes this organizational model of order and command as mechanistic and bureaucratic system based on the scientific management theory introduced by Frederick W. Taylor (1911)[7]. Mintzberg (1979) describes such organizations as machine bureaucracy. This

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[7] Frederic W. Taylor (1911) introduced in "The principles of scientific management" the division of work into small and simple tasks to increase the efficiency of the workforce. This led to monotonous production steps, which on one hand increased the output but on the other hand decreased self-determination and the motivation of the workers.

organizational model is designed for efficiency, optimization along the value chain. In terms of Morgan (2006), they are comparable to a machine, whereas its parts are based on standardized procedures, functions, and hierarchical and centralized structures. Tasks and responsibilities at the lower levels of the hierarchy are strictly separated from the upper levels. Consequently, management plans, controls and commands, and the workers in the factory take the orders and execute them, striving to perfect automatisation. Departments are mainly focused on their own goals, following the principles of division of labour and specialization (Mintzberg, 1979). Hence, interdepartmental exchange is very rare. In such hierarchal organizations, Schneckenberg (2009) emphasizes, decision-making is usually centralized, which means management takes the responsibility about most business decisions. Comparing contemporary organizations, this type of organizational model appears dominantly for instance in automated production industries, employing a work force operating on production lines or on construction sites (Mintzberg, 1979; Morgan, 2006).

Collective decision-making in such organizations, integrating groups and teams in the process is less common (Schneckenberg, 2009). However, for instance, the Japanese highly automated automobile industry developed organizational systems to integrate employees into the optimization process called Kaizen (Morgan, 2006). This approach facilitates process improvements and organizational learning by regularly involving their employees working on the production lines. The aim is to improve production processes, collectively solve problems and increase product quality utilizing expert circles and deliberating about solutions within the different production teams before their implementation (Morgan, 2006).

In contrast to the organizational structures in the industrial age organizations evolved with lean hierarchical structures, collaboration across all hierarchical levels and delegated power and decisions to responsible groups in a decentralized model (Malone, 2004). Mintzberg (1979) calls these types of organizations professional bureaucracy. In such organizations, management fosters an open communication culture, inter-departmental collaboration, knowledge exchange and organizational learning based on shared responsibilities. Morgan (2006) describes such organizations as a living system, adapting how an organism does to the environment or comparable with an information processing, thinking, learning and self-organizing brain. In such organizations a participative and democratic management style is common (Morgan, 2006). According to Morgan (2006) individuals in such organisations play an important role in carrying collectively the corporate objectives and the majority of job profiles are knowledge based. Consequently, responsibilities and decisions are delegated to the employees on all

hierarchical levels based on experience and expertise, which creates a supportive environment for collective decision-making.

These types of organizations can be found in volatile market environments, whereas products or even whole product families are changing rapidly. Organizations with such a profile reside most likely in the life science, electronic, information, communication and computer industries, where innovation is an intrinsic characteristic to follow the demands of the market (Mintzberg, 1979; Morgan, 2006). In order to follow changing markets, organizations need to be flexible, adapting their business processes and models following the demand (Tapscott & Williams, 2008). Knowledge exchange across the departments and beyond the company boundaries are imperative to successfully keep up with the pace of competition (Tapscott & Williams, 2008). Collective and decentralized decision-making across the hierarchical structures are a common approach of such organizations reflecting the collaborative environment (Schneckenberg, 2009). Involvement of employees in business decision-making requires methods to facilitate and guide the process of collective decision-making (Eden & Ackermann, 2010). This could be a challenge to establish specific methods to gain advantage of collective processes and to motivate employees to contribute. From a managerial perspective, according to Vroom and Yetton (1973), the question is how and to what extent managers involve their employees into the decision process. Vroom and Yetton (1973) found factors of integrating employees in the decision-making process such as commitment and participation. In addition, they developed a concept to choose an appropriate leadership style that considers situational requirements of group decision-making. They distinguish three leadership types, the autocratic, the consultative and the group-based. According to Vroom and Yetton (1973) the selection of a leadership type depends on the problem structure, the available information, willingness of employees to work on common goals and the importance of commitment about the final choice. In addition, organizational characteristics determine the leadership types, which could be an indication if decision-making follows decentralized or a centralized approach. Therefore, consultative and group-based types are more likely to implement collective decision-making than the autocratic type. In other words, the organization's characteristics, culture, communication and the management style influence the organizational decision-making.

Both, the strictly hierarchical, centralized and the flat and decentralized organizational models are common today, but rather in mixed versions of the two than in their pure form (Mintzberg, 1979; Morgan, 2006). For instance, an organization could combine machine and professional bureaucracy by incorporating different autonomous business units and production lines (Mintzberg, 1979). Decision-making in such an organizational model could

follow a decentralised approach in the business units and a centralized approach in the production lines and mainly for strategic decisions in the headquarters. Hence, corporate structures and culture determine how organizational decisions are performed and who is involved in the decision-making process (Schneckenberg, 2009; Simon, 1997a). Hence, not every organization is equally suitable to support collective decision-making and to utilize social information technologies to support collective action. Most likely organizations that follow a decentralized model are more suitable than strictly hierarchical and centrally managed organizations.

Additional types of organizational structures are innovative organizations or adhocracies following Mintzberg (1979). These types are closely related to matrix organizations mainly working in project teams integrating experts on demand from different areas of the organization. Another common type is the entrepreneurial organization such start-ups or small size organizations with a rather flat structure consisting of a workforce and their managers mainly the business owners (Mintzberg, 1979). Further organizational structures and business models appeared with the Internet following instead of a hierarchical a network model. For instance, communities of practice consisting of experts, loosely organized, collaborating in joint projects to innovate new products and services such as operating systems, applications, designs and problem solutions. The review above about the characteristics and types of organizations and decision-making and their combination suggests that different decision-making strategies and approaches could exist in the same organization.

Collective decision-making is a process of interaction, joint evaluation, exchange of information and deliberation. On one hand, ICT could be utilized to facilitate and guide the process, as a media to communicate and interact, to monitor the process and capture the outcome. As a consequence computer supported decision-making and cooperative work emerged in organizational settings (Borghoff & Schlichter, 2000). On the other hand, ICT influences how individuals interact, communicate and collaborate (Kling, 2000b). Both topics lead to the following literature discussion about how ICT influences social interaction and the collective decision-making process from a socio-technological perspective.

2.4 Social Informatics: The social Impact of Information Technology

Information technology evolved in the last decades in different areas, which had an impact on organizations, society and the global economy. Advancements in network technology, bandwidth, miniaturization, computing power and new software technologies changed the way of communication, interaction, information exchange and collaboration among individuals, groups

and communities in public, private and business environments. Declining information and communication costs accelerated the proliferation of computer technology. This development opened avenues for new business models and markets such as the electronic commerce, crowd sourcing, open innovation[8] and open source. According to Malone (2004) the utilization of information and communication technologies had an impact on organizational structures. He compares the change with the evolving of society from autocratic to democratic structures. Malone (2004) explains that inventing of the printing press and the accessibility of information reaching a much larger audience than before led also to new structures in society such as democracy. If this phenomenon is applicable to the evolution of organizations, purely centralized structures could transform into decentralized structures stimulated by technology and the availability of information to the employees (Malone, 2004). Organizations in the industrial age followed a hierarchical structure, because only management was able to gather the required information to control the organization. This was a common approach to control large organizations and benefit from economies of scale. New information and communication technologies provide employees of an organization with information they need to make business decisions by themselves in an informed way (Eason, 2005). Therefore, information technology allows organizations to keep the competitive advantage of economies of scale while benefit from flexibility and agility decentralization could provide (Eason, 2005). Hence, information technology changes not only the way of communication within organizations, it has an impact on the structure moving from centralized to decentralized structures such as lean hierarchies, and democratic approaches and networks (Sawyer & Rosenbaum, 2000). Finally this development has an impact on the organizational decision-making process making decisions centralized or decentralized (Malone, 2004).

Computer technology evolved with social needs of the individuals working with computers, which led to new types of software such as groupware and Computer Supported Collaborative Work (CSCW) (Buhse & Stamer, 2008). In other words, the need for communication and interaction of human beings induced a change in computer and information technology from exclusive data processing systems to a means of communication and interaction.

The objective of the review of social informatics is to understand how information technology influences individual and organizational behaviour and therefore decision-making. A focus is set on social informatics that studies the

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[8] Following Chesbrough (2003) Open Innovation describes how organizations extend their internal research and development department by using the knowledge and ideas of external resources such of a global community of researches and engineers to jointly solve problems, develop new products and services for different industries.

influence of information technology on interaction and collaboration among individuals and groups and social computing, emphasizing the characteristics of information systems and the design. Collective decision-making needs informed participants about the problem to find and evaluate alternatives to make a choice. This leads to the topic about information technology based decision-making systems that cover the need of interaction and exchange and the management of information required during the process.

2.4.1 Social construction of Information Technology

The following section reviews theories about the social construction of information technology. It discusses how social aspects influence information technology and vice versa. Technologies in general are socially shaped systems, embedded in a social context of interacting people, based on norms and social practice (Sawyer & Rosenbaum, 2000). From the early days of human society, technological innovations stimulated development and advancements of human beings and supported their adoption to the changing environment (Malone, 2004). For instance, the advancements of communication technologies such as telegraphs and telephones, and transportation technologies had an impact on society. They influenced the economy such as expanding trading markets, exchanging goods and services on a national and global scale. The invention of the printing press, as another example, enabled the distribution of knowledge with a much higher reach, to all social classes of the society, than it was possible before. As a consequence political systems changed from mainly centralistic structures such as autocracies to decentralized structures such as democracies (Malone, 2004). The emergence of microelectronics and information technology could be described as a third wave of revolutions after the agriculture and industrial revolutions, providing new ways of processing vast amounts of data and information (Eason, 2005).

The first personal computers that appeared at the workplace in the 1980s were primarily used as information processing, standalone devices. They supported employees performing individual tasks such as writing, or working with spreadsheets independent from centralized systems such as main frames. The personal computer allowed employees to work more independently and provided a kind of freedom to organize their work. However, the isolation of employees sitting behind their computers was contrary to the social need to exchange information and communicate with other individuals. This social need led to the development of network technology and different software applications that allowed computer-mediated communication. Due to the advancements of web technologies and the advent of electronic mail the personal computer became a linked communication and collaboration device for social interaction (Buhse & Stamer, 2008; Wang, Carley, Zeng, & Mao, 2007).

Today information and communication technologies are continuously influencing the society and the global economy (Sawyer & Rosenbaum, 2000). Significant drivers of these changes are decreasing communication costs and the advancements in broadband and web technologies, which led into one of the largest global communication networks, the Internet. The Internet brought a large number of new possibilities and markets to society such as electronic commerce, virtual communities, social network services, distance education or electronic publishing (Kling, 2000b). Furthermore, information technology is embedded in an increasing number of appliances and products and therefore touches most areas of social life (Sawyer & Rosenbaum, 2000). Therefore, social needs about communication and interaction become an important feature of these technologies and influence the evolution of information technology. In other words, the evolution of information technology and social needs influence each other (Kling, 2000a; Sawyer & Rosenbaum, 2000). For instance, the advancements in communication technology increased the possibilities of human communication, and interaction and allowed collaboration on large scale (Ou, Davison, Zhong, & Liang, 2010). With the Internet, a new form of communication among individuals and groups without geographical boundaries became a reality. The Internet today provides a variety of applications connecting people from all kinds of institutions and professions to provide all levels of society with information (Kling, 2007). Social network services, instant messaging and email connect individuals, groups and organizations around the globe. They allow maintaining private and business relationships over far distances at any time, at low costs and almost in real time.

However, it is not completely understood how these new communication and information technologies change and going to change the social behaviour of individuals, organizations, economy, structures and society in principle. Human beings follow a social need to interact and exchange with each other today and in the pre-age of the Internet and before the availability of electronic communication tools such as mobile phones, email and social media. In other words, the existing knowledge about social behaviour, communication and interaction may apply partly to modern communication. However, what changed significantly with the emerge of new communication technologies is the number of recipients an individual can reach, the speed and amount of information exchanged, the number of connections and interaction possibilities in large social networks. Mobile devices, handheld communication computers, tablet computers and smart phones, accelerate the dissemination in society, utilizing applications on the Internet as information and communication platforms. This continuously increases the number of users accessing the Internet and the participation in social network services (SNS), content sharing platforms and instant messaging to exchange and interact with communities up to a global reach (Lee, Park, & Kim, 2013). SNS are platforms for self-

presentation and self-disclosure to enrich the person's social encounters. However, participants mainly utilize SNS for social interaction to exchange about common interests, learn, share information and knowledge, rate and comment and discuss preferences, opinions, thoughts and beliefs (Cornejo, Tentori, & Favela, 2013). Hence, information technology influences individuals, society and the economy in many different ways, which leads into the scientific field of social informatics.

In order to understand the mutual effects of information technology and society Kling (2000b) claims that rigorous theoretical and empirical scientific methods have to be applied. Therefore, a new scientific field was introduced called social informatics or social computing. The main objectives of social informatics are to understand the interaction of human beings with information technologies and the impact in social contexts based on systematic empirical research (Kling, 2000a). More precisely Kling (2000b) defines social informatics as "an interdisciplinary study of the design, uses and consequences of information technologies that takes into account their interaction with institutional and cultural contexts". Wang, Carley, Zeng, and Mao (2007) add to this definition "Social computing is the computational facilitation of social studies and human social dynamics as well as the design and use of ICT that consider social context".

Social computing combines different scientific disciplines based on the understanding of ICT as socially shaped systems (Chakrapani & Ekbia, 2004; Sawyer & Tapia, 2007). Figure 2-2 provides an overview of social computing from different perspectives such as theory, infrastructure components and application. This figure illustrates that social computing is a cross-disciplinary science, combining different theories and methods, such as social theories, psychology, organizational theory, social network analysis, computer science and human-computer interaction (Wang, Carley, Zeng, & Mao, 2007). The objective of social computing is on one hand to understand the impact from both sides, social and technological, but as well to apply the findings in practice to design and enhance socio-technological systems. These systems aim to facilitate collaboration and communication of groups and the interaction between humans and computer devices (Wang, Carley, Zeng, & Mao, 2007).

Wang, Carley, Zeng, and Mao (2007) distinguish four areas of application of social computing. The first is about social media application such as wikis, social networks, blogs, micro blogs, content sharing platforms, tagging and social filtering. The second area is entertainment, creating online multi-user games with virtual agents acting intelligently and building communities. This learning from social computing helps to improve communication and collaboration for online communities (Kling, 2000a). Both areas focus on computer technology and combine social aspects in the design and development (Kling, 2000b). A third area is about business and government

applications that incorporate computer systems with social behaviour such as e-commerce, healthcare, e-business and e-government. The fourth area is about forecasting systems to simulate for instance dissemination of diseases or economic changes. Of specific interest are the capabilities of online communities to drive innovation from bottom-up such as open source software, which has an impact on organizations and the economy (Wang, Carley, Zeng, & Mao, 2007). This raises questions about what makes a community successful, what supports collaboration on common objectives and how to measure its performance. In addition, topics of interest are motivating factors, the role of social factors such as trust and other characteristics of social behaviour, and differences between public and closed groups and their relationships (Wang, Carley, Zeng, & Mao, 2007).

Social computing offers different methods to analyse social behaviour. One approach is to simulate complex social processes and social behaviour with models of artificial multi-agent systems (Kling, 2000b). A challenge of this approach is to model motivation, beliefs, emotions and other social behaviour (Wang, Carley, Zeng, & Mao, 2007). Another approach is to study organizations, interviewing individuals, documentary data and observing practitioners performing tasks and solving problems (Davenport, 2005).

Social informatics research concentrates primarily on the development of theories to improve information systems (Kling, 2000b). As Sawyer and Rosenbaum (2000) state social informatics bridges between information and computer science to broaden the pure technical view by including social aspects. For instance, social informatics research investigates how computerization changes organizational structures such as centralization or decentralization, which has an impact on hierarchies, power distribution and decision-making structures. Social informatics embrace analytical, normative and critical research components or the combination of it (Sawyer & Rosenbaum, 2000). The analytical orientation aims to generalize the use of ICT and derives theories from different cultural and organizational settings (Sawyer & Rosenbaum, 2000). The normative approach of social informatics is to guide practice, how to design and implement ICT in organizational and social contexts. The critical perspective of social informatics reflects a common understanding of ICT implementation in social context to avoid over simplification of the complex processes. For instance, limits of rule-based systems are critically questioned, such as expert systems, whether they are able to replace human decision-makers or if they are only a supporting means for human judgment (Sawyer & Rosenbaum, 2000).

Figure 2-2: Social Computing Overview
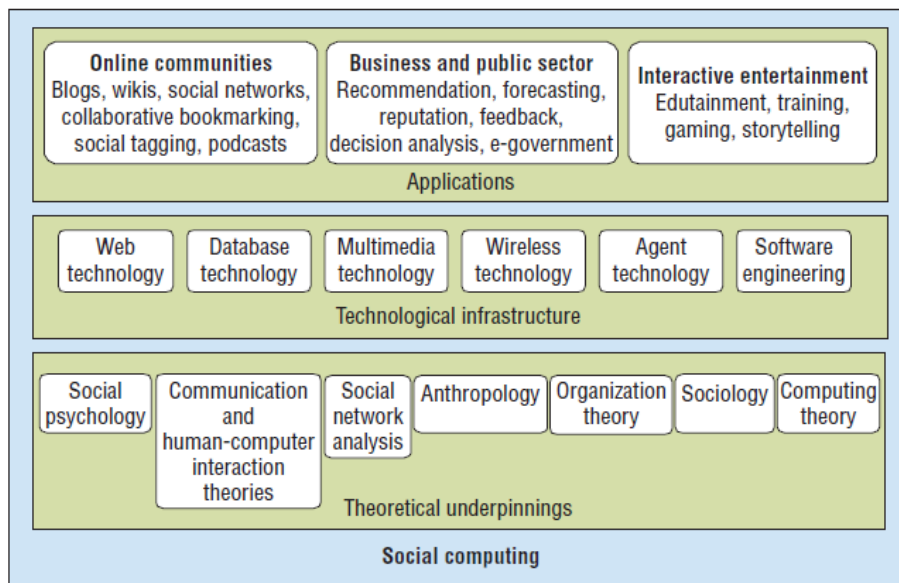
Source: Wang, Carley, Zeng, and Mao (2007)

Research in the 1970s and 1980s studied the social impact of ICT by following a deterministic approach to determine the causality of ICT and effects on organizations (Chakrapani & Ekbia, 2004; Wang, Carley, Zeng, & Mao, 2007). However, contrary results of empirical studies demonstrated the difficulty to generalize a cause and effect of these socio-economic and technical systems (Chakrapani & Ekbia, 2004). Consequently social informatics concentrates on the context such as for whom, for what purpose and under what specific conditions ICT improves work and quality of life and what hinders it in similar settings (Chakrapani & Ekbia, 2004). A specific scientific field about organizations is called organizational informatics which investigates in the design and implementation of ICT and how it changes organizational structures, processes and the workplace (Sawyer & Rosenbaum, 2000). Therefore, information systems are analysed on different levels of application such as group, departmental, organizational and society level (Sawyer & Rosenbaum, 2000). Communication, interaction and collaboration in organizational context combined with ICT are subjects of organizational computing, which means how computerization takes place in organizations and the workplace (Davenport, 2005).

What has been learned so far from these studies, according to Kling (2000b), is the importance of putting ICT and social life into a context when thinking about the design and the implementation. He claims that the successful implementation of information systems in organizations is not just a matter of implementation of new technologies, additional features, and the initiation of functional training programs for the employees. Kling (2000b) argues that the study of integrating such systems should contain a socio-technological

perspective, whereas culture, the user's adaptation and social integration play an important role. In other words, if the social context is neglected the results of empirical ICT integration studies may be controversial or misinterpreted since effects of ICT on organizations can differ depending on the setting they are applied (Chakrapani & Ekbia, 2004; Sawyer & Rosenbaum, 2000). For instance, the implementation of ICT in one organization could stimulate an increase of efficiency and productivity, but in other organizations showed the opposite. In short, even the most promising information technology may cause avoidance or low acceptance among users if it does not fit into the organizations culture or the organization has not cultivated its use as Malone (2004) explains.

Other studies argue that computer technology re-initiated the centralization of control in organizations. Hence, information technology enables management to control and monitor the whole organization. Therefore, the power of management increases through their exclusive access to organizational information. This leads to a centralistic decision-making structure because of restricted information access. Another empirical study by Kling (2000b) showed how power distribution influence the implementation of ICT. He found that the budgetary influence of individuals and groups positively correlates with the decision power about the availability of organizational computer systems. For instance, not every department has access to financial reports, whereas others do. This is in contradiction with theories that claim that ICT facilitates decentralizing, but shows how the social setting in organizations influences the outcome and utilization of ICT. Studies found that organizations became more decentralized, because of computer networks, knowledge management and corporate information systems. They enable the flow of information and empower management from all levels to take control and make sound or at least informed decisions (Kling, 2000b). This indicates that computer systems can improve or degrade the labour quality of employees, when using the level of participation in the organizational decision-making as a grade of satisfaction and motivation (Kling, 2000a).

Besides the impact of ICT on social structures, social informatics investigates on how and for what purpose computer systems are used. Social informatics does not simply accept that the Internet is capable of delivering more information to the users and therefore has an impact on their behaviour. It is more interested in what context users search in the Internet and what for. For instance, what are the reasons students preferred a long distance, rather than joining a classroom education. Another example, of social impacts of information technology, Kling (2000b) describes, are peer reviews of scientific journal articles. The Internet allows establishing a social process of selecting reviewers, and providing the authors with feedback, combining social and technological aspects. In addition, ICT allows authors to communicate with a

wide range of scientists and readers from distributed locations, at low communication costs, without using traditional channels such as publishers or libraries. Kling (2000b) found that the social appearance is of importance for sites in the Internet for publishing scientific articles. If these sites offer to build communities, and stimulate discussions among authors and peers, these sites are visited more often and articles are published more frequently than on other sites without these features (Kling, 2000b). Hence, the social context and the social needs play an important role if these technologies are accepted and utilized.

Organizations in the 1980s in the United States invested on average half of their capital in ICT, but studies about the productivity increase showed that the expected results did not follow the investments (Kling, 2007). The term productivity paradox was coined to describe this phenomenon (Kling, 2000b). Some of these effects could be explained by implementation failures, which means the systems were not properly designed to support the work process, or with the underestimation of the skills needed and adoption to gain value from ICT (Kling, 2007). From this follows that information technology alone does not yield economic and social value per se without considering design and social aspects. Human-computer interaction (HCI) is a scientific field originating in the 1980s motivated by the large scale of computer technology proliferation in organizations and households. The focus of this research is to improve computer systems interfaces and hard- and software interaction elements such as the graphical user interfaces, and devices for data entry such as a computer mouse, pens, touch screens and other (MacKenzie, 2012). The studies of HCI combine human factors such as sensors (sight, hear, touch, smell, taste), responders (limbs, voice, eye) and the brain (cognition, memory, perception) and human performance such as attention, reaction time, visual search and human error (MacKenzie, 2012).

Social informatics and social computing show the importance of investigating on the effects of ICT within the social context. As a consequence, to understand the influence of social behaviour in conjunction with decision-making and ICT requires to consider the social context. In the words of Kling (2000a) information technologies are socio-technological networks. Therefore, social informatics provides the basis to investigate why social media users search for advice to make a decision in their social network or read about experience and recommendations in user groups or online communities and why others are more reluctant to do so. In addition, the findings of social informatics allow extending the study on to how users perceive information, they receive from their social networks and how they integrate it in the decision process. This leads to the question about how the findings of social informatics and social computing relate to the advent of social media and what are the social media applications for decision-making. The next section discusses

different types of decision-making support systems to grasp their capabilities, benefits and limits and to understand how the capabilities relate to social media.

2.4.2 Information Technology based Decision-Making Support Systems

The following review introduces different decision-making support systems (DSS) in order to categorize them concerning their application in the decision-making process. In addition, to learn about their limitations and understand their relation to social media serving as DSS. Power (2008) distinguishes different types of DSS such as the data and information based. They primarily serve the decision maker with organizational data sets, context information and statistical reports. Another type, he mentions, are knowledge-driven, which belong to rule- and case-based systems also called expert systems. They guide the decision maker with suggestions about solutions through the decision-making process. The last category are systems supporting group and collective decision-making, which Power (2008) defines as communication-driven systems. This category of decision-making support systems shows similarities to social media applications. However, a comprehensive understanding of the different types, categories and limits is required to draw parallels to capabilities about social media and decision-making.

The primary purpose of DSS is to provide the decision-maker at different stages of the decision-making process with relevant information about a decision problem (Power, 2008). In the 1950s, early DSS provided mainly operational data, statistics and reports as a basis of managerial business decisions. Since then various types of DSS followed, such as rule- and case-based systems. According to Simon (1997b) the structure of a decision problem determines the design of a DSS. Therefore, he distinguishes between structured, unstructured and semi-structured decision problems. From a mathematical and algorithm perspective, he explained that structured routine and repeatable decision processes are programmable. This means structured decision-making problems can be described as mathematical model utilizing for instance decision trees or other mathematical algorithms from decision theory to solve for instance routine problems. Simon (1997b) emphasizes that unstructured decision problems are rather difficult to solve with computer programs, because of their complexity, the number of options and parameters that influence the decision. Semi-structured decision problems are in scope of DSS, which means that DSS support the decision process, but judgement and the final choice stays with the decision-maker.

Besides behavioural research and the limitations about rationality Simon (1997b) created different models and concepts of decision-making and problem solving in organizational, political and economic contexts. The outcomes of his research are various contributions including a four phases

decision-making process and concepts about technological decision-making support systems (Pomerol & Adam, 2004). This four-phase decision-making process starts with the intelligence phase, which is about gathering information to identify a decision problem. This follows the design phase that creates options available for the choice. The third phase performs the choice and the last phase reviews the implementation. If in one of these phases, for instance the problem solution is not satisfactory or in the intelligence phase not enough information available these phases are iterated. This is of relevance of DSS that support the different stages of the decision-making process, as they should allow changing parameters and repeating the process of information gathering if needed.

Information technology based DSS can be further divided into different categories such as information providing, mathematical modelling and simulation, expert systems, and mediating systems to distinguish how they support the decision-making process itself. The objective of this categorization is to compare social media with these categories to derive possibilities of social media based decision-making support systems and applications. The first categories of "classical" decision-making support systems are enterprise data processing systems. They provide the decision maker with different kinds of reports such as financial data, production input and output, sales, profits, market data, product quality and measurements and statistics. One of the earliest data processing systems introduced in business were management information systems (MIS) (Meixner & Haas, 2010). They provide managers primarily with reports of operational data to allow them to monitor and control the efficiency of the organization from a production, sales and financial perspective (Meixner & Haas, 2010). Evolutions of these systems were executive information systems (EIS). According to Meixner and Haas (2010) these data based DSS built cross relations of data sets, presenting them in spreadsheets and diagrams and allowing multidimensional data analysis. The data itself was collected from different organizational sources to predict for instance future trends about market demand or to derive counter measures if costs increased, sales dropped or margin diminished (March & Hevner, 2007). Other management and DSS followed, such as data warehousing (DW), business intelligence (BI), online analytical processing systems (OLAP), enterprise resource planning systems (ERP) and enterprise information management systems (EIM) to provide the decision-maker with information needed to make and justify decisions based on the reported data (Shim et al., 2002).

All these systems collect organizational and market data to generate specific information for management decision problems (Meixner & Haas, 2010). They belong to the information-providing category of decision-making support systems. This means, they provide only the basis but do not present the

solution of the problem or advise what alternative fits best. The technologies discussed above are widely disseminated in organizations and managers utilize them regularly to justify the course of action. However, the final choice falls back the decision maker. Hence, subjective interpretations and judgement, personal beliefs and opinions about the presented data influence the final choice. The second category are advanced DSS that use mathematical models, for instance models from rational decision theory, solving complex decision problems by using simulations, integrating significant amounts of data, and evaluating numerous alternatives (Sauter, 2011). Rule- and case-based DSS belong to the category of expert systems. They guide the decision process by applying rules and cases gained from experience and heuristics of experts to present the decision maker with a problem solution applied to similar cases (Sauter, 2011). The last category are group and collective decision-making systems, which support the decision process that involves more than one decision maker (Massey, 2008). They mediate the decision process and aim to avoid problems of collective decision processes such as groupthink.

A decision-making group consists of more than one individual identifying a problem and searching for a solution of a problem in a deliberative, participative and collaborative way. The members of a decision-making group perceive themselves as member of the group even if they do not have to be at the same location but responsible to jointly make a decision (Desanctis & Gallupe, 1987). Interpersonal communication among the members of the group, the exchange of opinions, ideas, and the contribution of knowledge based on the members experience are the foundations of group decisions and are a source of bias as well (Silver, 2013). Therefore in the 1980s group decision support systems (GDSS) were introduced with the aim to improve group collaboration, and supporting the collective decision-making process using computer and communication technology (Eisenführ et al., 2010). The main focus, GDSS follow, is the improvement of communication within a decision-making group in the process of converging to an accepted choice (Desanctis & Gallupe, 1987). GDSS direct the problem and decision analysis performed by groups and improve the exchange of information during the decision-making process (Nunamaker & Deokar, 2008). These systems are based on different technologies using computers to communicate and interact with the decision support software. They provide decision modelling methods such as risk analysis, decision trees and forecasting and integrate Delphi and nominal group methods to enhance the decision process in group meetings (Desanctis & Gallupe, 1987).

The impact of these systems depends on how they intervene in the decision process for instance to what extent they determine the rules the discussion has to follow. In other words, GDSS change the way in which individuals

participate in a group decision-making process. Desanctis and Gallupe (1987) identified three levels of group decision-making support systems. The first level serves as medium to avoid communication barriers among the group members by providing large screens to share ideas, including messaging features or anonymous voting functions. The second level provides features about risk analysis, structuring, and analysis methods and social judgement formation. The third level mediates the group decision-process utilizing controlling rules and expert advice.

As Eisenführ et al. (2010) explains, GDSS could reduce negative effects of group behaviour by allowing participants to act to some extent anonymously in the process, and provide their opinions more freely. For instance, a first level GDSS consists of computers connected to a projector. Each participant enters comments, feedback, options and suggestions about a decision problem into their computer and the results appear on the screen in front of the group. A common problem of group decision-making support systems is the generalization of group behaviour (Eisenführ et al., 2010). This means that a generic system design that fits most requirements across all group settings is too complex (Eisenführ et al., 2010). Groups exchange information in different ways and approach the different steps of the decision process following their specific requirements. For instance, decision-making rules may not fit to each problem and therefore the group has to decide which rules fits best. If a system offers many different rules and methods, the initial setup could become time consuming and even demotivating for the participants. Hence, following the levels defined by Desanctis and Gallupe (1987) a system of level one and two that enhances communication, structures the problem, and provides analytical decision tools is more likely applicable in practice than systems that prescribe the entire decision-making process.

How social media supports individuals and groups making decisions is comparable to the principle of GDSS systems. However, it differs in a higher number of participants, communication possibilities and applied aggregation mechanisms. Social networks, communities, blogs, social bookmarking and wikis support the information flow through different communication channels and invite individuals to participate and contribute. In other words, social media offers a platform to facilitate deliberation and collaboration in the decision-making process, and capturing and aggregating thoughts, comments, feedback and opinions. Hence, social media could be the bridge that connects knowledge and experience of individuals to support collective decision-making, but on a larger scale without geographical boundaries. In addition, social media could mitigate negative group behaviour such as groupthink, social pressures, conformity, polarization, leadership effects, hidden profiles and amplifying errors similar to the GDSS approach. This means, social media users participating in an online deliberation or discussion during a decision-

making process are not directly confronted with other participants. However, comment and feedback mechanisms of social media allow immediately reacting to the contributions and therefore influencing the participants and their contributions that may follow. In other words, social pressures, conformity, polarization, leadership effects, hidden profiles and amplifying errors could appear in collective decision-making processes mediated by social media as well. In essence, the findings of GDSS relate to social media and introduce a new focus of organizational social media application on the area of collective decision-making.

In order to understand and to identify the areas of application in organizational decision-making processes the following sections review theories about social media, characteristics, implementations and findings. The aim is to derive capabilities and the types of social media a collective decision-making process could benefit.

2.5 Social Media: Theoretical Framework and Phenomenological Models

A large number of definitions and concepts about social media already exist and not to add another one the first part of this review provides a definition, prominently used in literature, this thesis follows. As baseline to study the phenomena of social media and its relation to decision-making, the following creates a theoretical framework and visits different perspectives in available literature. Topics such as collective intelligence, the relation to behaviour of social insects described in swarm theory and the psychological aspects of mass-collaboration provide different views to discuss the phenomenological models available. Collective intelligence is a topic frequently mentioned in conjunction with social media. It describes how groups are able to act intelligently and how social media stimulates this effect. This phenomenon appears in groups of human beings, but also among social insects, which leads to the scientific field of swarm theory and its parallels to social media phenomena. Motivators of mass-collaboration play an important role to understand the mechanisms behind collaborative projects such as wikis, open source, open innovation and crowdsourcing. Therefore, the section about mass-collaboration discusses its motivators from a psychological perspective.

2.5.1 Definition of Social Media and Web 2.0

Social media is a means that creates perspectives of computer mediated social interaction and collaboration is a common generalization found in available literature (Kaplan & Haenlein, 2010a; Koch & Richter, 2007; O'Reilly, 2007; Tapscott & Williams, 2008). Prominent definitions describe social media as a new category of software applications, an evolution of web technologies, a new concept of computer systems utilization or a new way of communication,

collaboration and interaction. The term Web 2.0 appears frequently in conjunction with social media as synonym to describe the same concept. Both terms relate to each other since they emphasize the social aspect of computer system application. This thesis refers to Web 2.0 as a technical concept that transformed the Internet originating from a rather static unidirectional medium to a dynamic, participative and interactive communication and information network using latest advancements of ICT.

Social media in this context is the umbrella term for social software applications, based on web technology, with specific features and functions that allow social interaction and collaboration among individuals and groups. This rather technical perspective defines in a first step the kind of software that belongs to the category of social media applications and the technical basis called Web 2.0. However, this does not explain the meaning or the whole concept of social media such as social and psychological aspects. In other words, a comprehensive concept should incorporate also the understanding of the characteristic and the nature of the topic as well as the structure. Following the philosophical tradition of language theory and hermeneutics, the definition of the term social media begins with the analysis of the meaning of each word and their combination (Bryman & Bell, 2011). This enables the reflection on the topic of the thesis and base the inquiry on a clear definition. In addition, the analytical interpretation of meanings of words and texts allows classifying literature about their relevance for the research topic (Bryman & Bell, 2011). For instance, the term social media appears with different meanings in literature, whereby one study follows the definition of this thesis, but another study interprets the term differently and follows another view of the topic. Hence, for the researcher it is important to be precise and follow a rigorous approach during the analysis of literature as a basis of expanding body of knowledge by reflection, combination and application on the research topic (Bryman & Bell, 2011). Consequently, a study should define the terms and the combination of terms, which describe the main research topic, clearly and without ambiguity. This helps the reader to follow the topic, the position of the author and keeps the interpretations of the results consistent and clear. Not following this principle and using different definitions and interpretations in the same thesis could cause miss-interpretations by the reader (Bryman & Bell, 2011).

The term social media consists of the adjective <u>social</u> and the noun <u>media</u>. The word <u>media</u> follows a common definition found in most dictionaries such as Oxford, Merriam Webster, Cambridge or Collins. These dictionaries define media as a means of communication, information transmission, and to enable the propagation of matter in physical and chemical processes. The following definition considers media mainly as means of communication and information transmission. Considering the reach of a media, dictionaries distinguish mass

media such as television, radio, newspapers or telephone, mail or a network of computers such as the Internet. Hence, the main purpose of media in this context is to convey different kinds of information and in case of mass media reaching a significant number of individuals. The information, broadcasted by media, comprises various forms of content such as text, speech, pictures, videos, or music. Media in the term of social media refers to computers, software and networks that connect computers and individuals including mobile devices. They act as a means of communication to broadcast information, which is conform to the definition of media found in dictionaries. Hence, the term media used in social media refers to the common definition, which in essence describes a means that conveys information, independent on the physical structure of the transmission such as telephones, radios, newspapers, networks or the Internet.

Following the definitions in dictionaries such as Oxford, Merriam Webster, Cambridge or Collins social is an adjective that describes the characteristics of living organisms interacting and collaborating with each other. It describes the behaviour among individuals that are interested in the needs of others and how they influence each other. In addition, it characterizes how individuals contact and connect with each other or build and manage relationships. Hence, social media is defined in this thesis as a means of communication that allows exchanging information in the form of text, speech, pictures, videos, music or other kinds of content incorporating and considering needs, interests of individuals to connect, interact, communicate, building and maintaining relationships, exchange, collaborate and influence each other. In other words, media becomes a social media if it considers social needs, as described above, of human beings. This defines the basic concept of social media. The analysis of the terms social and media and the corresponding definition provides the basis of the following theoretical reviews, which explain social media in more detail concerning technology, application, specific software components and the phenomena about social media.

According to (Richter & Koch, 2007) social media are applications for indirect and direct social interaction mediated by computer systems and the connecting networks. The basic concepts are communication, coordination and coexistence to support relationships and to map identities by utilizing network and scaling effects. Koch and Richter (2007) distinguish three base functions of application (1) information management providing features about search, retrieve, manage and to rate information (2) identity and network-management, to present oneself, connect to others, and to maintain the social network (3) interaction and communication for direct or indirect communication among users. Kietzmann, Hermkens, McCarthy, and Silvestre (2011a) added criteria with more granularities to define social media from a functional perspective.

They developed a framework of functional blocks such as identity, conversation, sharing, presence, relationship, reputation and groups. Identity is a functional block that allows exposing personal data to create a digital image in social networks. This allows finding individuals with similar interests and opinions and building communities. Conversation is the capability of social media to interact with other participants in social networks and to convey information. Social media offers different forms of conversation to communicate with others, which is important to build relationships and to receive immediate feedback. Sharing is the possibility to exchange content with other participants in the network either to closed groups or accessible to the public. These content communities are platforms for sharing all kinds of digital artefacts such as videos, photos, slides, music, texts and reviews. They reflect the social need of sharing with others, present achievements or special skills, inform, teach and create awareness to improve the status in a social network. Presence indicates the availability of users for interaction and shows where the individual is located. This means in social media applications users can indicate their availability status by showing them as online, busy, away from the desk, travelling or offline.

Relationship functions determine the relation among users in a social network. For instance, professional networks display relationships using degrees. The first-degree relationships indicate directly connected individuals and higher degrees indicate relations through other users. This allows maintaining and extending the social network with closer and more distant relations or higher and lower relationship degrees. This is comparable to the concept of Granovetter (1973) referring to strong ties, first degree and weak ties relating to higher degree relationships. Reputation refers to the standing of an individual in a social network.

Different reputation functions are part of social media applications such as endorsement, content voting, view counts of videos, usefulness of comments, ratings, likes, counting the number of followers, or how active a user contributes in discussion groups. Groups refer to the possibility to create particular communities. If specific relationships and membership are essential in a social network, controlling functions determine a formal process allowing users to participate in closed groups or communities. This increases the quality of discussions and the trust among individuals with similar interests (Kietzmann et al., 2011a). These groups focus on certain areas of interest gathering participants for instance from universities, alumni, specific industries, professions, business, politics, culture, science and technology. In organizational context such communities could be established for offices, engineers, products, departments, customer relations, quality assurance, sales, marketing, services, expert circles or other common interests bridging

departmental boundaries and allow decision-making processes that involve individuals across the organizations.

Kaplan and Haenlein (2010a) found in the field of media research other criteria to categorize social media such as social presence, media richness, self-presentation and self-disclosure. According to Kaplan and Haenlein (2010a) the higher the social presence in the communication process the higher the influence on the communication partner. For instance, a face-to-face conversation provides a higher social presence as a mediated conversation by phone. Hence, video conferencing, allowing the participants to see each other, could add more social presence than telephone conferences and therefore increase the social influence on the participants. This effect is reflected in social media such as instant messaging including video and audio communication options. Media richness is about the reduction of ambiguity and uncertainty. Therefore, media are distinguished by the amount of information they are able to transport (Kaplan & Haenlein, 2010a).

Social media applications use different media types to transport information such as text, pictures, audio and video. Hence, degrees of media richness add another classification criterion to determine what kind of social media applications support the decision-making process more than others do. Thus, ambiguity of information decreases the efficiency of the decision-making process. Hence, media richness is a relevant factor to consider during the evaluation of social media for decision-making. Degrees of self-presentation and self-disclosure are aspects of the social process (Kaplan & Haenlein, 2010a). They are about the control of creating an image of a personality and the presentation of personal information in a social context. Both are aiming to create an identity and to influence the impression conveyed. In social networks, this aspect is of importance to connect to other individuals with similar interests and personalities that reflect their thoughts, beliefs and opinions. The above described media categories and the different degrees of social influence allow to categorize social media and to determine which social media tools should be applied in which context (Kaplan & Haenlein, 2010a). Social media primarily enables computer mediated social interaction such as communication, information exchange, discussion forums, aggregation of opinions, and creation of social networks, deliberation and collaboration. This is different to media such as radio, television, paper based books, journals, newspapers, or static web sites in the Internet. The consumers of such media have less immediate possibilities to interact and the information flows mainly unidirectional from the sender to the recipient. Social media adds to the media above the capabilities to support the basic needs of human beings to communicate, participate and interact with each other, building relationships, and share opinions. This suggests that the degrees of social influence of

media categories introduced above compared with social media most likely provide higher degrees than static media.

Kaplan and Haenlein (2010a) define social media as a group of web-based applications built on the foundations of Web 2.0 technologies, focusing on information exchange, participation and user generated content. They describe Web 2.0 as an evolution of the former Internet that applies to technologies, mainly supporting static content published by small number of individuals. Information exchange in the early days of the Internet was comparable to traditional media such as newspapers, radio or television with minimal possibilities of interaction. Kaplan and Haenlein (2010a) emphasize that Web 2.0 is not a new technical version of the Internet. This means, besides advancements in broadband and network technology, increasing performance of computer systems, responsive graphical user interfaces and mobile access, the principles from a technical perspective are the same in Web 2.0 (Kaplan & Haenlein, 2010a).

The evolutionary step is the change of how developers and users utilize the Internet as a platform that allows the exchange of content and changes their role to consumers and authors of the Internet content. Through this evolution, the Internet became much more interactive, based on new applications called social media. From a technical perspective, following Kaplan and Haenlein (2010a), Web 2.0 technologies provide the basis of implementing interactive elements for web pages and web applications. A major change compared to former technologies applied in the Internet is the possibility to update only parts of the web page, which provides them a more dynamic appearance. This means web applications update the information on the page or the input of the users asynchronously without the need to refresh the whole page every time. Web 2.0 technologies are asynchronous JavaScript and extensible markup language (XML) called Ajax to create interactive elements on web pages, Really Simple Syndication (RSS), to update the user with information about a page without the need accessing the page and streaming technology to provide animated content, audio and video. The advancement of broadband technology and the availability of the Web 2.0 technologies, accelerated the pervasion and the popularity of social media in the Internet (Koch & Richter, 2009). In addition, according to O'Reilly (2007) network effects improve and advance Web 2.0 technologies with an increasing number of users. Kaplan and Haenlein (2010a) distinguish five different categories of social media applications such as social network sites, online diaries or weblogs, collaborative projects, content communities, and virtual worlds. The following sections define the application of these categories and their relevance to decision-making processes in detail.

Social network sites (SNS) are computer mediated social network platforms connecting individuals to share common interests, activities, opinions,

thoughts and beliefs available on the Internet or on Intranets of an organization (Richter & Koch, 2008). Prominent SNS in the Internet are Facebook, Google+, Xing, LinkedIn and Instagram. Richter and Koch (2008) distinguish six basic functionalities of SNS such as identity management, expert finding, context awareness, contact management, network awareness and information exchange. Identity management provides functions to build and present a digital identity including for instance a person's contact information, skills, interests, views, opinions, and participation in communities and discussion groups. SNS combined with search functions allow individuals to find specific skills available in the social network. For instance, if problems need specific expertise the social network member could reach out to them and ask for advice and recommendations. Sharing the same interests and relationships provides context awareness among the individuals in the social network (Richter & Koch, 2008). This stimulates discussions about common topics and fosters collective problem solving. In addition, the context awareness creates trust, because of perceived personal similarities of the members (Richter & Koch, 2008).

Contact management allows maintaining the personal relationships and increasing the network to other individuals. Network awareness informs about status changes of participants, events or activities, specific news about contributions or comments in the network. Exchange functions support sharing of information and knowledge, provide comments, publish news, invite for discussions and participate in forums. Within an organizational context early implementations of SNS started as internal directories to search and contact individuals in the organization with specific skills and expertise (Koch & Richter, 2009). Additional functionalities of interaction such as communities, discussion forums and communication features transformed these directories into corporate SNS.

Blog is an abbreviation of the word weblog, which originated from online diaries and Bulletin Board Systems (BBS) introduced in the 80s (Kaplan & Haenlein, 2010a). In principle blogs are web-based publishing services to communicate ideas, thoughts, opinions, daily activities, instructions, announcements or reports mainly in a chronological order and edited by a single author or a group of authors (Koch & Richter, 2007). These blog authors, also called bloggers, use different types of media such as text, pictures, audio and video to convey their message. In addition, blogs offer feedback mechanisms to comment the content published, which gives them an information exchange characteristic. This means, blogs facilitate an interaction process between the author and reader and among the readers. Creating a blog is similar to the use of an online editor and therefore opens the utilization of blogs to a wide range and a large number of users, since specific knowledge about web technology or programming are not required

(Richter & Koch, 2007). This could be the reason that blogs became a widespread means of communication in the Internet covering almost every topic authors prefer to write. With the availability of such publishing services on mobile devices a derived form of blogs, the micro-blogs became popular. They are a short form of blogs allowing posting not more than 140 characters. Micro-blogs are mainly used to inform the subscribers, called followers of the micro-blogger, with a short messages, which aims to increase the awareness in the personal network (Richter & Koch, 2008). Prominent commercial platforms to create a personal blog are WordPress, Tumblr and for micro-blogs, Twitter, but also websites and social networks offer similar blogging platforms.

Blogs and micro-blogs construct a digital image of the personality of the blogger while they publish their personal thoughts, opinions and daily activities. This means the grade of self-presentation and self-disclosure is rather high, because with every post on the blogging platform a blogger discloses personal information to a public audience. This could reflect also the personal interests and the ideology of the blogger if the posts are equal with the real personality. The degree of media richness is high if the author uses rich media such as pictures, audio and video to transport the message. For micro-blogs such as Twitter, the media richness is lower since the messages published consist mainly of words and short statements. However, messages can be enriched with references pointing to audio and video articles. On the other hand, readers can learn about the bloggers experience for instance published in an expert blog and follow latest news about a topic. This could support decision-making as an additional source of information and knowledge. Organizations utilize blogs for corporate communication, project diaries, facilitate knowledge discussions with subject matter experts and external communication to inform customers (Koch & Richter, 2009). In addition, according to Koch and Richter (2009), blogs in organizations could stimulate discussions, inspire employees learn from information published such as best practices or problem solving strategies.

Another category of social media applications are collaborative projects such as wikis, open source, crowd sourcing or open innovation. They have in common that a signification number of individuals work on projects or problems self-organized with minimal supervision, coordination and hierarchical structures. For instance, wikis, derived from the Hawaiian word wikiwiki, which means quick, are applications to create, edit and publish content using specific web applications (Sunstein, 2008). They are a kind of group editors that allow collaboratively working on and publishing content utilizing web technologies (Koch & Richter, 2009). Furthermore, wikis are equipped with functionalities to comment, feedback, rate and discuss the contributions of the authors (Sunstein, 2008). Similar to blogs, technical or

programming skills are not required and open up the utilization to almost every individual with writing skills. Organizations utilize wikis to edit and publish manuals, instructions, protocols, reports, agendas, policies, best practices, training material, documentation and for knowledge exchange (Koch & Richter, 2009).

The success and quality of wikis depends on the willingness to participate and to contribute, following basic rules, quality and editing standards (Tapscott & Williams, 2008). The more participants are willing to contribute, the more information and knowledge aggregates into the edited texts. Willingness to contribute is based on extrinsic and intrinsic motivators. They may differ between organizational and public wikis in the Internet. Extrinsic motivators such as monetary incentives are less influential, since most authors contribute in public wikis without payment (Sunstein, 2008). A small number of professional authors receive monetary incentives to create for instance a better image of an organization that appears in a public wiki. However, the most significant number contributes without monetary incentives. What counts for online authors is reputation and social status through the recognition of their contributions by other authors and the readers (Sunstein, 2008). Other intrinsic motivators are personal satisfaction to write, to participate and to become part of a recognized work (Tapscott & Williams, 2008). This holds also true for open source. These collaborative projects are similar to wikis, but with another artefact. Open source describes the development of software by a large number of programmers contributing their code fragments into a product such as the operating system Linux. A characteristic of such collaborative projects is the absence of hierarchical structures and minimal centralized control for quality assurance. Hence, mechanisms of self-organization through interaction and self-control assure most the quality of the results that communities create (Tapscott & Williams, 2008).

Content communities are platforms for publishing and sharing all kinds of digital artefacts such as videos, pictures, slides, music, or all kinds of literature and texts (Kaplan & Haenlein, 2010a). Most prominent platforms are YouTube to share videos, Flickr to share pictures, Instagram to share pictures and videos, Spotify to share music playlists and SlideShare to share presentations. The motivation why users upload digital content on sharing platforms has different sources and are interpreted differently depending on the perspective such as social, psychological or economic theory (Kaplan & Haenlein, 2010a). A social concept of content sharing communities is the principle of give and take. This means, individuals normally contribute for a purpose or potential benefit. For instance, contributions could provide social status and reputation if the community recognizes and honours them reflected by ratings. Knowledge shared in instruction and best practice videos demonstrates the need of individuals to share their experience and show their skills to the public.

Other motivations from a psychological perspective are in the area of self-presentation and self-disclosure, which is reflected for instance in personal performance videos. Feedback mechanisms allow content communities to rate and comment the content shared and create content ranking lists to present other users with most prominent contributions. The appearance in such ranking lists has commercial consequences, which leads to economical perspectives such as product marketing. Content communities of video sharing platforms follow commercial objectives such as product placements, product introductions, event presentations, announcements or advertisements embedded at the beginning of or during posted videos. As a consequence, the awareness of an announced product or service increases with the popularity of videos on content sharing platforms. The authors of the videos receive a financial benefit from the vendor each time a user watches the video and the vendor benefits from this marketing product placement channel the video provides.

The section above discussed different social media categories, definitions, and aspects of common social aspects. They manifest in the area of participation, collaboration, contribution, self-disclosure, self-presentation, sharing, interaction and communication based on different social and psychological effects such as extrinsic and intrinsic motivators. These aspects relate to requirements of collective decision-making focussing on mechanisms that aggregate and capture knowledge into a collective choice. According to O'Reilly (2007) harnessing collective intelligence is a main aspect of social media responsible for the proliferation in the Internet. This leads to the following theoretical review investigating into basic mechanisms and the phenomena of social media compared with the theory of swarms.

2.5.2 Collective Intelligence and Swarm Theory

Intelligence in this context is the capability to solve problems based on knowledge, experience, combination, adoption and cognition. Therefore, collective intelligence describes the problem solving capability of groups (Malone, Laubacher, & Dellarocas, 2009). Research investigates in collective intelligence to study how groups collaborate to solve problems and how intelligence aggregates in this process (Malone & Klein, 2007). Advancements in computer technology gains increasing attention in academia and the proliferation of the Internet and social media. However, collective intelligence is not a new phenomenon that emerged with social media and the Internet. Collective intelligence arises mainly from social interaction with and without technical enhancements and appears among human being and other social species as well (Miller, 2010). For instance, most innovations in human history are to some extent the result of groups of human beings learning from each other, collaborating, sharing and extending the body of knowledge by imitation and refinement (Miller, 2010). In addition, collective intelligence is the basis of

democratic systems, which elects decision-making to the people as sovereign (Landemore, 2012). In other words, the founders of the democratic state follow the premise that the public is capable to make better decisions than a single or a couple of individuals.

Following Page (2008) the key of collective intelligence is cognitive diversity such as diverse perspectives, interpretations and heuristics to solve problems. Different views about solution candidates could lead to outcomes that are more robust because heterogeneous groups more likely challenge them than homogenous groups. Page (2008) mentions conditions as prerequisite for his statement such as the group of problem solvers must be of a significant size, the problem should be rather complex and difficult to solve, and the participants should own diverse perspectives and heuristics. In other words, if the group is small and the problems simple the effect of collective intelligence diminishes and single decision-makers are more likely to outperform the group most likely because of group effects. With the Internet the number of individuals involved and the speed of information distribution increases significantly (Landemore, 2012). In the age of the Internet and social media, collective intelligence reflects in collaborative projects, open source software, collective innovation platforms, social bookmarking or ranking systems.

The field of swarm intelligence is another perspective to study the phenomenon of collective intelligence. Swarms of social insects show similarities to collectives of human beings acting intelligently (Miller, 2010). Swarm intelligence that leads to efficient solutions of complex problems are the topic of a variety of studies about different species (Miller, 2010). Ants, bees, birds, fishes, bacteria or other organisms demonstrate achievements of the whole colony based on interactions of rather simple individuals. They are acting intelligently as a whole in a self-organized way without centralized control. According to Miller (2010) the optimization mechanism of ants to show their conspecific' feeding places is a phenomenon that demonstrates swarm intelligence. Ants prepare pheromone trails to mark the most efficient route. Obviously different trails lead to a feeding place, but with the frequency of ants following the shortest route the pheromones on the trial intensifies. This positive feedback mechanism is the basis of many individuals building an intelligent solution of a problem (Miller, 2010). Building formations to increase the chance to survive attacks of enemies observed with birds and schools of fishes is another finding that demonstrates how collectives are able to react as a whole intelligently interacting with each other (Bonabeau & Meyer, 2001). The reason why swarm intelligence occurs are flexibility, the ability to adapt to the altering environment and robustness of performance. This means, the group is able to perform even if some individuals fail. Such swarms are self-organized, which means the group is not centrally controlled or supervised (Bonabeau & Meyer, 2001). The findings of swarm intelligence transferred into

different kinds of application. They are established in the fields such as robotics, artificial intelligence, telephone networks, simulations about traffic, movements of crowds, and predictions in markets to understand and solve complex problems (Bonabeau & Meyer, 2001).

Applied to human beings an area of scientific interest is how the findings about complex swarm behaviour relate to individuals in groups interacting with each other in the Internet or organizations. For instance, the availability of feedback mechanisms is substantial for intelligent swarms to function. The same is applicable to feedback mechanisms in the form of ratings, ranking, and comments offered in most social media applications. Other behaviour similarities in social media are the creation of wikis (Miller, 2010). Normally a wiki starts with a topic started by an author. Other authors attracted by the topic start to add their contributions until the article is complete. This remembers to the ant trails that invite others to follow and could be an explanation for the initiation step of wikis aggregating knowledge (Miller, 2010). Human behaviour adds more complexity in order to apply the mechanism of swarm intelligence. However, basic mechanisms are similar and allow a general understanding how individuals in a crowd organize themselves and interact to create intelligent results. Therefore, the following section reviews mass-collaboration to understand the mechanisms why a large number of individuals collaborate without central control and are able to solve jointly complex problems.

2.5.3   Psychology of Mass-Collaboration and Problem Solving

Mass-collaboration describes a phenomenon occurring with large groups working jointly on projects or following a shared objective in a self-organized way without or minimal central control. More specific, according to Bradley and McDonald (2011), mass-collaboration occurs if large and diverse groups create value, following a mutual purpose and building collaborative communities to fulfil the tasks to reach a common goal. A prominent example is the online encyclopaedia Wikipedia created by thousands of participants editing and adding articles and new topics, with minimal central control for quality and content regulation reasons. Other examples of mass-collaboration are open source projects. They allow software developers to participate in the development of open software products. For instance, products created by communities of mass-collaboration are the Linux operating system, the application server Apache, the database MySQL, the web browser Firefox to name a view of an increasing list. Other mass-collaboration platforms such as crowdsourcing, also called open innovation invite special skilled people to share their ideas to create new variations of products, assist with packaging problems, work on designs for clothing or solve other problems of the industry. The Internet and social media create the technological, functional and social interaction fundament of mass-collaboration. Important for this thesis are the

mechanism and psychological aspects behind mass-collaboration in conjunction with problem solving and collective decision-making.

Tapscott and Williams (2008) define four principles of mass-collaboration to explain how organizations approach this new form of collaboration with external communities. The first principle is openness, which defines the willingness of organizations to open their doors to innovate jointly with an external community of researchers, engineers, scientists and other skilled people (Tapscott & Williams, 2008). This has an impact on how organizations share their intellectual capital with the economic environment and questions the principles of hiding knowledge. An important factor of organizations to be successful is to turn their intellectual capital or property into innovations to generate a competitive advantage. Therefore, companies protect these properties until they have been able to extinct the forecasted value or sell them to others. A common approach is to use patents to protect their innovations and prevent competitors to imitate without the costs of research and development. In an economy that utilizes mass-collaboration, the concept of protecting intellectual property might change (Tapscott & Williams, 2008). This means, the principle of openness and mass-collaboration, which is to share ideas and to use them for further development in large communities conflicts with the intellectual property and patent approach (Bradley & McDonald, 2011). Therefore, if organizations integrate mass-collaboration in their value chain, for instance participate in open innovation projects they should open at least partly their intellectual property towards an open innovation community. As a result, existing solutions could be enhanced or utilized to derive new products and further innovations (Tapscott & Williams, 2008).

Another advantage could be found in the integration of a large body of knowledge, experience and talent in organizational research and development processes to shorten the time to the market of research intensive products (Bradley & McDonald, 2011). Openness has most likely an impact on organizational behaviour, because internal teams start to collaborate with external communities working jointly in the value chain of organizations. Peering or peer production, the second principle, is about how organizations collaborate with communities in the Internet to innovate new products, share knowledge and experience, whereas the members of the external communities are not bound to the hierarchical structures of the organization (Tapscott & Williams, 2008). According to Tapscott and Williams (2008) this will have an impact on the research and development departments and requires new processes that integrate external resources into internal teams. The motivation principle describes why participants join self-organized social networks and communities to contribute for instance in open source projects or add articles in Wikipedia. The motivation to participate in mass-collaboration is based on different reward systems that could be segregated into intrinsic,

extrinsic, immediate and delayed pay-offs and individual and social psychological rewards (Ha & Kim, 2009). They vary from individual to individual and span from personal achievement, being part of an important whole, status to reputation, and monetary incentives (Ha & Kim, 2009). For instance, on open innovation platforms, organizations set out monetary incentives to the problem solver or the group of problem solvers.

However, most participants contribute without monetary motivation, hence social and psychological rewards influence the most. This is in contrary to economic theory that manifests individuals striving mainly to maximize their benefits (Ha & Kim, 2009). Instead, mass-collaboration shows human beings from a social perspective contributing, helping and sharing with others without the need for extrinsic benefits. For instance, if an individual publishes a problem in an online forum other participants provide feedback and help to solve the problem (Ha & Kim, 2009). The fourth principle is sharing, which means mass-collaboration works if the contributors share their knowledge and achievements with others to generate new and additional benefits. For instance, Wikipedia is a good example to show how knowledge aggregates with each contribution, which could reflect the motivation of the participants. Sharing most likely depends on motivation and openness, which means that mechanisms of social behaviour to participate and contribute and to open knowledge and experience to others are the basis for sharing. Bradley and McDonald (2011) add six characteristics of mass-collaboration such as participation, collective, transparency, independence, persistence and emergence. In other words, mass-collaboration means participation of a collective that shares information transparently, allows working independent in persistent communities that appear naturally without hierarchies or given structures.

The process of integrating external and internal communities into an organizational problem solving and decision-making process depends on the awareness how mass-collaboration works. If organizations establish internal communities for mass-collaboration, they should define the purpose as the basis of the construct (Bradley & McDonald, 2011). This is reflected by the fact that communities in the Internet mostly exist because of a specific purpose they follow to motivate others to participate. Independency, transparency and emergence are important factors to start the formation process of a community (Bradley & McDonald, 2011). An organization should not force the participation in communities, but engage employees by offering interesting topics (Bradley & McDonald, 2011). Therefore, intrinsic rewards are more important to grow a community that collaborates, shares their knowledge, contributes and supports each other. Social aspects of communities, sharing common interests and therefore improving communication and exchange might affect collective decision-making as well. The challenge is how to

aggregate the proposals created by the community into a meaningful choice or solutions of a problem based on the results of mass-collaboration in an organizational context.

2.6 Decision Making 2.0: Integration of Social Media and Decision-Making

Following the terminology of Enterprise 2.0, which describes an organization that is characterized by integrating social media in their business practice, the term Decision Making 2.0 specifies the integration of social media and decision-making (Bonabeau, 2009; Elragal & El-Telbany, 2012). Comparable to Enterprise 2.0 the focus of Decision Making 2.0 is the utilization of computer mediated communication, collaboration and knowledge management in organizations following a participative approach. In other words, decision-making 2.0 aims to aggregate experience, ideas, and opinions within a collective decision-making process by utilizing social media. In order to understand how social media could be integrated in organizational decision-making available technologies, their application possibilities and limitations are reviewed.

The influence of social media on decision-making takes place on different dimensions such as social, technological and psychological aspects. Therefore, in order to understand the phenomena, it is required to investigate where in the decision-making process the impact takes place and how the decision-maker or the group of decision makers are influenced. Social media affects different stages in a decision-making process such as building opinions about a problem, collecting information and knowledge about possible solutions, facilitate deliberation and discussions and convey recommendations of a choice based on experience and preferences of the participants. In order to understand the impact of social media on decision-making one could start studying the phenomenon in the Internet and then transfer the findings into a business context. Even if the business environment is quite different from the application of social media in the Internet, the effects could provide insights relevant for the business application. However, parameters such as policies, regulations, economic objectives, hierarchies, relations, competition and structures differ from a public environment. They should be evaluated carefully during the analysis and the inferring process. This leads to the topic about social media and organizational decision-making.

If an organization already implemented social media, collective decision-making could be a by-product of the integration. For instance, if a product management team requires new features of a product for a next generation, they could utilize the corporate social network to gather ideas or invite the members of the organization to rate and vote for the proposals. Another area of application could be to invite the employees to share their opinions about a

corporate problem that has an impact on all employees, for instance proposals how to cut costs (Davenport & Manville, 2012). Each decision problem might require specific capabilities of the social media application utilized. Hence, to systematically approach collective decision-making mediated by social media the analysis should include where to integrate social media in the decision-making process and what type of social media applies for what problem and solution space.

This leads to the concept of social media integration in collective decision-making processes, the main topic of this thesis. This concept includes the findings in the previous sections of the literature review building the theoretical framework based on behavioural decision-making, organizational behaviour, social informatics and social media applied in business environments.

2.6.1 Social Media and organizational Decision-Making

According to Carlsson (2003) social media influences how human beings collaborate, build communities, exchange information, jointly create content and request advice in social expert networks. As a consequence social information technology in a business context has an impact on organizational behaviour and therefore also on the decision-making process (Elragal & El-Telbany, 2012; Tapscott & Tapscott, 2010). Social media creates and aggregates information and knowledge by integrating collective intelligence in the course of interaction, which could enhance the collective decision-making process (Elragal & El-Telbany, 2012). The following section discusses from a functional and behavioural perspective how social media could influence the collective decision-making process in organizations.

A topic to start with the investigation is the impact of social media on collaborative projects observed in user generated content applications such as wikis. These collaborative projects illustrate how loosely connected individuals in online communities are able to create an encyclopaedia such as Wikipedia (Shirky, 2008; Tapscott & Williams, 2008). An explanation of this phenomenon could provide the study of intelligent swarms in natural habitats (Miller, 2010) discussed in the section above. Studying the behaviour of swarms shows parallels to human behaviour observed in groups such as self-organization and collaborative problem solving (Miller, 2010). Hence, swarm intelligence could explain how collaborative projects such as wikis, open source and open innovation work without the need for central coordination, guidance, extrinsic motivation and control. Human beings in large groups show parallels to swarm intelligence, creating collaboratively complex software systems, and solving problems. Tapscott and Williams (2008) coined this phenomenon mass collaboration to describe how large groups jointly work together in a self-controlled network. Miller (2010) stated how individuals are motivated to participate in mass collaboration is comparable to the dance of a

honeybee or the pheromone trails of ants to convince and motivate their conspecific fellows to follow into promising areas for feeding or new habitats. He elaborates a collaborative project, such as user-generated content, starts with the first lines in an article as initial point. For instance, in Wikipedia this attracts further contributors, comparable with positive feedback cycles or network effects to add more content. In context with collective decision-making, this could be an approach how to motivate employees to participate in the process, placing starting trails in social network discussions, blogs or wikis about different tasks such as new product design, best practices handbooks, or creating case based decision support systems.

Greenhow, Peppler, and Solomou (2011) investigated the social media influence on the creativity process of human beings and showed how this applies to the approach of Csikszentmihalyi (1997) system model. He defined creativity as a system composed of individuals, knowledge domains and fields of informed experts. Hence, if creativity could be defined as a collaborative process within knowledge or expert networks, social media could support joining ideas during a decision-making process into creative solutions. Another aspect of social media is the process of knowledge creation, externalization and exchange. Boateng et al. (2010) describe organizations as communities that create relationships among individuals to work towards organizational goals. They explained the knowledge creation process referring to the SECI[9] model of Nonaka and Takeuchi (1995) and mapped the Web 2.0 technologies and social media to different interaction modes. Hence, Web 2.0 technologies could also be a means to enhance organizational learning and the decision-making process. An additional effect explained by Schneckenberg (2009) combines social network services (SNS) such as Xing or LinkedIn with social network theory by Granovetter (1973) about strong and weak ties. This means, individuals follow normally for problem solving and decision-making their strong ties, which means the individuals they are familiar with and trust. Individuals of weak ties belong to relations that are more distant. Social media bridges barriers of distance and connects weak ties individuals with strong ties individuals. Most SNS rely on peer-groups, which means weak ties following the definition of Granovetter (1973). They could become an important resource of knowledge exchange since they extend the circle of knowledge resources for individuals and groups. Within an organizational context, SNS could become a platform connecting geographically dispersed experts and to invite them to participate in a decision-making process adding their opinions, expertise, judgement and preference or review alternatives and ideas.

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[9] The SECI model introduced by Nonaka and Takeuchi (1995) describes the flow and organizational knowledge creation process of tacit and explicit knowledge in the stages of socialization, externalization, combination and internalization.

Social media affects communication in different ways such connecting individuals less formal and ad hoc and enhance the exchange of information with lower barriers to interact. As discussed, instant messaging lowers the barriers to communicate and enterprise social networks stimulate to connect individuals and share their thoughts in blogs, wikis, and communities embedded in Intranets. An important component of collective decision-making is how communication and information exchange takes place. Collective decision-making requires individuals to collaborate, interact during the problem identification, analysis, solution generation and evaluation of different alternatives. Consequently, social media considered as a means for organizational communication could influence the decision-making process at different stages. For instance, on information gathering, searching for advice, involvement of experts, collection and aggregation of opinions, stimulation of deliberation and discussions in forums and communities, evaluation and judgement about options and vote for alternatives to infer a collective choice. Hence, the integration of social media technologies could influence every phase of an organizational collective judgment and decision-making process in business environments. This thesis investigates how this influence could manifest and what changes compared to the traditional approach of collective decision-making from a collaboration, interaction and communication perspective. Traditional means in this context without social media mediated processes.

As discussed in the literature reviews above several perspectives are of relevance to integrate social media in the organizational business processes such as collective decision-making and problem solving. The concept of social media integration in decision–making processes needs to consider behavioural, social, technological, economic and managerial aspects to understand the different characteristic of effects they could cause.

2.6.2 Concepts of Social Media Integration in Decision-Making Processes

Following the approach described by Goertz (2006) to create a social science concept applied to the integration of social media in the decision-making process each step in the decision-making process should be analysed from a theoretical and an empirical perspective to understand how and to what extent social media could influence these steps. This allows understanding the phenomena by systematically analysing each step and to reflect what could be different if social media is integrated.

Starting with the first step, the problem identification, the need or the intention to change the status quo, which is the initiator of a decision processes. In business context, indicators for a decision-making process for instance could be to change the design of a product, because the sales numbers decrease

or customers asked for new features. The awareness about this need could already start within a corporate social network, because members of the support team already registered the feedback from the customers, who are not satisfied with the current design. In addition, a blog within the corporate communities or a publication on the Intranet could spread this information. In other words, social media could be a means to create the awareness about a problem within groups and therefore could stimulate and initiate the start of the decision-making process. The difference of the decision-making process compared to the process without social media could be based on the number of individuals involved, the speed of dissemination and the involvement of different groups in the organization. Hence, the discussion about this problem would not just stay in a specific department or a small group, but would involve others or the entire organization. This could stimulate participation and draw the attention of different groups in the organization. The next step of the decision-making process could be delegated to the members of a corporate community of practice, who define objectives and decision criteria on the corporate social network platform. The following step would involve the collective intelligence of the organization to analyse and provide alternatives using for instance a wiki platform to collect the ideas or a corporate blog that invites the employees to discuss the alternatives. In order to infer the collective choice in the final step, employees could participate a vote or poll.

2.7 Summary

The literature review revisited theories relevant to collective decision-making in an organizational context from different perspectives such as behavioural, social, process, knowledge and technological aspects. This led to topics about organizational intelligence and the influence of organizational characteristics on the application of social media and collective decision-making. The theory discussion about social informatics reviewed concepts about how information technology influences the behaviour of individuals and groups and the decision-making process. A theoretical analysis of social media and the phenomena of collective intelligence and mass collaboration provided the basis of the theoretical discussion about social media integrated in collective decision-making in organisations.

The essential outcome of the literature review from a theoretical perspective suggests that social media integrated in collective decision-making processes in a business environment is feasible and could provide advantages. Advantages found in literature mainly concerning the integration of a variety of thoughts, opinions, experience and knowledge provided from the employees of an organization embedded in a decision-making process. This is partly reflected in the described findings about the application of social media in the Internet and in organizations. However, it also suggests that specific aspects of organizational behaviour are required. These are transparency, openness,

and willingness to share, less strictly hierarchical structures that allow information exchange and interaction and decentralized decision-making. In addition, not every social media application is equally suitable to advance collective decision-making. Compared to different stages in the decision-making process and the nature and complexity of the problems different social media applications are feasible but not equally suitable.

The objective of the empirical part of this thesis is to investigate about the phenomena of social media integration in collective decision-making processes in business environments to find evidence if and how social media influences collective decision-making. Therefore, this thesis focussed on real, potential and perceived benefits and disadvantages, if any, of utilizing social media integration in collective decision-making processes in corporate and less formal contexts and on how any barriers that may exist might be overcome. These results are the basis of the concept of social media integration in collective decision-making processes. The methods, research strategy and design applied to investigate about these phenomena are described in the next chapter.

3. Methodology

3.1 Introduction

This chapter discusses the research paradigm, the ontology, epistemology and methodology based on the philosophical position of the researcher in order to explain the chosen research strategy and the research design. The section research paradigm, ontology and epistemology revisits different worldviews and contrasts them in order to explain why the researcher follows a specifically view. This leads to a differentiation and the rationale why this thesis applied qualitative and not quantitative methods and why case studies fulfilled the purpose of answering the research question for this thesis as a basis of the research strategy. Therefore, the advantages and limitations of case studies are underlined in context with this research. This discussion follows the research design, explaining the choice of the research site, the data collection and analysis methods, the interview approach and the utilized interview guideline and its purpose. Measures to assure validity and reliability emphasize the integration of quality standards followed during the process of creating valid and reliable research results. The final section explains ethics considerations this thesis follows in line with the standards of the University of Gloucestershire.

3.2 Research Paradigm, Ontology and Epistemology

The research paradigm, the ontology, epistemology and methodology determines how a researcher defines social entities, and the relationship between the investigated social entity and the researcher. In addition, it defines how to conduct a research project to find evidence for the investigated phenomenon (Guba, 1990). In general, a research paradigm embraces a school of thoughts or a set of beliefs about the real world and how research should be performed in line with this world view and to extend the body of knowledge (Lincoln & Guba, 1985). Since many different paradigms exist, the researcher needs to understand the differences and to decide which one to follow (Bryman & Bell, 2011).

This decision influences the purpose and the function of the research, the research strategy, the research design, the planning, the methodology and the interpretation of the results that lead into concepts and theories (Creswell, 2009). Paradigms define also the reasoning to reach a conclusion that the researcher uses to infer or argument about the investigated phenomena such as inductive or deductive (Bryman & Bell, 2011). Paradigms manifest differently among the scientific fields and disciplines. For instance in the field of social science and more specific in the study of society and organizations, positions are divided into the objectivist, which sees the organization as a real entity that consists of structures and processes that exists independent from social actors (Burrell & Morgan, 1979).

In contrary the subjectivist, sees the organization as socially constructed entity created by individuals according to Burrell and Morgan (1979). They distinguish four basic paradigms, the functionalist, interpretivist, radical humanist and the radical structuralist. Each paradigm views a society or an organization, as part of the society, differently. They are mutually exclusive according to Burrell and Morgan (1979), which means a synthesis of these paradigms is not possible.

The functionalist paradigm has its roots in sociological positivism rationalizing an organization using methods of natural science to understand order, stability and equilibrium in society and the effect of regulations and control (Burrell & Morgan, 1979). In other words a functionalist understands the social world composed of empirical identifiable and measurable units using methods from natural science to study them (Burrell & Morgan, 1979).

The interpretive paradigm investigates about explanations of the social world based on subjective experience. This paradigm searches an understanding of the social world from the individual's point of view constructed by the individual. This social world exists through sharing of meaning between the subjects and therefore can only be approached through these subjective interpretation of this meaning (Burrell & Morgan, 1979).

The radical humanist views the social world similar to the interpretivist, but with an emphasis on the ideological substructures and consciousness of the subject. This means, the radical humanist is interested in the ideological constraints that influence human beings and how this could change society.

The radical structuralist focusses on structural changes and the influence on society and social formation for instance through political or economic crises. Hence, a research paradigm in social science also draws a picture of reality and the social entities within, which includes an ontological and an epistemological orientation that defines the nature of things as explained above.

With the paradigm decision, a researcher also decides about his or her ontological and epistemological position. A large number of literature describes contrasting philosophical positions such as positivism and constructionism or interpretivism or also called anti-positivism, which emphasises the essential differences between these world views (Berger & Luckmann, 1966; Burrell & Morgan, 1979; Kemper, 1981). A positivist follows the tradition of natural science based on sensory perception, causality, objectivity, observations, empirical experiments and measurements to formulate hypotheses, and to test and verify theories and laws (Bryman & Bell, 2011; Lincoln & Guba, 1985). In other words, according to Kemper (1981) a positivist investigates about social phenomena based on biological and

physical categories and social structure, power and status that determines the behaviour of human beings such as emotions. A positivist aims to reduce the complexity of measurable reality into smaller portions to create a model about it and to allow a reduction into dependent and independent variables to determine cause and effect and to measure and control (Bryman & Bell, 2011). Positivists place themselves outside the observed unit of investigation, aiming an inquiry free of values, using mainly quantitative methods such as statistical analysis of data to infer the validity of theories, to generalize phenomena or to deduce new laws to explain an objective reality (Creswell, 2009; Lincoln & Guba, 1985). In other words, a positivist believes that the real world could be decomposed into its basic elements, which would allow understanding the world and every phenomenon (Lincoln & Guba, 1985).

A constructionist understands the real world quite differently from a positivist view and postulates different methodologies to investigate in this reality. According to Burrell and Morgan (1979) an anti-positivist studies the social world from the view of the studied individual acting within a real-life setting. The researcher's position of an anti-positivist is not an external observer, but a part of the study participating directly in the investigation (Burrell & Morgan, 1979). A constructionist following Berger and Luckmann (1966) looks from a different perspective on a subjective reality that is constructed by individuals dependent on their experience, perception, interaction with other individuals, the social environment, history, values, cultural settings, subjective sense making, context and situation the individuals live in. In addition, a constructionist rejects the importance of biological and physical categories explaining human behaviour and rather determined by social norms and the situation they are involved (Kemper, 1981). The constructionist aims to understand the complexity of different perspectives rather than reducing the phenomena into simplified categories and places him or herself as part of the inquiry (Berger & Luckmann, 1966). In other words, the constructionist studies individuals in their context and agrees that he or she is part of this environment (Creswell, 2009).

Hence, the researcher's interpretation of the phenomena is influenced by the researcher's personal experience and biography and the environment. As a consequence, the researcher is part of the investigated unit (Creswell, 2009). The social constructionist emphasises the construction of meaning within the social interaction process among individuals concerning verbal and non-verbal communication, but also the influence of historical and cultural aspects of the individuals (Berger & Luckmann, 1966). Interpretivism follows similar epistemological grounds as constructionism (Bryman & Bell, 2011). However, interpretivism postulates that the real world can only be perceived and understood through the interpretation of human being's mental realities (Bryman & Bell, 2011). The subjective interpretations and meaning of words

is used as a key of explaining them in social action utilizing descriptive analysis (Bryman & Bell, 2011). This means, reality exists only as mental interpretations of human beings dependent on social context, social interaction and lived experience (Berger & Luckmann, 1966).

The research methods applied in the constructionist world view are based on an ideographic approach according to Burrell and Morgan (1979), which aims to gain knowledge directly from the studied subject. This includes qualitative methods, which means the researcher collects data in the field interacting with the studied individuals, asking questions using interviews and inductively interprets the meaning of the results, develops new theories or extends existing ones (Creswell, 2009).

The decision about the paradigm this thesis follows was determined to one part by the philosophical position of the researcher, but also by the investigated subject. The integration of social media technologies in collective judgment and decision-making processes in organizational business environments is a rather new topic in the scientific field (Merchant, 2012). Theories and empirical studies about different aspects such as decision-making theory, organizational behaviour, the social impact of information technology and social media exist, but the combination and the application to the subject of investigation, which are the individuals within an organization, are not well established. This suggests the application of a research methodology that follows an exploratory approach, suitable to contribute and advance already existing research and theory to increase the body of knowledge about an emerging phenomenon rather than following a theory testing or falsification approach (Bryman & Bell, 2011).

The second aspect is the focus of this study to gain a deep understanding about the complex collective decision-making process, influenced by social interaction of individuals in formal and less formal settings, mediated by information technology within an organizational context. This subject could be investigated either using quantitative methods such as surveys or qualitative such as interviews. A statistical approach asking a population about their experience with social media and decision-making could provide general aspects of usage and utilization within this population. This could show statistical trends in society and organizations about the distribution of social media in organizations, the fields of application and a basic understanding about their acceptance and general problems of integration.

However, to understand the complex social processes how individuals construct their reality, interact and collaborate, utilizing information technology in their working environment, influenced by organizational culture and social settings asks for qualitative methods. Therefore, the researcher needs to approach the social environment of the studied individuals, analysing their

behaviour within conversations, conducting interviews and investigating in the cultural context and structures of an organization. The way information technology evolved, how individuals in organizations learn about the application of social media influencing the interaction of individuals requires an understanding about their views. Further topics to understand are how this changes behaviour, the construction of meaning that influences their contributions, their choices and their decisions. During conversations with the investigated individuals, details could surface about how social media changes the way of interaction, but also what leads to avoidance or acceptance of their application within the working environment, dependent on the social settings.

This research followed three questions explained by Guba (1990) to define the position, worldview and the paradigm. The first question is about the ontological view about what the nature of reality is. Second the epistemological question about the relationship between the unit of investigation and the researcher and finally the question about the methodology, how the inquiry is conducted. Following these questions, this thesis is based on a social constructionist world view and the paradigm linked to it because (a) the researcher believes in the subjective construction of meaning of the world, arising from the interaction with an existing real world and human beings and their interpretation, (b) the aim of this research is to understand a phenomenon from the views of the examined individuals within a complex real life setting, (c) the research results rely on the experience of the individuals that could unfold important details during conversations in qualitative interviews, and (d) the topic is rather new with a small number of research and theories available.

In order to understand social phenomena from a constructionist worldview the results gathered from investigations are based on methods such as qualitative interviews, focus groups, ethnography, case studies, discourse and conversation analysis or observation, following the hermeneutic-phenomenological tradition and methods of interpretative understanding (Laverty, 2008). Following Heidegger, Macquarrie, and Robinson (1962) and van Manen (2010) hermeneutic-phenomenology is the study of human beings, their lived experience and their historical background that influences their perception and creation of meaning. Besides the understanding of how human beings experience reality, hermeneutic-phenomenology emphasis what this means to them (van Manen, 2010). In other words, individuals create their own meaning of the real world in the process of interaction. Therefore, hermeneutic-phenomenology examines human beings behaviour and focusses on verbal and non-verbal communication, analysing, and interpreting the meaning of language and its use (Annells, 1996). In the social process of constructing reality from a constructionist perspective interaction among individuals takes place by using language in different forms of communication (Bryman & Bell, 2011). Hence, to understand social phenomena the

investigation about meaning of verbal and non-verbal language allows the researcher to analyse, compare and interpret how reality is constructed.

The focus of this research is to investigate and explore about how human beings interact in formal and less formal social settings using computer-mediated communication and collaboration within the process of collective decision-making. The investigated objects of this research are individuals, their behaviour, perception, interaction and their lived experience influenced by their historical background, organizational culture and the environment. In other words, the aim of this thesis is to answer the research question by gaining an understanding about the social process in its complexity, which requires from the researcher's point of view an approach that allows engaging the individual and the researcher in an explorative process. Therefore, the research strategy applies a qualitative research approach based mainly on multiple case studies, semi-structured interviews and documentary data.

3.3 Research Strategy

3.3.1 Quantitative and Qualitative Research Approach

This thesis follows an interpretive paradigm in line with the philosophical position of a constructionist. Therefore, it applies a qualitative research approach, which utilized semi-structured interviews, analysis of documentation and case studies (Bryman & Bell, 2011). Although the qualitative research approach is widely accepted in academia, the discussions about the reliability, possibility of replication and validity of methodologies among the different paradigms are still ongoing (Bryman & Bell, 2011; Creswell, 2009; Flick, 2009). Since the analysis of qualitative data follows subjective interpretations and narrative discussions and conclusions, the overall approach could be perceived as less structured and logically justifiable compared to a quantitative perspective (Bryman & Bell, 2011; Silverman, 2011). However, qualitative analysis offers different methods to structure, to categorize and to code qualitative data to define relationships and patterns to infer explanation about a phenomenon and its cause (Creswell, 2009).

Probably the main issue about this methodological comparison is the comparison itself. This means since both methods follow a different epistemological strategy a judgement about which method is closer to the truth should consider a philosophical discussion. Both methodologies are capable of delivering scientific evidence for applied research and should be used according the capabilities and experience of the researcher and the investigated topic. Therefore, also the objective and the purpose of the inquiry are of importance, because it should determine the appropriate method. In social science, both methods are applied and in some cases, both appear in the same study, but with a different objectives (Creswell, 2009). For instance, if a researcher aims to understand and explain a phenomenon using

quantifiable terms such as statistical distributions of a population based on specific testing variables he or she investigates with a quantitative approach. The results of such an inquiry could allow the researcher to generalize a phenomenon and leading to an explanation about its causality. However, if the quantitative inquiry is not able to explain the whole context, this could lead into an in-depth qualitative study to understand the phenomenon within different settings and to explain why individuals behave the way it is shown in the statistics (Creswell, 2009). On the other hand, a quantitative study following a qualitative study could allow generalizing the findings to a larger population. In other words, both methods could supplement, but do not necessarily substitute each other.

This thesis aims to gain access to the experience of organizations and individuals in conjunction with social media technologies and collective decision-making in a business context. Therefore, to explore this relatively new phenomenon only qualitative methods were applied. This means, since this study touches to some extent rather new scientific grounds it was conducted as an exploratory research to add to the body of knowledge and to open avenues for future inquiries. To provide an insight about the applications of social media in different social settings, the study analysed organizations on different stages of integration. The aim was to improve the understanding of this social phenomenon by choosing contrasting cases. According to K. M. Eisenhardt (1989) multiple case studies provide a higher potential for theory building since they allow comparison among them for instance the replication of specific criteria. This research studied three different cases based on different organizations and industries. They stem from transportation, retail and information technology industries. The important criteria of the choice were the maturity these organizations present in terms of information technology mediated communication and decision-making, culture, hierarchical structures and power distribution to infer if these different criteria influence the decision-making process and if they do how the individuals perceive this in their real-life experience. Why these cases have been chosen for this thesis is further explained in the choice of research site section.

This research followed a standardized process that guided the research through the different phases of the project as recommended in the literature. This means determining the approach according to the research topic, selecting contrasting cases, using appropriate methods and analysing the data (K. M. Eisenhardt, 1989). Therefore, this research employed multiple sources of evidence, including semi-structured interviews and documentary information applying a triangulation technique, which is in this thesis the integration and combination of different data sources embedded in multiple case studies. Semi-structured interviews have been preferred over structured interviews following Kvale and Brinkmann (2015), because this study aims to

explore the phenomena by incorporating the findings into the research process for further adjustment of the questions to gain more insight. This means, during the interviews new perspectives might surface as the interview progresses. This provides the researcher with more flexibility to follow relevant details of the individual's experience by asking additional questions. The section Interviews discusses the interview technique more in detail and the justification of the choice for the semi-structured interview method.

3.3.2 Case Studies, Advantages and Limitations

A case study is a popular approach in business and management research to study a phenomenon within its context. They allow gaining an in depth understanding about complex interrelations. Compared to other methods in social science, a case study concentrates on a case, which could be an organization, a location, a person or a single event (Bryman & Bell, 2011). In other words, a case based inquiry investigates in a bounded setting to allow an intensive study of a specific setting. A case study embraces different advantages compared to other scientific methods. Primarily to investigate within a bounded setting, they allow a deep analysis of a complex phenomenon under conditions that are relevant to its real-life context. Case studies combine a set of methods to collect and analyse data to investigate within a complex scenario that has to be approached on multi levels of analysis (Eisenhardt, 1989). In other words, a case study is a flexible scientific method adaptable to the unit of analysis, individuals interacting in complex decision-making processes within different organizational socio-technological settings mediated by social media. A main distinction and advantage of case studies compared to other methods such as experiments is the ability to consider the context and the dynamics of an analysed unit. This could increase the complexity of an inquiry that only utilizes quantitative methods (Yin, 2009). For instance, if a research attempts to survey a phenomenon that depends on the setting and the environment the number of parameters that could influence the investigated topic increase and add to the complexity of inferring a cause and effect. Case studies are an appropriate research approach for new topics. They allow to access scientific areas that need an in-depth understanding and to develop new theories from empirical evidence. They demonstrate to some extent novelty using a iterative approach that use theory and data and vice versa (Eisenhardt, 1989).

The application of case studies is very broad. However, they do not fit every inquiry or research question (Yin, 2009). If the researcher asks for quantifiable evidence such as how many people suffered from an accident or what was the outcome of a specific program, such as a salary increase or changes to living standards the case study is possibly not the most appropriate method. These topics are most likely candidates for surveys that focus on statistical evidence. Case studies allow learning from a specific case. However, details about the

phenomenon, in order to generalize from one case study are rather limited compared to large surveys. In addition, if a research searches for evidence by conducting an experiment in a laboratory environment, investigating how variables react on manipulation then the case study is not the appropriate method. The case study quality depends on factors such as the experience of the researcher, the design, the processes and procedures and the selection of appropriate sites. Compared to a survey the quality of the results depends primarily on statistical and mathematical skills. In addition, the responsibility to avoid bias in a case study is largely with the researcher. He or she decides which data is relevant to collect, who to interview, what questions to ask and how to analyse and interpret the results. This means, qualitative case studies explain the results from the perspective of the researcher, which could be interpreted as a limit of the method, much likely from a positivist worldview.

Although the case study is an accepted method in academia, the criticisms are similar to those about qualitative approaches. This means, whether or not a case study is able to fulfil scientific standards of reliability, replication and validity. A concern often mentioned in the literature is about researchers not following a systematic and rigorous approach. In addition, data generated in case studies do not provide satisfying evidence for a scientific generalization. Of course, the study of a single case provides rather less comprehensive evidence than studies including a number of cases or a population, but, as with other methods, systematic procedures are defined and available for case studies to assure quality and reliability. The measures applied in this thesis are defined and explained in the section: 4.4.5 Measures leading to Validity and Reliability. Furthermore, the objective of the research using a case study or multiple case studies is important to understand. A case study does not primarily search for generalization of the findings, but particularization and understanding of the phenomenon and its complexity in a specific environment (Bryman & Bell, 2011). Yin (2009) describes different applications of case studies, such as to explain, describe, illustrate and enlighten complex causal links in real-life that are too complex to uncover in an experiment or a statistical inquiry. Therefore, if a research topic is appropriate to conduct a case study relates to the definition of the case study and the inferred requirements. Yin (2009) divides the definition of a case study into a scope and a technical definition, covering data collection and analysis. The first part is defined as follows:

> *A case study is an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between the phenomenon and context are not clearly evident.*

This definition emphasizes the key requirements of a case study. Furthermore, this definition reminds about the nature and the aim of case studies and allows

reflection on the research topic and the research strategy. The reflection assures the researcher about whether the topic is appropriate for a case study investigation. Applied to the <u>investigated</u> topic of this thesis, the integration of social media that emerges within an organizational context is a <u>contemporary phenomenon</u>. This study aims to gain access to the experience of organizations and individuals in conjunction with social media technologies and collective decision-making in a real-life business <u>context</u>. The influence of the <u>phenomenon</u> of social media on the organizational behaviour and as a consequence on the collective decision-making process within an organizational *context* is not <u>clearly evident</u>. Hence, from the scope definition of a case study the topic of this thesis would be suitable for a case study following (Yin, 2009).

The second part of the definition by Yin (2009) is the technical definition that focusses on data collection and analysis:

> *The case study inquiry copes with the technical distinctive situation in which there will be many more variables of interest than data points, and as one result relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result benefits from the prior development of theoretical propositions to guide the collection and analysis.*

The technical definition of the case study emphasizes the possible complexity of a case and the different methods needed and sources of evidence to study. The theoretical propositions are drawn from the literature review of this thesis leading into theoretical discussions and conclusions, which determined the selection of the methods to collect and analyse the data. Following Yin (2009) conducting a case study research, this thesis employed different sources of data. At the beginning of the case study, the available documentation and archival records were researched to provide information about the organization such as public articles, announcements, reports and other documentary relevant to the study. This documentary analysis provided a general understanding about the organization structure, business model, culture and its history. The other source of evidence served semi-structured qualitative interviews that provided the research data for an in-depth analysis, based on coding, and interpretation, to gain an understanding about how human beings experience and perceive decision-making within a socio-technological setting utilizing social media. The applied interview structures are further discussed in the section Interviews to justify the method and the techniques. In order to compare different organizational socio-technological settings to understand the influence of social media a multiple-case study was conducted. The objective was not to generalize the research results, which are normally not the objective of a constructionist, but to understand if different cultures and hierarchical structures of organizations and the experience about

the utilization of social media have an impact on the implementation and the utilization of the organizational process of collective decision-making.

3.4 Research Design

After choosing the research paradigm, and research strategy considerations about a quantitative and qualitative approach, the research design transfers the decisions and justifications into an applicable design to conduct the research (Bryman & Bell, 2011). The research design defines how to approach the unit of investigation, with appropriate research methods and guides the researcher through structured research process (Flick, 2009). For the researcher it is important to complete the research design consisting of the objectives and the purpose of the research, which stem from the research question (Creswell, 2009). In addition, the research design should be in line with the philosophical position of the researcher, since this will influence the selected methods, the analysis and argumentation about the results (Bryman & Bell, 2011). Therefore, a researcher should carefully evaluate the methods and the units of investigation to make sure that these criteria are met. Hence, the research design creates a framework about how to approach a unit of analysis, the choice of the research site, the data collection and the analysis. The units of investigation in this thesis were individuals interacting in complex decision-making processes within different organizational social real-life settings mediated by information technology based on social media. The research design followed a case study design that includes semi-structured interviews and documentary analysis. Finally, the research design closes with a discussion about the quality measures to make sure the process of data collecting, analysing and interpretation follows standard criteria such as validity, reliability and replication.

3.4.1 Choice of Research Sites

The choice of a research site should be in favour of the analysed unit, which means the research focus determines the site of inquiry (Eisenhardt, 1989). This process of sampling in qualitative research is different from sampling in quantitative research. For quantitative research, samples have to demonstrate a random character to apply statistical methods to determine the probabilities of an event. For this study, which is qualitative, a purposive sampling method was applied. Purposive sampling chooses the samples according to their characteristic to provide a satisfying level of relevance about the phenomenon to be studied. However, the availability and the willingness of the organizations to participate had also an influence on the choice of the sites. In order to reach an ideal purposive sampling would require higher levels of contrasting sites as this research is based on. In order to understand the phenomenon of social technology systems, their application should be studied within different social settings. Therefore, this thesis searched for evidence about the influence of social media integration in organizational decision-making and judgement

processes by investigating different research sites. In other words, different organizations showed specific patterns about information technology mediated processes, their integration and its barriers if any.

Suitable candidates for this research were organizations in a knowledge intensive and volatile industry. For instance, life science, high-tech, communication technology, computer industry, retail, education or engineering, because the utilization of information technology should be of importance. However, if the majority of employees are not involved in the information exchange process, knowledge sharing and collaboration the internal utilization of social media is less likely to be observable. Therefore, three sites have been carefully selected. The selection was based on their history, structure, and culture and how they operate to assure they were suitable for this research. In addition, candidate sites for this research had to utilize social media technologies such as social networks, discussion forums, intranets, wikis, expert groups, voting and blogs. Ideally utilizing social media technologies in conjunction with their decision-making process or they should be in the process of adopting such methods. A research site that already utilizes social media could provide information about the evolvement of the processes, and was a prerequisite to infer perceived benefits if any by the interviewed individuals.

The selection process started with the identification of sites fulfilling the criteria for this research based documentary data, articles, blogs other publications and discussions on social media platforms, corporate webpages and business reports. The second step was to address an individual from the management, the gate-keeper, to explain the purpose of the research and how the research will be conducted such as interview length and questions. This initial discussion provided a first insight about the organization and weather the criteria were met to generate the data required. After the second step, out of six suitable candidates, three were willing to participate in this research. Following the permission of the gate-keepers to conduct the interviews with members of the organization the gate-keeper provided the contact information of the employees willing to participate. Each participant was then addressed individually to explain the research topic, the purpose, the role of the interviewee and to schedule a meeting for the interview.

Three sites have been chosen that fulfilled the requirements above. They represent different organizations and industries from the fields of transportation, retail and information technology. These organizations represent different stages of implementing information technology and social media into their daily business for different purposes. Therefore, they have different organizational histories integrating information technology, which allowed comparing different evolution path and their readiness to integrate new technologies in their communication and decision-making processes. The

research sites present different cultures concerning hierarchical structures and decision-making processes and following different business models. This allowed contrasting them if they benefit from computer mediated collaboration and decision-making processes or if this creates problems for them from a managerial or from an individual's perspective. Internal communication and collaboration across teams and departments is an important key factor in their daily business combing different roles into a collective, participatory or centralized decision process. These criteria allowed inferring if they influence the decision-making process and if they did how the individuals perceive this in their real-life experience.

3.4.2 Data Collection and Analysis Methods

This research applied a structured data collection method within a case study design starting with an analysis of organizational data found in corporate announcements, annual reports, corporate sites, public articles and in social media and a series of interviews conducted at the research sites. The semi-structured interviews allowed repeating questions and therefore the comparison between different individuals and cases. Organizational data allowed to understand the general purpose, products and services, history, values, vision and culture. In addition to understand how the organizations are structured, hierarchical models, their challenges in the market, the competition, strategies, how they differentiate and how they follow market change such as demand and new technologies. Of further interest was how they communicate internally and externally, what kind of technologies they utilize, how they define collaboration among employees, groups and departments, their position about openness, transparency, how they utilize information technology and where they utilize it and for what purpose. For instance, where ICT is part of core business processes and where ICT plays a rather supporting role. This provided a general view of each organization from the outside, which means how they perceive themselves and how they would like to be seen. These individual data sets from each site provided in addition the possibility to contrast between an external and internal view of the interviewees, the organization and its management.

The preference was set on semi-structured interviews, because they allow to ask more questions if they lead to further details during the interview (Bryman & Bell, 2011). The interviews aimed to investigate three main areas: organizational behaviour concerning openness, transparency and communication, social media integration in a business context and its impact on the collective decision-making process. Since some effects are of a subtle nature, which means the interviewee is not fully aware the questions had to be carefully evaluated to collect this information. Hence, this is another reason for semi-structured interviews since they allow focusing in certain directions to uncover important insights.

The interviewees represented different roles to gain different perspectives in an organization on different hierarchical levels. They represented senior management, IT managers, team leaders, knowledge workers and other professionals from different departments. This was of importance to understand the influence of relationships in social networks, different perspectives within the organization between the individuals and how they perceive benefits if any, similarly or differently. Questions focused on the process of decision-making, such as who makes the decisions at what level and what are the technological aids implemented. Furthermore, the interviews delivered data about the usage of social technologies and the barriers preventing further integration.

The study followed an analytical framework that used transcription of the recorded interviews, organizing and preparing the transcripts for analysis by formatting and structuring sentences. After the structuring followed an in-depth study of the text by reading them several times, making notes, applying open and axial coding techniques, building concepts and categories following Silverman (2011), Creswell (2009), Bryman and Bell (2011) and Kvale and Brinkmann (2015). The analysis of each case followed a cross-case analysis that allowed comparison of the results, interrelating the categories and interpreting the relation between the cases (Yin, 2009). For the analysis, the analytical software NVivo was utilized to structure and to code and to work through the large amount of data, collected in the interviews. The aim of the analysis was to identify, understand and interpret common patterns of behaviour. A focus was set on perceived and real benefits or disadvantages if any and barriers that may exist concerning the application of social media integration in the area of collective decision-making within formal and less formal groups. The analytical process followed theoretical knowledge discussed in this study, previous research and utilized scientific analytical tools and methods following a rigorous research procedure.

The analysis of the data started with the transcription of eighteen hours of interview recordings into two-hundred-fifty pages of text. Each interview was structured into sections following the interview guideline. The transcription was supported by a transcription software, which allowed to listen to the recorded interview while writing, going back and forth if needed to understand each interview section and statements of the interviewees. After that started the structuring of the data with coding line by line of the transcribed interviews by utilizing a thematic technique identifying words or parts of sentence summarizing into ideas, concepts, actions, relationships and meanings the statements provided. In a first iteration two-hundred codes were created keeping the focus on relevance to the research topics. These codes were further condensed and refined in another iteration into one-hundred-thirty-five codes. In a next step the codes were sorted into twelve themes along the main

blocks of the interview guidelines and a focus on the research questions. For this analytical work Nvivo software was used to keep the overview about the vast data and to allow drilling down into specific topics of the interviews and to compare between the cases. During the reporting of the findings the codes were used to identify significant areas for research to pick interesting quotes from the interviewees and reflect and interpret how they link to topics such as perceived individual and collective organizational decision-making processes or perceived risks and disadvantages of social media integration.

3.4.3 Interviews

Qualitative interviews are a research inquiry conducted as a conversations between an interviewer and an individual, the interviewee, in order to understand a social phenomenon from the individual's perspectives, describing their perception of reality, meanings and experience (Bryman & Bell, 2011; Kvale & Brinkmann, 2015). In other words, according to Kvale and Brinkmann (2015) a qualitative interview is about the everyday lived world of individuals and their experience by constructing knowledge during the interaction between two individuals. The aim of a qualitative research interview is to gain a precise and specific description from the individuals about their experience, with a focus on the specific topic of inquiry. Precision and stringency in description reflects also the characteristic of the interview's quality.

For the interviewer it is essential to understand the meaning of what the interviewees express from their views and how they express it such as gesture, body languages or tone of voice (Kvale & Brinkmann, 2015). Hence, listening and sensitivity allows to recognise details of the conversation and to interpret how interviewees behave. For instance, the interviewer should be aware about ambiguities that might occur during the course of the interview. This means, the interviewee could make contradicting statements due to communication failures or cognitive limits. Therefore, a research interview has to follow methodological guidelines to cope with the qualitative interpersonal situation of the interview and to gain relevant information for the research topic. The researcher followed in this thesis an interview guideline to keep the focus of the interview and carefully listened to the answers of the interviewee. In addition, the researcher repeated the answers utilizing paraphrasing technique to make sure both parties, interviewee and interviewer, understood each other and in the case of misinterpretation or contradicting answers to give the possibility to rethink the answer or rephrase it.

Different types of interviews exist, such as structured, semi-structured and unstructured interviews applicable to different units of investigation (Bryman & Bell, 2011). A structured interview has a defined schedule of research questions the researcher strictly follows. The aim of this structured interview

approach is to increase the possibility to generalize the results and to simplify coding (Bryman & Bell, 2011).

A semi-structured interview follows a structure as well with defined questions, but when conducting the interview, the semi-structured approach permits the researcher more freedom to change the order of the questions and ask additional questions. These questions might appear during the interview and could provide a deeper insight and more detail about the topic (Bryman & Bell, 2011). An unstructured interview is similar to a free conversation, which could consist of a starting question that leads into different topics of interest (Bryman & Bell, 2011). Concerning the purpose and research objective and the individuals or groups interviewed, additional distinctions of interviews are possible. Flick (2007) distinguishes interviews such as the focus group interview, which are group interviews. The interviewed individuals share a common experience but also common characteristics such as demographics, habits or preferences.

Another interview type is the problem centric interview mostly applied in psychology to understand a problem by analysing the biography of an individual. In addition, Flick (2007) mentions the expert interview, which concentrates less on the biography of the interviewees, but on their expertise. For instance, individuals of an organization with specific functions or professional knowledge about business processes are participants of expert interviews.

The interviews in this study were conducted within multiple case studies. The aim of the interviews was to compare the answers from different sites that present different structures, cultures, distribution of power, business models and methods of decision-making. Following an interview guideline with structured topics and questions allowed analysing how the answers change between the individuals, but also between the different social settings. Therefore, semi-structured interviews were more appropriate than unstructured interviews for this study, because semi-structured interviews allowed a comparison between the interviews during the analysis of the data gathered from the cases. In addition, semi-structured interviews offer the flexibility to learn about the different settings in an organization and to receive additional details.

The interviews were conducted at the premises of the organizations in a closed meeting room allowing the interviewees to speak openly and to concentrate on the questions shielded from distraction and background noise. The interviews were recorded, because this allowed the interviewer to concentrate on the questions and answers without the need to note everything down. Furthermore, the recordings provided details that surfaced only in the analysis after the interview by listening to specific passages several times (Kvale

& Brinkmann, 2015). The gathered recordings went through different analytical steps starting with carefully listening, transcribing, coding, and condensing along the process of analysis and interpretation.

The main objective of the conducted qualitative interviews in this research was to gain an insight about how individuals in organizations perceive social media within a collective decision-making process and how this influences their behaviour. The questions were based on the theoretical discussions in the literature review, such as organizational behaviour, collective decision-making and the social impact of information technology in business environments. These theories served as guideline for the researcher and provided a basic understanding about related topics. However, keeping in mind the primary goal of qualitative interviews, which is openness towards a new phenomenon, following Kvale and Brinkmann (2015). The focus of the questions was to gain a deep understanding about the complex decision-making process that might be influenced by social interaction of human communities enhanced by technology, such as social networks, blogs, wikis and voting-systems within corporate and less formal contexts. Therefore, the questions aimed to identify the interviewee's perception of benefits or disadvantages of using social media and if barriers exist to utilize social media for collective decision-making processes. The structure of the interview and the questions is reflected in the interview guideline.

3.4.4 The Interview Guideline

An interview guideline provides the structure, defines the schedule of the questions and guides the researcher through the interview. The structure should provide an order of the topics that helps the interviewer and the interviewee to follow and check if all aspects are covered. In addition, the language of the questions should be comprehensive to make sure the interviewee understands them (Bryman & Bell, 2011). Furthermore, it is important to avoid leading questions, which means the interviewee should not be influenced by the question itself (Bryman & Bell, 2011). The guideline should also include a sheet that records information about the interviewee such as the name, gender, role, position, responsibilities or other information relevant for the later analysis. Formulating questions should follow the research area, the research question and the theories and conclusions from the literature review.

The introduction of the guideline used for this research started with the research topic to make sure the interviewee understands the purpose of the research and explains the research questions. The next section was about the basic information concerning the interviewee, such as the organization, department, name, role and responsibilities. The interview started with general questions about the individual within the organizational context. They focused

on organizational behaviour topics such as perceived openness, willingness to share information, hierarchical structures and culture. This provided an insight about organizational power structure and the possibility of centralized and decentralized decision-making. This part investigated also about the utilization of information technology that supports communication, interaction, information retrieval, exchange and collaboration at work. These questions focused on the experience, preference, perceived benefits, purpose and the kind of ICT the interviewee utilizes regularly in the daily business. The aim of this first block of questions was to learn about the socio-economic environment the interviewee lives in and the application of information technology.

The second part of the interview guideline embraced questions about the organizational decision-making process. The objective was to learn about decision-making strategies, processes, methods and tools applied to cope with daily business problems. An additional interest was set on the experience in the collective decision-making process and its perceived advantages and disadvantages.

The third block aimed to grasp if and how the interviewees utilize social media in context of decision-making and if so what were the perceived benefits, disadvantages or barriers to overcome. If the interviewee had no experience with social media and decision-making, the questions targeted on the personal position of the interviewee about this topic.

The last question block considered the general perception about the utilization of social media in the organization. For instance, support of management, policies, guidelines and barriers to overcome to disseminate social media in the organization.

3.4.5 Measures leading to Validity and Reliability

Quality assurance of the research process plays an important role in research to assure that the results generated provide evidence based on common quality standards and the findings are worth considering as a contribution to the body of knowledge (Golafshani, 2003). The discussion about which criteria are applicable across the different research strategies has not found common grounds (Flick, 2007; Golafshani, 2003). However, Yin (2009) emphasises the importance of standardized quality consideration when conducting case studies and qualitative research, such as validity and reliability. However it is questionable whether these two quality characteristics are applicable to qualitative research (Golafshani, 2003). Quality measures are required from both, quantitative and qualitative research strategies, but the approach, how to meet them is as different as the philosophical paradigms and the methodologies themselves differ (Bryman & Bell, 2011). In other words, the data, the analysis, interpretation and conclusions drawn upon follow different procedures and processes. The analysis in quantitative research primarily

focusses on quantifiable, measurable evidence, applying mathematical methods to replicate and test the process and the results (Creswell, 2009). Qualitative research aims to understand the phenomenon in a real-world setting, not isolating elements of the investigated unit and the researcher, but including the whole unit and the researcher to understand the phenomenon in its complexity (Creswell, 2009). This means the narrative and interpretative process of qualitative research itself is the method to justify reliable results.

Following Golafshani (2003) for both qualitative and quantitative research strategies, in order to meet quality standards, the researcher has to apply defined procedures to ensure reliability and validity of the analysis, interpretations and conclusions. A general requirement is to follow a consistent, systematic and methodological research process that is precisely documented (Bryman & Bell, 2011; Creswell, 2009; Flick, 2007; Yin, 2009). This starts with the research question and the unit of investigation, the selection of appropriate methods, planning the research, collecting data and applying appropriate methods of analysis (Bryman & Bell, 2011; Creswell, 2009). Qualitative research shares no direct comparison with quantitative quality characteristics, such as generalizability or external validity, consistency and stability of the results (Creswell, 2009). Therefore, the qualitative researcher follows other criteria and procedures to meet the quality standards of validity and reliability.

Reliability starts with the collected data such as interviews, the main portion of data utilized for this thesis and the transcripts. The researcher should check the data carefully against writing errors, while transferring audio information to transcripts (Creswell, 2009; Silverman, 2011). Another quality measure is to follow a defined coding procedure, which aims to keep the meaning and definitions of categories consistent and to make sure they are properly linked to the statements, words and paragraphs (Creswell, 2009).

The coding method applied in this thesis was based on an analysis that focuses on meaning following the steps of defining keywords on text passages of the transcripts. In addition, categorization and meaning condensation to structure the data and a critical interpretation of the meaning of what was said in the interviews following Kvale and Brinkmann (2015). The process was supported by the computer program NVivo, which offered consistency checking over the complete coding stack. Accuracy of the findings is another quality requirement of validity to be achieved by of the researcher.

Creswell (2009) describes several validity strategies to assure the accuracy of the findings. Triangulation, which was applied to this research, added to the validity of the research by using different sources of information from different perspective and documentary sources to support the evidence (Creswell, 2009; Golafshani, 2003). This research used semi-structured interviews and

documentary information from the investigated sites about their history, business model, hierarchical and cultural aspects. This allowed comparing perceived internal structures and cultures of an organization with what was published or perceived outside the organization. In other words, contradicting answers in the interviews were questioned, but also showed that real-life culture, power distribution and processes of decision-making may differ from how they are perceived.

Self-reflection about bias of the findings related to the researcher's biography, culture and the field he or she comes from allows the researcher to reflect how the results are constructed. This means to what extent the researcher is able to construct the reality that is reflected in the constructed reality of the investigated (Flick, 2007). In addition, the discussion about these possible biases provides the reader with an understanding of issues about interpretation and if the findings are applicable to other social settings (Creswell, 2009). A discussion about contrary results that may occur during the research could convey that the research took place in a real setting that could contradict with the expected results. One of the most important measures to increase validity of the findings is to have a supervisor, who critically assesses and audits the findings, provides feedback about the reasoning and the conclusions and examines if the researcher followed the defined procedures (Bryman & Bell, 2011). A comprehensive explanation of the findings and the setting in which they were produced is another measure to increases validity; because the reader is able to follow the context the research was conducted and allows further discussions about the results.

Yin (2009) adds four additional approaches to increase the quality of the analysis, including covering the research question and providing clear interpretation and using the available evidence. If rival interpretations exist about the findings they should be addressed either to explain why they appear or if they are not rival there should be a recommendation for future research. In addition, the analysis should focus on the primary issue of a case study, because avoidance of the main issue could be interpreted as the researcher avoiding discussing contradictory findings. Finally, the experience about the topic of the study could increase the quality of the findings because relevant parameters are identified by expert knowledge of the researcher providing an in-depth understanding about the investigated unit (Yin, 2009).

In qualitative research, the researcher determines the quality of the findings because he or she is part of the inquiry, following the philosophical paradigm of constructionism. In other words, the awareness about construction of reality, the bias this may cause, and the measures to cope with them improve the quality of a research. In addition, a comprehensive explanation of how the research was conducted, why it was conducted, what are the results and how the findings are derived, are the key factors of the quality assurance. The

criteria described above were applied in this research in order to provide the level of validity and reliability required to comply with the common standards of qualitative inquires.

3.5 Ethics

This research was conducted under the guidance of the University of Gloucestershire Handbook of Research Ethics. Following Creswell (2009) different measures were undertaken to ensure that ethical aspects of data collection, analysis and interpretation were properly handled. The main areas to be concerned were to inform the participants about the purpose of the study, and to receive the agreement of the individuals in authority and the respondents themselves. Furthermore, the anonymity of the interviewees, and the companies was protected. Finally the measures taken covered data protection and the length of time for retention of the data (Creswell, 2009). In conformity with the ethical standards of the University of Gloucestershire an information letter and consent form for research participants was developed, which identified the researcher, the institution, purpose of the research, and guarantee of confidentiality. The participants' names were encoded by using aliases to protect their identity. Data was stored on DVD and will be destroyed after five years, once the research has been completed.

The research itself has no direct link to specific products or projects of the researcher's company. There is no sponsorship from the employer for this research. The research questions were focused on the collective decision process and the utilization of social media in corporate and less formal contexts, without a link to specific products or projects implemented by the research's employer to avoid any bias arising from focusing on product or implementation problems. The researcher informed the participants that the research is primarily about the complex collective decision-making process potentially being enhanced by technology and not concerning the evaluation of any product or judgement about any employee's abilities or behaviour.

4. Findings

4.1 Introduction

This chapter reports the findings gained during the empirical inquiry of this thesis. The findings resulting from case studies that include interviews performed at the research sites and documentary data in context with the examined organizations. Three case studies building the foundation of the field research conducted over a period of nine month, resulting in thirty semi-structured interviews. For each investigated site, ten individuals from various departments and different roles and job levels participated in thirty to forty minutes semi-structured interviews recorded at their premises. Each interview followed an open conversation of about five to ten minutes with the interviewees to gain additional insights into the topics discussed during the interview. Documents shared by the interviewees such as internal presentations, videos, meeting minutes, figures and communication notes added to the overall data set. The interviews provided a recorded audio data of more than eighteen hours and two-hundred-fifty pages or approximately one-hundred-and-eighty-thousand words of transcribed text. This set of raw data was loaded into the qualitative analysis software NVivo for further analysis, structuring, coding and categorization. A series of one-hundred-thirty-five codes resulted from the analysis and split into twelve themes according to the question topics of the interview guideline. These themes were divided into (1) General Information, (2) Perceived transparency openness communication and the hierarchical structures, (3) Perceived utilization of ICT for communication interaction and collaboration, (4) Perceived utilization of social media integration within the organisational context, (5) Perceived risks and disadvantages of social media, (6) Overcome barriers of social media in organizational context, (7) Perceived individual and collective organisational decision-making process, (8) Social media and the process of decision-making, (9) Perceived benefits of social media integration in collective decision-making, (10) Perceived risks and disadvantages of social media integration in collective decision-making, (11) Barriers to integrate social media in the collective decision-making process, (12) Perceived social media governance.

. Each theme addresses one or more areas of investigation, which are <u>organizational behaviour</u> (context or social setting), <u>collective decision-making</u> (process or social process) and <u>social informatics</u> (computing and the influence of information technology on human beings).

For comparison and interpretation of the findings in the chapter cross-case study analysis, each case study reporting follows a consistent structure. The first section describes the organization within the economic context based on documentary data. The organizational information originates from public

media such as the company Internet sites, annual reports, publications, public relations, activities in external social networks and blogs and internal meeting notes, videos, corporate communication notes and presentations. This data set provides an initial perspective of how an organization perceives itself and how the external world should perceive it. This draws a self-perception of the organization including the structure of the organization, the main purpose, the brand and the identity, the culture, economic challenges, the role of corporate development, communication, ICT and social media. Hence, the first section explores organizational behaviour aspects of self-presentation conveyed to the outside world. The reflection of self-presentation is of relevance for the analysis of the phenomena social media and decision-making to contrast and reflect between the described culture, usage of information technology and the integration into decision-making and the perception of the interviewed employees. This shows that real-life culture, power distribution, the utilization of social media and the integration into processes of decision-making might differ from how employees perceive them. This technique of triangulation provides the researcher with the opportunity to reflect the results during the analysis and interpretation process within the context of the organizational behaviour. Furthermore, it provides an insight how the organization aligns their visions and objectives with the employees and their needs. In each case study, after the reporting of the findings concerning organizational structure, management, culture, communication and hierarchy follows a detailed analysis of the results gained from the semi-structured interviews according to the identified themes, categories, codes and the interview guideline structure:

(1) Perceived transparency, openness, communication and the hierarchical structures describes how interviewees perceived transparency and openness in their organization. The focus of the interview questions was on how communication takes place and how information flows within the teams, through the hierarchical structures and if they influence communication, transparency and openness. The questions aimed to understand the culture and organizational behaviour addressing how interviewees experienced this in real life.

(2) Perceived Utilization of ICT for communication, interaction and collaboration reports the results of the interviews concerning the perceived utilization of ICT applied on communication, interaction and collaboration. The intention was to understand how ICT integrates into the daily business processes and if ICT influences communication, interaction and collaboration from a social informatics perspective. In this context, the interviewees described different applications and systems they utilize for their daily business.

(3) Perceived individual and collective organisational decision-making process aims to provide an understanding about organizational behaviour in context

with individual and collective decision-making. In focus were centralized and decentralized business relevant decisions, the difference about them, if there are any, and the methods applied on the individual and collective decision-making processes. The general opinion and overall perception of the interviewees about collective decision-making and the process closed the questions in this section.

(4) Perceived utilization of social media integration within the organisational context reports how the interviewees perceived social media integration within the organizational context in general. The focus of the questions was on the kind of social media used regularly, the purpose, utilization, personal preferences, and if applicable, how they influence the daily business. Further questions about individual and organizational benefits, disadvantages and risks, aimed to understand the interviewee's general position about social media and if they experienced a change of personal behaviour or cultural change in context with social media and a resistance against its usage.

(5) Social media Integration in the collective decision-making process discusses the combined main topics of this research, social media utilization and collective decision-making in an organizational context. Interviewees explained how they perceived and if applicable how they experienced the influence if any of social media along the different steps of a business relevant decision-making process. Furthermore, the questions focused on how a group of participants could contribute their opinions in the decision-making process utilizing social media technology. In order to understand how the interviewees differentiated between the capabilities of social media they were asked about what kind of social media they already used or might be suitable for a decision-making process.

(6) Perceived influence of decision-making behaviour of social media, benefits, risks and disadvantages reports the findings about questions focused on the influence if any of social media on decision-making behaviour and the perceived benefits or improvements social media might provide when integrated into the decision-making process. On the other hand, the interviewees were asked to reflect on disadvantages and risks they experienced or they think could occur in conjunction of social media and the decision-making process.

(7) Barriers to integrate social media in the collective decision-making process describes the answers about social media and the decision-making process targeted on barriers. Interviewees were asked about the kind of barriers they experienced or they could think of and how to overcome them.

(8) General perception about social media, how to overcome barriers, and to improve the utilization was the last section of the interviews. This section aims

to understand the perception about social media from a general perspective. Questions focused on the existence of management support utilizing social media and if guidelines are provided how to use it. In addition, questions aimed to comprehend how to overcome barriers of disseminating social media within the organization and how to improve the utilization in daily business.

4.2 Case Study: Transportation Corporation

4.2.1 General Information

According to documentary data, articles, internal communication, blogs other publications and discussions on social media platforms, Transportation Corporation is one of the largest national travel and transportation agencies for passengers and goods, partly owned by the government. From an organizational point of view, Transportation Corporation acts as a private company. However, to a large portion they dependent on the state, which is their largest investor. This circumstance has a significant impact on decisions and control of financial investments, structural changes and the overall service Transportation Corporation provides. Hence, the state influences the organizational decisions incorporating public interests and are subject to political debates.

The main purpose of this organization is to ensure that more than one million passengers travel safely and reach their destination every day in time, utilizing modern and convenient means of transportation. Furthermore, Transportation Corporation ships tons of freight, national and across Europe, while preserving the ecologic environment by using sustainable energy resources. The company perceives itself in front of the public as an important contributor that increases the quality of life helping thousands of people to come together for business or private matters. Therefore, in their view, they are improving the economic and social competitiveness of the country. In addition, Transportation Corporation owns a large number of integrated firms to build and maintain railways, maintain power plants, train stations, office buildings, maintenance facilities for trains and wagons and travel agencies. A significant number of the business buildings are also available for rent for other companies for business, shops or apartments. In summary, this company embraces different kinds of purposes, businesses and people with a focus on transportation tightly integrated in the country's infrastructure.

The main economic challenges are new forms of transportation, prices that compete with individual traffic such as cars or in the future self-driven cars or long-distance bus services, transportation by trucks, and air traffic. The market competition has several dimensions, which requires Transportation Corporation to differentiate not only on service and quality but also on price. In other words, ticket prices, convenience, flexibility, time and overall costs are key in this market. Transportation Corporation faces on one hand the need for

flexibility and convenience, hence a large number of options for travellers and transportation of goods. This means continuous investments in the infrastructure and continuous improvements on handling daily traffic demand. On the other hand, selling tickets at prices that compete on costs and flexibility of alternative transportation means such cars, busses and planes.

4.2.2 Organizational Structure, Management, Culture, Communication and Hierarchy

Transportation Corporation consists of four divisions; passenger, freight, infrastructure and real estate, with additional service functions such as finance, human resources, IT and communications. The organization structure follows a functional, hierarchical model with a board of directors, chief executive officer (CEO), division directors, department and unit managers, groups, team leaders, project teams and employees in different roles and responsibilities, functions and cross-functions.

The organization brand and corporate identity stands for «Humanity», «Convenience», «Experience», «Ready for the Future» and «Sustainability", which should lead into a «Feel at Home while on the road" experience. The organization states that company achievements stem from the contributions of the employees, working day and night seven days a week for a high-quality standard and continuous availability of the transportation services.

The maintenance of the infrastructure, rising costs of real estates, limitations on available space are challenges this organization has to manage. In addition, an increasing number of passengers on a limited number of tracks besides competition on alternative transportation. Therefore, continuous improvement, optimization, innovation, developing new ideas for services and cutting costs by improving the efficiency of transportation processes are key to this organization. Furthermore, coordination, quality assurance, instant customer feedback, safety, employee development, communication, and information systems. Since they play an important role in the individual's lives, being responsible for their mobility, Transportation Corporation is a prominent topic in mass media. Hence, public relation in a sense of presence and image is an additional requirement for the economic success. Transportation Corporation understands corporate development from a strategic perspective as a comprehensive approach involving not only the CEO and the management board but involving divisions, departments across the whole group. This revealed on group wide innovation management initiatives and projects with business and strategic relevance. They understand also exploiting and retaining knowledge within the organization as key of the corporate development approach.

This organization states that communication is key for all internal and external activities. Therefore, they utilize a large number of different tools, technologies, responsible teams, channels and media to inform and support the internal and external dialog. Besides the employees located in different offices and manufacturing halls a large number are underway on the railroad working on the trains, at the rail way stations or along the tracks. Hence, corporate communication plays an important role to keep all employees up-to-date, no matter where they are, across departments, divisions and through the hierarchical levels. Also essential is the external communication to the public, customers, stakeholders and authorities. Therefore, Transportation Corporation informs frequently about company news, publish latest schedules, prices, delays, special offers, travel arrangements or other relevant travel topics. In the last couple of years, social media communication channels became relevant, such as Twitter, Facebook, YouTube, Instagram, Xing, Google+, LinkedIn, and Pinterest. For instance, Transportation Corporation produces special blogs such as the CEO Blog or launching special purpose communities on their Internet sites. These measures are part of their communication strategy to keep in touch with customers, answer questions, getting feedback, inform about special interests around rail travelling as well as providing specific apps on mobile devices.

IT is an essential part in most stages of the value chain and part of their innovation strategy. In addition, it plays an important role for their infrastructure planning, production and maintenance to improve efficiency on a given environment of a railway tracks network. The structural environment this network utilizes does not allow expanding significantly. However, it should be capable of coping with an increasing demand based on demographic and structural developments of mobility and commuting traffic. The services IT provides are business applications, process automation, information management, social media applications and infrastructure to assure business continuity. The IT solutions span from internal business software development, controlling, sales, ticket and railway scheduling systems to Internet portals and mobile applications.

Organizational Behaviour, Decision Making, Information Systems

Transportation Corporation states that they are an open and transparent organization, which allows employees to be part of the organizational development from bottom up to executive management levels. Management encourages collaboration among individuals, teams and departments, open communication and sharing of information and knowledge. Therefore, Transportation Corporation utilizes a variety of information management and communication systems integrated in business processes to support the exchange and interaction. A recent initiative was to equip the entire staff with mobile devices such as smart phones or tablets. The objective was to improve

the information flow particularly for employees mostly working outside the office on trains or along the tracks. According to statements of Transportation Corporation, they listen to the needs and feedback of their employees. They emphasise the importance of their contribution to the organizational development. From a hierarchical perspective, most departments follow the same organizational structure based on functional and partly a matrix approach. Departments close to production and personnel responsible for transportation operation, demanding higher requirements on security, are strictly hierarchical organized. Departments such as IT, corporate communication, research, development and marketing follow a leaner decentralized approach. This has an influence on decision-making, which means departments with leaner structures allow a decentralized or bottom up approach. In contrast, strictly hierarchical departments follow to a large extent top down decision-making and following strictly procedures and guidelines.

4.2.3 Perceived Transparency, Openness, Communication and the hierarchical Structures

According to the statements of most of the interviewees, the degree of transparency is a changing subject following the influence of cultural change and hierarchical adaptations. During the last couple of years, the organization entered in some areas a transformation process from a strictly hierarchical and less transparent towards an open and more transparent company. Management supports this through different measures based on technology to improve the knowledge exchange, adding corporate communication channels and encourage decentralization movements. They delegate responsibility and power to middle and lower management and to the employees. A manager of communication described it as follows:

> *We are since a couple of years within a transformation process. We initiated many different projects aiming to connect employees as part of our changing culture transformation process and I think we have already matured in respect to openness and transparency. The culture is changing significantly.*

On the other hand, interviewees described this process towards openness as challenging, because not just technological aids and open up the file shares to all teams solve this problem. In the view of the interviewees, the cultural change required takes time and a lot of effort to persuade the employees about the advantages this new way of transparency and open communication may provide. Therefore, not all employees are willing to follow this cultural change for various reasons as a product manager put it:

> *Of course, most of the information has now read access but the change starts with the individuals. They still think they need a confidential area. Hence, the awareness about the public*

information exchange is not entirely shared but efforts are underway. It is quite difficult. In the past employees had their information stored on the file servers, all separate. Probably the advantages of an open information exchange are still not understood. However, it will be a cultural change.

Within the organisation, groups are open and understand the value of sharing but others are still convinced that keeping information secret is an internal competitive advantage. The resistance about openness and sharing knowledge seems related to a concern about losing control or the power of unique knowledge held by individuals. This unique knowledge for instance specialist knowledge of subject matter experts making them more valuable, important for the organization, and less replaceable. It is about protecting the own job security as a team leader of IT project management described it:

It is not everywhere a problem and to determine who does not share would not be easy but there are many employees from all demographic structures, willing to share their knowledge. From others we experienced they are cautious and are afraid that their information will end in the wrong hands or that information should be protected and is not dedicated to all employees.

The interviewees described the degree of transparency dependent on the nature of the information. This means they perceived some information flows through the organization without filtering and some are not, such as confidential information or information that should not leave the organization. An employee described this as necessary because some information such as related to human resources, security related data or strategic discussions of the board should at least for a certain amount of time kept as secret before communicated to the employees or to the public. In general, employees perceived the organization following a principle of open and transparent communication. This demonstrates the availability of information hosted in different information management systems. Besides confidential areas with restricted access such as human resources or personal data, most areas are open without permission restrictions and allow the employees to search for information enterprise wide and exchange across the departments. A manager of enterprise content management systems from the IT department explained it as follows:

I perceive our organization as very transparent and open. We distinguish between three classification levels. There are confidential, internal and external communication levels. Confidential means we restrict communication because specific topics should not leave the organization. Internal means we share this information within the organization following the principle of openness. With the principle of openness, we aim to distribute

information within the organization to advance the utilization and reusability of information and knowledge.

Employees perceived hierarchical structures differently dependent on the department or division the employees come from or the management level they present. In some areas, interviewees perceived hierarchy as lean or flat and in some areas strictly hierarchical. Areas such as marketing, corporate communication, research and development or IT structures are hierarchical but much less strictly and decentralized in contrast to divisions with personnel working on the trains, along the tracks, infrastructure or maintenance sites. Security plays according to the interviewees in infrastructure and maintenance sties of the organization a very important role. In this area, management follows a strictly hierarchical command and control approach to maintain the security and safety levels vital to protect health and lives of the employees. A manager of the workplace team responsible to determine what the employees need for their daily work explained his view on it as follows:

> *We have different areas for instance infrastructure for railway structures vital to save lives where I experience much more hierarchy than in other areas. When I compare and look at the business for instance passenger transport or infrastructure, you will find much more hierarchical structures. Managers will tell you that approaching directly an employee without talking to his or her manager is not acceptable. In other words, you have to follow the line of command. This is some sort of ambivalence how I see it in our department or how I perceive it.*

The necessity of having different hierarchical structures in different parts of the organization is according to the interviewees acknowledged and makes sense. They explained that one approach would not work in a multi-purpose organization and lead to problems if the company would try to apply this in all divisions and departments. A lean and decentralized structure could be an advantage in a more creative or innovative department but a disadvantage in an area that has strictly to follow regulations according to the manager of communication:

> *I think our organization is a large corporation and there is no general formula about how communication, openness and hierarchical structures work. This is given by the organizational functions in the areas where we operate trains and we have to follow security relevant tasks where you have to follow strictly regulations otherwise, we would endanger human lives. This reflects how the employees collaborate. We experience these departments as much more hierarchical following rules and regulations. The other way around in departments for communication or marketing we are much more open, transparent and more creative.*

4.2.4 Perceived Utilization of ICT for Communication, Interaction and Collaboration

In this context, the interviewees described different applications and systems they use for their daily business. Most prominent tool mentioned is the email system, closely followed by instant messengers, the Intranet with integrated post and comment functions, enterprise content and document management systems, wikis and micro-blogs provided by the organization.

The interviewed employees explained communication in context with ICT as a conversation that happens on different kinds of unidirectional and bidirectional communication channels. Some apply ICT mainly for direct or asynchronous person-to-person communication or for a dialog conveyed asynchronously. For instance, by utilizing different media such as instant messengers or the email, Intranet comments, or a wiki equivalent application. The organization equips all employees with different media they may choose from to communicate and collaborate. This circumstance is reflected by the variety of forms of utilization in daily business processes. The following statements of the interviewees illustrate how they apply ICT in different ways:

> *In our organization, the Intranet is the primary source for our internal communication. The intranet offers different services such as news channels. Many employees use these services and learn to appreciate them.*
>
> *I use tools provided by the organization. These are Skype for Business, email, phone, smartphone and solutions such as Confluence, a web based solution that allows editing documents in parallel with other editors.*
>
> *In our organization, number one communication tool is of course email, this is clear, but what I use since I am more social is instant messaging and our wiki platform. I follow our developer communities and use Twitter quite a lot.*
>
> *I am using Skype to connect to screens of other users. This is for me the main advantage. If someone has a problem, we can share the screen and this is for me the most important benefit. I also use Skype for conferences, for example, I provided an introduction about SharePoint administration with hundred participants. I did a survey at the end and the feedback was very positive, because nobody had to move to a classroom and could follow the course by the way.*

The possibility to interact became an important feature when using ICT for communication and collaboration. According to the interviewees, ICT in the past only allowed unidirectional or less dedicated communication using email

and publications on the Intranet. Virtual conferences, online communities, instant conversations, comments, interaction and joint collaboration on documents did not exist or only limited and disconnected from the business processes. The interviewees perceived it as a necessary evolutionary step of the tools used in the past as a product manager characterized it:

> *The interaction becomes more and more important. This is a part where we invest a lot of money. Within the next two years, we will implement a new employee portal with lots of interaction possibilities. Today information is mainly consumed such as news channels but we implemented recently a comment function to comment for example news articles and since a couple of month we have a like-button comparable to Facebook „I like this page". There are always minor parts of people, who are using it and the majority does not because it is new.*

Besides communication, the interviewees explained how and in what areas they use ICT to collaborate. For some of them ICT has become an important element that supports their daily work with others. Active information exchange platforms and equivalents to wiki applications help them to improve the flow of knowledge and the efficiency. Most of the interviewees, independent if manager or employee explained that they are quite open to the new technologies and perceived them as an advantage. A communication manager and a software developer described their view on it as follows:

> *For me our eSpaces Community plays an important role. This is an online collaboration platform. This is something I use quite often and I take care my team is using it as well. The reason is simple; we have many advantages if we use this tool. Especially to share our knowledge and to improve the information flow.*

> *I use Confluence to collaborate, which is similar to a wiki. We use it to work on concepts or to work on project content. This is a lot of unstructured information, which will be either transferred into a classic document or stays there if it is about to change its content. We also use it for our architecture board. We see what we need to do, what are the objectives and share the opinions of the different business areas involved.*

The organization utilized mobile computer technology to reach out to all employees independent of their geographical location. Many employees are continuously traveling and the challenge was to keep them informed, enable them to provide feedback or involve them in topics that need attention. Therefore, the organization launched a companywide program to equip the employees with smart phones or tablet computers to improve the information flow and to connect employees as a project manager and a communication expert explained:

We made a huge step last year. All employees have been equipped with a smart phone or a tablet with access to the Intranet, to news apps and allows retrieving information. We aimed to inform the employees fast and easy.

The employees could choose, according to the nature of work which appliance they want. We did this to improve the communication among the employees. Also for the manager, this is a huge improvement. They are able to write directly a message. With telephone, this was not always the case. The objective is to utilize the appliance and support the business processes away from paper towards electronic communication, which is faster and with less sources of failure.

4.2.5 Perceived individual and collective organisational Decision-Making Process

Decision-Making following the interviewees at Transportation Corporation is performed centralized as well as decentralized dependent on the decision topic. The majority of decision-making takes place decentralized, concerning daily business problems and tasks. For instance, how to plan and execute a project, how to implement software features, introduce or optimize processes or to choose a communication and information exchange tool for collaboration. Financial relevant business topics requiring large investments or strategic measures, employees carry up the hierarchy ending in decision-making committees, the board or origin directly from the board. Following the interviewee's perception, most of the organizational decisions are collective, involving more than one participant. For instance, the collective consists of a functional group, a project team, an expert group, the employee and his or her managers or a committee or the board. According to the answers in the interviews, almost no business relevant decisions takes place in isolation without incorporating one or more stakeholders influencing the outcome. Although in some cases a single individual is accountable for the decision, the process involves the opinion of peers or direct managers. At Transportation Corporation, decisions take place from both directions, top down without involvement of the employees or bottom-up, asking employees directly about their opinion as a communication manager described it:

We follow both forms of decision-making. There are centralized decisions clearly made by the board according to the magnitude and business relevance of the topic. On the other hand, we try to allow our employees as much as possible freedom of action, which is also a question of culture. Therefore, it is not our goal to carry small business decisions up to the board and instead leave the decisions where the business happens. We do this also with quite important topics, for instance the development of the organization's mission statement.

Centralized and decentralized decision-making processes following each a collective approach involving employees on different levels. On management level, the board and committees make decisions, on middle and lower levels in the hierarchy expert groups, functional and cross-functional teams or their representatives. Employees may contribute in the decision-making process also relevant for the whole organization but not on all decisions. In addition, management expects that the employees make decisions and not just present the options. Some decisions with a high impact concerning legal and financial aspects need to stay with management according to the interviewees. However, the interviewees emphasize that transparency and explaining motivations and objectives are key to buy in the employees on management decisions. A product manager and a software developer pictured the difference of decentralized and centralized decisions at Transportation Corporation with an emphasis on the process and the motivation behind as follows:

> *It really depends on the topic. For instance, on organizational changes we follow an exemplary process, at least in my opinion. We build groups or workgroups not driven by management but from the employees, hence the employees may contribute in the decision-making process. These are selected employees and in that sense, not everybody may participate but the participants are selected from the workforce, which may participate the decision-making process. I think this is very positive.*

> *At Transportation Corporation, most decisions are made decentralized. As far as I see things, decisions are manly elaborated from bottom-up. Not just suggestions about options are presented but decisions already made by the employees, which the management approves. This means decision-making is often passed to the employees. The expectation is not to present alternatives but decisions made by the subject matter experts. Decisions from the upper management are mainly of strategic nature. For instance, larger impact decisions to invest in the area of Cloud or Open Data. These are topics the management decides or provides directions.*

The interviewees described different methods they apply in the decision-making process. Besides common methods of pro and contra comparison, weighting of alternatives criteria, strengths, weaknesses, opportunities, and threats (SWOT) analysis and the application of a decision matrix many employees refer to deliberation and a democratic process. During the process of deliberation, decision makers aim to find a consensus in the group and finally choose the alternative accepted by the majority. Business rules and legal regulations guide the process. They define who has to be involved according to the topic and if the decision has to be carried into a committee,

to management or to the board. In some cases, interviewees explained decisions carried up the hierarchy could be pushed back to a lower level to rethink and to try again to find a consensus. The following statements illustrate the lived processes applied from the perspective of the interviewed employees:

> *Normally we decide during discussions. We use SWOT analysis but we have to elaborate the content of the SWOT analysis first in discussions. The main problems of SWOT analysis are different opinions about various areas and as an outcome, different results might appear. Hence, before we start with a SWOT analysis we need to know what arguments we should use. Even if we think about costs for instance of two solutions or compare metadata, constraints, time, and effort and if one of the attributes diverge, we still use deliberation and discussions to choose the final alternative. In other words, to base decisions purely on comparison of attributes is rather seldom. Hence, we decide mainly during discussions and consensus building.*

> *Finally, all is about finding a consensus, which we do from a methodological point of view with large-scale communication. We communicate with each other and try to understand the opinions and the objections. We do this in workshops or at the coffee machine. The alternatives are already judged against each other and at the end, the one wins with the best arguments, which could be also a very political process. If a decision is not possible, we carry it up to the next level of management but normally it will be pushed back to us requesting a decision of the group.*

Most of the interviewees perceived the collective decision-making process partly positive with defined benefits but also disadvantages. Main benefits mentioned are the variety of opinions, alternatives available in the collective the more people are involved, the knowledge exchange and discussions among and with experts. Interviewees perceived collective decisions could lead into more sound decisions carried by the majority. They also described disadvantages, which go along with the process, considering complexity, time consumption, influence of leaders and group effects. At a certain point in time in the process, someone has to make the final decision to avoid endless discussions and to guide or moderate the process was a frequently mentioned countermeasure. In addition, the interviewed employees pointed out not all decision topics are equally suitable for a collective decision-making process. A product manager and a communication manager described it as follows:

> *In principle, I support this up to a certain level. If you let everyone argue, the process slows down and becomes cumbersome. Open the field in an early phase and obtain feedback is good but one has to make the decision at the end albeit not the entire collective has partly understood the decision. It is important at a certain point*

in time to say, now we have to decide, and the decision is this way but it has to be transparent, this is important. Decisions should not be made in isolation without justification.

In principle, I like it. Probably you already found out I really aim to make sure all people can add their opinion. I must not develop the Intranet entirely by my own. It is not my Intranet but our Intranet. Of course, someone has to carry the responsibility but I do not want to abuse this as my playground and instead provide the employees an added value. Therefore, it is very important to me to integrate the ideas of the collective and let them contribute in the decision-making process.

The rationale to apply centralized or decentralized decision-making processes relates to the business relevance from a financial, legal, security and strategic perspective. More than half of the interviewees think that both decision-making models make sense depending on the nature of the decision as two members of the management team in the IT department put it:

Yes, we have both, decision-making processes influenced strongly by teams and employees and decisions, which have to be made by the management, for instance decisions about legal aspects of the company. There are certain governance principles essential and require management involvement. Besides that, we have many decision-making processes performed mainly by local teams.

We live in a culture that allows participating and many want this. Sometimes we experience the problem that too many requests to participate and this leads into very long discussions about the decision instead to make them. I think the opportunity to join the conversation is available for everyone. In addition, our CEO approaches the employees and asks them to explain the problems they have. The intention is obvious and the importance recognized.

4.2.6 Perceived Utilization of Social Media integration within the organisational Context

Interviewees at Transportation Corporation perceive social media as a change of culture concerning the attitude of the management to open up the possibilities and to implement social media in the daily business. They perceive it as a testimony of trust from management to allow them to use social media in a self-responsible way as a communication manager explained it:

We went through a huge change during the last couple of years. On one hand about the possibilities but also about the culture and the general attitude of the management. We opened social media platforms about three to four years ago. Which means in our

> *organization everyone has now the possibility to use Facebook or Twitter at the working place. This was a decision that came along with a lot of dispute up to the board. However, at the end we found an agreement where we said the organization has to guide the employees to use these platforms in a self-responsible way. Since we became much more active on external social media platforms, we implemented them internally as well.*

The interviewees described different social media tools they use daily as well as the ones they prefer at the most. Prominent tools mentioned are instant messengers, community platforms for project management, wikis for user groups, information exchange and collaboration platforms. In addition, the Intranet to consume and exchange information by using integrated comment functions. A project manager and a software developer explained their experience as follows:

> *We use communities based on PMtoGo for project management and VMtoGo for VMWares. I participate in both communities. We also meet several times a year for exchange. In addition, we also use a platform called Confluence to collect important information relevant for the end users. You can contribute if you wish. This makes really sense for people from the project management.*

> *I personally use Skype and Email. We also use a wiki called Confluence we use for project planning and project definition, which will start in the following year I am responsible. We call it project profile, which we jointly create and publish in Confluence. I also use eSpace, our SharePoint solution, to upload and jointly edit documents.*

Most of the interviewees mentioned the availability status and the communication possibilities with instant messengers as a benefit that allows instant and direct communication in different situations. For instance, during meetings and while working on other things. Benefits are also located in the area of jointly working on content; involve several people on the same platform to share ideas and opinions as a software developer put it:

> *I think mainly in the area of collectively working on content. Jointly editing content became much easier, because today I can prepare documents and document structures and simultaneously let the people work on the content. In the past, I had to compound a document by myself by receiving the content in chunks, which I had to merge afterwards.*

When asked about disadvantages and risks of social media the interviewees mentioned frequently the permanent availability, disturbing and annoying requests from instant messengers, losing focus in endless online discussions. Furthermore, misunderstandings during the virtual dialog and losing control of

the corporate communication process. In other words, the original purpose of the messages sent out to the employees for instance to inform about a management decision could get out of control. This means, if an opinion making process enters online debates with a high number of followers. This could according to interviewees become a new challenge management is confronted with. For instance, if an opinion maker in online discussions is able to convince the employees not to accept management decisions. According to the interviewees, this is also a matter of cultural change allowing the employees to make their own opinion. However, if the direction turns into the negative management should trust the collective to turn it back into the positive by social self-regulation according to the interviewees. Main perceived risks are wasting time, which means the concern that employees spend too much time in discussions while using social media according to the answers of a product manager, a software engineer and a communication expert:

> *It is a real-time hole. It can eat up a lot of time because it multiplies the coffee talk or the water-cooler meeting. If people are social, they enjoy talking and spending hours with chatting and sometimes not even about business relevant topics. You can connect with huge number of people you not even know. Therefore, I think this is a huge risk concerning wasting time. This needs a lot maturity to cope with it.*

> *Yes, things changed. Sometimes this is very disturbing because people reaching out for you on many more different channels even if you are on the phone or in front of the computer. You are disturbed much more often. As soon as people see my status turns green, they immediately try to contact me on Skype. Sometimes you really need to decide to go offline.*

> *In order to keep discussions and this creativity under control on social media platforms seems to me challenging. I think this is a disadvantage because people might lose the focus on the main topic. This is much easier in a workshop with a moderator who can tell the participants they lost the main discussion topic and get them back. In social media, this seems to be quite difficult, especially when the participants can communicate almost at the same time.*

Interviewees explained that social media initiates a changing process of personal and organizational behaviour concerning how employees communicate and collaborate. Many discussions about organizational topics among the employees took place outside the company after work hours. Therefore, the outcome stayed in a small group not shared with the rest of the employees. Today employees more often express their thoughts on the Intranet, which leads in their view to more openness and transparency in the organization about what employees care about or what disturbs them. In

addition, how people interact with each other changed in areas of engaging in discussions and exchange information. For instance, instant messengers accelerated the process of approaching each other and decreased the usage of email as a communication manager and product manager described it:

> *The environment of our organization became much more dynamic. Internal communication became much easier, as did listening to feedback from employees. What people discussed in the past in the pub they hopefully discuss or express also with comments in the Intranet. Of course, these comments are sometimes criticising but this is ok. We prefer this much more than conversion taking place only in the pub. This leads to much more transparency in the organization.*

> *Social media changed the way to interact with other people. Today I ask if someone could spare some time with me to discuss a topic using Skype before I call. This is a kind of a preliminary clarification, which is much faster. Therefore, I am writing fewer emails. In the past, if you did not reach a person, you had to wait but today, if the status is red I can ask if the person could call me back as soon as possible. This is a shift of behaviour, which makes it much easier to approach others.*

4.2.7 Social Media Integration in the collective Decision-Making Process

Interviewees described the utilization of social media in collective decision-making processes taking place on board level and online polls, which are at the beginning of further plans to involve employees in the decision-making process. The following statements of a communication manager and a manager of workplace design provide an insight how social media is utilized at Transportation Corporation. They explained how computer enhanced decision-making is implemented at board level but also for the entire organization including the advantages and the challenges they face:

> *For board level decision-making, we have the possibility to process decision-points and business actions by using our electronic decision-making platform called decide. In other words, the platform allows to present decision-points and business actions in advance to the board meetings and board members are able to accept or reject them online. This means we already have the possibility to make decisions electronically where the topic does not need discussion and deliberation.*

> *We utilize surveys and polls for instance here in our building. We determined the name of the new staff restaurant by using a democratic ballot involving all employees. We also try on other occasions to use electronic media for democratic voting. However, the participation is still not there where we wish. For me social*

media are also a means to allow us to process decision-making electronically and to automate asynchronously decision-making without the need of physical presence of the employees.

At Transportation Corporation, information management systems become multi-purpose systems not only to store information but also to communicate, to exchange and to interact. According to interviewees, employees use information management systems primarily store and exchange information but also to ask employees about opinions about the content and discuss different alternatives to solve a problem. In the view of the interviewees communication and collaboration is an integrated process in the management and creating of information. For instance, by utilizing built-in comment functions as a communication manager framed it:

I see a great potential on our platform eSpaces we use to exchange and upload content. Everyone has access. Since we all share the same information basis about the same topic with the same status helps a lot towards transparency. I see for instance who has edited what. I am able to reconstruct the history of a document and in parallel; I have the possibility, which we have in eSpace, to comment, starting surveys and quick polls to collect opinions. This has a strong influence in my opinion.

4.2.8 Perceived Influence of Decision-Making Behaviour of Social Media, Benefits, Risks and Disadvantages

Interviewees describe perceived influence of social media embedded in their daily business on opinion making but also feedback that influences further actions for instance on development of products following the statements of a product and a project manager:

I am using the comment functions available on the Intranet because as a product manager, I have to inform about my products and to answer questions. At this point the social discussion starts. People asking questions and we answer. In principle based on this interaction, employees questioning and comment most of the decisions, literally from bottom up. From this point of view, influence is feasible. We experience this effect on ourselves. In the past measures have been enforced with a technical introduction without any discussions.

Social media influences the opinion making process in many directions. It depends how an organization utilizes social media. I am certain there are decisions, where we utilize social media or at least push the decision in one or the other direction. This could happen with a high level of presence in social media. For instance, if a product gets pushed over all channels. Hence, if someone

possesses enough budget to do this than he or she is able to influence the decision.

Benefits the interviewees perceived about social media are about the extended possibilities to gather opinions and feedback during the decision-making process. In addition, the stimulation of discussions and deliberations before the decision makers make the final decision. According to the interviewees, social media fosters the exchange and the integration of the employees. Interviewees perceived the decision-making process easier and leading into more sound decisions because more information adds to the alternatives. A software developer and a team lead illustrated this as follows:

> *For me this is a topic known from social media, which relates to decision-making. It is much easier to get the input from other people and the possibility to provide feedback that quickly leads into discussions. In addition, the effort to find relevant data decreased significantly, which means I am able to find much more information within the same period for a decision and therefore decisions are sounder. This is clearly a benefit for me.*

> *For us our internal Wikipedia called Confluence is a tool that offers the needed functionality. Everyone can contribute his or her thoughts. This is an ideal tool to approach the decision-making. At least in an early phase. We are able to go further, for instance, to look at a product and the first release rolled out for testing and then over different channels such as Skype for Business or the Intranet to ask for feedback. In addition, we use a community, an ICT-community or a forum to allow the exchange among the users and help each other.*

The main risks about social media and decision-making mentioned in the interviews are distraction, opinion manipulation, security breach, losing control of the process, information errors and misleading arguments. The risk of distraction caused by social media is about information overload and the overwhelming supply of options. However, the problem of distraction caused by spending a lot of time while discussing private matters during working hours was not an issue. According to the interviewees, this effect disappeared because meanwhile most employees are used to social media. Therefore, social media lost the attraction of the new but became a tool for communication, interaction and exchange. This enables not all but most employees to differentiate between utilization for business applications and the private application. The security risk occurred in context with internal information leakage to the public because employees did not follow the policies. The leakage happened by accident when discussing internal topics on external via social media was another reason mentioned concerning security. Opinion manipulation was another risk that concerned the interviewed employees. They expected this to happen whenever the decision

could provide a unique advantage for an individual or a group. This could lead to misleading arguments or information errors either on purpose or by accident. In addition, losing control of the opinion making process was also a concern the interviewees pointed out. A team lead and an IT manager explained it as follows:

> *I see a lot of risks and disadvantages. Cultural change and how we communicate, plays an important role. There are people who know how to use it from their private life. Some are able to cope with this media and some are not. In the beginning, we intended to use social features more intensively but we had to turn them off before going live. The main concern was about losing control of the opinion making process. We were afraid that this process could escape the control of our internal communication policies. For instance, with the follower principle on Twitter a specific position could form within the community and someone could reach more followers as our CEO.*

> *I think social media platforms are helpful for the decision-making process within the organization. Employees discuss and exchange information in this process about different topics, which are in some cased not public. During an internal conference, we experienced a security problem. People used Twitter during a conference to provide feedback but unfortunately, some of these tweets went public.*

Another interviewee from a software developer group described risks in the area of limitations through prejudice, personal preferences and groupthink. He explained that this could lead a collective into the wrong direction during the decision-making process following misleading arguments. Interviewees mentioned furthermore the volatile and less formal characteristic of social media. Hence, people might take the discussions not with the same seriousness as for instance in face-to-face meetings:

> *I can imagine that some people taking a topic less seriously in contrast to a physical meeting or a decision made by email. In my opinion, social media has an inert volatile factor. If one starts a survey, maybe feedback flows in or others just wait and see what happens. Not for me personally but I can envision that this volatile factor many employees keep at the back of their mind.*

> *I think it becomes more and more difficult to argue against an alternative the majority already prefers. As a human being, you start to doubt if you are really on the right track and if you do the right thing. This is a danger one has to face. In our political system in Switzerland, we have seen in the past when asking the crowd making wrong decisions is also possible.*

4.2.9 Barriers to integrate Social Media in the collective Decision-making Process

Most barriers were unclear benefits, additional workload, information overload, personal exposure and usability. Furthermore, the absence of suitable knowledge and expertise about how to apply social media in the daily business. According to the interviewees, this obstructs the integration of social media in the collective decision-making process following the statements of a software developer and a project manager:

> *I think the barriers are primarily in the application of the systems. It is not sufficient if we just provide social media and communication tools to the people. They need to know as well how it works, how to work with it and if there are different options how to utilize social media. Options are how to find a consensus, how to express things and how to structure information in a way that others are able to orient themselves. It is not enough to make social media available but to tell how to use it.*

> *Yes, I envision myself either in the organization or in my private life. Always something, that adds on top. Should I be here, this I should do in addition, which links to extra effort, more workload and time. I think I can learn things quickly and I am open to new things but to find out what I really benefit from it and on what occasion to use it on first sight does just generate more effort for me.*

According to the interviewees, not every person is comfortable to let others view what they think. For instance, their preferences, beliefs, opinions but also personal failures. Therefore, the avoidance of personal exposure to larger groups or the entire organization was a prominent barrier mentioned. This means employees from other groups or departments are able to read and judge about the contribution an individual publishes on social media. This could make them vulnerable to criticism as a chief architect illustrated it:

> *People can follow about what you are working on or your decisions are exposed to the crowd. This could become quite difficult. I was once chief architect responsible for the internal wiki, which I pushed and I invested quite a lot in making people using it. The only thing we are doing is processing knowledge. We produce nothing else than knowledge. We do not install servers; we do not write any line of code or helping end users directly with their problems. In other words, our knowledge has to be made public and this means a lot of effort and defending against criticism. If we do not publish any article or any comment, are we doing nothing? This is an anxiety, to have others see what you are doing. Many people have a problem with it.*

Interviewees explained several ways to overcome barriers. In the first place was to educate the employees how to utilize social media in the decision-making process and to explain the value behind. Following their perception, showing how to use social media is not sufficient but needs inspiring by example and a process of learning, allowance to fail, to experiment and practical application. A team lead responsible for the digital workplace, in line with statements of other interviewees, explained how to overcome barriers of resistance against social media by involving management in the business processes and the practical application of social media:

> *You need first a basic understanding about social media. At the beginning, it was quite difficult because people did not understand the benefit they get. This does not convey through a presentation but through experience. We had very positive experiences when we engaged managers willing to live the process and integrate the team using these new tools. After three month a lot of employees that refused initially to use these tools started using it because their manager simply said I will mainly communicate this way and after a while, he had many followers that I see also as a change in culture. For us this is the most promising concept to break barriers.*

4.2.10 General Perception about Social Media and how to overcome Barriers to improve the Utilization

Most of the interviewees were aware about the existence of guidelines of social media usage provided from the organization and governed by management. The organization provides online learning courses and some are mandatory to open up the use of Facebook, Twitter or other social media tools. According to the interviewees, the guidelines focus mainly on social media for external use to educate about the risks and specific communication behaviour. For instance, on external social networks the employee communicates solely as a private person and never in the name of the company. However, interviewees mentioned also mechanisms how to govern the utilization of social media for internal use without guidelines. Every comment appears with the name of the author to avoid anonymous misbehaviour and a team of moderators that keeps the level of communication rules and guide the discussions. Interviewees perceived the active control of content posted and the language used as necessary measure.

Comparable barriers as in the social media decision-making integration section reoccurred in the interview section about general social media application. Barriers interviewees often mentioned were reluctance to share knowledge because of a concern to become replaceable or the lack of knowledge how to use the new tools efficiently as a software developer explained them:

Normally it is about groups of people that dislike sharing their knowledge. They are afraid that others know what they do and maybe believe they do not enough or he or she is able to replace them because their knowledge is not unique anymore. The second is the "how" to work with it, what shall I do with it. This can create a kind of inhibition threshold. We implemented virtual team rooms in SharePoint and needed a lot of lobbying, show how to use it and how to work with it.

In addition, a communication manager and a project manager talked about technical barriers existing because of complexity and long-term implementations. They explained that integration projects exceed the technical innovation cycles, hence at the point in time the implementation is finished the technology is already outdated. The interviewees perceived security measures also as technical barriers that hinder the data flow between different entities within the organization and to external users. The problem of missing confidence and comfort of exposing personal opinions in online discussions or posts to a larger audience within the company was a topic that led the interviewees to conclude that a cultural change is imperative to improve this:

We have still many barriers in the technical area, very simple but some hurdles to overcome during the implementation. It is clear that complex IT architectures need quite some time to develop and this leads sometimes that new technologies supersede them. This is one barrier and the other is certainly on the cultural level that people really dare to express their opinions. During the last years, we made some progress. One can see this at the number of comments in the Intranet, which is good and is cheering. However, we need to intensify this, of course, this is also a question of leadership and of the culture transformation process, and we are right in the middle.

I experience this repeatedly. If something does not work than because of security and technical reasons. There we have a topic on the table. In the area of virtual working spaces to allow us to exchange internally and externally. Today this is only possible very cumbersome that nobody has access to data they should not. These are barriers in our organization, which hinder our collaboration and knowledge exchange across teams.

Other interviewees described a category of barriers related to adoption and the time needed to go through this necessary process. They expressed the problem as department specific, which relates to the amount of time people are allowed to spend with social media applications. Therefore, a barrier exists to gain the needed experience with social media as mentioned by a product manager:

We need to differentiate. In our IT department, we are quite open. People are affine to technology. From this point of view, the barriers are rather small. However, when I look at the business, the main barriers are among users that are not enough engaged, do not spend enough time because they think this time is not worth it. In our department, this is different because management allows us to engage us intensely and write articles in our internal wiki. I think other businesses have less time and other priorities. Therefore, they are not used to utilize social media as we are.

Interviewees talked about different ways to overcome the barriers to utilize social media within their organization. The measures are mainly in the area of involving the management to show the employees they support the usage. In addition, to exemplify by using the tools by themselves for instance in the daily communication and the exchange of information. Improvements of usability of application to integrate seamlessly into the business processes, interviewees mentioned several times. The change of culture was also relevant in the answers, which the interviewees described as a transformation process to open communication. Consequently, this would lower inhibitions of expressing themselves within the community, and would become part of a collaborative discussion culture. Furthermore, the interviewees emphasized that this adds to the understanding of benefits the individuals gain from social media.

4.2.11 Summary

The following table 1 provides an overview and summaries the findings of case study Transportation Corporation divided into analytical themes, areas of investigation and the findings derived from the interviews.

Table 1 Summary of Findings Case Study Transportation Corporation

Analytical Themes	Areas of Investigation	Findings
Organizational Structure, Management, Culture, Communication and Hierarchy	Organizational Behaviour	• **Organisation's perspective**: Hierarchical structure with integrated matrix organisations. Mixed management approach: strict hierarchical and centralized or flat and decentralized based on purpose of department or unit. Culture creates an environment to foster innovation and efficiency, involving employees actively in the process of business development to improve the services provided. Communication: organization understands communication as key for internal and external activities. They utilize a large number of different tools, technologies, responsible teams, channels and media to inform and support the internal and external dialog.

Transparency, openness, communication and hierarchical structures	Organizational Behaviour	• **Organisation's perspective**: Highly transparent and open on both internal and external communication across all hierarchy level • **Employees' perspective**: Transparent and open internal communication between individuals, teams and groups and external to customers. Less transparent and less open across departments, dependent on management approach: strict hierarchical: less transparent and less open. Flat: transparent and open.
Utilization of ICT for communication, interaction and collaboration	Social Informatics	• **Applications**: Email system, instant messengers, Intranet with integrated post and comment functions, content management systems, business process management systems • **Purpose**: Communication: corporate news, messaging, individual, teams, and group conversations, collaborative information and document management, information exchange, virtual meetings • **Information Flow**: Low restrictions concerning access rights applied on corporate information systems open to everyone. Exceptions: confidential areas: human resources, management • **Change of behaviour**: Virtual conferences, online communities, instant conversations, comments, interaction and joint collaboration on documents connected to business processes changed the communication habits and collaboration behaviour: direct, ad hoc, less formal, increasing inter-connections with teams and groups geographically dispersed, networking collaboration structures
Individual and collective organisational Decision-Making Process	Collective Decision-Making, Organizational Behaviour	• **Approach:** Mixture of a collective decentralized and centralized process: Centralized: decisions of financial, organizational structure or strategic impact. Decentralized: daily business problems, project delivery, project approach, business procedures, teams, methods • **Methods:** Pro and contra comparison, weighting of alternatives criteria, SWOT analysis, decision matrix, deliberation, democratic process, business rules and policies. • **Participants:** Functional and expert groups, project teams, employee and his or her

		managers, committees, management teams and the management board
		• **Perception:** Positive: variety of opinions, buy in of participants, solid outcome, involvement of experts and stakeholders. Negative: time consuming, endless discussions, losing focus and control of process
Utilization of Social Media integration within the organisational Context	Social Informatics	• **Applications:** instant messengers, community platforms for project management, wikis for user groups, information exchange, sharing and collaboration platforms, the Intranet to consume and exchange information by using integrated comment and rating functions • **Purpose:** Internal and external communication channels, collaborative projects, information exchange, ad hoc meetings, feedback about team, department or corporate wide initiatives • **Behavioural Change:** Changed from a 1-to-n communication into a platform for n-to-n information exchange and feedback involving participants from different teams located in different departments and units utilizing strong and weak ties
Social Media Integration in the collective Decision-Making Process	Social Informatics, Collective Decision-Making, Organizational Behaviour	• **Applications:** Integrated polling and rating functions, opinion gathering utilizing wikis, online discussions and deliberation on content sharing platforms, online forums and micro-blogs • **Purpose:** Partly applied in all stages of the decision-making process: Information collection, opinion and alternative collection, evaluation, aggregation, rating and voting • **Behavioural Change:** less impact on final decision, access to many opinions, supporting and enhancing influence on decision-making
Influence of Decision-Making Behaviour of Social Media, Benefits, Risks and Disadvantages	Social Informatics, Collective Decision-Making, Organizational Behaviour	• **Benefits:** Acceleration of the process of opinion collection and aggregation, less physical and formal meeting required, less effort to reach out to the decision-makers, availability of participants independent of geographical location, engaging experts when needed • **Risks:** Opinion manipulation, exposure of personal thoughts and beliefs to the community: if failure losing respect and standing

		• **Disadvantages:** Additional workload, losing control and focus, less formal process leading to lower quality of contributions
Barriers to integrate Social Media in the collective Decision-making Process	Social Informatics, Collective Decision-Making, Organizational Behaviour	• **Barriers:** Unclear benefits and utilization, additional workload, information overload, personal exposure and usability, missing integration in business applications, missing standards • **How to overcome Barriers:** Change management, business application integration, educate employees how to utilize social media in the decision-making process, explain the benefits, involve management with good example
General perception about Social Media and how to overcome barriers to improve the utilization	Social Informatics, Collective Decision-Making, Organizational Behaviour	• **General Perception:** The organization is at the beginning of a journey to mature in the application of social media, utilization in different areas started but missing standard approach and guidelines • **How to overcome Barriers:** Management supports and provides guidance, usability, integration, cultural change and transformation process required to share, discuss, deliberate and collaborate on collective actions

The results reported in this case study based on interviews and documentary data showed aspects of organizational behaviour focussing on structure, management approach, culture, transparency and openness to understand the fundaments of Transportation Corporation from an internal and external perspective. The findings about transparency, openness, communication and hierarchical structures summarized in Table 1 Summary of Findings Case Study Transportation Corporation above showed that Transportation Corporation views itself as open and transparent organization aiming a culture that creates an environment to foster innovation and efficiency by involving their employees actively in the process of business development to improve continuously their transportation services. Concerning organizational structure, management, culture, communication and hierarchy Transportation Corporation follows a hierarchical structure but with different levels of application, from highly strict and centralized, to lean and decentralized. These levels of application follow the purpose and specific requirements of the divisions and departments. Divisions close to train and transport operation are stricter because of security requirements and tight schedules. On the other hand, divisions such as IT, marketing, human resources and communication

follow a significant leaner approach. The results showed how these hierarchical differences change organizational behaviour, the utilization of IT and decision-making. In the area of utilization of ICT for communication, interaction and collaboration Transportation Corporation created different communication channels to inform and engage their employees in business decisions and motivates to utilize information technology in daily business. For instance, by equipping the entire staff with smart phones and tablet computers. The interviewees confirmed that Transportation Corporation lives a culture of openness and transparency. They illustrated this by means of low restrictions about access rights applied on the corporate information systems open to everyone. In addition, they perceived organizational communication between individuals, teams and management as open and transparent. From the employees' perspective the interviewees reported an awareness about the advantages of a corporate flow of information and knowledge exchange retrievable independent where the employees are located. However, they also argued about the need to keep certain information secret internally or that should not leave the organization for instance in the human resources area or strategic matters.

The next topic of the findings summarized in Table 1 focussed on the individual and collective organisational decision-making process focussing on approach, methods and perception. Most of the interviewees perceived decision-making as a mixture of decentralized and centralized process with management involved or solely performed by groups of employees. Business relevant decisions in the daily business are decentralized and management motivates the employees to make decisions. Besides some methods mentioned to guide the decision process a majority of interviewees described deliberation as the most applied method in the collective decision-making process. If after a collective decision-making process, a consensus was not found, management might advise but expects the group to rethink and make the final decision. Most interviewees perceived that collective decision-making offers more advantages than disadvantages. They emphasized the variety of alternatives, the involved expertise, the possibility to engage different stakeholders and the higher grade of acceptance among employees because of involvement. On the other hand, according to the interviewees not all decision problems are equally suitable for collective decision-making processes. For instance, complex topics could lead into endless discussions. In other words, the process could become cumbersome to find a commonly accepted alternative and paralyze the group to find any decision.

From the analysis topic utilization of social media integration within the organisational context follows that social media plays a substantial role in external communication and public relations but also the internal use has matured over time. According to the interviewees, social media became an

important internal channel of communication, interaction and the exchange of information in some areas. Social media changed the way in which employees communicate. They use tools comparable to wikis to work jointly on documents but also to exchange information and opinions. The Intranet changed from a one-way communication into a platform for information exchange and feedback. For instance, product managers utilize comment functions and "like"-buttons to receive feedback about product innovations, functional design decisions and releases. Management aims to utilize the social aspects of interchange of social media to engage closer with the employees. The goal is to bring after work discussions back into organization. The main purpose is to understand what employees think about the organization, what matters to them and what they would change. Barriers of social media application occur in different areas. Interviewees mentioned mainly exposing the own thoughts in public, missing education, understanding the value and benefits but also technical barriers that slow down the process of adoption. Technical barriers are about complexity of application, usability and missing integration.

The combination of collective decision-making and social media at Transportation Corporation partly integrates in business processes described in Table 1 concerning social media integration in the collective decision-making process. They use dedicated decision platforms to present business decision topics in advance to board meetings to collect options and preferences of the members. Interviewees described different occasions when they integrated social media in the decision-making process. Examples mentioned are polls, opinion gathering on wikis and online discussions. The next part of the findings summarizes the influence of social media on decision-making behaviour and their benefits, risks and disadvantages. The advantages argued are similar to the ones of the collective decision-making without the IT support as elaborated above. Advantages added to the utilization of social media are a perceived acceleration of the process of opinion gathering because less physical meeting needed and less effort to reach out to the decision-makers. Interviewees mentioned as benefits in addition the availability of participants, independent of their geographical location and engaging a team quickly on the social media platform, without the need of formal meetings. They also perceived the possibility to log the comments and document the process as a benefit of social media integration in the collective decision-making process, which allows reproducing the rationales for the decision. However, interviewees mentioned also disadvantages such as participants do not take the process seriously because of a less formal perceived characteristic of social media. Barriers to integrate social media in the collective decision-making process followed to some extent as a consequence of the disadvantages. Interviewees were concerned about opinion manipulation and exposure of thoughts and beliefs to the

organizational public becoming vulnerable to criticism. Lacking trust about the reliability of the process, losing personal unique knowhow and becoming replaceable were additional mentioned barriers. Finally, additional workload to get used to this new media and the missing understanding of the value of integrating social media in a collective decision-making process added to the disadvantages discussed.

The final topic of the findings summarized in Table 1 was about the general perception of social media and how to overcome barriers to improve the utilization. Interviewees describe the application of social media in general as a journey to mature in the application. They confirmed that the management of Transportation Corporation supports and provides guidance. Therefore, in the near future Transportation Corporation plans further social media features to be implemented. This aims to take advantage of this media in the area of interaction and knowledge exchange. In addition, to get closer to the employees' opinions and to enhance the information exchange of existing information management systems. To overcome barriers of social media application in the organisation the interviewees mentioned education, experience in the daily business application, process integration of social media, and utilization and inspiring examples by other teams and departments. Most important emphasized by interviewees was the engagement of management to motivate the employees.

4.3   Case Study: Retail Corporation

4.3.1   General Information

Retail Corporation is one of the largest national retail companies for consumer goods, food and non-food products, education, recreation and financial services. From an organizational perspective, they act in three different organizational forms, an association, a cooperative organization and a foundation combined into the Retail Corporation Federation, representing the entire group. Every member of the group controls their core business functions autonomously with financial and personnel responsibility and ownership.

The main purpose of Retail Corporation is to sell consumer goods in their grocery stores, supermarkets, shops and speciality stores. They produce these goods to a large portion in their own factories and source the remaining products from a broad network of national and international suppliers. The goods Retail Corporation sells span from groceries to non-food products such as cosmetics, cleaning supplies, household appliances, consumer electronics, clothing, sporting goods, furniture and tools for do-it-yourself home gardening, building and refurbishing. In addition, they own restaurants situated normally in their supermarkets, fitness and education centres with a variety of evening and day classes spanning from languages, business, management, information technology, health and arts. They run their own banks, online

shops, public golf courses, gas stations and own a large number of real estates. This makes Retail Corporation a multi-purpose organization with a focus on retail, services and trading goods. In addition, they are active in funding social and cultural projects. According to articles, corporate sites, social media and journals, they aim to contribute to the society development in the area of arts, education, recreation, economy and environmental sustainability.

The main economic challenges are competing retailers in the national market. Competition focuses primarily on cost leadership for comparable products and services and diversification following demand and contemporary needs. Therefore, Retail Corporation follows a competitive pricing and diversification strategy, which requires high flexibility, a horizontal integrated supplier network, and optimized processes along efficient and low-cost value chains. Innovation of new products following new food trends such convenient food, special diets, health treatments, supplements and food for allergic and organic food based on sustainable production and additional services are key factors to differentiate against the competitors. Quality of products but also image and brand play an important role to keep customers in the shops, specialty stores and supermarkets of Retail Corporation. Hence, Retail Corporation emphasise their presences in daily advertisements, weekly consumer magazines, commercials in newspapers, on TV shows, advertising in public areas and sponsorships of events such as sports, recreation and arts. Their marketing campaigns aim to combine products with values of trust, sustainability, support for regional business, and a healthy life style for all demographic groups and consumer segments such as singles, couples and families of all social classes.

4.3.2 Organizational Structure, Management, Culture, Communication and Hierarchy

The organisational structure of Retail Corporation consists of a board of directors led by the CEO and President. Each member of the board represents one of six functional departments; human resources, marketing, logistics and information technology, industries, finance and trading. Every department follows a hierarchical structure with department directors, area managers, team leaders, groups, teams and employees with different roles, cross-functions and responsibilities.

The organization's brand stands for serving the community with goods and services, placing people in the centre of the economy. Retail Corporation defines its values around "trust", "identification", "regionalism", "sustainability", "national identity", "price-performance-ratio", "uniqueness", and "freshness". The relationship and collaboration with partners and regional associates is of high importance for Retail Corporation business because each of them is part of the product selling chain and represents the brand of Retail Corporation.

For Retail Corporation selling natural, sustainable groceries and products in line with their values is the principle of doing business and placing human beings in the centre as the most important factor. They understand themselves as organization that expedites sustainable consumption, social lifestyle, quality of life in front of society but also in front of their employees. Retail Corporation derives its success from the values that enable and improve the efficiency of the employees with the objective meeting the consumer's expectations on product and service quality.

Presence and self-presentation in most common media such as newspapers and TV are an important part of their communication and marketing strategy. Social media such as Facebook, Google+, Twitter, YouTube and a public wiki are channels they utilize to provide customers with latest news and receive feedback about products. In addition, finding new hires and apprentices, announce events, publish stories and to establish communities around Retail Corporation topics. IT Systems play an essential role for external and internal communication and information management. The internal IT infrastructure at Retail Corporation offers a variety of communication channels for employees, teams and departments, partners and suppliers across all levels of the hierarchy. Information systems such as most prominent the Intranet, news channels, internal communities, wikis, sharing platforms and email provide the employees with latest information about the organization, programs, events, strategic measures and announcements. Since the last couple of years, these information systems became an important additional communication channels to receive feedback from the employees to keep management connected with the organization's staff. Using different communication channels allows Retail Corporation to assure that all group members keep in touch independent of their location and working place in the head quarter, in the shops, stores and factories. Hence, IT is an essential part of Retail Corporation's infrastructure because it allows exchanging information in their network of corporations, factories, stores, supermarkets and suppliers. Delivery of goods and logistics requires high degrees of integration and a well-functioning communication environment. The Retail Corporation IT department focusses on supporting functions such as finance, sales, marketing but also research and development. Communication is essential to keep the employees up-to-date with the latest initiatives, special sales, new products, changing of pricing strategy. In addition, data analysis of customer purchasing behaviour origin from sales data but also customer feedback with an increasing amount of data stemming from social media.

Organizational Behaviour, Decision Making, Information Systems

Retail Corporation states that their employees are the centre of success. Therefore, continuous education, apprenticeship programs, personal development, defined career paths, the possibility to learn on the job,

distributed responsibility and an open culture independent of demographics is key. Retail Corporation present themselves in public as an open and transparent organization with a need for participation and collective social responsibility internal and in front of the society. Daily business decisions are mainly made decentralized on department level, within decision committees, project or functional teams, groups or between employees and managers. The hierarchical structures show differences dependent on the department and specific areas such as factories and shops. Hierarchies are stricter close to manufacturing and logistics areas where safety, regulation standards are required but also time pressure determine the daily business. They are less strict in IT, marketing, human resources, research and development, and communication, which allow more creativity and an individual problem-solving processes.

Feedback from customers and the employees are important according to Retail Corporation to continuously evolve and stay competitive. Beside storing and archiving corporate data from the different functional areas and along the value chains, the information systems support collaboration within teams and across departments. For instance, the exchange of information within project teams utilizes information systems to keep the members up to date with latest changes, tracking and decisions.

4.3.3 Perceived Transparency, Openness, Communication and the hierarchical Structures

Most of the interviewees perceived their organization as transparent and open, with differences on department, group and hierarchical level. In more strictly hierarchically organized departments, communication was perceived less transparent then in less hierarchical departments. The interviewees perceived open communication also differently referring to the difference between internal and external communication. The external communication was perceived more open than in some areas across the departments. A project manager of the Intranet and communication and a marketing manager described it as follows:

> *I perceive our organization as very transparent. Also concerning communication, we are open. Especially internally, we follow the principle to communicate everything openly. I think, since our organization is quite large, not all departments follow this principle but in general, I perceive our organization transparent and we communicate open.*

> *It really depends because of the size of our organization. In some areas a very open communication takes place, for instance within teams and partly even between departments or divisions. On the other hand, in some areas I experience non-transparency as well. This leads into situations that initiatives taking place in one*

department but the others hardly know about it. One finds out about things, which one should know about. This shows our internal transparency. Towards external communication, our organization tries to be very transparent. This reflects our core guideline of external communication.

According to the interviewees, hierarchical structures seemed to influence the degree of transparency lived at Retail Corporation. Mainly across the departments, the interviewees described an effect that in some situations slows down the flow of information. The reasons they mentioned were different hierarchical approaches such as strict to less strict and conflicting objectives such as financial constraints or resource distribution the departments follow. In contrast, within teams and among employees on similar hierarchical levels communication takes place very openly and transparent as a project manager from the IT department mentioned:

> *In my opinion, hierarchical structures are quite noticeable. Within a department and especially in our department it is not that relevant but still perceptible. The mode of collaboration is very cooperative but if one works on large-scale projects involving other departments we experience the power of other hierarchical levels quite obviously. This shows also a drawback of the basis of our organizational structure, which is quite hierarchical.*

In general, interviewees described that employees are willing to share their knowledge, but hierarchical structures in some cases become a challenge, creating artificial boundaries that hinder the flow of information. On the other hand, interviewees explained that different media of communication might help to cross the boundaries. However, the systems they use currently for managing information are not at the level that allows exchanging knowledge without losing information in the process. They are creating problems on finding and retrieval because the sources are distrusted over several systems, which are not linked with each other. In other words, the systems lack the functions needed to exchange and interact as a team manager and a project manager for the Intranet put it:

> *Maybe I should start with the structures. I think we have hierarchical structures and partly we live them too strict. These structures and the boundaries they construct become quite difficult to overcome them. Different types of communication media could help. I think the willingness to share knowledge is good. Not excellent but I perceive the willingness to share knowledge in principle is real. Where we face problems in our organization is how to structure, store and make our knowledge available. This has nothing to do with denial but with missing knowhow and not enough time to spend for this.*

> *The willingness to share knowledge exists but the technical options are at the moment not available in a level that allows exchanging and retrieving knowledge simple and quickly. Therefore, we exchange by using the telephone and ask other colleagues, who knows what. This is the way, how we retrieve knowledge today.*

According to the interviewees, management is aware about the importance of interdepartmental communication, transparency and knowledge exchange. Familiarizing and mutual introduction are key ingredients of their approach. Overcome inhibitions of communication by letting departments introduce themselves to the others, explaining their purpose, responsibilities and the people working in the departments is the primary goal the management at Retail Corporation follows as an IT manager reported:

> *We identified some approaches. Management is aware about the problem as they face it the same way as we do. They experience as well that they have communication problems and they are not perceived as transparent as they should be. Since one and a half years, our management started initiatives on regular basis to introduce departments in the organization. We think the introduction of departments and groups improve the communication, and transparency.*

Having different hierarchical structures in different parts of the organization is according to the interviewees accepted. In their view a multi-purpose organization with one hierarchical approach would not work. A decentralized structure with less strict hierarchical structures could be an advantage to foster innovative and creative departments. However, this would be less applicable in stores, manufacturing areas and shops that must follow strict regulations for safety, health, food preservation, fast delivery, logistics and highest hygiene requirements according to a manager of communication:

> *In my opinion, it really depends on the department and the organization. We are all hierarchical organized through the whole organization, but with different guidelines, transparent to everyone. However, I think we have massive differences in this area comparing our different organizations we combine. I guess this has to be this way. A store is much more hierarchical organized then we are in our department. We have many different structures but this makes sense and is intended.*

4.3.4 Perceived Utilization of ICT for Communication, Interaction and Collaboration

Most interviewees at Retail Corporation mentioned besides personal interaction and telephone, the email system as their main electronic

communication tool. This was closely followed by different instant messaging applications, collaboration platforms, the Intranet, enterprise content and document management systems. In addition, they utilize wikis and physical and virtual social networks. The organization provides the employees with different tools for communication, information exchange and collaboration. Following the answers of the interviewees, the purpose, the complexity of the topic and the addressees determine the tool utilized. If less formal, direct communication is the primary focus, the interviewed employees prefer tools such as instant messengers. If information retrieval and exchange of information is key to communicate, collaboration platforms and the Intranet are the applications of choice. The following statements of the interviewees illustrate how they apply ICT in different ways:

> *My main communication conveys by email because we are a large organization distributed over different locations. A lot of exchange happens through the Intranet and other structures. I use mainly Lynch or Skype to communicate and Slack depending with whom I work with. If I communicate with engineers, I use Slack since they use this tool as well. I also use a closed Facebook group to post news and collaborate with the digital team of Retail Corporation. Information and data exchange happens mainly over our internal Retail Corporation-Box comparable to a Dropbox.*

> *I still use primarily email. For less formal things Lynch and Slack. We use our web-based box comparable with Dropbox for information and data exchange. Unfortunately, this is not deployed in all departments. We also use a ticketing system to collaborate and exchange in our development projects and use it case by case.*

> *Email is my main means for communication and for short consultations, which I do not need to store I use Lynch. The Intranet is my news channel and repository and SharePoint my tool for project specific collaboration, wiki for the documentation and Jira, our ticketing system, to manage problems and bugs.*

Interviewees described the utilization of ICT in the area of collaboration to a large portion in context with projects. Which means projects build the context and the demand to utilize ICT for collaboration. Documentation and the exchange of information and jointly working on documents using wikis and content management platforms were the most mentioned purposes. The Intranet is a central area for information retrieval. It also allows commenting and interacting but not all employees use this possibility. According to the interviewees, the Intranet provides an additional channel to retrieve information and to interact using the comment function according to a software engineer and a manager for corporate communication:

My main information tool is the Intranet. I have a personal habit to read every morning the news on the Intranet. Hence, I can follow what Retail Corporation communicates in general and I am able to retrieve most Information about the organization. I also use the Intranet to provide feedback by using the comment function.

We use wikis as well. One can setup project wikis we use internally. In the past I used this quite often. Today we also use predefined structures based on folders where we edit and store documents and protocols because not all employees know how to work with wikis.

ICT plays an important role in the daily communication and the flow of information in the organization. The interaction and collaboration part concentrates mainly on project work utilizing different communication and exchange tools. Email and instant messengers mainly establish direct communication. For less formal interaction, the interviewees use instant messengers and if formal communication is required email. The reason is a common view that instant messenger chats information is not captured the same way as email. In other words, the interviewees were concerned about that the chat information is not stored properly. The organization is less strict concerning the utilization of the provided tools and standards are not established in a way to guide the employees to understand the advantage of using the same platform. According to the interviewees, the large number of available tools increases the chance that not all participants in the communication use the same or do not know how to use it. Hence, benefits of a network effect, that increases the more employees using the same system, are not fully utilized, following the statements of the interviewees.

4.3.5 Perceived individual and collective organisational Decision-Making Process

According to the interviewees, most business decisions with a smaller impact for the entire organization take place decentralized within the teams and groups. They explained that employees carry the expertise and understanding about the problem to make sound decisions and the acceptance increases the more employees participate. This is the case in less strictly hierarchically manged departments. In contrast to strictly hierarchical departments, where to a large portion the decisions made by management. In all departments, if the impact concerns larger investments, a committee or management on upper levels makes the decision. In some of these decisions, where subject matter expertise is required employees participate partly in the process and provide the alternatives management bases the decision on. In other words, at Retail Corporation, decisions take place from both directions, the majority bottom-up and some top down without involvement of the employees as a communication manager and a project manager described it:

I normally decide by involving the employees. In some areas, management has not the knowhow for instance if there is a need to evaluate a new tool. In my opinion, we are extremely bottom up driven about what are the needs of the users, what helps to support the work, which becomes the basis of the decision-making of the management. I apply three scenarios in my project, which I develop with my employees. First, I ask the employees about their needs using surveys or interviews or meetings. After that, I carry the results into the core team to define three different scenarios, which we present to the steering committee and the responsible directors make the final decision. It is very important to involve the employees to carry the decision or the whole process generates at the end a useless outcome.

Concerning projects involving large amounts of money, management clearly makes the decisions. We have also rules to determine who decides when concerning the level of investment. However, we, the employees quite often have the possibility to make decisions by our own. I normally involve my manager or the team to increase the acceptance and the support. Of course, you take small decisions for yourself but if the decision affects more people, you start to talk, discuss and align with the team to determine if the request is really needed and if it should be implemented at all.

The interviewees explained that centralized and decentralized decision-making processes follow both a collective approach involving employees on different levels and depending on the topic from different departments. Hence, business relevant decisions at Retail Corporation involve usually more than one individual, no matter if the decision is on management, employee or on both levels. For larger endeavours, they utilize steering committees consisting of subject matter experts, employee representatives, internal customers, stakeholders and managers. A team leader from the IT department and a project manager reported it as follows:

We know both scenarios. It depends on the importance, the dimension or magnitude of the topic. Mostly a budget comes along with a decision and if the decision involves a large budget, we normally have to involve a committee to decide. These are mainly subject matter representatives or representatives from higher management levels. Of course, to a certain degree, employees are allowed to make business relevant decisions but only with less influence or smaller financial consequences. In my opinion, this is to some extent, the management approach we are following where we allow everyone, at least partly, to make decisions. We dismissed the patriarchal approach or at least we try to avoid it.

The employees have the possibility to influence the decision-making process by bringing in their proposals. Up to a certain

scope, they are normally free to influence or even force decisions into a certain direction. However, we need the agreement of the internal customer. This is of advantage because we avoid different applications for the same problem and instead apply a consistent standard for all departments. Albeit, the steering committee decides yes or no at the end.

The interviewees described different methods they apply in the decision-making process. Common methods are pre-studies, proof of concepts, cost-benefit analysis and the application of a decision matrix. However, most of the interviewed employees referred to deliberation as their preferred approach to decide within the team. During the process of deliberation, decision makers aim to find a consensus in the group and finally choose the alternative accepted by the majority. In addition, business rules and legal regulations guide the process. They define who has to be involved according to the topic and if the decision stays in the team, has to be carried into a committee, up to the management or the board. The following statements illustrate the processes applied in daily business:

Out of several alternatives, we try to find the most promising one by performing pre-studies or a proof of concept and at the end present the findings, if we are talking about large endeavours. Not for smaller projects but for large ones we approach a committee to decide. Sometimes we also invite external providers to present their solution to gain further alternatives. This is how we make decisions in our department.

In general, there is always a discussion and depending on the topic a presentation with the objectives, that everybody talks about the same and have the same basis. In our case, this is mainly a cost-benefit analysis, which determines if we implement the solution or not. In my case, the decisions are about implementing a change request or not. From our IT department we receive the effort assumptions and on that basis, we can decide. A quite simple process in my opinion.

The overall perception about the collective decision-making process was mainly perceived positive with a lower number of disadvantages. Interviewees mentioned that the decision problem could be too complex and difficult to understand by a broad audience leading into prolonged debates or wrong assumptions. Friction caused by misunderstandings, leading into endless discussions and delaying the whole process was a concern the interviewees mentioned prominently. In addition, they described the negative influence of a dominant person, who could push the decision in his or her preferred direction. This means, a dominant person could overrule the opinion of the silent participants if not controlled properly. However, involving a large group of individuals in the process, idea diversity, opinions and expertise supersedes

the negative aspects, according to the interviewees. Most prominent advantages mentioned were broader acceptance and a stronger backup of alternative evaluation, which might lead to decisions that are more robust. A project manager, team lead and IT director explained how they perceived the decision-making process as follows:

I think the collective decision-making process is fundamental important if decisions have to be carried to the employees on all levels. It depends on the nature of the decision if a collective process is applicable. However, for strategic directions I think a collective decision-making is not always necessary but adoption of a business processes or a corporate vision could be quite interesting to develop collectively. This means in my opinion the decision topic determines the process but for a high percentage I would argue, collective is always better. Nevertheless, the collective process needs more time and creates friction.

Sometimes collective decision-making could be quite cumbersome. It will definitely not support a fast implementation and instead delays the process. Nevertheless, if at the end everyone supports the decision and a collective consensus can be found in a reasonable time it is definitely a good thing. Because all carry the decision. However, it has advantages and disadvantages.

If the collective process works well, it is the better choice. However, if too many possess not enough information or addressed the topic not properly, the decision might become random. It might happen that someone dominates the discussion but does not hold any subject matter expertise and silent characters might get lost in the process. Nevertheless, in committees, concerning important decisions, we maintain a supporting culture of deciding in a collective fashion.

The interviewees explained that both, a centralized and decentralized collective decision-making approach are appropriate following the impact of the decision problem. In general, collective decision-making applies in almost every business decision, no matter if centralized, made by a management team or decentralized by the employees. According to the interviewees if a decision is made collectively, the involvement is much higher among the teams, departments or the entire organisation and the consequences are carried on many shoulders. This helps to defend a decision even if it was at the end not optimal. In other words, a decision supported by a large number of employees are preferable over decisions made a by single person as a project manager and a team lead explained:

I think it is good. In my opinion in a large organization or a department, which is responsible for the entire corporation it is an

advantage to have a broader support. On one hand, the people are well informed and on the other hand jointly making decisions assures if something goes wrong nobody can claim the others fault. Instead if the decision was collectively made the consequences and the responsibility are borne jointly.

The question is who will be responsible. Maybe individuals across different parts of the organization. Therefore, it could be a matrix organization, which makes the decision. Finally, someone takes the responsibility, which illustrates how we are organized. Of course, there are buy and budgeting considerations, where we must follow our incentive driven management, which could be difficult. However, I think it is much more efficient to let the individuals make the decision who are involved in the topic.

4.3.6 Perceived Utilization of Social Media Integration within the organisational Context

Retail Corporation offers their employees different social media applications such as instant messengers, wikis, an Intranet with comment and rating functions and content management systems with collaboration functionalities and sharing platforms. For external communication, the interviewees perceived the utilization of social media quite mature, how customers are addressed and communities are involved in discussions about Retail Corporation. However, for internal purposes the interviewees perceived the utilization of social media not at the level to gain full advantage. Because of missing standards, weak integrations in daily business processes and the lack of knowhow about the application in practice. However, the organization improves continuously, following the statements of the interviewees, and the tools disseminate in different areas and intensify their utilization. The areas applied are generally communication, exchanging information and providing feedback as a project manager and a team leader depicted:

We utilize social media quite a lot and see many advantages. We use also a wiki, not for the whole company but across the department to document our knowledge. Our Intranet has a comment and "like"-function. We use instant messaging, which means we have the possibility to use a tool but IT does not prescribe a certain standard. In our case, we use Skype for business but every employee is relatively free what he or she chooses. What we plan for the next year are communities to offer this aspect in the organization allowing creating subject matter communities, where the employees can exchange about specific topics.

Retail Corporation utilizes social media for customer communication, to demonstrate presences in the market and to represent the organization for instance on Facebook and other

social platforms. For instance, to announce new products. I think Retail Corporation does a very good job there. If we look at the utilization internally, I see the need to backlog demand. We are still in the beginning, which I ask myself why. We use it externally quite well but internally in my opinion still not at the right level. I would appreciate to have a skills database where I can search for specific skills and get in contact with the person I need.

Social media prominently mentioned for exchange at Retail Corporation were wikis in context with projects to work jointly on project documentation and exchange information. In addition, the intranet with the possibility to publish documents, articles, and comment and rating functions to learn about and publish opinions. A team leader of the engineering department described his perception as follows:

In our engineering department, we use our own wiki. We created our own platform, which the employees use quite intensively. Our entire competencies for the software development are stored in this platform. The employees are obliged to keep it tidy and use it regularly as a kind of dictionary. It is also of advantage for new hires because they find the information they need rather quickly and learn about the rules and regulations. However, this is specific for our department. In other words, everyone can contribute a lot or nothing.

According to the interviewees, instant messengers or group chat tools are a frequently utilized social media besides email to address employees in the organization. The interviewees described benefits of instant messengers around sharing content, involving several people on the same platform, joint problem solving and opinion exchange as an IT supporter, team leader and a director put it:

I use instant messengers daily but not as much as email. I use the instant messengers increasingly more often to offer remote-support. Screen sharing and access to the user's view is an efficient tool for us in the support department to communicate and to exchange information, sometimes just short messages, which the users reply. We receive short sentences and not very long emails. Sometimes we exchange an invoice number, a print screen or just a short request.

I use less emails and do less calls. Still I think the amount of incoming and outbound emails did not decrease at all. Instant Messaging is very fast but it has the disadvantage not to be as binding. The next day nobody remembers what was exchanged the other day but with an email, I still have something written in my hand.

The advantage of using an instant messenger is the speed; one gets much faster answers about different topics and understands opinions about the topics much quicker.

Disadvantages and risks about social media utilized in an organizational context concentrated around the topics of continuous availability, distraction and confidential information leaking. In addition, missing formal preservation, retrieval options and personal exposure. The interviewees perceived social media as a means that leads into a seamless transition between work and private life. In other words, social media invite to be continuously available. The interviewed employees were worried about that this becomes the standard and an expected way of working. In addition, the interviewees are concerned that social media has a potential to distract the employees from their daily work and consequently decrease their productivity. Interviewees criticized missing formal regulations and filing options of communications taking place within social media such as online discussions. They explained that important information could get lost, because the retention and retrieval of social media content is not clearly defined or only partly implemented. Another risk mentioned was personal exposure to the corporate public. If an employee expresses officially his or her opinion for instance in comments on the Intranet in front of other employees and the management, they could become vulnerable. In other words, this could lead to open criticism and worst case into verbal attacks causing a negative impact on personal reputation. The interviewees classified this as a personal risk. Overall, the nature of the disadvantages and risks are multi-layered and perceived differently following the statements of a team leader, product manager, and a software engineer:

I think everything became much more hectic. We need to get some distance where one says consciously I stop to work with it and move back into my offline world. I have to decide between the online and the offline world. I do not want to be online 24 hours a day and being permanently available, which I perceive as not living my life. I say really conscious to myself I do not need to watch my phone on the weekend if I received some messages.

A big risk is distraction. You could very easily get caught in this social media universe. It is not a loss of efficiency but a kind of not being able to focus on one topic. Many topics come in parallel and this has to be processed somehow or one needs to ignore things.

Social media could start a storm you are personally exposed. Once I experienced that someone expressed in public his or her opinion in a forum comment and was severely criticized by the others. This could cause reactions, which at the end influences people not to place any comment.

Interviewees located the area where social media changed their behaviour in daily business mainly around communication and interaction. Social media provides new channels of communication. They allow getting in touch with other employees asking for help, feedback or an opinion less formal and much quicker. For instance, an integrated instant messenger shows the availability of a person with the help of a status indicator such as green for available or red for busy. This provides a visible aid for the communication and informs immediately if the person to contact is ready for a conversation. The interviewees perceived this kind of communication as much more efficient as trying to call someone and leave a message on the message box. In addition, social media provides managers with a sensor about the general mood in the team. They help to react more agile than waiting for the next meeting by monitoring feedbacks, comments, and ratings as a manager of communication and a project manager perceived it:

> *Social Media for me is an additional channel. As the fax did it for the daily business, social media facilitates the daily business. You also get a better feeling for trends, urgent situations either from different aspect. It is a kind of sensor for the mood of individuals.*

> *Many things became easier. I do not write an email for every small sentence. On the other hand, things became more complex because of the number of communication channels that exist and without a standard used from everyone. This makes it difficult to find the information you need if you have to search for it on different locations. However, I see the positive aspects much more compelling than the negative.*

4.3.7 Social Media Integration in the collective Decision-Making Process

The interviewed employees framed their experience about collective decision-making processes and social media in the context of opinion gathering and opinion making. In addition, about communication enhancements, and the possibility to address larger groups, alternative evaluation and polls within the organization. The interviewees used wikis and blogs to document the decision-making process and to integrate opinions from the participants. For instance, by using feedback mechanisms provided by comment and rating functions integrated in content management systems and the Intranet. They explained how they utilized the Intranet as a media to establish larger polls asking the employees about topics of general organizational interest. Furthermore, interviewees applied social media to gather contributions at a larger scale about vision statement development or to ask about preferences about alternatives during a decision-making process. They also mentioned limitations they experienced with social media. For instance, social media was perceived less suitable for a collective decision-making process addressing

problems of high complexity. This could lead into very high efforts to describe the problem or decision topic to a larger group with different knowledge in a comprehensible way. The following statements of a project manager and a communication manager describe examples of social media integration in a collective decision-making process and its limitations:

> *We launched a while ago a new Intranet and the task was to find a new name for it. We presented five alternatives and asked the employees to vote for the one they prefer the most on our Intranet. Unfortunately, it came never to a final decision because the board did not approve the name since it was too closely linked to the founder of our organization. However, this was a very good example to involve the employees into a collective decision for something they would see probably every day.*

> *I think we can do this now. For instance, we could engage a closed group on Facebook for an open discussion about any topic. Blogs and wikis are very promising for decision-making in order to make the decisions comprehensible. I like wikis very much to document the whole process. You can follow exactly who has made when which contribution or answer. I think this is a very good decision-making tool, I would claim a central one.*

Interviewees perceived Social Media also as a supporting platform, which enhanced the decision-making process from a communicating and interacting perspective, engaging a larger group of people as a project manager and a team leader framed it:

> *I think social media in some sense are able to support the decision-making process for instance if you would like to ask a larger group of employees about their option about specific solutions or you aim to have their commitment for a specific alternative, which for them would be the most suitable.*

> *I remember our annual employee events, which is interesting in this context of involving employees using text message comparable to a micro blog on the smart phones and a beamer. About five hundred people were able to ask questions which were presented to the audience with the beamer. A team answered the questions and for some topics, we were able to vote.*

4.3.8 Perceived Influence of Decision-Making Behaviour of Social Media, Benefits, Risks and Disadvantages

The Interviewees depicted the influence of social media on decision-making behaviour in the area of how a community creates opinions during the gathering and deliberation process and how individuals influence each other utilizing social media. Furthermore, the interviewees perceived the process in

context with social media enhances transparency, which might influence on trust of the employees in the process and the choice made by the collective. Transparency and comprehensibility were attributes they mentioned concerning the integration of wikis in the decision-making process. Wikis allow recording each step of the process and the contributions, proposals and alternatives discussed. Following the interviewees, social media stimulates a large group to deliberate about a problem and possible solutions. However, comparable to group discussions some participants move the decision process into a specific direction following the statements of a product and a project manager:

> *The community of users determines social media and this community determines the direction how a decision develops. For political decisions, my social environment influences me if I go more to the right or to the left. I am shaped also by messages broadcasted by social media news feeds, which means they amplify a tendency the final decision goes.*

> *Social media provide a good overview about a topic. For instance, a wiki enhances transparency and comprehensibility. Transparency is in my opinion the most important factor to build trust and to allow following how the decision-making process progressed. Of course, it depends on the importance of the decision. The more the top management is involved the less transparent the process becomes. Social media allows controlling this process of selective information.*

Described benefits about social media integrated within a decision-making process were similar to the advantages the interviewees mentioned about general advantages of social media. Frequently mentioned benefits were additional possibilities to exchange with a geographical dispersed group, the enhanced communication during the decision-making process and the access to expert knowledge. Social media in the decision-making process according to the interviewees allows involving the people, which are affected by the decision itself. For instance, the software tool they will use how they address customer demands within a product development cycle or how a business process should be changed and optimized. A software developer and a team lead illustrated this as follows:

> *An advantage of social media is the possibility to exchange. Every media as such helps to enhance communication and in my opinion, it is important to know how to use it. Especially in projects, it is very important because communication is the main topic.*

> *The advantage we came across is the timing and geographical aspect, which I perceive as relatively good. It is quite simple to involve and integrate a larger group of people. I do not see in a*

sense real disadvantages. However, it is all about the topic and who is involved. I think the younger generation is much more into social media than the older generations. This will probably change within the next ten years. Our management is not like a start-up company, which has already many digital natives.

The main disadvantages about social media and decision-making mentioned in the interviews were distraction and opinion manipulation. In addition, losing control of the decision-making process if not facilitated properly, information bias and misleading arguments. The interviewees explained the risk of distraction occurs in conjunction with information overload. This overload might cause losing the focus on the problem itself and slowing down the whole process according to the interviewees. They reasoned this because the participants are overwhelmed with opinions about alternatives piling up during the online deliberation and within comments and feedbacks. Opinion manipulation was seen as a risk in context with misleading information, which could occur on purpose or by accident. In addition, participants do not possess the required knowledge and expertise to understand the problem and to make educated decisions. Therefore, this might lead to wrong assumptions moving the involved employees in the process into less optimal direction. Following a team lead and an IT manager perception illustrates the above:

What I mentioned before, if the information is not properly processed and if no further coordination takes place it could lead to wrong decisions in some circumstances. Well, the same risk applies as well if you meet in person. If the information is well prepared, you could come to a decision much faster. In particular, if you are decentral organized the distance could become a barrier. This is an advantage to make decisions using social media.

About the disadvantages, you could lose yourself and the entire decision-making process could get out of control. I see this as a risk. In other words, if you are spending almost your entire time with social media you are getting distracted and I think this is not the idea behind.

4.3.9 Barriers to integrate Social Media in the collective Decision-making Process

Most occurring barriers were unclear benefits, additional workload, information overload, personal exposure and usability. Furthermore, a lack of a common standard across the departments using different social media platforms in the daily business for the same purpose. This obstructs the integration of social media in the collective decision-making process as a communication manager explained it:

For instance, I have employees in my projects who do not use social media at all. We have entire departments working with social media intensively and other departments use them not at all. This is almost a clash of cultures. These departments, at the end use still the old established tools. Another difficulty I see, I have project teams who use wikis only. I do not tell them that they should not but if I have afterwards to transfer the whole content into other formats. This creates a lot of extra effort.

According to the interviewees, personal exposure generates discomfort for a majority of employees. Allowing others to view what one thinks, what one likes, personal preferences, beliefs and opinions not every individual is comfortable about within the organizational context. This means others could read and judge about the contribution one publishes on social media. In addition, the contributions and online discussions provide not the required information and therefore employees are hesitant to make a choice as a software engineer and intranet project manager illustrated it:

You are never sure if the decision was really based on profound information or someone misunderstood the text, because it is too long and because of that, people do not read it, which could become a barrier as well.

I perceive not from a majority but from many employees to post or like something in the Intranet and social media as a challenge not just in the organization but also external. Despite we allow to post anonymously, in other words, you do not see who liked something but the people still hesitate. I guess because they do not know what will happen with the data. They have the feeling someone will track how often someone liked, or in general, they are reluctant to expose themselves in the organisational public.

The interviewees placed measures of how to overcome these barriers in the area of change management. For instance, providing the employees with specific trainings about the integration of social media in the decision-making process. Employees need to understand the benefits and advantages about social media to utilize these technologies in their business decisions. In addition, according to the interviewees, guidance and support from the management is key. If management provides good examples, how they utilize social media, the employees would most likely follow. Another measure to lower barriers was mentioned about usability of social media and the integration in existing business applications. The application should allow retrieving information from different sources during the decision-making process without the need to switch between different interfaces. This means, social media should be seamless integrated in business processes.

4.3.10 General perception about Social Media and how to overcome Barriers to improve the Utilization

In general, the interviewees experienced the application of social media within the organization as a positive enhancement of their daily work. They perceived it as a necessary evolution process to mature and foster a learning organization. For instance, in the area of sharing information, communicate with each other and aggregate opinions of a larger group to support sound decisions. Most prominent barriers interviewees located in the area of understanding how to use social media efficiently and the business value social media might provide. In the view of the interviewees, both could be mitigated by additional education programs and experience in practice. Another barrier they explained was that the management lacks the trust and confidence in the employees to solve business problems by themselves and consequently accept less required power and control. The interviewees were aware about guidelines but see them also as a barrier because too many regulations prevent the open usage of social media. For instance, strict and rigorous security regulations slow down the flow of information. A communication manager and a project manager explained how to overcome these barriers as follows:

> *I see two tiers, the employee tier and the management tier. The employees need the skills and the management needs to trust and accept to lose partly the control. I think these are different things. Openness and education within the organization and the allowance to use social media at the work place is very important. In addition, we have quite strict guidelines to tell us what is allowed and what is not. I think this is sometimes cumbersome but I understand the security risk as well. I think it is also related with the readiness to innovate and the trust in the employees. This has to be fostered by the management to share information and building social networks to utilize the potential of social media.*

> *In the past, IT in some cases just rolled out a tool and sometimes the employees were aware about it or not. They did not know what the tool is for or what it offers. A real communication about it was missing. I think if the people use a tool more often and know, what they can do with it contributes a lot. Of course, management has to demonstrate what has to be applied and lived in the organization and this is in my opinion a high barrier to increase the usage of social media any further.*

Interviewees described barriers also in the area of culture and the willingness to adapt to new trends and technologies. They mentioned the importance of an organizational culture, which motivates and encourages employees utilizing new ways of communication and interaction. This leads to a learning and open organizational culture that fosters collective action and collaboration.

In addition, they mentioned barriers that do not apply to all generations present in the organization. The interviewees experienced that older generations are more reluctant than younger generations. They explained that younger generations adapt quicker and are familiar with social media before they entered the professional live as mentioned by a team leader and a communication expert:

> *I think it is a question about the individual and if he or she is open or less open to use social media. We are a very forward-thinking organization and are willing to follow new trends or even set new trends. I think a barrier is also the age if someone participates or not. Not everyone has a Facebook account only if there is a Retail Corporation one.*

> *I assume it origins from the employees who do not know how to use it. In addition, the topic about culture is really comprehensive and central. I think you have to seed the basic opinion and let it slowly grow to get it right and the top management has to be involved because I guess, without their support it will be quite difficult.*

Interviewees also explained how to extend the usage of social media and lower barriers in different areas from a technical, social and cultural perspective. Important for them was how to motivate the employees to participate and contribute in online discussions, special interest communities or collaborative projects and content sharing. From a technical perspective, usability and integration in business applications lowers barriers of utilization. From a cultural perspective, they assumed that the more employees utilizing social media in their daily work the more employees would follow. Which means, employees could be motivated if they experience how others benefit from sharing, online discussions, feedback and less formal and direct interaction. In addition, management support and guidance would be a motivator to utilize social media on larger scale. The interviewed employees explained this as a cultural change motivated and fostered by management, which leads into a transformation process towards leaner hierarchies and open collaboration across departments.

4.3.11 Summary

The following table 2 summarizes the findings of case study Retail Corporation divided in analytical themes, areas of investigation and findings.

Table 2: Summary of Findings Case Study Retail Corporation

Analytical Themes	Areas of Investigation	Findings
Organizational Structure, Management, Culture, Communication and Hierarchy	Organizational Behaviour	• **Organisation's perspective**: Hierarchical structure from strictly hierarchical and centralized to less strictly and decentralized management approach based on purpose of department or unit. Culture: derives its success from the values that enable and improve the efficiency of the employees with the objective meeting the consumer's expectations on product and service quality. Communication: Using different communication channels to assure that all group members keep in touch independent of their location and working place in the head quarter, in the shops, stores and factories
Transparency, openness, communication and hierarchical structures	Organizational Behaviour	• **Organisation's perspective**: open and transparent organization with a need for participation and collective social responsibility internal and in front of the society • **Employees' perspective**: Transparent and open internal communication between individuals, teams and groups and external to customers. Less transparent across departments, dependent on management approach: strict hierarchical: less transparent and less open. Flat: transparent and open.
Utilization of ICT for communication, interaction and collaboration	Social Informatics	• **Applications**: email system, instant messaging applications, collaboration platforms, Intranet, enterprise content and document management systems, business process management systems • **Purpose**: Purpose: Communication: corporate news, messaging, individual, teams, and group conversations, collaborative information and document management in project context, information exchange, virtual meetings • **Information Flow**: Within departments, teams and groups information systems open for collaboration and exchange. Exceptions: confidential areas: human resources, management. Between departments and divisions different information systems creating information silos and slow down information flow • **Change of behaviour**: instant conversations, interaction and joint collaboration on documents

		connected to business processes changed the communication habits and collaboration behaviour: direct, ad hoc, less formal, joint collaboration with different teams and groups, networking interaction
Individual and collective organisational Decision-Making Process	Collective Decision-Making, Organizational Behaviour	• **Approach:** Mixture of a collective decentralized and centralized process: Centralized: decisions of lager investments, organizational structure or strategic impact. Decentralized (majority): daily business problems, project delivery, project approach, business procedures • **Participants:** Functional and expert groups, project teams, employee and his or her managers, committees, management teams and the management board. Employee collectively decide or advise. • **Methods:** Pre-studies, proof of concept, cost-benefit analysis, decision matrix, deliberation about consensus in teams, business rules and policies • **Perception:** Positive: involving a large group of people in the process, availability of a diversity of ideas, opinions and expertise. Negative: lack of control, biased communication, wrong assumption, prolonged debates
Utilization of Social Media integration within the organisational Context	Social Informatics	• **Applications:** Instant messengers, wikis, Intranet with comment and rating functions, content management systems with collaboration functionalities and sharing platforms, virtual project rooms, blogs and micro-blogs • **Purpose:** Internal and external communication, exchanging information and providing feedback, share and jointly edit documents mainly among project teams, publish documents, articles, comment and rating contributions • **Behavioural Change:** Less formal, direct, ad hoc interaction with other employees asking for help, feedback or an opinion. Managers reach out to employees asking for feedback more frequently
Social Media Integration in the collective Decision-Making Process	Social Informatics, Collective Decision-Making,	• **Applications:** Integrated polling and rating functions, opinion gathering utilizing wikis, online discussions and deliberation on content sharing platforms, online forums and blogs

	Organizational Behaviour	• **Purpose:** Opinion gathering, opinion making, communication enhancements, address larger groups, alternative evaluation and polls within the organization, process documentation • **Behavioural Change:** Less impact on final decision, access to many opinions, supporting and enhancing influence on decision-making
Influence of Decision-Making Behaviour of Social Media, Benefits, Risks and Disadvantages	Social Informatics, Collective Decision-Making, Organizational Behaviour	• **Benefits:** Enhances transparency of the process, which increases trust, recording of each step of the process, stimulates a large group to deliberate about a problem and possible solutions, exchange with a geographical dispersed group • **Risks:** Opinion manipulation, exposure of personal thoughts and beliefs to the community: if failure losing respect and standing, misleading arguments • **Disadvantages:** Distraction, losing control and focus, information overload, tedious and cumbersome process
Barriers to integrate Social Media in the collective Decision-making Process	Social Informatics, Collective Decision-Making, Organizational Behaviour	• **Barriers:** Unclear benefits, additional workload, information overload, personal exposure, usability, lack of a common standards across the departments, motivation, denial of new technology • **How to overcome Barriers:** Change management, special trainings, how to utilize social media in the decision-making process, explain the benefits, involve management with good example, integration in business applications
General perception about Social Media and how to overcome barriers to improve the utilization	Social Informatics, Collective Decision-Making, Organizational Behaviour	• **General Perception:** Positive enhancement of daily work and a necessary evolution process to mature and foster a learning organization in the area of sharing information, communicate with each other and understand the opinion of a larger group to support sound decisions • **How to overcome Barriers:** Management supports and provides guidance, usability, integrations, standards, cultural change and transformation process supported and fostered by management towards a leaner hierarchical structures and open collaboration across departments

The results of this case study provided different insights about organizational behaviour focussing on structure, management approach, culture, transparency and openness from an external and internal perspective. The first topic of the findings summarized in Table 2 above refers to organizational structure, management, culture, communication and hierarchy. Retail Corporation is a multi-purpose organization highly diversified, consisting of many organizations managed with a hierarchical but also cooperative approach among the members of the group. They understand themselves as important part of the society influencing life style, health, education, culture and arts. The image they stand for is sustainability, quality, openness and transparency from an internal and external perspective. The level of hierarchical structures reaches from lean to strict hierarchies depending on the organizational function. Organizations in the area of logistics, manufacturing, food production, shops and stores follow a strict hierarchical approach whereas organizations closer to the head quarter with functions such as marketing, corporate communication, IT and human resources are much leaner organized. This has an impact on decision-making in general, collective decision-making and the application of social media. Leaner organizations at Retail Corporation are more open towards new forms of communication and a collective decentralized approach to make decisions than highly strict organizational areas. Concerning the findings about transparency, openness, communication and hierarchical structures the interviewed employees perceived Retail Corporation as an open and transparent organization especially towards the public but also internally, in line with the image Retail Corporation cares about. The interviewees explained that this is a common corporate culture, encouraged by the management, lived within departments, groups and teams. If it comes to openness about cross-department communication and transparency, they experienced boundaries that sometimes hinder the information flow. This led to situations one department launched an initiative to improve for instance a business process or deployed a new tool, other departments were not aware about. Regarding the utilization of ICT for communication, interaction and collaboration Information systems play a key role at Retail Corporation offering a variety of business applications they source from different vendors. In addition, they extend and customize their software solutions, and host and operate them by themselves. Retail Corporation equips their staff with general-purpose software for content management, communication, information exchange and interaction. According to the interviewees to many different tools offered for the same purpose and in some areas corporate standards are missing. This led to problems about communicating across departments and the information exchange, because of different data formats, redundant applications or inconsistent communication platforms. Email is still a very common communication platform used at Retail Corporation besides instant messengers, the Intranet, content sharing platforms and wikis.

Concerning the individual and collective organisational decision-making processes the interviewees reported that for most business relevant topics collective decision-making is a mix of centralized and decentralized processes. Smaller endeavours with less financial impact are entirely kept on business level, which means the employees decide decentralized and autonomously. However, if decisions are about larger investments or of strategic nature the rule at Retail Corporation is to involve at least a decision committee or the board. Common methods applied in the decision-making process are decision-matrix with different criteria, cost-benefit evaluations, pre-studies, and proof of concepts. Collective decisions are typically subject to deliberations within the group or team to reach a consensus about the alternatives to choose utilizing a democratic approach. If the group or team is not able or not allowed to make the decision, they can still participate by preparing and explaining the advantages and disadvantages of the alternatives to support the management to make the decision. The interviewees characterized the collective decision-making process with a significant higher number of positive than negative attributes. The primary advantages they mentioned was the possibility to involve a larger group including experts and the diversity of opinions to support sound decisions. In addition, the buy in of the participants to back up a decision even if the decision turns out to be less optimal. A disadvantage they often emphasized were a tendency to endless discussions, which could become cumbersome. A problem they experienced if the topic is too complex to grasp by the majority of the participants or the opinions are too far apart.

Following the findings summarized in Table 2 about the utilization of social media integration within the organisational context, Retail Corporation employees utilize social media mainly for communication, collaboration and information exchange. Retail Corporation employs social media intensively for external customer communication but less intensive for internal application. In the last couple of years, instant messengers and group chat tools became a real alternative to email. This new communication media allows according to the interviewed employees a less formal interaction with other team members, peers and managers. For instance, product managers and service engineers use instant messengers to contact and support users by sharing screens and working jointly on problems. The Intranet evolved from a purely one-way communication to an interactive platform. This is at Retail Corporation the main platform for corporate information exchange to keep the employees informed and receive their feedback. Wikis the interviewees mainly use in projects for documentation, to provide feedback and to inform the team members about the latest status of a milestone or support needed in some areas. Disadvantages the interviewees complained about were the perceived permanent availability and the fleeting and less formal character of online discussions compared to an email exchange. In addition, they mentioned

distraction and personal exposure. Distraction caused by an overload of available information could drag the participants away from the topic or problem. Personal exposure to the corporate public could lead to criticism about opinions and comments posted and therefore causing discomfort and avoidance.

The interviewees described social media Integration in the collective decision-making processes in context with problem description and process initiation. In addition, to present alternatives, gather and make opinions, to establish votes, polls and to document the process. Another investigated topic focussed on the influence of social media on decision-making behaviour and their benefits, risks and disadvantages. The interviewees described different decision-making possibilities of social media utilizing the Intranet to initiate the process, describe the problem in wikis and gathering opinions in blogs or discussion forums. The advantages were stated in the area to involve geographical dispersed individuals with less effort, the documentation and tractability of the decision-making process to understand the emergence of the decision, how options and alternatives evolved. In addition, the enhanced possibilities about communication and the availability of almost immediate feedback from a larger group. The interviewees described the disadvantages similar to ones mentioned in context with the application in a general business context. They felt that different levels of understanding about a topic within the collective could degrade the robustness of a decision. In addition, misleading arguments, opinion manipulation, losing the silent individuals in the process, and without moderation ending in endless discussions, added to the list of disadvantages.

The last topics discussed in the findings summarized in Table 2 are barriers to integrate social media in the collective decision-making process and the general perception about social media and how to overcome barriers to improve the utilization. In general, most interviewees perceived social media as an additional means that supports communication and the exchange of information and knowledge. They located barriers of further utilization of social media within a business context due to the age of the users, the degree of integration within the business processes and usability of the applications. The interviewees experience younger people as more flexible and open towards new technologies and communication tools than older generations. Improvements about usability, seamless integration are measures the interviewees mentioned to overcome barriers of social media utilization. In addition, they stated the support by the management of high importance that demonstrates the benefit of social media. Furthermore, education about how to use them efficiently and most important a change of the organizational culture towards openness and knowledge sharing, guided by a corporate standard. Finally, in the view of the interviewees, management must accept to

lose partly the control of the process and trust the employees to use the tools efficiently without too many restrictions.

4.4   Case Study: Software Corporation

4.4.1   General Information

Software Corporation is a public listed company active in the field of information technology, primarily focused on computer software development. They operate four headquarters in North America, Europe, Japan and Asia Pacific with several subsidiaries gathering more than hundred and twenty offices around the globe.

The main purpose of Software Corporation is to develop and sell software products and services for enterprise information management. Their applications are focused on managing structured and unstructured corporate data. They provide technologies in the area of capturing, content management, archiving, business process management, customer experience management, data discovery and analytics, business networks for trading and output management. Software Corporation offers professional services supporting and consulting their customers during joint software deployment projects. These services cover project management, planning, specification, design, implementation, test and rollout. In addition, the offerings include business and technical consulting and learning services. Furthermore, managed services to operate systems in production on premise or hosted environments and managed as cloud services, which means the provision of hardware and software as a service in their own or rented data centres. The software products are applied in most major industries such as energy or utilities, manufacturing, financial services, government, entertainment, retail and life science. According to Software Corporation to improve productivity and innovation, they provide companies with better insight about their data while covering information security, compliance and privacy regulations. Besides developing and selling computer software and services, they fund scientific programs at Universities in the area of computer science to contribute to the body of knowledge in information management methods and technology and collaborate with industry partners, non-profit organizations, institutions, and governments to support education. Furthermore, they are active in a variety of social and charity programs.

From an economic point of view, the software market is a highly competitive growth market dominated by global technology leaders. Software Corporation competes against other players in the software market, who sell comparable products with similar functions and services. Some of them are smaller providing primarily point solutions to specific business problems and others are large software vendors competing with comparable product portfolios, covering most of the functional areas as Software Corporation offers.

Therefore, diversification of products and services, a variety of available integrations into existing systems and a broad portfolio of services are key factors of differentiation and competition. Besides differentiation most of the competition is based on pricing, special bundle offers and license models spanning from perpetual to subscription.

Software Corporation sees themselves as a market leader and innovator in the EIM market. They aim to provide their products and services at the state-of-the-art to the customers. In addition, Software Corporation informs and demonstrates how these software products and services evolve into the future and change the organization towards digitalization in public articles, blogs and conferences. According to Software Corporation, they heavily invest in research and development to stay competitive and further mature their products. In addition, they invest in external market research to detect and integrate future demand into next generations of products and services.

4.4.2 Organizational Structure, Management, Culture, Communication and Hierarchy

The organizational structure of Software Corporation consists of a board of directors, an executive leadership team including CEO and President, functional executive directors, geographic and functional department directors, team leaders, project teams, groups and employees with different responsibilities, roles and cross-functions organized in a hierarchical, and cross-functional and matrix organizations.

The organization brand and corporate identity stands for «Customers», «Trust», «Excellence», «Innovation» and «Best Place to Work", which should lead into a customer oriented organization driven by innovation and high performance. Software Corporation emphasizes the importance of personal development, education programs, diversity and a work-life balance to foster the innovative potential of each member of the organization working as a global team. The organization states that overall company goal is to provide customers with applications that allow them lowering operational costs, while supporting faster growth, reducing security risks, providing the information organizations needed for their business and to stay competitive.

Due to the competitive environment, innovation is a key factor for their business to stay successful but also presence in the media for customer and public relations. Besides several annual customer conferences, Software Corporation uses different communication channels to inform its customers, keep in touch and to receive feedback. Therefore, they utilize social media such as Twitter, Facebook, YouTube, Instagram, Google+, LinkedIn, and Flipboard to communicate with the outside world. Internally Software Corporation provides their employees with a variety of different technologies

and tools for communication, interaction, information management and exchange. The Intranet, a corporate social network platform, newsletters, blogs and an internal TV channel for global corporate meetings play an important role in keeping the employees up-to-date. Special news channels provide the latest information about departments, events, new policies, training programs, achievements and updates from the board. For instance, quarterly results and new strategic directions or mandatory trainings about compliance and security measures.

For employee development, special training portals are offered to track the education level and to offer trainings for new products, procedures, management skills and polices. The organization provides also a corporate social network platform to establish communities of special interests and practices for discussions and knowledge exchange. Manuals and instructions, for instances purchasing processes or the application of a tools or computer hardware, are provided by a corporate wiki platform. A corporate content management system, provides all departments with the functionally to store and manage their documents. Data and information are accessible for all employees except management and security data such as data concerning human resources. The main goal is to provide a platform to distribute the corporate knowledge and invite to exchange. In addition, different instant messengers, group chat and conferencing tools are available in order to communicate and organize meetings with participants geographically dispersed. A majority of meetings occurs online, because of costs and the efforts to gather the needed experts from different parts of the organization. Different corporate blogs are a means of information exchange. The CEO, the chief engineer, the chief marketing officer and others from the executive leadership team utilize this media to inform the employees and customers about trends, personal thoughts about technology, events, innovations and specific areas of the organization. IT in general integrates in most business areas and processes, supporting functional units with applications such as financial applications, sales tools, statistics, online analytical processing and development platforms. In addition, customer relationship management, controlling, and reporting, time booking tools, contracts management, human resources file and records management and automated business processes.

Organizational Behaviour, Decision Making, Information Systems

Software Corporation states that openness and transparency among employees on all hierarchical levels is of high importance to allow continuous improvement by utilizing the potential of information sharing and knowledge exchange. Education, sharing experience, teamwork and corporate social networks and communities are key factors of corporate success and readiness

in the words of Software Corporation. Therefore, Software Corporation supports a learning organization, which is well informed about processes, developments of new technologies and strategies. Software Corporation consists of a large number of organizations that were acquired during the last two decades. Hence, Software Corporation combines different cultures and organizational structures that merge and adapt over time extending existing or building new business areas. The organization follows a hierarchical structure based on functions and a matrix organization for internal and external projects. Decision-making processes are implemented decentralized and centralized. If business decisions are of significant financial impact or relate to legal, contractual and human resources topics, decision-making is ruled by corporate approval policies. This guides the decision-making process about the management level to be involved. Hence, the impact of a business decisions based on financial, legal and risk factors, determines whether the decision-making process follows a centralized or decentralized approach. Daily business decisions of smaller impact such as problem solving in projects, provision of services, and organization of local marketing events are typically made decentralized. For instance, project teams decide about the implementation approach they follow and tools to plan, calculate, control, and organize or how they engage with prospects and customers and what measures and tools they chose case by case. At Software Corporation, business decisions are not made in isolation but in groups and teams involving subject matter experts or management if needed to provide the prescribed approval backup.

Software Corporation provides its employees with different information management and communication tools and applications such as content management systems and collaborative platforms for information sharing and reuse. These tools and platforms are open to all employees and accessible worldwide enhanced with additional applications for specific requirements of functional areas such finance systems, software development environments or ticketing systems. Individuals, teams and departments have the possibility to setup news channels integrated in the content management systems to inform about topics of general interest, for instance, how they managed projects, what they recently deployed in the organization, security measures, project progress or lessons learned. In addition, they regularly use the Intranet to invite employees to provide feedback about campaigns, social events, new tools and software deployed internally before they are released to the customers.

4.4.3 Perceived Transparency, Openness, Communication and the hierarchical Structures

The interviewees at Software Corporation explained transparency and openness as an evolving process from a perceived less transparent towards

a more open communication approach. However, the interviewees emphasized room for improvement, because in their view many decisions for instance about new strategies, presented by the board, were not as transparent as to allow the employees to understand the entire rationale behind it. They acknowledged the willingness of the management to evolve towards more transparency in communication and providing information to the employees more open and consistent as positive signal. In addition, the interviewees explained different communication channels management and employees utilize to provide supporting information about the topics discussed or broadcasted. These are explanations, questions, and answers upfront to support the employees in understanding the intention of an initiative, a product strategy, customer communication or a new policy. Furthermore, sessions and employee information meetings are recorded to allow employees to consume the information as they go and in digestible chunks. On the other hand, the interviewees perceived the number of communication channels and the information they convey overwhelming. They perceived this as information overload and stated in some cases that this decreases the value of the information itself, because it could cause an inability to choose the appropriate information. A support manager and a technical trainer described it as follows:

> *In my opinion, we are at a medium level but we experience a considerable ongoing improvement. I am with the company for several years and I perceive an intention within the organization to provide more transparency and to communicate openly and accessible in all areas.*

> *Open communication improved a lot since the last CEO changed a couple of years ago, which probably relates to the growth of the company. We use today professional channels and own a TV studio to broadcast corporate information. However, I do not believe transparency became much higher but the available communication increased, which not always correlates with improvements on the quality of the information.*

According to the interviewees, the willingness to share information in the organization is real with differences across departments and regions. The interviewees described sharing information as a lived culture that the organization characterizes and the management actively supports. Project teams share their experience and success stories with other teams in calls, blogs, content management platforms, the Intranet and newsletters to improve practice, knowledge exchange and business processes. In addition, if teams succeeded for instance winning a deal the strategy and the approach are shared with the entire organization. An important enabler to share experience and knowledge are the different information systems deployed in the organization and the configuration that allows accessing with view restrictions.

Only for confidential information, restrictions exist but for the majority of data the systems are open as an IT manager and a facility manager stated it:

> *Willingness to share knowledge is quite high, because the Intranet platforms are designed to store everything, you can chat, and you can share with others, which means quite transparent and if confidentiality is needed you can configure it accordingly.*

> *Within several areas willingness or the intention of sharing knowledge is quite high. This manifests in many discussions among the employees within the regional and European groups. The more distant the departments are from the local region or from Europe the lesser the communication flows directly but via the headquarters in North America.*

The interviewees perceived communication as transparent and open supported by the management and the policies of information management systems. Most of these systems apply low restrictions and allow sharing information following a concept of openness. Besides the willingness of sharing information and the awareness about the advantages, the interviewees explained that not all employees and departments understand this the same and described the reasons why some employees still hide their information. In some areas, the interviewees understand that for security reasons access to confidential information needs to be restricted but they also explained occasions they experienced that information was hidden for personal advantages and internal competition following the statements of a learning services manager and a team leader:

> *Sometimes I have the impression we have people who are reluctant to share and they tend to keep things for themselves. Maybe for different tactical reasons. This is because you cannot find any information from them in the Intranet or within the tools one uses. You ask yourself is it because I have no permissions or is someone hiding but at the end, you are not able to judge because you simply do not know.*

> *Well it depends on the data, which priority and security area they belong. If we are in facility management, we talk about high security data where we use restricted folders in the Intranet to manage the access, which is for us quite important.*

The interviewees perceived hierarchical structures differently depending on the nature of the topic. For technical discussions, project specific topics, purely local and regional matters, or department specific topics, hierarchy is perceived flatter and less strict. If the topics are of internal political nature concerning power or the impact spreads across departments such as larger investments, policies, strategies or human resources, hierarchy is perceived

much stricter and transparency is decreasing as a global architect explained it:

> *Through the different hierarchical levels, it depends. Of course, there are the discussions of political nature within the upper management level that is less transparent but if the topics more on technical level transparency is there.*

4.4.4 Perceived Utilization of ICT for Communication, Interaction and Collaboration

The communication media at first place reported through all interviewees was email following different additional tools such as instant messengers, the Intranet, video conferencing and other platforms for information exchange. These tools are used for different purposes and occasions as an engineer and an employee from the customer support department stated, and problems this creates:

> *Phone, email, and chat tools or instant messenger, which I use internally to write quickly a message to my colleagues to provide them with guidance or help. I use email, phone, mobile devices but increasingly more frequent mobile devices, email and chat communication.*

> *I use mainly email and chat tools, which we recently changed to another product. We had already different tools in the past. It does not matter what chat tool we are using but I see a repeating problem with the information generate in the chats. These tools might create information silos since they are closed systems.*

Besides email and instant messengers, interviewees described how they use the Intranet as an additional media to interact, communicate and exchange information. They characterized these platforms as essential to allow communication across teams and groups, which are in some cases geographically dispersed. Integrated comment functionalities allow providing feedback about the published content and discussions about topics. For instance, progress documentation within projects, initiatives, campaigns or development processes. The following statement of a facility manager illustrates the different media utilized for communication and the role of the Intranet:

> *Clearly, Outlook, our email system for ordinary communication but for certain areas we use the Intranet, where we post larger amounts of data. Because the departments are geographically quite distributed in countries such as Germany, Netherlands and in Switzerland. Therefore, we need the Intranet to combine content and allow joint access to edit and collaborate.*

Chat tools and instant messengers with integrated video conferencing functionalities added new channels to the existing corporate communication tools the organization offers to the employees. Following the statements of the interviewees, video conferencing and instant messengers became a common additional option and in in some areas a substitute for communication that was before entirely based on phone and email. However, email dominates for asynchronous communication. According to the interviewees, email satisfies the requirements of a formal information exchange compared to instant messengers or phone, because emails capture and preserve the information exchanged if rules for archiving are applied. Emails are business records containing for instance agreements, statements, conditions, procedures and policies with date, sender and addressee. An engineering team leader at Software Corporation described utilization of video conferencing and email as follows:

> *I use mainly video conferencing. Phone not anymore and besides chat-media such as Lynch or any other tool, email. Email covers still the largest portion of my communication and information exchange, because it is time independent, but everything that was related to telephone before, whenever I need to communicate in real time, I do with videoconferencing or chat.*

Wikis and content sharing platforms are further means of corporate collaboration and communication focusing mainly on a specific context given by the content jointly created, shared and discussed. According to the interviewees, collaborative content creating and sharing platforms such as wikis and content management systems are additional media they utilize for corporate communication. The purpose the interviewees described are in the area of information distribution, business process documentation, content evaluation and provision of feedback. Sharing information about system configurations, user guides, business processes and policies are specific purposes as a product specialist explained:

> *Wikis are primarily information platforms we use to document for instance configurations of our systems. It would be impossible to keep all the information in mind. On the other hand, the systems provide other colleagues with information they need for their daily business and to start discussions about enhancements and lessons learned about the systems used and on what they are based.*

ICT brought some change into the communication landscape at Software Corporation. Telephone and email are the technologies that dominate. However, new media such as instant messengers with video conferencing capabilities, wikis and sharing platforms gained in significance for organizational communication, interaction and collaboration. These new

media currently do not replace but substitute or extend established media such as telephone or email. An advantage often mentioned by the interviewees was the ability to collaborate with dispersed teams without geographical boundaries and the efforts to organize and gather employees at one place. The interviewees described ICT as an enabler of corporate communication utilizing collaborative platforms and instant messengers with video conferencing functions instead of physical meetings.

4.4.5 Perceived individual and collective organisational Decision-Making Process

For most of the interviewees both, a centralized and a decentralized decision-making process are common within the organization. The decision-making itself occurs normally within groups. In other words, business relevant decisions made by a single individual are, if they exist at all, the exception. The interviewees explained that independent on the hierarchical levels a decision involves more than one person, which is guided and prescribed by business rules such as approval policies. Decisions with less business relevance such as project approach, design changes and resourcing are made decentralized and with larger impact centralized. For instance, the members of a decision committee deliberate first, propose solutions and afterwards make a decision. If needed management acts as the final approver for a decision. However, if business decisions origin from the teams at lower levels, the levels above have to approve first before the proposal is presented. Interviewees perceived the distinction between business relevance and decentralized or centralized decision-making process reasonable. They explained that the level of responsibility rules the decision-making approach and the involvement of the participants. On the other hand, the interviewees appreciated their involvement and the possibility to participate in business decisions according to the perception of a principal architect and a facility manager:

> *We have decisions the employees are involved. In my opinion, we are quite open and let our employees intensively participate in decision-making process. Of course, there are also decisions the management makes independent from the employees. However, it depends on the decision topic and the hierarchical level needed.*

> *We decide always within the team, because our decisions are of high impact to the organization. It flows from the employees from the bottom up from employees of the different departments. Because we from the facility management are a part of the whole organization combining technology, logistics and human resources.*

Besides responsibility, approval policies and the impact of a decision that determines who has to be involved within a decision-making process, the interviewees emphasized the importance of influencing a decision when they are not the decision-maker. In many cases, the decision-makers, mainly management, do not possess the required expertise or perfect information about a topic to allow them to make fully educated decisions. Therefore, employees have the change to either educate them about a subject or make proposals or recommendations. Vice versa, management asks directly about feedback or opinions from the employees to make the decision. The interviewees explained that they perceive this as a signal of trust but also a logical consequence to receive the buy in of the employees involved. In addition, the interviewees stated that management is not capable to understand every process and the business needs in detail. Therefore, they believe it makes sense to leave some decisions with the business and the employees directly involved how a support manager explained it:

> *We have situations management asks about our opinions. We are allowed to provide our feedback and I think we can influence decisions with that. You can point out problems or things that need to be changed and in this way to force decisions as well. I think our management needs such hints and recommendations, because they are not able to grasp any detail of our daily business.*

The interviews explained that decision-making at Software Corporation is based on methods, business processes, guidelines, approval policies, and deliberation and discussions across teams and groups. According to the interviewees, different methods are applied within the decision-making process starting with analysing the problem, gathering information from different sources and asking other employees about their opinion and advice. In addition, consulting case studies, and proof of concepts to judge about an alternative before they are implemented. Besides supporting decision-making tools such as SWOT analysis, and decision matrix and cost-benefit analysis the employees attempt to generate a consensus among the participants. The process applied is to deliberate about the different alternatives, discussing benefits, costs and disadvantages, while presenting different solutions to the participants following the statements of the interviewees:

> *I analyse a problem first with tools such as the Internet, descriptions, blogs and forums to gain a certain level of knowledge and then I try internal sources and ask experts before I decide.*

> *If we need to evaluate a tool we ask consultants to help us or we ask for case studies from analysts for instance within the magic quadrants. Sometimes we involve the vendor to do a joint proof of concept to see if the tool is appropriate.*

In general, our decisions are based mainly on alternatives, which means we look at different options at least at a plan A or a plan B. This is because we are always confronted with a changing environment, with different agendas and schedules for the implementations. Therefore, we need to be flexible and choose between different options.

According to the interviewees, collective decision-making is perceived positive. Positive means collective decision-making generates solid decisions supported by a team or group and are not just dictated by management. However, the interviewed employees stated that some of the business decisions have to be made by management, because of financial, contractual, regulatory or legal reasons. Disadvantages and problems the interviewees described were by mistake excluding individuals from the process that should participate for instance to gain their buy in. In addition, endless discussions about alternatives that might slow down the whole process significantly and consequently decreasing efficiency. Therefore, the interviewees emphasized the need of guidance and moderation within the process to make sure the collective stays on the objectives and moves towards an outcome. In the view of the interviewees, not every decision is applicable to a collective decision-making process. For instance, ad hoc decisions or very complex topics are less suitable for a collective decision-making process. According to the interviewees, collective decision-making takes normally longer than an individual decision-making process, because much more alignment is needed to involve and inform the participants. An engineer and an IT manager explained how they experienced collective decision-making with the following statements:

I think collective decision-making is better than something that comes from upper management only. There are things, which need to be decided from above, which is right. However, if the direction is clear or something is specified to guide about the topic we should always use collective decision-making, because the people participate the decision-making, are involved and part of the decision.

If you involve too many people in the decision-making process, it can become very cumbersome. If someone was not involved in the process and not happy about it is sad but it is as it is. I think not everyone can participate. In principle good decisions need to be fast and many things take much too long.

The reasons for collective decision-making follow the principles of collective action and the advantages of a process that involves different opinions, thought, expertise and variations to support problem solving. In principle, the interviewees explained the rationale of a collective decision-making process

based on collecting and integrating different thoughts and opinions allowing reflecting on a problem from different angles and perspectives. The experience of many could be utilized and lead into an efficient problem solving and decision-making process following the statements of a product expert:

> *I think this is good, I think it is a very good approach, because different opinions come together or occur and you really need to deal with it or you just start to think about them while they appear. Other hints and opinions are often quite helpful. The process is not fast but maybe lead to a more solid decision. This is very helpful to find a solution efficiently.*

4.4.6 Perceived Utilization of Social Media Integration within the organisational Context

Software Corporation provides a variety of social media tools and application integrated with platforms such as the Intranet, business applications and content management systems or as separate systems. The application span from instant messengers, corporate social networks, blogs, wikis and sharing and collaboration platforms. Most preferred are instant messengers, wikis, blogs and the Intranet to retrieve and exchange information or interact with employees on formal and less formal conversations. The interviewees complained about the number of platforms available providing comparable or similar functions. This creates the difficulty to choose the most appropriate tool or the commonly used and decreases the benefits from network effects if employees using different platforms for the same purpose. For instance, information is not shared corporate wide, which on the other hand creates information silos. The following statements from a software architect and a support engineer describe the situation perceived at Software Corporation:

> *Chaotic, we have too many different social media applications in place. Of course, some of the applications are more preferred then others. We utilize social media such as blogs, or wikis across the departments, hosted by our own, which ingests a high volume of corporate data. I personally mainly use wikis or blogs the organization provides.*

> *I think we utilize social media quite well. However, in my opinion we are overwhelmed with all the applications and options our organization provides us. Often, we do not know which one to use for what. We use many products with partly similar functions, which at the end is a little too much.*

Main advantages of social media described by the interviewees were about information exchange, collaboration on larger scale, less alignment in collaborative content generation and enhanced access to corporate knowledge for instance provided by wikis. On the other hand, interviewees

described the availability status of group chat tools as an advantage and a disadvantage. Interviewees explained that they enjoy the possibility to address an employee according to the availability status, quickly and less formal or prepare for a conservation while the addresses are busy. However, instant messengers are also perceived annoying and disturbing. For instance, if the employees need to concentrate or are in a meeting and continuously addressed by others. Disadvantages and risks were mentioned in the area of information silos created by social media that are not integrated into other content management systems. In addition, the interviewees stated that information provided by instant messengers, social networks, blogs, and forums could be of low quality if the contributions and content are not audited and the creation processes are not moderated. According to the interviewees, misleading information for instance provided by participants with insufficient or superficial knowledge could lead into wrong decisions. This means, the process lacks of governance about who possesses the appropriate knowledge and expertise to participate. The following statements report the disadvantages a technology architect, product specialist and a facility manager stated:

> *I think it depends on the social media I use but it could easily create information silos, because the tool is not available for everyone but only for the communication parties using social media. If I use a chat tool such as Lynch, ask someone a question, and get an answer. If I would do the same, using a blog or a wiki the information would be shared with many people.*

> *Disadvantages about social media are in some cases the quality of messages published with less care. I know people who publish a large number of messages during a day to show how transparent and visible they are. However, these are not the information, which are useful.*

> *Yes, I see a real risk in context with social media. What is working at large scale may work also at smaller scale as well. Social media could provide a person with the capability to manipulate others. I see this as a real danger, because a small group of people might enforce their opinion, others read this without questioning.*

When interviewees asked about how social media changed their personal behaviour concerning daily business, they described the way of how they communicate and engage with each other. They care more about opinions others provide for instance on the Intranet or corporate and external social networks. It became a common habit to compare and to judge about a topic. Networking and engaging with other employees could be established with less effort. In other words, social media lowered barriers to contact other

employees to engage and receive feedback as a facility manager, a technical trainer and a team leader mentioned:

Of course, because it is very easy, social media provides the opinion of other employees, which I appreciate. These are parameters, which show me how others also in other organizations think and I am able to understand the overall atmosphere, spirit, and mood in the team and entire organization, which is important for me since we acquired quite a lot other companies with new employees.

For me personally some things changed, not a lot but the possibility to approach others directly is an important change. Sometimes I receive messages for help where users tell me they already know me from other cases. This is another dimension of communication, which is new. A real helpful factor is saving time.

My daily business changed with video conferencing. Meanwhile I use them for all my team meetings, because it is easier and I need to see the faces I communicate. I can do this also with chat tools, which let me answer when I like to. You can get yourself a coffee first and answer afterwards, which changed with social media.

4.4.7 Social Media Integration in the collective Decision-Making Process

For the interviewees, the possibility to collect information from a larger group and the combination of thoughts and opinions was one of the areas where they experienced the application of social media in the decision-making process. Utilization of social media starts right after the problem identification and recognition step to collect information about the problem, different options and possible alternatives. With the support of social media, information is aggregated from different sources leading into a collective decision as software architect and a support manager stated:

I see it mainly when information and people are integrated into the decision-making process. In other words, everything in context with communication in any form. For a decision-making, I need information, which I can utilize with social media as an additional means for communication.

If you need to make a decision, you require suitable information. You search for such information via blogs, wikis and forums. In addition, I find a useful link to a web page, or tweet in Twitter, which supports me in the decision-making process. However, the decision is not entirely driven by social media but influenced.

At a further advanced stage of the collective decision-making process, according to the interviews, social media facilitates discussions, evaluations

and ratings about alternatives. In other words, social media allows the employees engaging a group of individuals in deliberation and discussions. The platforms utilized are corporate social network, wikis, or content management systems with integrated rating, comment and poll functions. A facility manager and a professional services consultant explained it as follows:

> *I compare it with a decision-making process within a community or a board, which is normally a discussion within a group. This allows presenting concerns or opinions and discussing arguments about alternatives, which helps to understand and to invalidate concerns. With social media, it becomes easier; because of the number of opinions, that convinces the participants.*

> *We know platforms that allow gathering a larger group and support polls or ballots, with the possibility to evaluate and present graphically. For instance, schedule making for about twenty people, which would be quite difficult if you need to address everyone individually. Hence, these platforms are useful and allow in this case finding a date rather quickly. Other business relevant questions can be answered with the same approach.*

The interviewees emphasized that social media enhances and supports the decision-making process collecting data and involving the required audience. However, social media covers partly the decision-making process. Physical meetings and discussions are still relevant for the decision-making process and policies and management influence the outcome of larger endeavours. The interviewees explained that the integration of social media is a learning process for the entire organization. In some areas of the organization, the utilization of social media is at the beginning and in other areas integrated in the daily business.

4.4.8 Perceived Influence of Decision-Making Behaviour of Social Media, Benefits, Risks and Disadvantages

Interviewees described the influence of social media and decision-making embedded in a problem information collecting, aggregating, and evaluation and solving process. The influence described focusses on supporting the interaction with other individuals and groups from a behavioural point of view. The interviewees mentioned that social media lowers barriers to involve individuals in a collective decision-making process. In their view, it became easier in a sense that approaching a group could start with initial questions to a community or a chat group initiating a less formal discussion without the need to officially invite and gather individuals for a meeting. For instance, at customer support and the IT department the interviewees perceived the influence of social media and decision-making in the area of problem solving for their internal and external customers. They established forums and communities to engage the participants in the problem-solving process. The

interviewees explained rooms for improvement to contact directly the internal and external customers utilizing embedded chat tools to start discussions, which could increase the benefit of social media integration following the statements of a solution consultant:

> *I see a lot of potential but it depends on how it is implemented for instance in our customer support area. If the customers report their problems in such a system, it is easier to find a solution, because similar problems might help to identify the root cause of the problem. In addition, we should also use chat functionality to get directly in touch with our customers.*

Overall benefits of social media and the collective decision-making process are located in the area of a less formal and faster interaction and engagement with other employees. For instance, asking in ad hoc discussions about opinions, thoughts and feedback concerning a problem or alternative are benefits mentioned often in the interviews. In addition, the interviewees appreciated the availability of many opinions and alternatives, which might in their view aggregate to more solid decision foundations compared to a decision made by a single individual. The variety of opinions and alternatives allows considering a problem from different angles. Participation and being part of the process provides another benefit. In the view of the interviewed individuals, this increases the willingness to accept the final decision, because the participants perceive themselves as part of the problem-solving process. This stimulates to accept responsibility for the decision taken, according to the interviewees.

Disadvantages and concerns perceived by the interviewees concentrated around of less control about the audience participating in the process and the quality of the contributed information. The invitation to participate in a collective decision-making process could address an inappropriate audience, lacking the knowledge, expertise and experience required to make an educated decision as a facility manager mentioned:

> *Social media is an additional communication channel you do not necessarily know the audience or you communicate without knowing whom you talk to and if you addressed the right people in the process, which is a disadvantage in my opinion.*

Therefore, interviewees mentioned selection and moderation, as key measure to guide the decision-making process. Another disadvantage, mentioned by the interviewees, was about personal exposure to a larger audience in the organization while posting opinions and thoughts in online discussions and decision-making processes. They explained that failure, misunderstandings, and not accepted opinions could lead to not constructive and inappropriate criticism. Therefore, the interviewees explained their concerns about a

negative influence on their personal career this criticism may have. The interviewees explained that this could be a reason why they are reluctant to participate an online discussion and decision-making process. Another disadvantage was about information overload. In the view of the interviewees, social media adds to the variety of information system already in place leading into losing focus and distraction. In order to distinguish between the relevant and the less relevant information becomes a challenge. Furthermore, low quality of the informative content conveyed by social media could lead to misinterpretations.

Finally, interviewees were concerned about opinion manipulation during the decision-making process. They explained an individual or group could utilize social media in the decision-making process to favour a specific alternative for their own advantage. In the view of the interviewees, this could lead into abuse or pushing the decision into a certain direction not reflecting the choice of the majority.

4.4.9 Barriers to integrate Social Media in the collective Decision-making Process

Interviewees explained barriers in context with personal habits and to favour channels they are used to. This means, the change utilizing new tools creates barriers of resistance about the unknown involving a process of convincing the users about the advantages. Another barrier materialized in trust about the information created and provided during the process of decision-making. This is what the interviewees called the quality of information utilized in the process. The less the perceived quality of the information provided the less the interviewees trust the decision-making process and the outcome. In addition, the interviewees mentioned information overload as a common barrier following the statements of a product expert:

> *For me it is always the same main argument, the quality of the information. On the other hand, the overload of information. However, social media let you find persons to talk to or web pages to research or provide different communication channels. At the end, I personally keep my two to three favourites even if I already spent several years with the Internet or social media. If I have to make a decision, I use my sources I am used to.*

Some of the interviewees pointed out that barriers origin from the culture of the organization not entirely true for the whole organization but in some areas. Employees are not used to share their thoughts openly and enter online discussions with a larger group to deliberate about a problem. They fear that what they discuss in an online conversation could be used to judge about them in general. In other words, if they fail, their personal career could be influenced negatively. Others mentioned that the language could be a barrier as well. For

instance, if the conversation is in English, for some employees, who speak a different language, to follow a discussion could be difficult and creating a language barrier. A solution consultant framed it as follows:

I see a cultural background. Maybe language could be the reason. Some people hesitate to publish something in English, because they fear to lose their face in front of the audience. On the other hand, some users simply are not willing to share their information with others.

The interviewees mentioned that they perceived a lack of change management that creates barriers of utilizing social media within the decision-making process. According to the interviewees, employees are not aware about the benefits or do not understand how to utilize social media integrated in business processes. In addition, in the view of the interviewees, the age of the employees could play an important role in creating barriers. The interviewees mentioned the difference between older and younger employees adapting to new technologies. They emphasized that older employees might need more focus on change management than younger employees as an architect explained it:

We need a change management process the employees need to utilize social media. I think this is also a question of age. Younger employees are much more open and adapt to social media quicker than older employees adapt. There are the barriers much higher. Therefore, change management is important to show the employees how to use social media, and to show their personal benefits about it.

4.4.10 General perception about Social Media and how to overcome

Barriers to improve the Utilization

Overall interviewees reported that they are used to utilize social media in their daily business for different purposes. In order to integrate and utilize social media in the entire organization employees have to be aware about the benefits and the application in business processes. The interviewees knew about guidelines concerning the general application of social media within the organization. However, most guidelines known define how to apply social media concerning external communication. This means, employees are guided about information security, personal data exposure and the problems of internal information leaking to the outside world. Employees are allowed to participate in social networks but with restrictions what and how to communicate. For the internal application, interviewees perceived less guidance in how to communicate and what application should be used for what purpose. Concerning communication using social media, for instance in discussion forums, communities, blogs or instant messengers, interviewees

stated a need for moderation to improve the efficiency, quality and the outcome of such conversations. Interviewees explained that for external communication for instance for customer support moderators are established in customer forums. These moderators keep the conversation between customers and employees and among customers on a level that allows the group to benefit from the conversation and problem-solving process. However, internal forums, at least the ones the interviewees mentioned do not apply the moderation concept and therefore could present an area of improvement using social media and lower barriers as a product support expert stated:

> *I think moderation is important. Conversations should be moderated to decrease the number of the messages published and on the other hand increase the quality of these messages. You will not achieve this by controlling the messages but by moderation. In a good blog, you always integrate a moderator, who decides if a message contributes or has no value at all. We should have this in our guidelines as well.*

Other categories of barriers explained by the interviewees were in the area of usability and the integration of social media in business applications. They believe that the acceptance of social media within the organization could be improved if seamless integrations in business applications are available. In other words, employees would be more open towards utilization of social media if additional efforts to use them are minimal and the benefit is perceived as real as a software architect explained it:

> *Certainly, a better integration would help. For instance, what I think demonstrates a good integration example is Lynch. It is tightly integrated into Outlook that informs about the status of the people and allows starting a chat conversation directly from Outlook. In my opinion, usability is an important topic and I assume this is the main problem we experience with our internal social networks. If the tool is not usable, because you have trouble to work with it or to find certain areas of interest people will not use it at all.*

Another area of barriers mentioned were demographic factors such as age group. Interviewees explained according to their personal experience that older generations are less willing to change the status quo of commutation and collaboration procedures. They perceived conversations and collaboration more efficient in physical meetings instead of using new media. Hence, this creates barriers of change. In addition, interviewees were concerned about the quality of social media utilized conversations. They perceived a decrease of information quality, because people care less about the information they provide. In other words, employees are reluctant to participate conversation on social media platforms, because they assume that information provided in chats or in blogs or comments are of less value for their daily business. In the

view of the interviewees, some employees utilize social media mainly for self-presentation. Therefore, the value of the information they publish is perceived only partly of business value. Another category of barriers mentioned was about personal exposure in context with publishing opinions and the security of confidential information. Interviewees were concerned if the information they provide was safe and secured against abuse. For instance, in anonymous polls they are uncertain if the answers used for statistical purpose only. This means, personal opinions could be used also to judge about the employee. A professional services director mentioned it as follows:

> *I assume it could be a generation topic about security concerns using these tools. Are we certain the information we provide is absolutely safe. Concerning large polls in the company there is a feeling about an uncertainty if they are anonymous or not.*

Communication with a certain degree of freedom and less control is a basic requirement to gain from the advantages social media provides, according to the interviewees. They reasoned this with a requirement for creativity finding solutions and openly discussing about a topic, adding thoughts, allowing criticism, which keeps the flow of a deliberation process. This means, the employees would prefer that management allow open discussions, which they do not monitor. However, guidelines are important to control the conversation supporting a level of good manner, politeness and respect as a facility manager explained it:

> *Social media need a certain level of anonymity in a sense that the employee should not perceive being controlled. They should provide the possibility to express their opinions freely. Of course, specific rules have to be implemented to avoid insults or offending against the organization. This is also the reason why guidelines and regulations are needed.*

Further measures to lower barriers of social media integration within business focused on the definition of internal standards for social media applications and a consolidation of existing tools. Interviewees complained about too many social media applications exist for the same purpose. While employees not utilizing the same wiki platform, different chat tools or sharing platforms they might create information silos and lower network effects. A technical consultant explained the issue about standardization as follows:

> *Standardization, decreasing the supply of tools but provide them with the needed functions that at the end I have my one or two tools I am able to cover most of my daily work. For instance, telephone, chat, web sharing should be one tool. I think the acceptance could be improved if one tool becomes a usable standard.*

Following the interviewees, change management and a perceived engagement of management to support the utilization of social media decreases barriers. Employees need guidance, training, examples, experience, and the chance to experiment and find ways to integrate social media in business processes. In the view of the interviewees, integration means the seamless integration of social media in business applications. For instance, comment and chat functions, discussion forums or wikis embedded in content management, project, marketing management and financial applications. Furthermore, improvements about usability, balancing user interface and available functions, allowing the users to adapt quickly to social media and encourage their usage. The interviewees perceived the support of management as a strong signal towards the utilization of social media. This means, if management shows the capabilities of social media such as blogs or news channels they frequently update to inform the employees. According to the interviewees, active management involvement has a positive effect on the acceptance of the employees.

4.4.11 Summary

The following table 3 summarizes the findings of case study Software Corporation divided into analytical themes, areas of investigation and findings.

Table 3: Summary of Findings Case Study Software Corporation

Analytical Themes	Areas of Investigation	Findings
Organizational Structure, Management, Culture, Communication and Hierarchy	Organizational Behaviour	• **Organisation's perspective**: Hierarchical structure with integrated matrix organisations. Culture: importance of personal development, education programs, diversity and a work-life balance to foster the innovative potential of each member of the organization working as a global team. Communication: on all hierarchical levels is of high importance to allow continuous improvement by utilizing the potential of information sharing and knowledge exchange.
Transparency, openness, communication and hierarchical structures	Organizational Behaviour	• **Organisation's perspective**: Openness and transparency among employees on all hierarchical levels is of high importance to allow continuous improvement by utilizing the potential of information sharing and knowledge exchange • **Employees' perspective**: High transparency and openness among teams, groups and departments. Evolving process between management and employees. From a perceived less transparent towards a more open communication approach. Acknowledged the

		willingness of the management to evolve towards more transparency in communication and providing information.
Utilization of ICT for communication, interaction and collaboration	Social Informatics	• **Applications**: Email system, instant messengers, Intranet, video conferencing, enterprise information management systems, team collaboration tools, content exchange applications • **Purpose**: Communication, collaboration and interaction across teams and groups, corporate new channels, , exchange and store information, virtual meetings • **Information Flow**: Low restrictions concerning access rights applied on corporate information systems open to everyone. Exceptions: confidential areas: human resources, management • **Change of behaviour**: Instant conversations, feedback on jointly created documents connected to business processes changed the communication habits and collaboration behaviour: direct, ad hoc, less formal, collaboration with teams and groups geographically dispersed, emerging networking structures
Individual and collective organisational Decision-Making Process	Collective Decision-Making, Organizational Behaviour	• **Approach:** Mixture of a collective decentralized and centralized process: Centralized: decisions of financial, organizational structure, legal, contractual or strategic impact. Decentralized: daily business problems, project delivery, project approach, business procedures, team selection • **Participants:** Project teams, functional and expert groups, employee and his or her managers, management teams and the management board • **Methods:** Case studies, proof of concepts, SWOT analysis, decision matrix, cost-benefit analysis, deliberation to find a consensus, business rules and policies • **Perception:** Positive: solid decisions supported by a team or group, involves different opinions, thoughts, expertise and variations to support problem. Negative: excluding individuals from the process, endless discussions about

		alternatives, slow process and therefore decreasing efficiency
Utilization of Social Media integration within the organisational Context	Social Informatics	• **Applications: I**nstant messengers, corporate social networks, Intranet, blogs, micro-blogs, wikis and sharing and collaboration platforms. • **Purpose:** Information sharing, retrieval and exchange, interact with employees on formal and less formal conversations, engage project teams, large-scale collaboration on corporate level, news channels, establishing special interest communities, feedback and ratings about contributions, corporate votes and polls, jointly edit documents (manuals, guides, policies, project documentation) • **Behavioural Change:** lowered barriers to contact other employees to engage and receive feedback, care more about opinions from others, common habit to compare judgements in social networks about a topic, networking and engaging with other employees with less effort
Social Media Integration in the collective Decision-Making Process	Social Informatics, Collective Decision-Making, Organizational Behaviour	• **Applications**: Corporate social network, wikis, or content management systems with integrated rating, comment and poll functions • **Purpose:** Problem identification and recognition step to collect information about the problem, different options and possible alternatives, aggregated information from different sources, engaging a group of individuals in deliberation and discussions • **Behavioural Change:** less impact on final decision but enhances and supports the decision-making process by collecting data and involving the required audience
Influence of Decision-Making Behaviour of Social Media, Benefits, Risks and Disadvantages	Social Informatics, Collective Decision-Making, Organizational Behaviour	• **Benefits:** Less formal and faster interaction and engagement with other employees, no need for physical meetings, availability of different opinions and alternatives, aggregation mechanisms, engagement of a large number of participants to support the decision • **Risks:** Opinion manipulation, exposure of personal thoughts and beliefs to the community: in case of failure losing respect and standing, misleading arguments pushing decision in wrong directions

		• **Disadvantages:** Less control about the audience participating and quality of the contributed information, information overload, distraction
Barriers to integrate Social Media in the collective Decision-making Process	Social Informatics, Collective Decision-Making, Organizational Behaviour	• **Barriers:** Change utilizing new tools, lacking of trust about the information created, abuse of information provided, information overload, personal exposure, language barriers, missing integration in business applications • **How to overcome Barriers:** Change management, business application integration, educate employees how to utilize social media in the decision-making process, explain the benefits
General perception about Social Media and how to overcome barriers to improve the utilization	Social Informatics, Organizational Behaviour	• **General Perception:** Employees are used to utilize social media in their daily business for different purposes mainly for communication and information exchange. In order to integrate and utilize social media in business processes employees have to be aware about the benefits and the application in business processes • **How to overcome Barriers:** Further management support with good example and guidance, usability improvements, integration in business applications, moderation of online discussions, assessments of contribution quality, change management, allow open discussions, standardization of available social media platforms

The case study of Software Corporation showed different perspectives about organizational behaviour from an external and internal perspective to contrast documentary data, aspects of organizational structure, management approach, culture, transparency and openness with the learnings from the interviewees and real-life experience.

From the organizations' perspective following the first two topics of findings discussed in Table 3 about organizational structure, management, culture, communication and hierarchy, transparency and openness for Software Corporation, openness, transparency, and willingness to share knowledge are the basis of a learning and innovative organization. They are in line with their values: trust, innovation, excellence and best place to work focussing on customers and the culture Software corporation aims to foster. They follow a homogenous hierarchical structure applied in all departments and utilize a matrix approach to conduct projects involving employees from different teams.

Software Corporation uses a variety of media channels to communicate internally and externally. They utilize these channels to inform customers and employees about latest initiatives, events, new products and software releases. From an employees' perspective for most of the interviewees, internal communication was perceived open and transparent among individuals, groups, teams and departments. With the exception of restricted areas such as human resources, information hiding was of no concern for the interviewed employees and they perceived a common willingness sharing knowledge. Concerning corporate transparency and openness, the interviewees emphasised that they mainly communicate open and transparent within teams, across departments and lager groups. Concerning the utilization of ICT for communication, interaction and collaboration the corporate information systems are utilized for collaboration and communication and as sharing and learning platforms. Their configuration demonstrated how Software Corporation follows the principle of openness. Hence, most of these systems are configured with view restrictions. In other words, most of the information stored is open to everyone in the organization. The restricted areas such as human resources or financial reporting data kept confidential at least for the latter a short time period. However, the interviewees acknowledged this as necessary measure. Differences about transparency exist across hierarchical levels. Interviewees assumed that not all information is shared equally. For instance, measures of senior management or the board were not explained in the detail and in a way, all employees understand the rationale behind. However, the interviewees perceived that information flows through the organization without or less hindrance and management supports actively a culture of sharing. For instance, management frequently invites the employees to share their opinions, talk about issues and publish events they organized to foster a social cohesion within the organization.

Concerning the individual and collective organisational decision-making processes most interviewees explained that decision-making takes place decentralized or centralized determined by business relevancy. The interviewees emphasized if management needs to be involved, a team of subject matter experts present the alternatives and consult about financial impacts and risks to allow management to decide. Policies and business rules about management involvement and the required approval levels guide the employees through the process of business relevant decisions. At Software Corporation decision-making is a process that involves more than one person and many decisions are performed within a group. The most frequent applied methods are deliberation about alternatives, proof-of-concept, SWOT analysis, decision matrix and special decision guidelines. For instance, to evaluate if a bid for a tender should be followed or not, follows different decision parameters. Such decisions are performed within a team from different departments such as sales, pre-sales, services and legal. The

interviewees perceived collective decision-making rather positive and described benefits such as the integration of a large group into the process, integrating different thoughts and opinions to allow a solid reflection of the problem. In addition, they mentioned a higher acceptance rate of a decision if the employees are actively involved and participate as a benefit. However, they also conceded the necessity to involve management into the process for contractual or legal reasons and bear the responsibility for lager endeavours and financial investments. Never the less the possibility to contribute to the final decision was appreciated as a sign of trust towards the employees.

The utilization of social media integration within the organisational context focussed on customer relationship management and communication. Social media plays an important role for Software Corporation utilizing Facebook, Twitter, Google+, LinkedIn, YouTube, Instagram and Flipboard as main marketing channels. Besides the corporate web site, these social media channels are the means Software Corporations uses to interact with their customers and share news about the organization. Internally social media is a platform for exchange, collaboration, sharing information, working jointly on documents and establishing special interest communities. Software Corporation provides their employees a variety of tools based on their own products and in combination with third party products such as instant messengers with sharing, presentation, polling, video and exchanging capabilities for larger groups. In addition, corporate social networks, blogs, micro-blogs, wikis, sharing, collaboration and interactive learning platforms.

The interviewees reported that they are overwhelmed about the variety of tools available and for some it is challenging to choose the right one for a specific business purpose. However, Software Corporation offers online trainings for most of the tools to improve acceptance and efficiency. Concerning advantages, interviewees mentioned different areas of their personal experience. For instance, faster and less formal communication enhanced by the availability status in chat tools and the possibility to collaborate with different people spread across different locations. More specific for international projects, the interviewees described sharing platforms with integrated chat and comment functions to enhance collaboration across teams. Main disadvantages perceived were information overload, continuous availability, and personal exposure, missing standards, misleading and biased information caused by superficial knowledge and a lack of control and moderation. In addition, the interviewees explained, if social media is not tightly integrated into existing information management systems this might create information silos. They compared it with email where only the directly involved individuals within an email conversation are aware about a discussed topic. Other employees are not able to benefit because the information is stored only in personal mailboxes.

About the findings described in Table 3 regarding social media integration in the collective decision-making process the interviewees mainly described individual and collective decision-making in combination with social media in the area of information gathering after problem identification. Furthermore, involving a group into the evaluation process about alternatives. For instance, asking participants about their opinions utilizing polls or ratings. The interviewees explained how they utilize social media such as social corporate networks, wikis, polls, forums and instant messengers to integrate the knowledge, expertise and experience into the decision process. They utilize the knowledge captured in these systems and combine new contributions during online discussions.

Relevant to the findings above about the influence of social media on decision-making behaviour and their benefits, risks and disadvantages, the main benefits perceived were in the area of efficient problem solving, involving experts and the possibilities to integrate different opinions into the evaluation process. According to the interviewees, asking an online community about a problem and receiving advice became easier and less formal. Disadvantages mentioned were about less control of the decision-making process, misleading information, opinion manipulation and personal exposure. Without moderation, which controls the process and the contributions, the interviewees explained that the quality of the information might decrease. In addition, if individuals participate, who do not possess the required knowledge to contribute to the solution finding, the process could become cumbersome. For some interviewees the process could end in a waste of time if the objective is not clear, leading the audience into the wrong direction or individuals defend their contributions and losing the focus.

Barriers to integrate social media in the collective decision-making process frequently mentioned were about additional workload, lacking integrations into the business processes, reluctance to new processes and tools and unclear benefits. Another barrier was about personal exposure in front of a larger audience, which could lead to personal offence if the opinions not accepted or biased and therefore subject to public criticism. Interviewees were convinced that barriers are located in a general resistance against change.

Concerning the general perception about social media and how to overcome barriers to improve the utilization interviewees appreciated the availability of social media in the organization to interact with peers, managers, customers and partners. They acknowledged the need for policies and guidelines to provide the employees with more certainty about what is allowed and what is not. However, the interviewees were convinced that too much control could keep the employees away from participating. In other words, the right balance between rules, control and freedom of online discussions are key. In this context, interviewees emphasized the importance of moderators to make sure

the conversations remain at a constructive and efficient level. Usability and low integration levels create also barriers to utilize social media following the opinions of the interviewees. For some interviewees the degree of quality and value of information fluctuate, which is a characteristic of social media and therefore could become a waste time. However, the interviewees did not provide real examples about this assumption but explained it as prejudice about social media that relates to the acceptance of new tools. The key to lower the barriers were explained in the area of change management, consolidation of tools and common standards of social media platforms within the organization. Interviewees stated that managers, who demonstrate the utilization of social media by example convincing the employees to participate. For instance, while frequently communicate, interact and collaborate with the teams, and jointly develop solutions utilizing social media. This would be a means to lower barriers and support the dissemination of social media in the organization. The more commonly used the better social media integrate into the business processes according to the interviewees.

5. Cross-Case Analysis and Discussion

5.1 Introduction

The analysis in chapter five above reported the results from each case study individually. This was the first step of the qualitative field research analysing each case and reflecting about their specific characteristics. The next step, the cross-case analysis discussed in this chapter, compares, contrasts, reflects and synthesises the results of all three case studies to uncover patterns, similarities, and differences following Stake (2005) and Yin (2009). This means, the major objective of this chapter is to understand and unfold the knowledge captured in the combination of the qualitative data sets. The findings of each case: Transportation Corporation, Retail Corporation and Software Corporation summarized in Table 1: Summary of Findings Case Study Transportation Corporation, Table 2: Summary of Findings Case Study Retail Corporation and Table 3: Summary of Findings Case Study Software Corporation above provided the basis and led to the outcome of this research to address, discuss and answer the three research questions of this scientific project.

The first research question focuses on patterns, common and contrasting characteristics of the organizations in context with real and potential benefits and disadvantages of social media and collective decision-making. The second question reflects perceived benefits and disadvantages based on the perception of the interviewees. The third research question investigated about the existence and reasons of barriers blocking or slow down the integration and utilization of social media in collective decision-making processes. Interviewees were asked about their experience and opinions, why barriers exist and how to overcome them.

The analysis conducted a systematic process of qualitative research following a narrative approach in accordance with Bryman and Bell (2011), Creswell (2009) and (Flick, 2007) of thinking, reflecting, and interpreting while comparing codes, categories and themes across the three case studies. Each theme identified addresses a specific area of investigation and builds a structure of codes extracted from the transcribed interviews in the form of summarizing statements, describing repeating topics and reflecting its meaning along the analysis process. During this iterative process, a synthesis of relevant literature, theories and the collected data provided the link between the known and the explored unknown to add to the existing body of knowledge. The main theoretical areas compared were organizational behaviour, social informatics and collective decision-making. More specific the cross-case analysis focused on organizational culture, structure, management approach, hierarchies, collaboration, joint action, transparency, willingness to share knowledge, the utilization and integration of social technologies and the

collective decision-making process within different socio-economic systems. These research areas guided through the analysis, building the framework to reflect the existing theories and allowed approaching the answers of the research questions systematically.

The combination of the findings of social media and the collective decision-making process across the investigated socio-economic environments and the individuals, their experience and perception in real life context provided the data basis. The largest component were semi-structured interviews augmented with documentary data, internal communication, meeting minutes, business reports, corporate blogs, publications and discussions on social media platforms. The emphasis in the interpretation of the interviews followed Berger and Luckmann (1966) seeking an understanding of the phenomena by focussing on the construction of meaning within the social interaction process among individuals and the influence of cultural aspects. In essence, the main objective of the analysis was to understand the views and perceptions of the researched individuals. This means, how they construct meaning that influences their contributions, their choices concerning the application of social media interaction and how they changed their habits and behaviour.

The reported findings summarized in in Table 1: Summary of Findings Case Study Transportation Corporation, Table 2: Summary of Findings Case Study Retail Corporation and Table 3: Summary of Findings Case Study Software Corporation above were also combined to derive patterns or differences caused by specific factors of organizational behaviour. The objective was to grasp how organizations embed the complex process of decision-making into their daily business and utilize information and social communication technologies for this purpose. The analysis of organizational behaviour provided insights and specific factors about collective problem solving and team collaboration that influence whether and how organizations utilize social media and integrate this technology into collective actions. These factors comprised a further analysis of management approach, hierarchical models and structure, power distribution, culture, motivation and communication following Robbins and Judge (2014).

Hierarchical models relate to a common approach to make business decisions centralized, decentralized or a mix of both (Morgan, 2006). Another related area of reflection was organizational intelligence. In this thesis, organizational intelligence refers to the capabilities of an organization to utilize its intellectual capital for collective problem solving and decision-making (March, 1999; Nonaka & Takeuchi, 1995). This means in the context of social media, how this technology is capable enhancing organizational intelligence by supporting the process of capturing corporate intellectual capital and its utilization. Another topic this analysis followed was how power distribution and hierarchical structures determine the characteristic of organizations with

respect to the influence on collective action, and the aggregation of corporate knowledge and opinions into a business relevant choice (Hofstede et al., 2010).

Therefore, all three cases were contrasted to find evidence whether a certain characteristic relates to openness and willingness to share information and knowledge, and whether the characteristics of an organization relate to collective decision-making and the utilization of social technologies. Social media supports interaction, communication, collaboration and exchange of information, thoughts, opinions, and establishes communities of common interests (McAfee, 2009; Tapscott & Williams, 2011). Hence, organizational characteristics such as collective action, collaboration, openness, willingness to share and decentralized structures are more likely to utilize social media than strictly hierarchical, less transparent and centralized organizations. In other words, if an organization demonstrates capabilities of utilizing its intellectual capital, following an engaging management approach, involving their employees into collective decision-making processes, they are more likely to utilize social technologies to enhance this process (Schneckenberg, 2009). The combined findings of the field research partly confirmed this assumption. However, all three organizations are combinations of characteristics such as strictly hierarchical and less hierarchical models, centralized and decentralized structures, which leads to different capabilities of active and less active utilization and creation of intellectual capital. This means an organization is capable of collective action, collaboration, openness and willingness to share even if parts of the organization following centralized and strictly hierarchical structures. Hence, the application of social media differs from one part of the organization to the other. From a pure information and communication media to an integrated platform to collaborate and collective decision-making.

This led to the discussion how organizations could benefit from social media integrated in collective decision-making processes and disadvantages, risks this could cause. In order to derive evidence about objective real and potential benefits and disadvantages, the findings were contrasted with the perception of benefits and disadvantages based on real life experience of the interviewees. These findings followed a discussion concerning barriers about the integration of social media into a collective decision-making process. Most interviewees mentioned culture, organizational structure, and willingness to share knowledge, personal exposure, unclear value, missing standards, and lack of change management as key factors to create barriers. In addition, they explained specific countermeasure to overcome them. The findings pointed to the assumption that organizational and individual behaviour have an influence on the integration of social media concerning benefits, disadvantages and barriers.

5.2 Organizational Behaviour, Social Informatics and Collective Decision-Making

Organizational behaviour, social informatics and collective decision-making were the main topics of the conducted case studies that present the foundation to answer the research questions. How characteristics of organizations and technology mutually influence collective decision-making provided the scientific grounds of this research. Organizational behaviour was reflected in the ability of interdisciplinary collaboration across departments to utilize corporate knowledge in computer mediated collective decision-making processes.

Based on the findings concerning theme (1) General information the investigated organizations showed comparable characteristics concerning management approach, functional structures, hierarchies and integrated matrix organizations. However, Transportation Corporation and Retail Corporation act mainly in a national market and Software Corporation international. All three organizations compete within their fields with diversification of products and services and differentiate on price, special products and a variety of services. Innovation and agile adaptation to changing demand are key for these organizations. They are operating in highly competitive and volatile markets in the transportation, retail and computer software industry. Competitors with comparable products and services drive these organizations to continuously innovate and differentiate.

The studied organizations present three different industries with multiple distinct organizational forms such as a partly private company with a large portion owned by the state, an association, and a public listed company. Software Corporation follows a homogenous management approach based on functional areas with hierarchical power distribution. Business decision-making follows centralized and decentralized structures according to the nature of the topic. Transportation and Retail Corporation demonstrate how different hierarchical models co-exist within the same organization. They implement in some areas a strictly hierarchical and centralized model and in other parts a less strictly but hierarchical and decentralized model. According to the collected data, this refers to different functional areas that combine different purposes within the same organization. Both organizations operate production factories with strict requirements about safety, rigorous production processes, standards and regulation and functional areas such as sales, marketing, corporate communication, human resources, finance, research and development, IT and services. The closer the departments to the production sites the stricter the implemented and perceived hierarchy, which was confirmed by the interviewees from both organizations. This is an interesting aspect for the analysis since hierarchy and power distribution influences how

and if employees are involved in business decisions and collective action according to Schneckenberg (2009). In other words, the selection of these research sites allowed contrasting the different organizational models and their influence on collective decision-making.

The interviewees of all three case studies confirmed, according to their perception and experience that a strictly hierarchical model tends to more centralized decision-making. This is in line with the findings of Morgan (2006) and Hofstede et al. (2010). In other words, relevant business decisions are made by management with minimal involvement of the employees. However, the results of the case studies showed that also in strictly hierarchical organizations business decisions with less impact or with smaller financial consequences are handled decentralized. For instance, decentralized decisions are how to approach a project specific problem, customer interaction, solution design or what alternatives are presented to management. This suggests that strictly hierarchical management models are not per se centralized and rather a mix of centralized and decentralized. For instance, at Transportation Corporation employees working on the trains following a strictly hierarchical structure. However, if they have to make business relevant decisions, they involve in some cases the whole board crew. In addition, employees at production sites are also involved in opinion gathering and organization wide polls. They are invited to participate for instance utilizing their smart phones or mobile computers. In strictly hierarchical areas, employees participate business decisions only partly with less influence compared to areas with leaner hierarchies. In these areas, the level of influence is higher and participating in the entire decision-making process is more common. Strictly hierarchical areas follow mainly guidelines, given processes and standards or rule based decision-making. In less strictly hierarchies, choices emerge out of deliberation, discussions and aggregated opinions according to the results of the case studies.

Comparing the findings of theme (2) Perceived transparency openness communication and the hierarchical structures, openness, transparency, joint problem solving, and the willingness to share knowledge were perceived as a living culture in all three organizations. Both from an external and internal point of view. In other words, how the organizations present themselves to the outside world was in general confirmed by the interviewed employees. However, differences were reported between external and internal communication and the flow of information. The interviewees perceived transparency to the external environment as high. All three organizations inform their customers frequently about new products and services, issues, events and organizational changes. Transparent communication plays in all three organization a key role for public relations and customer relationship management. In relation to the findings in theme (3) Perceived utilization of

ICT for communication interaction and collaboration the organizations utilize different communication channels to inform their customers, to keep in touch and to receive feedback. For instance, common social media channels are Twitter, Facebook, YouTube, Instagram, Google+, LinkedIn, and Flipboard to communicate with the outside world. Internal openness and transparency among the employees, teams and groups was described as a characteristic how employees collaborate and interact in the investigated organizations. Organizational information and knowledge exchange is established by email, phone, and instant messengers, group chat tools, physical and online meetings, corporate communication, the Intranet, collaborative platforms and information management systems. Communication and the flow of information are aspects that influence collective decision-making following Malone (2004). Organizational structure and culture influence the flow of information and communication systems act as an enabler (Davenport & Prusak, 2000). In other words, information technology influences the flow of information and to some extent the culture of openness and transparency and willingness to share (Kling & Lamb, 1999). In accordance with the findings, organizations with a less open and transparent culture and rather strict hierarchical structures configure their information systems more restricted than decentralized and less hierarchical organizations. In other words, the information systems reflect organizational behaviour concerning their willingness to share information across the departments. Information systems in all three organizations are configured with view restrictions following a principle of openness to allow all employees to access the information they need with some exceptions concerning confidential data for instance human resources. This reflects communication, organizational structure, openness and transparency within the organization (Malone, 2004).

Information systems play an essential role for each organization in the area of core and supporting business process automation, internal and external communication, collaboration, information management, documentation and the preservation of corporate knowledge. Information management is key for their operations to provide the information needed to collaborate and interact during the course of daily business across departments and organizations and as a basis for business decisions. The organisations invest continuously in their computing infrastructure and upgrade their business software and applications with latest technologies or develop them by themselves. In addition, information technology is utilized as communication media for internal and external exchange. All three organizations provide their employees a variety of communication and collaboration technologies. A pattern observed in all three cases was a lack of software standardization. Interviewees complained about an overwhelming number of available applications. They mentioned that some of them provide exactly the same functions based on different products. Concerning communication, interaction

and collaboration tools, the organizations offer the employees many and redundant options, which leads to gaps in the information flow, information silos and lowers network effects these tools could provide. For instance, the organizations provide different instance messengers, group chat tools, wikis, and content sharing platforms and therefore not all employees can be reached or benefit from the information stored. In addition, this creates virtual boundaries between groups and departments diminishing the possibility of utilizing new communication channels to enhance corporate communication. An explanation about this phenomenon pattern points to the circumstance that the organizations are in an exploration phase in the area of new forms of communication and collaboration tools. Especially in the area of internal social media applications. For example, well-established systems such as enterprise resource planning (ERP) systems or financial systems are standardized in all three organizations but social media are not.

Concerning the findings about theme (4) Perceived utilization of social media integration within the organisational context social media are available in all three organizations such as wikis, an Intranet with interaction possibilities, and different instant messengers with capabilities to exchange information, building groups, present content and meet, social networks, sharing platforms, blogs and micro-blogs. The organizations utilize social media intensively for external communication by participating in social networks such as Facebook, LinkedIn, Google+, Twitter, and Instagram to interact with their customers. This leads to a second pattern observed by comparing external versus internal utilization of social media. The interviewees explained in all three organizations that they perceived the utilisation of social media for the external communication much more mature than the internal application. This could relate to the circumstance that organizations started with the utilization of social media for external use that added to existing communication functions. External application of social media focuses mainly on marketing channels for customer communications about company news, products and services and marketing research about brand recognition and consumer behaviour. Other external applications are customer support communities and forums allowing customers to interact with the organization for problem solving and interacting with other customers to share their experience. Both examples of external application provide measurable benefits such customer satisfaction or increasing sales based on campaigns published on social media. According to the interviewees, the purpose of internal social media application concentrates in all three organizations on communication and information exchange enhancements. Integration into business processes are at the beginning in an experimenting and learning phase. Referring to (5) Perceived risks and disadvantages of social media the interviewees mentioned in all three organizations to problem of distraction, losing focus of the objectives, biased information, opinion manipulation and lack of integration and usability

and unclear benefits and business purpose, which creates barriers of utilization of social media in the organization. In order to overcome such barriers comparing theme (6) Overcome barriers of social media in organizational context, interviewees mentioned the need of additional training, the explanation about the application, purpose, benefits, improving usability and providing seamless integration in business processes, motivation measures to participate in online discussions and contribute to collaborative projects by adding these in personal goals and received acknowledgments and awards.

Analysing theme (7) Perceived individual and collective organisational decision-making process in all three organizations, collective decision-making follows a similar approach independent on the hierarchical level. From the board of directors to a group of employees decision-making processes following similar stages. Business decisions in all three organizations are influenced by different parties, which means none of these decisions are made in isolation. The participation of employees reaches from problem identification, problem analysis, solution generation, evaluation and selection performed by a committee, management or a group or team. Corporate wide polls are utilized to involve employees in business decisions that affect the entire organization. However, most of these collective decisions are limited in impact. For instance, they are about the name of a site, opinions about a product, optimizations of a business processes or new campaign but less likely about financial or strategic topics. Such decisions stay with management and are made centralized. All three organizations utilize different communication channels such as email, the Intranet, corporate social networks and polling tools to ask their employees about their opinions and feedback.

Cost-benefit analysis, pre-studies, decision-matrix, SWOT analysis, and financial reporting systems are common decision-making support tools to evaluate alternatives and to provide a basis for decisions made by another groups such as management or a committee. Discussions and deliberation to find a consensus about a choice are the most prominent approaches mentioned for a collective decision-making process. In other words, the decision tools in most cases support the evaluation and the selection of an alternative but the final choice depends on the arguments presented within group discussions.

According to the interviewees, the majority of the collective decision-making processes follow partly a formal process utilizing decision-making support tools but to a large portion depend on discussions in the group influencing the final choice. Hence, derived from the findings in all three cases, business decisions are besides factors such as financial, strategic, compliance and legal constraints a matter of personal interaction, presentation of the problem, and argumentation about the solutions. This means, personal preference and

argumentation are important factors of business decisions. This means, individuals participating in a decision-making process in the deliberation phase could be able to convince the group and changing their judgement. For instance, introducing soft factors such as the experience of a supplier or other advantages and justifying higher costs compared to other solutions. Hence, the collective decision-making process in business environments is a complex social process that considers, besides analytical tools and relevant data, preferences, opinions, arguments and objectives of the involved individuals and groups. Social media are capable to engage a collective focussed on a specific problem or topic. In addition, they collect and aggregate thoughts, opinions, preferences and contributions, support the social process of deliberation and argumentation and selecting an alternative by utilizing poll, voting and ranking mechanisms.

The findings of the first part of the cross-case analysis provided common patterns about organizational behaviour concerning structure, management approach, openness, transparency and willingness to share. This led to the discussion about their influence on collective decision-making, and the integration of supporting information technologies to interact, share and exchange relevant information to make a choice. This provided the basis to discuss the research questions about benefits, disadvantages and barriers of the utilization of social media and the collective decision-making process in the following sections.

5.3 Real and potential Benefits and Disadvantages of Social Media Integration in collective Decision-Making Processes

The analysis of real and potential benefits and disadvantages of social media integration in collective decision-making processes followed an objective three-stage thinking, reflection and interpretation approach before concluding and answering the <u>first research question</u>. First stage was to grasp how different social media types fit into each step of a decision-making process. Therefore, this stage discusses possibilities how the different social media application types could be integrated and utilized in each step of a decision-making process. The second stage reviews the collective decision-making from a characteristic perspective differentiating between an individual and collective process. This provides an understanding about specific requirements of a collective decision-making process compared to an individual decision-making process. The purpose of this stage is to link capabilities of social media to specific characteristics for instance engaging a large group to contribute to a specific topic and support collective action. The third stage reflects the influence of social media on the employee's behaviour

concerning collaboration, sharing knowledge, contribution, exchange and interaction.

According to the findings in the case studies, social media are part of the information technology infrastructure in all three organizations. The different social media technologies they apply are instant messengers and group chat tools, corporate social networks, information sharing platforms, wikis, blogs and micro-blogs. They are utilized in the areas of corporate communication, information exchange, special interest communities, joint content creation and integrated feedback mechanisms based on comments and ranking. Some of the applications are integrated into business processes. For instance, during the development phase of new products and services, wikis are utilized to collaborate, exchange, interact and jointly work on documentations and manuals. In addition, collecting opinions and listen to the thoughts of employees about these products and services the organizations use feedback mechanisms integrated in the Intranet. The first research question is an objective view about real benefits of social media integrated in collective decision-making. Real benefits mean that the data provides evidence that satisfies scientific criteria and allows deriving the existence and generalization to other cases and organizations. Hence, the discussion is based on the findings from all three organizations, how they utilize social media and integrate it in collective decision-making. The following Table 4 illustrates exemplary for each step of a collective decision-making process how to integrate and combine specific social media types derived from the findings. For instance, a social network could be utilized for the problem identification step by creating a community to start a discussion to establish a common understanding in the group. A wiki could be used to gather information about the problem in the analysis step and content communities could add their solution descriptions on a sharing platform or the Intranet accessible to the group. With micro-blogs the community could be requested to discuss the solutions and provide criteria for the evaluation and presenting the solutions to the group. By utilizing group chat tools in the final selection step, the group could be invited to vote for the solutions. However, the applicability of the social media types depends on the nature of the problem such as structure and complexity, the groups involved and the aggregation mechanisms the types provide. Therefore, the group should first evaluate which social media types or their combination provides the required support for each step of the decision-making process.

Table 4: Decision-Making Steps and Social Media

	Problem Identification	Problem Analysis	Solution Generation	Solution Evaluation	Solution Selection
Social Networks Sites	Create specific community Start problem discussion	Invite for feedback about the problem Start deliberation process	Invite community to contribute solutions	Initiate solution evaluation and voting process	Choose solutions based on criteria and voting results
Collaborative Projects (Wiki)	Create a wiki for a specific problem	Participants add their comments about the problem	Participants describe the solutions	Participants comment and feedback	Choose Solution based on comments and feedback
Blogs Forums	Initiate problem discussion with specific blog	Invite for comments and feedback	Invite to contribute solutions	Invite to comment and feedback about solutions	Choose solution based on comments and feedback
Micro-Blogs	Engage problem discussion within a micro-blog	Engage for problem analysis, gathering information and discussion	Participants provide different opinions and suggest solutions	Use likes, followers or polls to evaluate solutions	Choose solutions based on likes, followers, polls
Content Communities	Information gathering Contribute content	Use content to learn about problem (text, video, graphs, slides)	Present solutions with pictures, video, graphs, slides	Use comments, likes to evaluate	Choose solution based on comments and likes
Instant Messengers	Create group chat and invite conversation about problem	Start problem discussion and analysis	Show solutions in group chat	Collect opinions and discuss solutions	Vote within group chat
Intranet	Inform about a problem	Invite for feedback and comment about the problem	Invite to contribute solutions using comments	Evaluate solutions by utilizing likes, polls and rankings	Choose solution based on likes, polls and rankings

Before analysing the real and potential benefits of integrating social media in collective-decision making and answering the research question, it is worth reflecting on the process, which could potentially be influenced by social media. Therefore, general characteristics are analysed in order to link them to the capabilities of social media and to grasp potential changes or enhancements in the process based on findings in the case studies.

A collective decision-making process carries distinct characteristics compared to the individual process. The main difference is that two or more individuals, spanning from small to large groups, are involved in the decision-making

process. In addition, along the process for a collective choice the involved individuals might change from one decision-making step to the other. For instance, one part of the participants of a collective decision-making process analyses a problem and creates a set of alternatives with different evaluation criteria. After this, they hand the alternatives over to another group, committee or management to make the final decision (Silver, 2013). On the other hand, alternatives could be presented to a collective to ask for their choice utilizing mechanisms such as opinion aggregation, polls and voting. This means collective decision-making is a staged approach of single or multiple groups towards a common goal.

According to March (1999) corporate intelligence measures the ability of organizations to utilize their intellectual capital to make sound decisions. In this context, social media could act as an enabler to integrate corporate intelligence in the decision-making process at a larger scale. In addition, by utilizing the logging functions of social media, learnings and best practices from joint problem-solving sessions could be stored for reuse, utilizing wikis or discussions in communities or forums. Furthermore, social media connects employees across teams and departments, extending knowledge and expertise in the process. This follows the weak and strong ties concept of social networks following Granovetter (1973). He explains the integration of weak ties, which means the integration of expertise from distant networks, as a possible enhancement of the problem-solving process. This means, social media aggregates opinions, thoughts and experience of teams directly assigned to the problem and allows extending the decision-making team with experts originating from other teams of the organization. This could increase the level of variety of possible solutions, alternatives, expertise and problem-solving skills.

The benefits social technology offers are not necessarily evident on the surface. However, benefits start to appear during the combined investigation of social informatics and organizational behaviour aspects. Therefore, the answer of the first research question about the real and potential benefits and disadvantages of social media integration into the collective decision-making process follows two iterations. First from the obvious, what the data showed during the first analysis on the surface to a more detailed analysis about meanings behind to discuss potential benefits. Social media described above are utilizable for each individual step in the collective decision-making process. The utilization depends on the functionality the application offers for instance to collect ideas, opinions, aggregate them and leading into a collective choice. The collective decision-making process is a collection of joint actions of a group of individuals. Each step requires to provide, create, capture, collect and aggregate information, which could lead into a final decision based on collective action or if a consensus was not found starting an iterative process.

Real benefits, according to the aggregated data from all three case studies, can be divided into six categories: communication, interaction, involvement, reproducibility, aggregation and physical presence. In order to start a collective decision-making process, the participants need to be addressed and the topic or problem has to be described. Social media allows reaching out to a larger group and presenting the problem in a variety of forms such as text, pictures, audio and video. This allows communicating the idea or the problem definition in a more comprehensible way, which is a benefit of social media within the collective decision-making process. The collective decision-making process is a process of interaction such brain storming, discussions, deliberations, exchanging ideas and opinions. Social media provides different sets of functions to interact synchronously and asynchronously. The benefit of interaction during the decision-making process utilizing social media is to follow the progress of the process, because each interaction is captured. This allows the participants to think and to digest contributions, comments and feedback from other participants. Within a collective decision-making process, the profiles of the participants involved influence the outcome (Landemore & Elster, 2012). According to Landemore and Elster (2012), Malone and Klein (2007) and Surowiecki (2005) the outcome of a collective decision statistically is more likely to lead into an educated choice if the participants possess enough information and intellectual capability to understand, contribute, judge and decide. Social media provide functions to select participants according to their profiles during the process to add expertise if needed. For instance, a virtual community moderator could admit participants to a closed decision-making group according to their profile, skills and expertise. During and after the decision-making process the reproducibility of the process allows the participants to reflect and to learn about solutions created. Social media logs automatically the contributions such as comments, solution descriptions, and discussions during the process, which is a benefit for reusability of knowledge. Aggregation of the contributions are the ingredients of a collective choice (Hansson, 2005) . Social media offers aggregation functions such as ratings, polls, and votes during or at the end of the decision-making process to select the solution preferred by the majority of the participants, stakeholders or other individuals involved. Virtual presence is another real benefit. Employees enjoy the freedom to participate a discussion about the decision or problem-solving process at their convenience wherever they are physically located. More precisely, the benefits are about involving individuals into ad hoc discussions without the need of physical presence. In addition, reaching a large audience or the entire organization without limiting geographical boundaries and the possibility to follow the process asynchronously for instance over different time zones. As a side effect, this lowers costs for travelling and accommodation, special facilities such as meeting rooms, meeting equipment and administrative efforts to gather employees coming from different geographical locations. For instance, observations showed a common practice organizing

virtual meetings with participants even from the same location, because the team members were on the road or worked from their home office.

<u>Potential benefits</u>, following the findings in the cross-case analysis processes surface with the following characteristics: <u>connecting employees</u>, <u>motivation</u>, <u>relationships</u>, <u>transparent and direct communication</u>, <u>keeping the employees informed</u>, <u>less formal but faster process</u>, <u>fostering a discussing and deliberating culture of involvement</u> and <u>participation</u>. Making collective decisions is a common approach found in all three investigated organizations. Business decisions in socio-economic systems are not made in isolation either given by the complexity of the problem or by internal and external compliance, policies and regulatory requirements (Beach & Connolly, 2005). Social media connects individuals and engages them into collective actions. This allows adding expertise from individuals not necessarily closely related to common tasks, responsibilities or functions in the decision-making team as needed. Hence, a potential benefit of social media integrated in the collective decision-making process is the involvement of individuals and groups with special skills and experience outside usual practice. This could change how organizations involve employees in collective decision-making processes following Kling et al. (2005) about the mutual influence of information technology and behaviour. For instance, during deliberations and online discussions participants contribute with their experience based on tacit and explicit knowledge. In other words, tacit knowledge could be captured in a discussion forum and directly integrated into the decision-making process.

Another potential benefit emerges in the area of swarm theory following Miller (2010) and Bonabeau and Meyer (2001) concerning the motivation to collaborate and act collectively. Social media is based on network effects and contributions of many, which means for instance the more individuals utilize the same social media platform or add to a collaborative project such as a wiki the more individuals can benefit (Tapscott & Williams, 2008). The motivation of individuals to contribute is based on different factors such as social exchange and recognition (Zur Shapira, 1997). In addition, motivating factors are related to being part of the whole, common identity, following and imitating what others do, which carries similarities to swarm theory (Miller, 2010). In other words, the behaviour of groups follows similar patterns compared to a swarm following others to achieve a common goal. For instance, in natural environments to defend against predators or to find habitats with a promising environment to settle. Compared to social media, the visibility of contributions of others and the value for the individual could attract to participate the process. This points to findings of Kling et al. (2005) that information technology and social behaviour mutually influence each other. Hence, a potential benefit of social media in the collective decision-making process is a changing effect on organizational behaviour and culture, concerning

collaboration, interaction and joint problem solving. The more employees engage into a collective process the more they feel integrated and part of the whole. Social media platforms support this through their integrative characteristic.

An effect, which is comparable to the metaphor March (1999) used to characterize an organization that acts in analogy to a brain and nervous system. Information flows through the networks of an organization similar to neurons transporting electric signals. The main objectives are joint achievements, optimization of collaboration and adaptation to integrate the knowledge and experience the organizations carries as a whole (March, 1999). The role of social media in this context is an enabler and accelerator to the process of collective action building the connections and the networks of individuals to support the information flow and interaction.

Real disadvantages of social media integration in collective decision-making, according to the findings, are distraction, losing focus of the objectives, biased information, opinion manipulation and a less formal nature of the process. Decisions on social media platforms could amplify ideas and opinions pushing them into a certain direction comparable to the effect of collective decision-making processes without supporting technologies (Janis, 1982). In other words, the disadvantages are similar to collective decision-making in groups. Groupthink, the neglecting of the silent and the influence of power of dominant participants influence the group during the decision-making process (Janis, 1982). The difference compared to decision-making processes and social media, lies in the number of individuals involved and the speed information is spread. Hence, the dynamics of the process are more difficult to control than a group sitting physically together deliberating. For instance, large virtual group contributions could be added at a high frequency and in parallel. On one hand, social media invites to contribute with a free mind similar to a brainstorming process. However, without control-mechanism the process could lose focus and escape the genuine objective of the decision-making process. This could lead into endless discussions no one is bringing to an end and a decision-making process without a choice or consensus. In other words, a challenge is to keep the process and the dynamics under control and make sure the contributions add to the conversations and discussions about problem identification, analysis and evaluation.

The lack of engagement to contribute is another disadvantage that was mentioned in context of the less formal character of discussions in social media. Employees are not motivated to contribute, because they perceive the participation of the discussion not as mandatory compared to a physical meeting. In other words, discussions on social media platforms could be perceived as loose and unstructured interaction with uncertain outcome. This could relate to a lack of change management. In other words, social media

applications are deployed to the employees with insufficient instructions and trainings, which would support the employees utilizing the new tools efficiently with a dedicated purpose.

Potential disadvantages of social media in the collective decision-making process are found in the areas of readiness of an organization to adapt to the new possibilities, too many options and freedom of choice, time consumption, efficiency, less formal character and information overload. If an organization is not ready to utilize social media from a management and cultural perspective and the employees are not used to the new media the efforts could exceed the objectives to support or enhance decision-making processes. Employees need additional trainings and experience to get familiar with the new technology and utilize it efficiently. Hence, the deployment of social media adds to the overall costs. The budgetary situation could become tenser without measurable factors of returns on investments, which are mainly of qualitative nature concerning social media. On the other hand, interviewees in management positions explained a concern about a virtual shift of power distributions and hierarchy structures. At the first glance, this could be recognized as a positive move into an organization that emphasises on collective actions and starts to implement decentralized structures. However, not every organization, department and its management are ready for a decentralized approach and need time to adapt. Observations showed departments or groups that became early adopters in the organization, utilizing social media platforms. This led to excluding other departments or groups from the decision-making process, because they were not ready to use the new technology.

A collective decision-making process with or without social media could become a lengthy process the more people are involved. Therefore, social media could add more time to the whole process to prepare the information, starting the process, control the process, aggregate the contributions and derive a choice. Furthermore, social media allows to communicate and to interact on a less formal and less structured basis. For instance, no formal framework is needed to open a group chat for a discussion or joint action. Hence, this allows acting fast and exchange information directly without the need to invite formally to a meeting. However, complex topics, which require a formal structure to control the process, could become difficult to manage with social media if contributions are added without control and moderation. This leads to another disadvantage about information overload.

Social media allows participating different decision-making processes in parallel. Hence, following each discussion could be become overwhelming. Also within a single process, the information to be digested could become challenging for the participants not being able to distinguish what adds to the discussion or what should be neglected. In other words, employees perceive

social media as an additional source of information adding to the existing systems such as email, which adds to a perceived information overload. This section discussed real and potential benefits and disadvantages based on observations, documentary data and interviews. The next section steps into the real-life perception of individuals and discusses real and perceived benefits, which leads to the second research question.

5.4 Perceived Benefits and Disadvantages of utilizing Social Media in collective Decision-Making Processes

The second research question is about perceived benefits and disadvantages utilizing social media in collective decision-making within a business environment. In essence, this research question focusses on how individuals perceive social media in the collective decision-making process in real life. The objective analysis above about real and potential benefits and disadvantages of social media integration in collective decision-making processes provided the basic knowledge to be extended to further analysis and interpretation about the second research question. The process contrasts real life experience reported to understand meanings the individuals stated to grasp what is a real and what is a perceived benefit following Berger and Luckmann (1966) and the findings about Enterprise 2.0 from McAfee (2009) and Tapscott and Williams (2008). This leads to triangulated in-depth analysis of the research topic combined with observations and documentary data and the analysis about organizational behaviour and real and potential benefits.

Interviewees reported benefits and disadvantages of social media and explained how they perceived them in daily business actions. In order to understand the motivation and meaning of the statements the analysis approach followed three iterative stages comparing the themes (9) Perceived benefits of social media integration in collective decision-making and (10) Perceived risks and disadvantages of social media integration in collective decision-making collected from the three investigated organizations. The first stage discusses social media application in daily business processes and possible changes they cause, according to the statements of the interviewees. This provides a general understanding of the perceived influence of social media. The second stage discusses how employees utilize social media in a business relevant decision-making process by comparing the findings from the individual case studies. In focus are real life views about the application of social media in collective decision-making processes. The third stage discusses the perceived benefits and disadvantages the interviewees described, and contrasts them to the findings about real and potential benefits and disadvantages to answer the second research question.

The interviewed employees utilize social media in different areas during the course of daily business. While email still dominates information exchange and

communication, social media emerge in the form of additional communication channels and information exchange. In addition, they serve as collaboration platforms and self-presentation, complementary or as substitutes to existing systems, which confirms the observations from McAfee (2009) about Enterprise 2.0. The list of types of social media utilized in the investigated organizations in the order of frequency such as daily, weekly, or less starts with groupware applications such as enhanced instant messengers or group chat tools with capabilities of content sharing and presentation, polls, data and information exchange, embedded in existing content management and email systems or standalone applications. Interviewees explained that instant messengers and group chat tools changed their interaction habits and behaviour of communication within the teams and groups. Contacting individuals from other teams or departments became easier in the sense of finding the right people in the corporate directory and invite to an informal chat. The interviewees perceived this informal interaction as an efficient way of collaboration with co-workers and management to start ad hoc discussions or ask for advice about a business decision, problem solutions or educating and supporting others utilizing screen sharing sessions.

The interviewees emphasized the advantage to be aware if a person is available and the possibility to interact while working on other tasks in parallel or during a meeting independent on location and time. In other words, the capability of asynchronous and synchronous interaction provides an advantage depicting social media as powerful communication tool. Furthermore, the interviewees perceived instant messengers and group chats as an enabler for a faster peer-to-peer communication than email and some stated that they already prefer group chats to phone or email. Blogs were other media mentioned to exchange and distribute information instead of email. According to the interviewed employees, blogs allow to broadcast information to a project team or a larger group and invite for comments without the need of managing lengthy distribution lists. Hence, employees are able to follow discussions without the need to search for specific emails or lengthy email threads.

Feedback mechanisms integrated in enterprise content management systems or the Intranet are additional sources of information. A minority of the interviewed employees actively utilized comment and feedback mechanisms but perceived the possibility as a benefit acting mainly as consumers of the information. Management utilizes social media such as the Intranet and blogs with feedback mechanisms to inform and to listen to the opinions of the employees with the objective to foster engagement, participation, knowledge exchange and motivation to contribute actively to business topics.

Wikis are a common means of project teams, product and customer support departments, corporate communication and IT. The main purpose is about

editing jointly documentations, manuals, regulations and policies and coping efficiently with the volatile characteristics of these documents and the different stakeholder that need to contribute. The possibility of aggregation of contributions, working in parallel on different parts and the efficient way of editing larger documents, engaging the whole team, were prominent reasons to utilize these tools in business context. Wikis at all three sites are equipped with feedback and comment functionalities to allow the interaction and discussion about contributions or suggestion, changes and new topics.

A majority of the interviewed employees consume blogs and micro-blogs for information purposes about a topic of interest concerning their team, new products and messages from the board. In other words, a minority acts as an active internal blogger and more as a follower. Reasons prominently mentioned by the interviewees are lack of time or not used to utilize blogs. Software Corporation implemented a corporate social network platform for communities of common interests establishing subject matter discussions and following special events, initiatives and product launches. However, the other two organizations are in the process to implement corporate social platforms in the near future, because of a demand to build special interest communities. They aim to foster knowledge exchange and the possibility to find individuals with specific skills in the organization. In essence, the overall purpose of social media in the investigated organizations are mainly focused on communication enhancements, adding more channels, direct and indirect interaction with peers and management. In addition, to enhance the flow of information and exchange within teams and groups across the organization to access tacit and explicit corporate knowledge.

The real-life experience of the interviewees reflects how they utilize social media within the decision-making process and benefits they perceive. Communication and interaction capabilities provide benefits concerning ad hoc discussion for problem analysis and solution generation according to the interviewees. They utilize group chats, communities and wikis to integrate thoughts, opinions and solutions from a larger but dedicated group in the decision-making process. Another benefit relates to information gathering including existing solutions captured in past decision-making processes to reuse them in the solution generation process. In other words, social media is an additional source of information and knowledge to consult during the course of a business decision.

Perceived benefits about the integration of social media and collective decision-making processes based on the interviews follow similar patterns compared to the categories identified in the first research question. According to the interviewees, they are of supporting and enhancing character. Social media is a means to communicate with groups, starting discussions, collaborate, share common interests, ideas and thoughts, and aggregate

information and opinions (Tapscott & Williams, 2008). The perceived benefits stated for a decision-making process addressing <u>communication</u>, <u>interaction</u>, <u>involvement</u>, <u>variety of opinions</u>, <u>engaging employees in collective actions</u>, <u>integrating experts</u>, <u>reproducibility</u>, <u>aggregation</u> and <u>physical presence.</u> Communication and interacting with a larger group on different channels for instance to ask employees about their opinion within project teams, departments and across the entire organization demonstrated a perceived benefit for the interviewed employees. In other words, the interviewees perceived a main advantage of social media in the integration of many participants with a variety of opinions and contributions in the process. In addition, they perceived the outcome of a decision-making process sound and solid, because they believe in the advantage of the involvement of many that contributed to a common outcome. Another perceived benefit points to the involvement and participation, which increased the level of acceptance among the employees about a decision they contributed. Furthermore, being part of decisions on organizational level provides acknowledgement and appreciation. The interviewees perceived this as trust of the management towards the capabilities of employees to solve business problems and find suitable solutions independently acting as a collective. Involvement of experts and the participants that add to the discussion is a common way to apply social media in the collective decision-making process. Interviewees mentioned the flexibility and the reach of involvement independent where the experts is located.

Social media platforms allow capturing and archiving the entire process. Therefore, reproducibility of the process was emphasized as benefit. In addition, the interviewees mentioned the advantage of aggregation mechanisms such as polls, votes and rankings that provide continuous feedback about solutions presented during the course of a decision. This means, during the decision-making process generated solutions could be presented to another audience to judge and vote. For instance, the marketing team asks the employees about their opinions or suggestions concerning a new product name or design or ask for a slogan for a campaign to profit from organizational intelligence described by March (1999). The organizations integrate these ranking and voting mechanisms in the Intranet, corporate social networks, content management systems or standalone internal and external applications to utilize social media in the decision-making process. For employees frequently travelling or working from distant locations, physical presence at meetings becomes a challenge. In all three organizations, employees are allowed to work partly from home, at different locations or travelling during the week. For instance, at Transportation Corporation a large portion of the staff is on the road working on trains or along the tracks. Hence, a perceived benefit is the independence of physical location and the flexibility to participate virtually a discussion during a decision-making process.

An additional finding during the analysis of benefits is the importance of the context that influences the utilization of social media in organizations. This is related to openness, transparency, willingness to share knowledge and the acceptance of failure as a means to learn and advance.

Perceived disadvantages of social media integration in collective decision-making, according to the findings in the interviews are personal exposure, opinion manipulation, and additional workload, losing control and focus, information overload and distraction. Personal exposure influences participation compared to social media in a less formal context. For instance, the opportunities to comment and provide feedback about a topic or during the decision-making process are perceived as an advantage of social media. However, in this context, a major concern mentioned is the exposure of personal opinions and the reactions they could cause such as criticism and negative feedback in a business environment. Consequently, many interviewees reported that they are rather reluctant or cautious about providing personal comments in the organizational public. Opinion manipulation was a frequently mentioned concern in context with the information and contributions presented during the decision-making process. According to the interviewees, individuals and groups could push a decision into their preferred direction emphasizing the advantages of an alternative. The interviewees related this concern to external experience of social media. Other disadvantages interviewees experienced about losing control and focus of the genuine problem topic during discussions and deliberation of a decision problem. They perceived the decision-making process tedious and cumbersome if opinions are broadly discussed and judged without an outcome. For most of the interviewees, social media embodies another source of unstructured information adding to the information already available. Therefore, they perceived the integration of social media in the decision-making process creating an information overload, which leads to the disadvantage of distraction. Interviewees perceived social media distracts from the problem-solving process and open up the discussions to lose itself in different directions. The identified perceived disadvantages play an important role about the barriers integrating and utilizing social media in the collective decision-making process. Some of the perceived disadvantages translate into barriers compared to the findings in the following section.

5.5 Barriers to integrating and utilizing Social Media in the collective Decision-Making Process

The third research question is about barriers integrating and utilizing social media in the collective decision-making process. General barriers utilizing social media and specifically in context with decision-making are to some extent similar barriers according to the interviewees. In other words, barriers

that apply to the utilization of social media in general lead to barriers in context with the utilization of social media in the decision-making process and vice versa. Barriers are found on different levels from the interviewees' perspective. Prominent barriers mentioned in (11) Barriers to integrate social media in the collective decision-making process across the three case studies are mainly of psychological and behavioural nature and to a smaller part, technical aspects including security, data transfer and information management. This means, following Kling (2000b), Sawyer and Rosenbaum (2000) and Wang, Carley, Zeng, and Mao (2007) computerization influences organizational structures such as centralization or decentralization and an impact on hierarchies, power distribution and decision-making structures. Furthermore, information technology influence business processes, behaviour, collaboration and exchange (Kling, 2000b). Therefore, acceptance of a new technology relates to changing existing thinking models and habits, which could lead to discomfort and refusal among the employees. Hence, barriers mentioned were <u>denial</u> and <u>missing trust</u> in the new technology, <u>discomfort to expose personal thoughts</u> to a larger audience and the <u>change of personal habits</u>. Interviewees were concerned and doubtful about the capabilities of social media to support and improve the efficiency of a collective decision-making process. They perceived it as a risk for a larger group to utilize social media through a complex decision-making process, instead of holding physical meetings and gatherings to deliberate and discuss business relevant topics. In other words, if a topic reaches a certain level of complexity the effort to explain it in a comprehensive way to all participants could become difficult, lead to misunderstandings, and consequently to wrong arguments and less suitable solutions and alternatives. For a significant number of the interviewees, personal exposure of thoughts and opinions is a concern within a formal business context. They perceived it as a risk to expose personal ideas and opinions to a larger group. If their arguments fail, are not accepted or their contributions are misunderstood, the consequences could lead to direct criticism or losing face in front of the group, management or the entire organization.

According to Kaplan and Haenlein (2010a) self-presentation and status is a typical characteristic of social media and motivates to participate and contribute. Individuals who participate or contribute in social media on a social network, blogs, micro-blogs or sharing platforms and collaborative projects present their thoughts, opinions, beliefs and values in most cases to an anonymous audience. Through their personal profiles, comments, contributions, statements, ratings, and opinions they publish, the audience constructs a picture of the personality of these individuals. For instance, recommender systems or other monitoring and aggregating systems are capable of creating a profile of a person including habits, preferences, values and beliefs according to their utilization of social media (Watkins & Rodriguez,

2008). Within the organizations, the situation is different concerning personal exposure and the willingness to share preferences, values, beliefs and opinions. The audience is a selected group belonging to the same origination, related to the individual in a business context. They are controlled by hierarchies, functions and responsibilities influencing personal careers, acceptance, standing and internal competition. Comments, contributions and opinions during the collective decision-making process could have a direct impact on the individual. For instance, if a contribution to a solution for a problem or a comment about an alternative is perceived by the participants as invalid, the reach and spread of this failure could become immediately visible to the group or the entire organization. In other words, the participants become vulnerable to criticism and could lose the trust of their peers and management in their judgement or expertise. Hence, the need for self-presentation to show achievements and to be honoured within the organization is real but individuals might step back on corporate social media platforms, because of the risk of personal exposure and the consequences. In addition, if an organizational culture is less failure tolerant this effect could be amplified by the reach of social media. Consequently, employees are careful about the utilization of social media in organizational context and about personal contributions, which creates a barrier to use social media in the collective decision-making process.

This is different if this social media is a means for communication and information exchange only. For instance, working in the team on a manual or product documentation or guidelines utilizing wikis is perceived as less risky compared to the open discussion within a collective decision-making process. Normally a group works together on the content of a document that is less related to personal preferences but given topics and structures. Another concern when debating virtually about a topic is the difficulty to interpret emotions. They are captured ambiguously by social media, which could lead to misinterpretations by the participants. Interviewees mentioned that in some situations it could be of importance to understand the overall mood and emotions by reading body language or listen to the tone of the voice. The tone could be convincing or an indicator, how serious participants take the conversation and the contributions in the process. Hence, a larger number of interviewees believe that if possible, physical meetings should be preferred over virtual meetings. On the other hand, the interviewees understand organisational and logistic challenges when engaging with larger groups and the advantages of social media gathering individuals virtually.

A common pattern could be derived from the interviewees concerning prejudice about social media. Interviewees perceived social media as a means to communicate and interact on an informal and unstructured way known from the experience in private applications such as Facebook, Twitter, Instagram or Wikipedia. This is related in general to change management and the process

to train the employees using the new technology and integrate them into the business processes. Since the implementation of social media could require cultural changes towards decentralization and less control, strictly hierarchical organizations could experience resistance situated on all management levels.

Another dimension of barriers is related to the human machine interface and the integration in existing information and communication systems. Barriers increase if the usability is low, which slows down the acceptance process. Normally employees avoid complex systems and try to find work arounds not to use them in the business process (Kling, 2000b). Other barriers are related to technical concerns in the area of retention and security. Interviewees perceived social media as formless media with almost no structure and difficulties to capture the information created in discussions and collective actions. In addition, missing standards create barriers if not the entire organization utilizes the same system for the same purpose. Utilizing social media for a larger group needs common tools and standards that allow reaching participants through the entire organization to gain from network effects and to avoid information silos. Another concern mentioned was security, for instance confidential information discussed in a closed group should be accessible only by this group. Therefore, barriers are created if management and employees do not trust the mechanisms of social media to protect confidential data.

From a management perspective, losing control was mentioned in the area of process control and the delegation of business decisions to the employees. The concern explained was about the dynamics within the whole process of deliberation in the decision-making process that could lose the focus of the objective solving a problem and lead to endless discussions. Further concerns that create barriers are about abuse of personal information, additional workload in the daily business, unclear benefits, refusal to share knowledge, missing trust in the information presented in the process, manipulation of opinions, and continuous availability. A concern mentioned by the interviewees was about the abuse of their personal data and the contributions in the process. They were concerned if this information could be used by others to judge about their performance, how they act in a group, and if their contributions are of value. They feared that this could be used by management to collect additional information about an employee for ranking purposes. This relates to organizational behaviour and culture concerning about openness and transparency. If employees feel more under observation, they are reluctant to share what could be used against them. Additional workload is related to the concern if social media provides real advantages in the business processes or if they simply create data silos and information systems that add to the large number of systems already in place. Social media engages according to the interviewees and as a side effect increases the perceived

expected availability. This is related to the concern about unclear benefits. If social media is perceived as additional workload without clear outcome, the employees are reluctant to utilize it. A collective decision-making process involves individuals with heterogeneous profiles (Hansson, 2005). For some decision-making processes participants do not know each other and are not aware about their skills, knowledge and experience. Hence, a barrier is related to trust and weak ties. In other words, if participants perceive the contributions from other participants as less educated and informed they lose trust in the whole process and return to their strong ties.

Interviewees suggested different approaches how to overcome the barriers they mentioned such as implementing a proper change management that provides not only the technology but also training and guidance about efficient utilization and clear benefits for the business. In addition, standardization of tools for the same purpose to foster network effects and enhance the flow of information. Through measures on usability improvements of the social media applications and seamless integrations in business processes, the interviewees saw additional possibilities to lower barriers. Furthermore, the allowance to experiment and learn through experience. A topic mentioned by many interviewees was management support. The interviewed employees mentioned that management should motivate by example, utilizing social media integrated in decision-making processes. Concerning (12) Perceived social media governance, the interviewees agreed about the need of guidelines and governance about the utilization of social media. For instance, moderators are required to support and control the discussions to preserve the quality of the contributions and motivate employees to participate.

5.6   Summary

The cross-case analysis provided an insight into the existence of differences between the organizations in the investigated areas relevant to social media and collective decision-making in a business environment. The qualitative inquiry found similarities and patterns allowing the interpretation of the collected data and deriving new findings answering the research questions. The comparison and contrasting of the findings provided a deeper understanding of the complex process of collective decision-making and the significant influence of context and technology. The investigated organizations provided a relevant mix of organizational structures, management approaches and culture to derive how they support the integration of social media.

All three organizations compete in different highly competitive markets such as transportation, retail and computer software with diversification and differentiation. Therefore, innovation and continuous improvements are key according to their corporate statements found on their web sites, articles and explained by interviewed employees on all levels. They stated that corporate

knowledge and intelligence is one of the most important competitive advantages. Therefore, they are looking for new technologies, methods and approaches to efficiently reuse and utilize their corporate intellectual capital. Hence, these organizations are more likely to be open for new information and communication technologies such as social media and the possibilities they offer. Following Kling et al. (2005) information and communication technology influence how individuals communicate and interact. On the other hand, social behaviour and the individuals influence what kind of information and communication technology they need. In other words, organizational behaviour shapes the information systems, their functions and their setup.

The analysis showed that organizations with strict hierarchical structures are more likely to apply this structure to their information systems. In contrast, the investigation showed that less strict areas in the same organization follow a principle of openness with exceptions concerning confidential data. All three organizations are familiar with social media and on a mature level concerning external communication. According to the interviewed employees, internal application is on a much lower level. Evidence of the absence of clear standards and inappropriate applications indicated that these organizations are in an exploration phase. Social media applications are mainly utilized for communication, collaborative projects and information exchange. However, the business purpose of these applications and their integration within the business processes were not clear to the interviewed employees. On the other hand, the findings showed that real and perceived benefits and disadvantages are related to each other. Benefits frequently mentioned at all three sites were in the area of communication, interaction, involvement, reproducibility, aggregation and physical presence. Potential benefits surfaced such as connecting employees, motivation, relationships, transparent and direct communication, keeping the employees informed, providing a less formal but faster process, fostering a discussing and deliberating culture of involvement and participation. In essence, the identified benefits manifest a characteristic of social media; employees in the investigated organizations were aware about and had already experienced their application in daily business. In addition, the awareness of disadvantages such as personal exposure, distraction, losing focus of the objectives, biased information, opinion manipulation and a less formal nature of the process shows that employees engage with and reflect upon their use of the new media. This was further confirmed by several reports about how social media changed the behaviour how the interviewees communicate, gather, exchange and collectively act but also what concerns them. In other words, new technologies within an organization mean a change of the status quo. Employees have to get familiar with the new technology otherwise reluctance, denial and concerns prevail, which leads to the barriers mentioned such as abuse of personal information, additional workload in the daily business, unclear benefits, refusal to share

knowledge, missing trust in the information presented in the process, manipulation of opinions, and continuous availability.

All these benefits, disadvantages and barriers demonstrate the complexity of a collective decision-making process and the influence of organizational behaviour and information technology. Social media shows benefits in the area of communication and interaction, which are essential in a collective process. They also lead to concerns about personal data abuse, unsecure information, opinion manipulation and biased information. However, these concerns are comparable to collective decision-making processes without technology support. In other words, groupthink, social pressures, conformity, polarization, leadership effects, hidden profiles, amplifying errors and cohesion exist in the collective decision-making process with and without the integration of social media in the process. In essence, social media were perceived as enablers of social interaction within the organization. They fulfil the needs for efficient and less formal communication and enable the involvement of teams and groups regardless of their location.

An essential finding of this study is the importance of the social environment or the context, which is different in organizations compared to the application of social media in the Internet. Cohesion, social pressures, conformity, polarization, leadership effects play a significant role in organizational context. In addition, how an organization tolerates failure and encourages openness and transparency are key factors in the willingness of individuals to expose their thoughts, opinions and contributions. The social environment is therefore related to organizational behaviour and influences the degree to which and manner social media are integrated into business processes, decision-making and collective action. If an organization is used to collective action they are more likely to support the utilization of social media. Motivation and the involvement of management are also key. If employees perceive the support of management as genuine and management provides good examples, then the acceptance of social media is likely to be higher. In addition, this suggests the implementation of change management processes to allow the employees to experiment with social media to increase their level of experience.

6. Conclusion

6.1 Introduction

This chapter summarizes the key findings in relation to the objectives and the research questions of this qualitative research project. In focus of this inquiry were the implications of the integration of social media technologies into collective judgment and decision-making processes in organizational business environments. After the reflection on key findings follows a discussion of the theoretical and practical contributions, the limitations of this research and suggestions for future research.

6.2 Key Findings

This research project systematically followed three objectives. The first was to gain a deep understanding of the complex decision-making process and the influence of social information technology within organizational formal and less formal contexts. A qualitative approach was chosen as research strategy based on multiple case studies, semi-structured interviews and documentary data. The case studies represented three different industries, organizational structures and local and international markets. The empirical data gained from the case studies provided the foundation for the second objective of this research: to explore, contrast, compare and interpret real, potential and perceived benefits, disadvantages and barriers of social media integration in collective decision-making processes. The third objective was to find evidence whether or not social media technologies are capable of advancing the collective decision-making process, and if they do, to identify ways of integrating and utilizing, knowledge, technology and process, based on the findings and to identify any elements, which may obstruct this.

The key findings are divided into three focus areas, (a) social media within a business environment and organizational readiness, (b) social media and collective action in business such as mass collaboration and joint problem solving and (c) social media integrated in collective decision-making, derived from the benefits, disadvantages and barriers identified.

The three investigated organizations showed comparable patterns how they integrate social media in their business processes. From a managerial perspective, the utilization of social media aimed in all three companies to enhance corporate communication, information exchange and interaction between employees, groups, teams, across departments and hierarchies. For instance, polling and voting systems were used to collect feedback from the employees about organization-wide topics such as new products, designs, tools, processes, campaigns and initiatives. Furthermore, the investigated organizations applied social media technologies to improve collaboration and collective action such as collaborative projects, information flow and to foster

tacit and explicit knowledge exchange. Social media components are integrated in collaborative platforms and content management systems or as stand-alone solutions. For instance, enterprise content management platforms are extended by social media add-on functions such as comment, rating, polling, and voting functions, to create communities, to exchange documents, invite for discussions or add blogs and wikis, and to support a collaborative and interactive document management process. In addition, corporate social networks provide self-presentation functions to publish profiles in the corporate directory to find subject matter experts and to create activity threads employees could follow.

However, the application of social media in all three organizations mainly takes place in dedicated functional areas such as product management, IT support, corporate communication, services, sales, research and development, marketing and cross-functional teams. In these areas, social media integrates in daily business and enhances, according to the employees, communication, interaction and exchange. In other areas such as production sites, factories, logistic departments, operations and departments dominated by security standards and regulations, the employees perceived the application of social media as less relevant with unclear benefits. The difference between these departments and functional areas manifested in hierarchical structures and management approach. The cross-case analysis showed that hierarchical structures and management approach such as decentralized and centralized, influence the utilization of social media.

Retail and Transportation Corporation allowed contrasting between different models. Both follow a heterogeneous management approach across the departments following different forms from strictly to less strictly hierarchical, centralized, and decentralized models. Social media was available in all departments independent of the applied hierarchical models. However, the less strictly departments utilized social media in a broader context compared to the strictly hierarchical departments. The less strictly departments reported that they apply collective problem solving and knowledge exchange as common practice. In contrast, the departments with strictly hierarchical models followed mainly the instructions given by the superiors and the defined procedures for instance at production or construction sites with less occasions to collectively solve problems. In general, the interviewed employees perceived the working environment, and the communication and knowledge sharing culture as open and transparent within the teams and across hierarchies. However, interviewees reported differences between the departments. Strictly hierarchical departments were perceived as less open and less willing to share knowledge with other departments than the less hierarchical.

The above leads to the first key finding about social media within a business environment and organizational readiness. The cross-case analysis showed the importance of social and behavioural context within a socio-economic system and the application of social information technology. The application of social media reflects the organizational structures, openness and willingness to share knowledge and the requirement to collectively collaborate, interact and exchange. This leads to a characteristic requirement of information flow and the dynamics of business processes. Departments following strictly defined procedures require less coordination among the employees than departments with multi-disciplinary changing tasks such as product development and management that needs to create ideas about new products, solutions and enhancements while interacting with development teams and internal and external customers. The study showed that employees within such a context are more likely to adapt to social technologies than in more restricted areas.

Readiness about the integration of social media into business processes requires according to the findings of this study the following key social elements: open and transparent communication culture, willingness to share knowledge, the capability and the need for decentralized problem solving, collective action and contribution, engagement and participation at team, group, department or corporate level. Participation, engagement and contributions of individuals and groups are the essential ingredients for social media to work. For instance, group chats, special interest communities on social network platforms, collaborative projects such as wikis and content sharing platforms require contributions of the collective to provide a collective benefit. The investigation showed that collective decision-making requires similar key social elements that make social media work such as participation, contribution, engagement and collective action.

In order to understand the phenomenon of social media integrated in collective decision-making processes in an organizational and less formal context the study answered three research questions.

1. What are the real and potential benefits and disadvantages, if any, of social media integration in collective decision-making processes in organizational and less formal contexts such as interest groups?

The basis to answer the first research question followed the observations at the research sites and the available documentary data provided. The cross-case analysis and discussion identified real benefits such as communication, interaction, involvement, reproducibility, aggregation and physical presence. These benefits cover three areas: (1) the social aspect, (2) information management and (3) facilitating of a collective decision-making process. Social media provides different communication channels that allow the

employees to involve participants in ad hoc discussions mainly supported by group chat and instant messengers, wikis and blogs. Information management is the capability of collecting data during the decision-making process and aggregating the contributions. Social networks and collaborative platforms allow addressing and meeting a group of individuals independent of their location. This facilitates discussions, deliberations and the flow of information to support the decision-making process.

Another group of benefits are potential benefits. They are mainly located in the area of (1) social development, (2) organizational behaviour and (3) corporate intelligence and technology. In order to support the collective decision-making process social media stimulates and accelerates corporate wide collaboration and collective action by <u>connecting employees from different departments</u>, <u>building new relationships</u>, <u>fostering transparent and direct communication</u>, <u>keeping the employees informed</u>, <u>providing less formal but faster communication</u>, <u>fostering a reflective culture of involvement, participation</u> and <u>motivation.</u> Social media within a decision-making process provides immediate results and supports the information flow, which motivates employees to engage and contribute. In addition, employees are able to build new relationships and extend their network to provide more options about whom to involve in the process.

The research identified disadvantages in the area of limited capabilities of information consumption, biased information, lack of structure, vulnerability to manipulation and security. These disadvantages surfaced as <u>distraction</u> and <u>losing focus of the objectives.</u> Social media allows participating and follow different discussions in parallel and contributing in a freethinking or brainstorming mode. This could distract the participants from following the objective of the decision-making process or lead to information overload and endless discussions without an outcome. Vulnerability to manipulation and security is about the information provided during the process and the security of personal and corporate data. Disadvantages such as <u>biased information</u>, <u>opinion manipulation</u> and the <u>less formal nature of the process</u> surfaced during the analysis. Mechanisms that avoid biased information provided through social media are not available and could lead the collective in the wrong direction. In addition, a group or an individual could use social media to manipulate opinions by emphasizing certain topics during the decision-making process, for instance by favouring a specific solution and disqualifying other solutions. This relates to comparable problems known from collective decision-making processes without information technology support such as groupthink, social pressures, conformity, polarization, leadership effects and hidden profiles. These negative effects potentially amplify due to the large number of individuals participating in discussions utilized by social media. The individuals are part of a socio-economic system characterized with hierarchical

dependencies, different objectives and internal competition. Hence, organizational behaviour and the social aspects influence the application of social media and perceived benefits and disadvantages. This leads to the second research question that focuses on real life experience and perception.

2. What are the perceived benefits and disadvantages, if any, of utilizing social media in collective decision-making processes in organizational and less formal contexts?

Perceived benefits about the integration of social media and collective decision-making processes focused on the data sets gained from the interviews. The findings confirmed that the identified benefits concerning the first research question follow similar categories. An explanation for this is the known characteristics of social media application, which guides and influences the employees and reflects their real-life experience. The perceived benefits stated in context with decision-making process addressed <u>communication</u>, <u>interaction</u>, and <u>involvement</u>, <u>variety of opinions</u>, <u>engaging employees in collective actions</u> and <u>integrating experts.</u> Benefits point to aspects of (1) social interaction (2) variation of opinions (3) involvement of expert knowledge.

Comparable to the findings during the analysis of the first research question social factors play a significant role, which on the other hand emphasises the influence of characteristics about organizational behaviour and the mutual influence of the socio-economic and technological environment. Learning from the contributions, the possibility of engaging employees with the needed skills and expertise and the enrichment of a variety of thoughts and opinions in the collective action are key benefits of social media. They enhance collaborative problem identification, problem analysis, solution generation, solution evaluation and solution selection. The social media mediated decision-making process was perceived as less formal but more efficient and faster because of fewer requirements to participate and to facilitate the process. However, the results emphasized that the integration of social media in collective decision-making processes is at the beginning of a social development process, which comes with rethinking approaches, procedures, business processes, culture and structures. Such changes could cause resistance to utilizing social media and slow down the process of integration, which leads to the third research question about barriers.

3. How could any identified barriers to integrating and utilizing social media in the collective decision-making process be overcome?

The identified barriers appear in different dimensions such technical, social and cognitive capabilities. (1) Trust in the new technology and its capabilities, (2) protection of personal data, (3) exposure of personal opinions and knowledge, (4) lack of knowledge and experience, and (5) trust in information

presented. These dimensions manifest in specific barriers such as a low degree of <u>application usability</u>, <u>abuse of personal information</u>, <u>additional workload</u> in the daily business, <u>unclear benefits</u>, <u>refusal to share knowledge</u>, <u>missing trust in the information presented in the process</u>, concerns about <u>manipulation of opinions</u>, and <u>continuous availability.</u>

Employees perceived a low level of usability and the lack of integration of social media in business applications as a significant cause for barriers. If users have to change between applications in the process of decision-making or the user interface is too complex users most likely avoid utilizing social media and seek for work arounds not to use them. In the view of a large number of interviewees, social media in decision-making processes imposes additional workload, which to some extent relates to the level of experience and the education about the utilization of social media in business process. Hence, employees need to learn first about the integration possibilities before they enter a level of optimization to increase the efficiency of the process. This leads into the overall level of trust in the technology and its capabilities within organizations and unclear benefits. The social environment and organizational constraints provide barriers about personal exposure of opinions and knowledge. Employees considered the exposure of personal opinions to a large number of employees as a risk if their opinions are not expected, criticized or wrong. Another concern to participate in collective decision-making was about information provided in the process and its abuse and manipulation. Employees felt insecure about the information presented in a discussion concerning the possibility of favouring an alternative based on biased arguments either because of lack of knowledge or on purpose. A prominent barrier was about permanent availability, which was an overall observation of the employees. With social media on their laptops, tablets and mobile phones employees felt the pressure increased to be available for business decisions outside business hours.

Identified measures to lower these barriers are in the area of change management that address training, guidance, integration, the allowance to experiment, learn and optimize, improvements about usability, integration in business processes and management support. Management support was mentioned in all cases as a key measure to convince employees to integrate social media in business processes. This means, guidance based on good example by the management, was mentioned as a key motivator to lower the barriers.

The answers to the research questions above support the conclusion of this thesis that social media technologies are capable of advancing the collective decision-making process of integrating and utilizing, knowledge, technology and process. However, disadvantages and barriers slow down the process of their integration and adoption in the daily business. The utilization of social

media reflects the readiness of an organization to utilize and merge information technology and collective action. On one hand, factors to be considered are technological requirements to integrate the software components of social media in existing platforms, usability enhancements and data security. More important are individual and organizational behaviour and the social environment. In other words, the socio-economic system creates the prerequisites of integration. Openness, transparency, joint problem solving and collective action concerning communication and information flow are supportive characteristics of the organization to integrate social media. In addition, decentralized and less strict hierarchies that allow employees to take responsibility for business decisions and a general perception of failure as a learning process stimulate participation in collective decision-making processes. Consequently, the integration process of social media in collective decision-making processes depends on these characteristics. Interviewees described in all three organizations a cultural process, influencing the behaviour from the individual to the entire organization towards a common business practice of collective action. In addition, they perceived a transformation of decentralization towards less hierarchical structures caused by cultural change in the organization, new generations entering and the changing information technology landscape integrating social media.

6.3   Contributions to Theory

This research project contributed to the combination of three main theoretical fields. <u>Social informatics</u> about the mutual influence of information technology and human beings from a behavioural perspective combined with <u>organizational behaviour</u> theory building the context of social media integration in <u>collective decision-making</u> processes.

The thesis was influenced by existing literature to provide the foundation of further development of knowledge and the exploration of new grounds. The works of Einhorn and Hogarth (1981), Tversky and Kahneman (1974), Slovic et al. (1977) and March and Heath (1994) provided the insight about the social dimensions of decision-making and the difference between individual and collective process. This was further developed in the combination of organizational perspectives considering organizational behaviour and its relevance for decision-making within socio-economic environments. Further theoretical grounds were provided by behavioural decision-making theory in business contexts and the characteristics of organizations with a focus on organizational intelligence: in essence, how organisations utilize their intellectual capital such as shared knowledge and experience in the course of collective decision-making.

This thesis showed the importance of social structures in organizations and the implementation of information technology supporting the process of

decision-making. The effect of social media provides a new dimension of knowledge about collective and behavioural decision-making. Information technology not only enhances a process by supporting with computation and information management capabilities, it also changes how individuals collaborate as a collective. This confirms the theory about social informatics in the sense of mutual influence and in addition the transformation of technical to social processes.

The exploration of social media within an organizational context in this thesis provided additional aspects to consider the context. The utilization of social media follows different rules than in the Internet. Social aspects such as groupthink, social pressures, conformity, polarization, leadership effects, hierarchies, policies, economic constraints, organizational strategies and hidden profiles play a significant role in the application of social media in organizations. The benefits of mass collaboration in organizations are limited due to the number of employees. Motivation in the context of swarm theory showed that organizations are similar to swarms the way that they utilize social media. Organizations with less strict hierarchical structures act more likely collectively than strict hierarchies.

This research added to the body of knowledge in the combination of three theories that relate to social media and collective decision-making in business context. Collective action in organizations and managerial approach influence the utilization of information technology. Social media theory extends to organizational theory and provides additional insights into how individuals interact and collaborate when equipped with additional communication channels, social networks, content exchange and collaborative platforms. The research showed that social media enhances collective decision-making in organisations.

Furthermore, the findings emphasized that besides technical similarities, behaviour and characteristics concerning the application of social media in the Internet do not exactly apply to organisational contexts. This is because organizations provide a different context compared with the environment in the Internet. Groups in the Internet emerge with fewer constraints and fewer regulations and policies, mostly based on common interests, building a loose form of connections and social networks. Organizations follow objectives based on economics and specific purposes determined by demand and supply, markets, and competition. Hence, the theory about social media integrated in collective decision-making in organizational and less formal contexts such as groups of interest has to take into account the socio-economic environment, individual and organizational behaviour, which guides how social media could be applied and integrated in this context. These are the main contributions this thesis provides to the body of knowledge from a theoretical perspective.

6.4 Contributions to Practice

This research showed advantages and barriers of the integration of social media into collective decision-making. For organizations, the implementation of social media is more about social change than a technological change. Employees learn and familiarize themselves with the new tools with less resistance if the utilization and the integration in the business process is seamless and without additional efforts and workload. Change management is key, and this requires the commitment and support from management by setting a good example.

This thesis showed that the integration of social media relates largely to organizational behaviour and culture. If cultural aspects such as decentralization, collective action and collaboration are not fostered in an organization the benefit from social media will most likely be confined to communication enhancements and miss the advantages gathering employees with different skills and different experience working for instance on collaborative projects and collective decisions.

This could lead to questioning the real benefits of social media if communication enhancements are the only benefits perceived and acknowledged. In other words, the advantages compared in a cost-benefit analysis could not reach a level of budgetary justification. Working with social media in the course of daily business is a learning process. Organizations need their employees to familiarize themselves with, integrate, adapt to and engage with social media to gain from the advantages of participation, informed employees, network effects and collective action in decision-making processes. Social media encourage collective action by connecting, informing and enabling interaction similar to intelligent swarms or organisms. From a practical perspective, this research showed that the benefits of social media integrated in collective decision-making are real.

From a managerial perspective, social media provides management with new possibilities to interact with the employees. While in the Internet the utilization of social media such as mass collaboration is well established, the application in organizations requires additional measures to benefit, to address disadvantages and overcome barriers. Disadvantages are mainly in the areas of distraction and information overload, which lead to uncertain outcomes and bias in communication. This relates to the barriers concerning uncertainty about the benefits, lack of trust in the new technology, usability, security of personal data as well as a lack of openness and transparency that raise concerns about personal exposure. The identified disadvantages and barriers point to the topics management needs to address during the evaluation of social media applications such as usability and integration in business processes. However, they recommend measures to guide the employees

during the adoption process and the application in collective action. Therefore, the progress and the transformation process should be closely monitored in terms of participation and feedback from the employees.

6.5 Limitations of Research

The limitations of this research are found in the nature of qualitative case studies. First, the number of cases are limited to three and the number of interviews to thirty. The sampling was based on a purposive sampling method with the aim to focus on variations (Ritchie et al., 2013). However, availability of the cases and the organizations willing to participate influenced the selection of this research project as well. In addition, qualitative studies have their limitations (Bryman & Bell, 2011). Since they are suitable to investigate relatively new topics, this research was exploratory. However, the generalization possibilities are limited due to the number of samples available (Creswell, 2009; Eisenhardt, 1989; Yin, 2009). The interviews provided an in-depth analysis of real life experience and perceptions (Kvale & Brinkmann, 2015; Rowley, 2012). However, these are limited to the interviewees interviewed and influenced by the interaction between researcher and the interviewee and the interpretation that resulted from the analysis.

The selection aimed to involve as many different roles from different departments of the organization to provide contrasting samples based on different views and environments. However, the selection of the participants in a real-life environment was limited by the availability and willingness to participate in this research. Therefore, not every role and every department or division had their representatives. This could limit contrasting different views from different departments and environments.

The research analysed each step of a decision-making process and how social media could be utilized. This was based partly on the results of the interviews and the analysis of capabilities and characteristics of social media types. However, the level of how social media would be applied in the decision-making process would require further investigation and observation of real-life application.

The research has shown that the application of social media within organizations is a learning process of testing, adoption and optimization. However, this thesis covers a limited timeframe of nine month reflecting a period of the real-life experience of the interviewees. In order to gain a broader picture of the organizations and how they mature in the application of social media a longitudinal research design could provide additional insights (Bryman & Bell, 2011). Financial and economic impacts such as efforts, returns on investments, and competitive advantages are not reflected in this thesis. This could play an important role in the evaluation of social information technology investments and could influence the landscape available to the

employees. Only organizations with social media already in place were willing to participate in this research. In other words, the investigated organizations present not highly different maturity levels of social media application, which leads to a lower level of contrast. Furthermore, the organizations investigated were located in two different countries representing three different industries. This could be a limitation for generalizations concerning other countries, cultures and industries from an ethnographical and organizational behaviour perspective such as communication, collaboration and organizational structures.

6.6   Suggestions for Future Research

Since the beginning of this research project in 2013, the evolution of computing and the pace of the development of new business applications towards the digitalization of business processes have accelerated. Technologies such as mobile computing, artificial intelligence, cloud computing, internet of things, robotics, self-controlled cars, big data analytics and electronic discovery have entered economic and managerial discussions. Furthermore, the software components for collaboration and communication have become commodities in business information systems and relevant for most industries. Organizations need to rethink their business models, their distribution channels, vertical and horizontal integration towards service platforms. This has an impact on organizational structures and influences internal and external communication, collaboration and collective action such as open innovation and mass collaboration projects. Social media integration into business processes is therefore an emerging and ongoing process.

Future studies should focus on how organizations integrate their knowledge into daily business utilizing information technology. As computing becomes more social, organizations are changing their management approach towards the virtualization of teams. Hence, organizations are integrating services into their products and outsourcing what is not related to their core business and purpose. Organizations are starting to become more focussed on core competencies, but also more distributed concerning supporting services.

Finally, organizational decision-making is becoming a collective activity. The key to collective decision-making is to collect and aggregate opinions and contributions. Therefore, decision-making is becoming a virtual process and social media will be an integrative part of this process. Future research should be a combination of social behaviour, computing and decision-making to cover social and technological aspects. Since this is a learning process, future research should investigate over longer periods to understand how organizations mature. Closely related to this, motivation is another field for future research to understand the incentives employees need to work as a collective on problem solving and decision-making.

Another area for future research are predictive markets and crowd funding, which is another way to involve people in collective action for instance, where to invest money, new product launches, new initiatives or new projects. Managerial impact on social media in organizations and organizational behaviour will be a field of future research concerning the guidance of the employees and the identification of management approaches that consider collective action and technology.

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Appendices

Appendix 1: Semi-structured Interview Guideline

DECISION-MAKING AND SOCIAL MEDIA

The integration of social media technologies into collective judgment and decision-making processes in organizational business environments

The purpose of this interview is to explore the implications of the integration of social media technologies such as social networks, blogs, wikis, instant messaging, social bookmarking, rating and voting-systems within formal and less formal contexts in business environments. The focus of this study is on real and potential benefits and disadvantages of social media integration in collective decision-making, which means how individuals and groups integrate social media in the decision-making processes. Therefore, this inquiry seeks evidence to establish whether or not social media technologies are capable of advancing the collective decision-making process, and if it does, to identify ways of integrating and utilizing, knowledge, technology and process, based on the findings and any elements, which may obstruct this.

All your answers will be treated anonymously and confidentially!

Information about the Interview	
Name of Interviewer	
Name of Interviewee / Role and Responsibilities	
Name of Organization	
Name of the Department/ Function	
Date of Interview	
Location of Interview	

Interview Guideline:

Research Questions

1. What are the real and potential benefits and disadvantages, if any, of social media integration in collective decision-making processes in corporate and less formal contexts?

2. What are the real and perceived benefits, if any, of utilizing social media in collective decision-making processes in corporate and less formal contexts?

3. How could any identified barriers to integrating and utilizing social media in the collective decision-making process be overcome?

The Interview

Introduction and General Questions

1. Briefly describe your job, position and your responsibilities

2. How would describe your organization in terms transparency, openness, willingness to share, and hierarchical structures?

3. What kind of software applications are you mainly using for communication, information retrieval and exchange and collaboration purpose at work?

A. Questions about the organizational decision-making process

4. Are decisions made in your organization more centrally mostly by the management or more distributed, involving employees in groups and teams? If there is a difference, what kinds of decisions are made centrally and what kinds of decisions are more decentralized?

5. If you are confronted with a business decision, how do you proceed and whom do you normally involve in the decision-making process?

6. How do you evaluate different alternatives?

7. If you have to involve more than one person in the decision-making process, how do you proceed and what are the main problems?

8. Do you use any decision-making support systems to guide the process, collect and evaluate different alternatives and make a choice?

9. How do you perceive the collective decision-making process in general?

B. Questions about social media utilization in the daily business

10. If you think about social media usage in your organization how would describe it?

11. How do you perceive social media in the daily business?

12. What kind of social media (if any) are you using regularly at work and for what purpose?

13. What kind of social media do you prefer the most and why?

14. How would/does the usage of social media change your daily business practice?

15. What are or would be the main benefits of social media for you and your department or organization?

16. What are the main disadvantages and risks about using social media at work?

C. Questions about social media and decision-making

17. If you think about social media and the decision-making process, what steps could the usage of social media influence and how?

18. Could social media be relevant in a decision-making process that involves more than one person?

19. What kind of social media could be used in such a decision-making process?

20. How does or would social media influence your decision-making behaviour?

21. What would be the benefits of social media being integrated in the decision-making process? What could be improved?

22. What are/would be the disadvantages of social media and the decision-making process?

23. What are/would be the main barriers to use social media for decision-making? How could they be overcome?

D. General Questions about social media and the organization

24. Does your organization encourage the use of social media?

25. Does your organization provide you with guidelines of how to use social media?

26. Do you see any general barriers to use social media in your organization? How could they be overcome?

Thank you very much for your time and your support.

Dieter Kehl

Appendix 2: Table of Themes and Codes

Summary of Themes and Codes / Interviews - Decision Making and Social Media

Theme: (1) General Information

    Corporate Communication
    Customer Support
    Employee
    ICT Workplace
    IT
    Management
    Marketing
    Product Management
    Professional Services
    Sales

Theme: (2) Perceived transparency openness communication and the hierarchical structures

    Centralized
    Decentralized
    Divisional
    Evolution of the Organization
    Flat Organization
    Functional
    General Perception
    Hierarchal Organization
    Hierarchical Influence on Communication
    Information and Knowledge Hiding
    Information and Knowledge Sharing
    Information Flow
    Non-transparent Communication
    Less Transparent Communication
    Matrix Organization
    Openness
    Supporting Technology
    Transparent Communication

Theme: (3) Perceived Utilization of ICT for communication interaction and collaboration

    Intensive Usage of ICT to communicate
    Interactive Usage of Communication Platforms
    Low Usage of ICT to communicate
    Number of Communication Channels
    Purpose of ICT to communicate
    Using mainly common ICT to communicate
    Using new generation ICT to communicate

Theme: (4) Perceived Utilization of Social Media integration within the organisational Context

    Change of Behaviour through Social Media
    Changing Working Processes
    Common Understanding of Social Media

Individual Benefits of Social Media
Organizational Benefits of Social Media
Preference of Social Media Tools
Social Media at the workplace
Social Media in daily Usage
Social Media within the Organization
Utilization of Social Media

Theme: (5) Perceived Risks and Disadvantages of Social Media

Disadvantages of Social Media
Losing Control
Mitigation of Risks using Social Media
Personal Exposure to Failures
Reason for Resistance against Usage
Risks of Social Media
Time Consumption

Theme: (6) Overcome Barriers of Social Media in Organizational Context

Culture Change
External Information Exchange
How to use Social Media
Improve Security
Knowledge about added Value
Knowledge and Information hiding
Management Support
Usability

Theme: (7) Perceived individual and collective organisational Decision-Making Process

Centralized Decision Making
Collective Decision-Making Process
De-centralized Decision Making
Decisions made by employees
Decisions made by management
Individual Decision-Making Process
Methods used for collective Decision-Making
Methods used for individual Decision-Making
Perception of collective Decision-Making
Problems perceived in collective Decision-Making Processes
Rational for De-centralized or Centralized Decision-Making

Theme: (8) Social Media and the Process of Decision Making

Change of Decision Making Behaviour
Perceived Benefits
Process using Social Media
Social Media Tools applied

Theme: (9) Perceived Benefits of Social Media Integration in collective Decision-Making

Acceptance of Decision by participants
Better understanding of the Problem
Collection of Ideas
Decentralization
Deliberation of Problems

Efficient Problem-Solving Process
Faster Process
Information Retrieval
Internal Polls
Involve geographical dispersed Individuals
More sound Decisions
Opinion making
Show Personal Engagement
Social Governance
Variety of Opinions available in the Process

Theme: (10) Perceived Risks and Disadvantages of Social Media Integration in collective Decision-Making

Decentralization of Decisions
Distraction
Information Errors
Misleading Arguments
Not taken seriously
Opinion Manipulation
Permanent Availability
Personal Exposure
Security

Theme: (11) Barriers to integrate Social Media in the collective Decision-making Process

Added Value unclear
Additional Workload
Age group
Common Understanding of the Application of Social Media
Information overflow
Manipulation of Opinions
Personal Exposure
Platform
Process Integration
Training of Employees
Usability

Theme: (12) Perceived Social Media Governance

Available Guidelines
Code of Conduct
Controlled by Management
Freedom to use Social Media
Necessity of Governance