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A complex responsive processes perspective

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BY
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Dissertation submitted June 2015

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ABSTRACT

Information systems (IS) are considered a strategic asset in many organizations today (Chen et al., 2010) and the business value of implementing IS continuous to be a major research topic (Schryen, 2013). Furthermore, it has long been clear that achieving business value from implementing IS requires related organizational change (Ashurst et al., 2008). Thus, IS-related organizational change is an area of concern for the IS literature (see e.g. Ashurst et al., 2008; Cooper, 2000; Robey & Boudreau, 1999; Schryen, 2013), and this dissertation positions it-self within this area.

The phenomenon of IS-related organizational changes has been studied from a number of different perspectives in the IS literature. For instance, some papers focus on the IS-related organizational change as taking place through a number of stages following a predefined order. Some focus on the organizational change as a purposeful process of setting goals, evaluating means and implementing the planned change. Others focus on the role of power, conflict and differences and yet other focus on competition between entities as a driver of change. Despite the comprehensive literature, IS-related organizational change and the related business value still presents a challenge for leaders and mangers in organizations today (see e.g. IT in Practice, 2013;1014; Kappelman et al., 2014). It continuous to be a focus in the practice oriented literature and further, some have even pointed to the present complex, digitized world as a challenges to rational planning and strategy (IT in practice, 2014). Thus, it seems relevant to explore alternative approaches to IS-related organizational change and in this way improve our understanding of the phenomenon.

This dissertation therefor introduces the *Complex Responsive Processes* perspective (Stacey, 2001; Stacey et al., 2000), as a novel approach to the study of IS-related organizational change. The perspective combines insights from complexity science with insight from social science and directs attention towards the importance of interactions and communication. More specifically, the perspective expects organizational change to occur when the people interacting differ (significantly) from each other, in this way, the foundation for change is differences, and the related conflict and power balance (Stacey, 2005).

To explore empirically the usefulness of the Complex Responsive Processes perspective, an interpretive case study (Walsham, 1995) was conducted of an IS-related organizational change process in a Danish municipality. In the municipality's school area, a process towards the digital school in 2014 was initiated in 2009. Through observations, interviews and access to numerous internal documents, the process was studied using the Complex Responsive Processes perspective as a sensitizing device. Five episodes were identified within the empirical process: *Benchmarking*, *Strategizing*, *Improving infrastructure*, *Analyzing* and *Re-organizing*. These episodes as well as the process as a whole were analyzed to improve the understanding of IS-related organizational change.

This dissertation contributes to the IS literature by introducing the Complex Responsive Processes perspective as a novel perspective on IS-related organizational change. The case study points to aspects of the process, which needs to be taken into account. More specifically, this dissertation stresses the role of conflict as a potential driver of IS-related organizational change as well as the need for ongoing initiatives to ensure the needed local changes. Further, power is emphasized as a relational phenomenon influencing the process along with the multiple participants. Altogether, this leads to an understanding of the change process as uncontrollable and unplannable in nature. These contributions are of relevance for the IS literature on IS-related organizational change as well as for the wider IS literature, additionally practitioners engaging in similar processes might benefit from considering the aspects

DANSK RESUME

Information systems (IS) betragtes i dag i mange organisationer som en strategisk styrke (Chen m.fl., 2010), ligeledes forsætter forretningsværdien af at implementere IS med at være af forskningsmæssig interesse (Schryen, 2013). Det har længe været velkendt, at relaterede organisatoriske forandringer er en forudsætning for at opnår forretningsværdig af investeringerne (Ashurst m.fl.., 2008). Således betragtes IS-relateret organisatorisk forandring som et forskningsfelt indenfor IS-litteraturen (se f.eks. Ashurst m.fl., 2008; Cooper, 2000; Robey & Boudreau, 1999; Schryen, 2013), og denne afhandling indskriver sig i dette forskningsfelt.

Fænomenet IS-relateret organisatorisk forandring har været studeret fra et utal af forskellige perspektiver i IS-litteraturen. For eksempel fokuserer nogle artikler på IS-relateret organisatorisk forandring som noget der udfolder sig gennem et antal foruddefinerede faser der følger en iboende orden. Nogle fokuserer på organisatorisk forandring som en bevidst proces, hvor der defineres mål, evalueres midler og implementeres planlagte forandringer. Andre fokuserer på betydningen af magt, konflikt og forskelligheder, og endnu andre fokuserer på konkurrence mellem enheder som drivkraften bag forandring. På trods af den omfattende litteratur udgør IS-relateret organisatorisk forandring til stadighed en udfordring for ledere af organisationer (se f.eks. IT in Practice, 2013;1014; Kappelman m.fl., 2014). Den praksisorienterede litteratur fortsætter med at fokusere på dette, og nogle påpeger ligefrem at tidens komplekse, digitaliserede verden udfordre rational planlægning og strategi (IT in practice, 2014). Det synes således relevant at undersøge alternative tilgange til IS-relateret organisatorisk forandring og på den måde forbedre vores nuværende forståelse af fænomenet.

Denne afhandling introducerer derfor perspektivet *Complex Responsive Processes* (Stacey, 2001; Stacey m.fl., 2000), som en ny tilgang til studiet af IS-relateret organisatorisk forandring. Dette perspektiv kombinerer indsigt fra kompleksitetsteori med indsigt fra samfunds- og humanvidenskaberne og understøtter dermed et fokus på betydningen af samspil og kommunikation. Perspektivet forventer på den baggrund at forandring vil finde sted når de personer der interagere er tilstrækkeligt forskellige, dermed er udgangspunktet for forandring forskellighed og den tilknyttede konflikt og magtbalance (Stacey, 2005). Den empiriske relevans af perspektivet Complex Responsive Processes blev undersøgt gennem et fortolkende casestudie (Walsham, 1995) af en IS-relateret organisatorisk forandringsproces i en dansk kommune. Indenfor kommunens folkeskoleområde blev der i 2009 initieret en proces for at realisere den digitale skole i 2014. Med udgangspunkt i observationer, interviews og adgang til et stort antal interne dokumenter blev processen studeret i lyset af Complex Responsive Processes perspektivet. I den empiriske proces viste det sig muligt at identificere fem episoder: *Benchmarking*, *Strategizing*, *Improving infrastructure*, *Analyzing* and *Re-*

organizing. For at forbedre vores forståelse af IS-relateret organisatorisk forandring blev både episoderne og processen som helhed analyseret.

Afhandlingen bidrager til IS-litteraturen ved at introducere perspektivet Complex Responsive Processes som et nyt perspektiv på IS-relateret organisatorisk forandring. Gennem casestudiet understreges aspekter af processen som er nødvendige at tage højde for. Mere konkret, understreger afhandlingen betydningen af konflikt som en potentiel drivkraft bag IS-relaterede organisatorisk forandringsprocesser og understreger endvidere behovet for løbende initiativer for at understøtte de nødvendige lokale forandringer. Desuden fremhæves magt som et relationelt fænomen der påvirker processen i lighed med de mange deltagere. Samlet set fører dette til en forståelse af forandringsprocessen som ukontrollerbar og umulig at planlægge. Disse bidrag er relevante for IS-litteraturen omkring IS-relateret organisatorisk forandring og for den bredere IS-litterature, yderligere vil praktikere som deltager i lignende processer kunne have glæde af at overveje de påpegede aspekter.

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Writing this dissertation as well as conducting the PhD study behind it has been a long and difficult journey. From the beginning, I have approached the work as an opportunity for learning and developing as a researcher. Therefore, I have challenged my-self and put my-self on the line along with my work, and in this way I have matured professionally but also personally. Looking back, it is clear to me that it has been a very personal journey filled with individual choices; however, I could not have made these choices or completed my work without inspiration and support from numerous people. Mentioning them all here would be an exhausting task and a hope that most of them know that I am grateful for their help along the way. A few should however be mentioned.

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CHAPTER

RESEACH FOCUS

1

Introduction

The purpose of this first chapter is to set the stage for the remaining dissertation by stressing the crucial elements of the dissertation. More specifically, the chapter introduces the research area, the research study and the research focus guiding this dissertation. The chapter leads with a section on the link between IT/IS and organizational change. This is followed by reflections on challenges related to IS-related organizational change from a practical perspective as well as a theoretical perspective. Subsequently, the specific focus in this dissertation is outlined. A theoretical perspective or sensitizing device is proposed and the empirical study is introduced.

The presentation of the theoretical as well as empirical focus leads to the outlining of the research focus on improving the understanding of IS-related organizational change before the chapter ends with a short outlining of the structure of the dissertation.

1.1 IT and Organizational Change

In many organizations today information systems (IS), including both information technology (IT) and people, processes and structures (Piccoli, 2007), is considered a strategic asset and massive resources is allocated to investments in IT (see e.g. Chen et al., 2010). From an IS research perspective the business value of investments in IS has been a major focus, and is predicted to continue to be so (Schryen, 2013). According to Schryen the vast majority of the IS papers on the business value of IS investments stresses the operational and strategic relevance of IS. However, he further highlights that the causal relationship between IS investments and business value remains to be fully explained (Schryen, 2013). Cooper (2000) likewise points to the IS research on the link between IT and business value through organizational change. Despite the literature's focus on the link between the two, Cooper points out, that organizational inertia often leads to IT developments that reflect the organizational status quo. This insight leads him to research strategies and techniques, which might support IS-related organizational change. More specifically Cooper researches the role of creativity in the 2000-paper. Other IS researchers have likewise acknowledged the relevance of the link between IT and organizational change. For instance, Ashurst et al. (2008) points out that a stream of IS literature have associated the introduction of IT in an organizational context with organizational change for decades. Further, they highlight that despite the research focus the potential organizational benefits from investments in IT continue to disappoint. Therefore, they develop a conceptual model of benefits realization capability, and find out that the capability and the related competences are generally not enacted in practice (Ashurst et al., 2008). Another paper stressing the relevance of the link between IT and organizational change is Robey and Boudreau 1999). In this paper, they highlight that there seems to exist an implicit deterministic logic in the general understanding of IT as either a determinant or an enabler of radical organizational change. Robey & Boudreau challenge this logic, as they perceive neither the technology nor the management decisions to be deterministic. Rather they introduce a logic of opposition, which is preoccupied with both the forces promoting and the forces inhibiting change and consider IT one of those forces. Lastly, Im et al. (2013) stress *the current interest in developing a better understanding of how IT transforms organizations and creates value* (Im et al., 2013: 471).

This glimpse into the IS literature shows that the link between IT and organizational change, or what will be termed IS-related organizational change from hereon, have been addressed in the IS literature from many different perspectives all agreeing on the existence and relevance of the research focus and the practical challenges associated with the phenomenon. As this dissertation intends to contribute to our understanding of phenomenon by introducing a novel perspective on IS-related

organizational change, the following section examines practical as well as theoretical challenges thereby stressing the need for improving our understanding.

1.2 Practical and Theoretical Challenges

This section directs the attention towards the practical and theoretical challenges associated with IS-related organizational change. The purpose of this is to establish a preliminary understanding of the potential contributions to be made by this dissertation. Building on the overview of the practical and theoretical challenges identified in this section, the following two sections outline the choice of theoretical perspective as well as the empirical focus through which the dissertation address the identified challenges.

1.2.1 The practical challenges

The practical challenges regarding IS-related organizational change is evident both in the international and Danish literature concerning practical challenges related to IS. In the international context, the Society for Information Management (SIM) conducts an annual survey of *the key issues facing IT executives* and has done so in collaboration with different universities since 1980 (Kappelman et al., 2014: 237). The findings from the survey are published in MIS Quarterly Executive, and according to the 2014-paper reporting from the survey, all but one[1] of the top ten IT management concerns in 2014 relates to obtaining business value from IT (Kappelman et al., 2014). More specifically, the top ten concerns in 2014 were:

1. Alignment of IT with the Business
2. Security/Privacy
3. Business Agility/Flexibility
4. Business Productivity
5. IT Time-to-Market/Speed of IT Delivery
6. IT Value Proposition in the Business
7. Velocity of Change in the Business
8. Innovation
9. Business Cost Reduction/Controls
10. Revenue Generating IT Projects

Kappelman et al., 2014: 239

During the previous five years the concerns had likewise been in top ten, except for concern five, six, seven and eight, which were issues raised for the first time in the in the 2014 survey. However, two of these four new issues were included in some of the other top ten concerns in the 2012 and 2013 surveys (Kappelman et al., 2014). The concerns, which dropped out of the top ten list due to the attention given to the

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[1] Concern no. two *Security/Privacy* went from being scored as seven, eight or nine since 2008 (Kappelman et al., 2014: 239).

four new concerns all, focused more on the delivery of IT services and less on the business value[2] (Kappelman et al., 2014).

> "*The other changes in rankings indicate there has been a shift in priorities and focus away from tactical and operational IT issues like efficiency, service delivery, and cost reduction to more strategic and organizational priorities like business agility, innovation, the velocity of change in the organization, IT time-to-market, and the value of IT to the business.*" (Kappelman et al., 2014: 238)

In the Danish context a large IT/IS consultancy company, *Ramboll Management Consulting* had since 1996 collaborated with the association *Danish IT* to conduct an annual survey of the benefits and challenges of applying IT in public and private organizations in Denmark. Based on the survey a likewise annually report called *IT in practice* was published. The report built on a survey among the CIOs and CEOs in the 500 largest companies and local end central government agencies in Denmark (IT in Practice, 2014). The focus of the publication was to map the current developments and describe the future trends. The audience was practitioners from the IT and as well as business side of both private and public organizations. Thus, the publication came in two versions, a private sector version and a public sector version. In 2011, the private sector version was published in English for the first time in the hope of assisting the debate in the increasingly globalized private sector in Denmark (IT in Practice, 2011). Looking into the 2014 version of IT in Practice, two of the four topics was *Business Development & Innovation* and *Digital Opportunities*. Thereby, suggesting a focus on the importance of IS-related business value in the Danish context as well. In the first and recurrent part of the publication, the strategic consequences of the four other topics were stressed. This part pointed to the business opportunities arising from the technology but also the related challenges. Regarding the opportunities, the publication highlighted that:

> "*Over the past 30-40 years, IT has been the single greatest factor in the streamlining of companies' **business processes**.*" (IT in practice, 2014: 9)

The publication moved on to emphasize the possibilities of extending this focus to the processes including customers, vendors and other partners. Similarly new technologies were emphasized as opportunities to create business value.
Regarding the realization of business value from IT investments, the 2013-version of IT in Practice emphasized the need to focus on the related organizational or business process changes. Further, the publication highlighted that pursuing these benefits required change management.

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[2] The three concerns, which dropped out of the top ten list was: *IT Cost Reduction and Controls* (in top ten since 2003), *IT Service Delivery/IT Operations/ITIL/IT Service Delivery/'Keeping the Lights On* (added to the list of issues in 2013), *IT Efficiency* (in top ten since 2009) (Kappelman et al., 2014).

> *"Lack of or inadequate change management has however the unfortunate consequence that the proper capacity among the employees to handle the new work processes, technology and mindset are not build, which leads to the intended benefits of the project fail to happen."* (IT in Practice, 2013: 127)

Their point was that, change management was needed to realize the benefits but simultaneously that change management is a challenge for many organizations. Therefore, they stressed elements of change management, which were often under-prioritized. More specifically, the report stressed that it is all about understanding and taking into account the employees' thoughts, actions and motivations. In practice, the publication suggested focusing on involving and engaging the employees, building relations, telling success stories and matching expectations (IT in practice, 2013: 129). Furthermore, the publication highlighted that it is not the new technology in it-self but rather new use of technology, which leads to realizations of benefits.

> *"Therefore is it critical that all affected participants understand and can see the purpose of the new system and the new work processes – and they have to feel motivated to follow them."* (IT in Practice, 2013: 133)

Further, in the 2014-version of the publication another challenge associated with change management and other forms of management was highlighted, more specifically, that a complex, digitized world challenged rational planning and strategy.

> *"In the reality of a complex, digitised world, managers must plan and facilitate interactive processes that prioritise action at all times and at all levels."* (IT in Practice, 2014: 13)

The point being that organizations should focus on actions and planning the process as it unfolds rather that expect to be able to develop grand plans and then later implement these.

Above, it has been illustrated that practitioners are aware of the close link between IT and organizational change, including the need for IT investments to be linked to organizational change to enable realization of business value. This is however considered a challenging task, as changing organizational processes requires change management which can no longer depend on simply planning and implementing but rather have to embrace the interactive processes and attempt to facilitate change. Thus, an example of how a process of IS-related organizational change has unfolded and an emphasis of aspects to be aware of might be helpful for practitioners. An

empirical study of IS-related organizational change would indicate aspects to be aware of and enrich the understanding of how such processes unfold empirically.

1.2.2 The theoretical challenges

As established in section 1.1 above, the phenomenon of IS-related organizational change has received attention in the IS literature over time and from different perspectives. In a paper on organizational change, Van de Ven & Poole stressed that different theoretical perspectives highlight different aspects of organizational change thus allowing the researcher to comprehend a specific part of the phenomenon (1995). To account for the fundamental differences between focus of theoretical perspectives Van de Ven & Poole developed a typology of theories of organizational change. Their typology consists of four *motors* of change (see section 2.2 for further details):

Life cycle motor	Focus on a number of stages following a predefined order or logic
Teleology motor	Focus on a purposeful process of setting goals, evaluating means and implementing the planed change
Dialectic motor	Focus on the role of power, conflict and differences
Evolution motor	Focus on competition between entities

Van de Ven & Poole (1995) highlight that the four motors should be seen as *basic theories* and that many theoretical perspectives combine two or more motors in their explanation of change. According to the authors, the four motors of change can be linked to the classis distinction between first- and second-order changes (Meyer et al., 1993). More specifically, the constructive mode of change, which the teleology and the dialectic motor build on, tends to generate second-order change, whereas the pre-scribed mode of change, which the life cycle and the evolution motor build on, tends to generate first-order change. Second-order change is related to discontinuous, uncertain and radical changes and is often assumed the more difficult form of change (see e.g. Tanriverdi et al., 2010 for an outline of the necessity and difficulties related to this type of change). Attempting to understand second-order change by drawing upon the teleology motor, leads to a focus on the organizational goals and plans to create change. If this is difficult, it implies that the leaders need other competences, better tools or more knowledge. Drawing upon the dialectic motor leads to a focus on power, conflict and confrontation between different actors, values or other elements related to second-order change. In this way, focus is directed to the unfolding of less rational and planned organizational processes leading to second-order change. Further, as the dialectic motor according to Van de Ven & Poole (1995) focuses on multiple entities a study drawing upon this motor would be aware of the diversity and the multiple potential participants. According to this motor, conflict and difficulties are a natural part of a change process.

Within the IS literature all four motors have been applied in studies of IS-related organizational change. For instance, Bala & Venkatesh (2013) and Wei et al. (2005) drew upon the life cycle motor of change. On the other hand, Marble (2000), Loftin & Moosbruker (1982), Markus & Benjamin (1996) and Robey & Sahay (1996) were some of the papers drawing upon the teleology motor. Whereas for instance, Allen et al. (2013), Leonardi (2011) and Robey & Boudreau (1999) drew upon the dialectic motor. Lastly, El Sawy et al. (2010), Porra (1999) and Cho et al. (2008) are examples of papers drawing upon the evolution motor[3]. Thus, it would seem that all four motors of organizational change are considered relevant for studying IS-related organizational change. Further, it is according to Van de Ven & Poole (1995) very positive, that the literature draws upon all of the four motors as the diversity of approaches enables a richer understanding of the phenomenon. Regarding the dialectic motor, the focus seemed to be more on power and differences and less on conflict and confrontation (see section 2.4).

By looking for links to the dialectic motor of change in the selection of a theoretical perspective or sensitizing device for an empirical study of IS-related organizational change, the study will attend to the power, conflict and differences in the process. More specifically, the focus will be on the less rational and less planned aspects of the process including multiple actors. In this way, the study will contribute to understanding of IS-related organizational change as second-order change. Further, selecting a sensitizing device with this focus provides an opportunity to address the practical challenges identified in the previous subsection.

1.3 Complex Responsive Processes – a Sensitizing Device

As mentioned above a theoretical perspective directs attention to specific parts of a phenomenon (Van de Ven & Poole, 1995), here the process of IS-related organizational change. The choice of theoretical perspective is thus of great importance, in particularly when it, like here, is applied as a sensitizing device (Klein & Myers, 1999). In this way, the perspective directed my attention during my study and assisted my understanding and conceptualization of the empirical process. In my study, the intention was to apply a sensitizing device, which drew upon the dialectic motor of change and emphasized specifically conflict as a driver of change. This would contribute to the understanding of IS-related organizational change as a second-order change and would address the practical challenges regarding the limitations of rational planning.

More specifically the applied sensitizing device was the *Complex Responsive Processes perspective*, introduced by Stacey et al. (2000) and Stacey (2001)[4]. Generally, the perspective is concerned with organizations and management within a

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[3] See Chapter 2 for details on the application of the four motors in the literature on IS-related organizational change.
[4] See chapter 3 for further details.

complexity perspective. Stacey and his colleagues from the University of Hertfordshire understand humans as social beings and organizational life as processes of local interaction or communication and the global patterns these local interactions create and are created by (Stacey et al., 2000; Stacey, 2005). Their point is that people only interact with a limited number of other people and that it is within these local interactions that patterns are created and present. Thus, it does not make sense to consider or study the patterns interdependently of the local interactions, but simultaneously the particularization or effect of patterns in the local interactions are important to understand to fully understand the interactions and organizational life (Stacey, 2005).

When it comes to change, it is assumed to take place when people change something in their local interactions (Stacey, 2005). Furthermore, Stacey and his colleges expect change to occur when the people interacting differ (significantly) from each other and thus encounter in interactions patterned by conflict. At the same time, it should be emphasized that change processes are considered unpredictable in nature (Stacey, 2005). More specifically, this means that individuals, e.g. managers, might wish to create change and will therefore act towards this goal. At the same time, the sensitizing device focuses extensively on differences and the related conflict as a driver of change. Further, such processes are stressed as unpredictable due to the interactions between the people, off which an organization consists. Processes in which the participants both enable and restrain each other; together the interactions create status quo or changes depending on the differences and the power balance between the participants.

Attempting to understand change would thus require an eye for the differences and related conflict between the involved people and the way they interact. In an empirical study, this would suggest an in-depth or interpretive study, which would allow a study of the interactions or communications between people. Further, it would suggest a process study as following the process over time would allow the research to observe the relation between specific interactions and change.

1.4 A Case Study of IS-related organizational change

As the Complex Responsive Processes perspective suggests the relevance of an in-depth study of the phenomenon over time, an interpretive case study was conducted (Flyvbjerg, 2006; Klein & Myers, 1999; Walsham, 1995). This methodological approach was relevant as e.g. Flyvbjerg (2006) emphasizes case studies as particularly helpful when it comes to learning and understanding complex issues. A particular reason for this is that the methodological approach encourages a study of the phenomenon in its real-life context (Flyvbjerg, 2006; Walsham, 1995). By focusing not only on the phenomenon it-self but also on the context and the link between phenomenon and context, a more holistic understanding of the phenomenon

is enabled. Furthermore, the approach enables a focus on the development of the process over time paying close attention to the human participants as well as the organizational context (Walsham, 1995).

This dissertation is preoccupied with IS-related organizational change processes and in particular with the related aspect of power, conflict and differences. Thus, the case should reflect this focus, holding a process of IS-related organizational change, which could be assumed to be influenced by power, conflict and differences. According to most of the political science literature, public organizations are typically characterized by multiple vague and often conflicting goals, for instance the conflict between efficiency and fairness (see e.g. Heffron, 1989; Kettl, 2012)[5]. Further, the nature of the goals along with the leaders weaker authority presents a challenge for managing within public organizations, as managing requires balancing the conflicts and often depends on persuasion rather than authority (Kettl, 2012). As I furthermore hold a master degree in public administration and had studied public organizations and particularly municipalities empirically during my master study I had insight into the specific context. This insight allowed me to understand the way of organizing and communicating in this particular setting. Moreover, I had established contacts with a number of IT-leaders from Danish municipalities through my participation in a collaborative practice research (see e.g. Mathiassen, 2002) project during my mater and the beginning of my PhD study[6], thus providing easy access to potential cases. Overall, a public organization and more specifically a municipality seemed like an obvious choice of case for my interpretive case study focusing on the role of power, conflict and differences regarding IS-related organizational change.

The specific case organization was therefore a Danish municipality, which in the early 2010 launched a strategic effort towards realizing *The Digital School* by 2014. The overall aim of the effort was to improve the public school teaching by rethinking the use of IT at the schools (hereafter referred to as school-IT) and thus enable organizational change related to the teaching methods, communication forms and general service delivery. In this way, the municipality brought IT into the core products and services of their schools and through that process, could potentially transform those core products and services, similar to the concept of second-order change. Furthermore, the IT-leader (formally Head of Center for IT, Digitalization and Welfare Technologies) as well as other key participants attempted to facilitate an interactive process as suggested in the subsection regarding the practical challenges. The process began in early 2009 building on a situation of dissatisfaction and conflict regarding the performance for school-IT during 2008. The process covered a number of different activities from the beginning in 2009 to the end in

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[5] The distinction between public and private organization is not clear-cut, and some characteristic of the typical public organization fit some types of private organizations as well (see e.g. Heffron, 1989).
[6] See section 4.1 for details.

2014[7], and during the analysis of the empirical process, five episodes were identified. This enabled a comprehension of the extensive empirical material without limiting the complexity and richness of the empirical material too much. Furthermore, the division into episodes supported a hermeneutic analysis of the empirical material, by enabling the movement back and forth between the parts (here the episodes and activities) and the whole (here the IS-related organizational change process)[8].

1.5 Studying IS-related Organizational Change

Based on the above sections this section stresses the research focus and introduces the research questions. As described above, the focus of this dissertation is the process of IS-related organizational change. Further, the relevance of drawing upon the dialectic motor of change in a study of the phenomenon has been described. Thus, this dissertation introduces the Complex Responsive Processes perspective and applies it in an interpretive case study of an empirical process of IS-related organizational changes in a Danish municipality. Together this lead to the following purpose:

> **The purpose of the dissertation is to study how the application of the Complex Responsive Processes perspective as a sensitizing device in an empirical study can contribute to the understanding of IS-related organizational change processes**

As the purpose of introducing and applying the perspective to the case study is an attempt to improve our understanding of the phenomenon, this leads to the question of how the dialectic foundation of the Complex Responsive Processes perspective contributes to the IS literature on the phenomenon.

> **Research question 1: How can a case study sensitized by a theoretical perspective drawing upon the dialectic motor help us understand specific aspects of IS-related organizational change?**

Building on an understanding of the contributions made by applying a sensitizing device drawing upon the dialectic motor to the case study, this dissertation intends to identify the way in which the application of the Complex Responsive Processes

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[7] The case study was however conducted during the two-year period from early 2011 to the end of 2012, the previous parts of the process were studied retrospectively, and the last part of the process was not studied (see Chapter 4 for details).

[8] The analysis is described in section 4.4 and the resulting understanding of the process is unfolded in Chapter 5.

perspective highlights aspects differing from those highlighted by studies applying other theoretical perspectives yet still drawing upon the dialectic motor of change.

> **Research question 2: How can we more specifically understand IS-related organizational change based on a case study sensitized by the Complex Responsive Processes perspective?**

As the Complex Responsive Processes perspective is introduces as a novel sensitizing device and as the perspective is not focusing solely on change, but rather offers a general worldview regarding organizations and management, the perspective might be of relevance for other areas of IS research as well. Thus, this potential is researched as well.

> **Research question 3: How can the application of the Complex Responsive Processes perspective as a sensitizing device contribute to the understanding of other phenomenon within the broader IS literature?**

Overall, answering the research questions build on a number of different elements (a detailed outline of the structure of the argument in the dissertation is presented in the next section). Firstly, the research questions direct the attention towards *understanding* the phenomenon. In the dissertation, and my case study, understanding is approached from a qualitative, hermeneutic perspective. Additionally, the study was occupied with attempting to understand the organizational activities related to IS-related organizational change from a Complex Responsive Processes perspective. More specifically, this meant that the organizational processes were studied in detail, focusing on the participants and the accounts they give for the process and their motivations. Furthermore, the study focused on the process as a whole as well as on the parts of the process (episodes) separately. To study *how* the use of the sensitizing device might contribute to our understanding conducting a case study of an empirical process of IS-related organizational change was likewise relevant. Therefore, did the case study built on an in-depth familiarity with the Complex Responsive Processes perspective, which was obtained through intensive reading as well as participation in PhD courses on the topic. Additionally, to be able to claim that introducing a novel sensitizing device *contributes*, an overview of the current understanding was required. Thus, the IS literature was reviewed. The insights from the literature reviews enabled an argument to be built for the opportunity to contribute and later the argument that an actual contribution was made.

Together it was expected that an interpretive case study sensitized by the Complex Responsive Processes perspective and guided by the research questions would enable an understanding of the role of power, conflict and differences related to IS-related organizational change processes and in this way to be able to meet some of the challenges introduced in section 1.2.

1.6 Structure of argument

The primary purpose of this dissertation is to communicate the conducted case study. Thus, the structure does not follow the actual research process; rather the structure attempts to assists the ease of comprehending the material. Thus, the chapters bring forward the information needed to continue with the next chapter in the dissertation. The research process it-self is described in detail in Chapter 4, thus allowing the reader to learn about and evaluate the research process as the foundation for his or hers appreciation of the dissertation and the findings. Elsewhere the dissertation still seeks to report the research process as accurately as it is possible without reducing the purpose of providing an overview of the research and findings.

This dissertation consists of seven chapters of different character and extent. The first chapter, the present *Chapter 1 Research Focus* guides the reader through the most important elements of this dissertation. More specifically, the area of concern (IS-related organizational change) was presented, followed by reflections on the related practical and theoretical challenges. Later the theoretical as well as empirical approaches were introduced and the research questions guiding the research were outlined. Lastly, the chapter outlines the structure of the dissertation thus, providing the reader with an overview of the logic behind and further enabling the reader to move between chapters if needed.

The following two chapters, *Chapter 2 Theoretical Background* and *Chapter 3 Complex Responsive Processes,* provide the theoretical foundation on which the dissertation builds. Chapter 2, presents the theoretical background identified through reviews of the IS literature. As this dissertation intends to contribute to the IS literature on IS-related organizational change, IS literature on this phenomenon was identified and classified according to a theoretical framework of organizational change process theories (Van de Ven & Poole, 1995). In this way, different perspectives on IS-related organizational change were identified in the literature. In addition to a description of the framework and the method used to identify and classify the papers, the chapter also reports the findings from the literature review and thus the understanding of the phenomenon to which this dissertation intents to contribute to. Chapter 3 builds on the insides from Chapter 2 in an argument for the choice and relevance of the sensitizing device. The chapter further presents the Complex Responsive Processes perspective, more specifically its background, key concepts, understanding of change and use in the existing literature as well as in the present study. The perspective is described in some detail, as it functioned as a

sensitizing device during the interactions with the case as well as during the analysis of the empirical material. Furthermore, based on theoretical background presented in Chapter 2 the application of the perspective with its approach to change is a significant part of the contribution to the existing literature.

Next, *Chapter 4 Case Design* presents the methodological approach in detail. The chapter opens with a description of the research process, focusing in particular on the development of the research focus. Further, the chapter focuses on the case study design and the implications regarding quality criteria and the role of the researcher thereby providing the reader further insight into the research process and allowing the individual reader to evaluate the study and through that the findings. Following that, the chapter provides an overview of the empirical case including the context as well as the case. Then, the chapter continues with a presentation of the empirical material and a description of how these materials where analyzed. Here the chapter builds on the insights into the sensitizing device provided through Chapter 3. The following chapter, *Chapter 5 Case Analysis*, builds directly on the descriptions of the case design, including the approach to the analysis of the empirical material as it is presented in Chapter 4. The chapter contains the analysis, which is divided according to the five episodes identified within the empirical material as described in Chapter 4. The chapter contains a brief presentation of the episodes as well as an analysis of the episodes separately and of the process as a whole. Both the analysis of the parts (episodes) and the whole (process) is considered essential in a hermeneutically oriented study, and both are therefore included in the dissertation as they contributes to the understanding of IS-related organizational change (research question 1 and 2).

Chapter 6 Contributions discusses the contributions made by this dissertation. The chapter combines the insights from Chapter 5 with the insights from Chapter 2 and Chapter 3, more specifically, linking the findings from the case analysis to the insight on the theoretical background and the prior use of the sensitizing device. The contributions presented in the chapter are divided in three based on the three research questions presented above. In this way, the answer to each of the questions is discussed separately.

CHAPTER
THEORETICAL
BACKGROUND

2

Introduction

The chapter examines the phenomenon of IS-related organizational change and the extant IS literature concerning the phenomenon. To become acquainted with the IS literature on IS-related organizational change, a review of the literature was required along with a classification of the literature. Thus, this review draws upon the typology of change process theories put forward by Van de Ven & Poole (1995). Furthermore, this review of the literature clarifies the foundation for research question 1 and 2 presented in section 1.5.

The first part of this chapter introduces Van de Ven & Poole's typology (1995); their four motors of change (Life cycle, Teleology, Evolution, Dialectic) form the basis for the classification of the identified literature. This is followed by a presentation of an initial literature review regarding the use of the four motors of change in the IS literature. The review is described regarding the methods used as well as the classification of papers identified. The last part of the chapter presents a second literature review focusing specifically on the use of the dialectic motor, as the sensitizing device applied in this dissertation draws upon this motor of change. Similar to the initial literature review, this review is likewise described regarding the methods used, the classification of the papers identified and the potential for contribution to the literature.

2.1 A literature review on IS-related organizational change

The phenomenon of IS-related organizational change has received a lot of attention in the IS literature from a number of different perspectives (e.g. Ashurst et al., 2008; Cooper, 2000; Robey & Boudreau, 1999; Schryen, 2013). Thus, to identify the potential for contributions to the literature and its relevance to the present study, insight into the extant literature is necessary. The relevance of understanding the extant literature is stressed by Webster & Watson (2002), who understand literature reviews as a foundation for advancing knowledge (p. xiii). Hence, a literature review on IS-related organizational change was conducted in high quality IS outlets. To comprehend the insights present in the literature this dissertation draws upon existing knowledge of differences among perspectives on organizational change. More specifically, Van de Ven & Poole's typology of change process theories is applied to classify the identified papers. Their typology consists of a two-by-two matrix identifying four motors of change, comprehending change in different ways, and thus emphasizing different elements in the change processes (see section 2.2 below). The insights from the classification then serve as the foundation for this dissertation by pointing out the gaps in the literature and thus the potential contributions to be made by this dissertation.

The review of the literature was conducted in two phases. First an initial literature review was conducted by searching top IS journals and classifying the papers according to the four motors of change in Van de Ven & Poole's typology. This provided a general understanding of the approaches to IS-related organizational change. As drawing upon different motors of change leads to different focuses and insights, discussions both within and across the different motors are beneficial. The second literature review focused more specifically on understanding the literature drawing upon the dialectic motor. This motor is the one, which the applied sensitizing device draws upon as this motor stresses changes originating from multiple entities (people in this case) with different intentions or values.

2.2 A typology of change process theories

The purpose of the literature reviews was primarily to get an overview of the literature and an appreciation for the differences within it. To get such an overview the identified literature was analyzed according to an existing and widely used framework. Conducting a grounded theory analysis of the literature would give a detailed and specific understanding of the literature and its nuances. However, approaching the literature (or empirical material) from a grounded theory perspective requires extensive work. Thus, the literature was analyzed according to an existing framework instead, as it matches the purpose of acquiring an overview nicely. The framework applied in the analysis is Van de Ven & Poole (1995). Their paper introducing a typology of change process theories was published in Academy

of Management Review and is well known and well cited today[9]. Based on an extensive review of the literature, they developed their typology, which consists of four *motors* of change portrayed in a two-by-two matrix (see Figure 2.1 below). According to Van de Ven & Poole, it is important to understand which motors a theory draws upon, because the motors highlight different parts of organizational development and change processes. More specifically the motors focus on different units of analysis (single or multiple entities) and perceive the process as driven by different modes of change.

The vertical dimension regarding the unit of change is rather easy to comprehend. The typology focuses on the number of entities, meaning that the model works for different organizational levels and it makes no difference whether the entity/entities focus on individuals, groups, organizations, populations or larger communities of organizations. The horizontal dimension distinguishes between a *Prescribed* and *Constructive* mode of change. This dimension focuses on:

> "*whether the sequence of change events is prescribed a priori by either deterministic or probabilistic laws, or whether the progression is constructed and emerges as the change process unfolds*" (Van de Ven & Poole, 1995: 522).

The prescribed mode of change means that organizations develop in a *pre-specified direction* and that the process follows a *pre-established program* or *action routine*. Thus, organizations change from one stage to the next naturally forming according to some type of rule. Typically, this leads to continuous change rather than radical change.

Regarding the constructive part of the dimension, this mode of change assumes change is unpredictable and emergent as the action routines are changed rather than followed. This leads to second-order change, where breaking away from the old state triggers uncertainty and a need to make sense of the new order. The combination of the two dimensions produce four motors of change, which are: a) Life Cycle, b) Teleology, c) Evolution and d) Dialectic (see Figure 2.1).

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[9] The citation according to Google Scholar is above 3,000.

Process Theories of Organizational Development and Change[a]
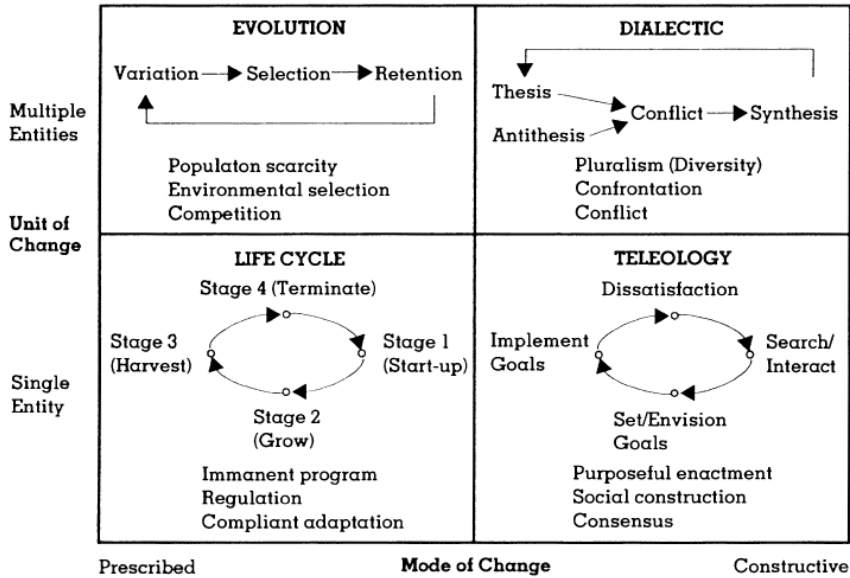
Figure 2.1: Van de Ven & Poole's typology

The life cycle motor explains change within a single entity from a prescribed mode of change. This motor draws upon a metaphor of organic growth and perceives change as taking place in stages. The possibility of change and its forms exist in the entity before the change takes place, just waiting to unfold. The rule structuring this change process might take the form of institutional rules or programs, but also logical or natural sequences of development are used to explain organizational development and change within the life cycle motor. This motor perceives initiation to be the first stage in a linear process from initiation to termination, through which the entity develops towards a pre-determined form.

As opposed to the life cycle motor, the teleology motor draws upon the constructive mode of change; the two motors do however share a focus on a single entity. This perspective understands development and change as guided by goals or an envisioned end state. Hence, development and change are not prescribed in the entity but rather something the entity attains through an intentional pursuit for the creatively envisioned end state. Even though there are no rules guiding the sequence of events it does not mean that the process meets no restraints. The entity needs to handle restraints such as limited resources and other restraints from the environment, but despite these restraints, the entity acts purposefully in reaching its goals. The initiation of the process is considered to be the social construction of an envisioned

end state possibly influenced by an experienced need for change caused by external or internal factors.

The evolution motor explains change among multiple entities as a prescriptive process, where variation, selection and retention account for change among a typically large number of entities. The variation is typically assumed to *just happen*, based on random chance. The focus is then on the selection which happens based on competition for scarce resources, where those who fit the resource profile in the area survive. A certain level of stability is assured by retention, e.g. through inertia or resistance to change. Overall, this motor perceives the process of change as cumulative and ongoing, but also as following rules and being somewhat predictable at an aggregate level. Thus, the population as a whole follows a rule or logic that we can understand, however, this does not enable us to predict the path of a specific entity. In this perspective, the competition for scarce resources initiates the change. Thus, the entities change to better fit the environment and improve their chances of survival.

The last motor is the dialectic motor, which similar to the evolution motor, explains change by focusing on two or more entities and their interactions. However, the dialectic motor draws upon the constructive mode of change when explaining the interactions between the entities. The point is that the entities hold opposing values, interests or goals, and that they compete for their values to gain dominance or control. This means that as long as the power between the entities is balanced the situation is stable, but when one entity gains sufficient power to confront the status quo, change can happen, as this entity is able to impose its goals and values or through a syntheses of the opposing goals and values form a new status quo. Thus, the confrontation of opposing forces combined with a shift in the relative power balance is considered to initiate a change process.

Having briefly described the four motors in their pure form, it is worth mentioning the point made by Van de Ven & Poole that while all theories of organizational development and change build on these motors, theories are often more complicated. This is primarily because they combine the motors to capture better the complex organizational development and change processes they study. This leads them to highlight the possibility of improving the explanatory power of a theory by combining motors. They likewise emphasized that drawing upon the different motors enables the researchers to see and understand different aspects and dynamics in organizational development and change processes. Taking this into account Van de Ven & Poole distinguished between single-motor theories, dual-motor theories, tri-motor theories and quad-motor theories and laid out the 16 potential combinations[10].

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[10] See Van de Ven & Poole (1995) p. 528 for further details.

2.3 The four motors of change in the IS literature

To acquire insight into the approaches to IS-related organizational change in the IS literature a literature review was conducted in top IS outlets. In addition to the purpose of acquiring insight, this literature review was also constructed with the intent to identify relevant search words to be used in the second literature review (see below). The initial literature review identified and classified papers according to Van de Ven & Poole's four motors of change (life cycle, teleology, evolution or dialectic motor of change) (1995).

2.3.1 Reviewing the use of the four motors of change in the IS literature

As the topic of the review (IS-related organizational change) has been identified and defined, the next step in a literature review (cf. Webster & Watson, 2002) is to identify a pool of IS papers on the topic. Therefore, a search was completed using the search engine Web of Science (https://webofknowledge.com/). The search covered two top IS journals *Management Information Systems Quarterly* (MISQ) and *Information Systems Research* (ISR)[11]. Further a third high quality IS journal was included in the search, *European Journal of Information Systems* (EJIS), to include a European perspective, which might differ from the perspective of the two America journals. By focusing on high quality outlets, it is fair to assume that the major contributions in the field will be found in those leading journals (Webster & Watson, 2002)[12]. However, it is also clear, that many interesting and relevant papers on IS-related organizational change is published elsewhere. As the literature on IS-related organizational change is extensive (see e.g. Schryen, 2013), reviewing the entire literature would be a time consuming task. Therefore, the focus on top journals was chosen to get an understanding of different approaches to the IS-related organizational change[13]. The literature review does not provide an overview of the literature as a whole, but provide an understanding of the tendencies within the literature.

As the focus of the search was IS-related organizational change, *organizational change* seems to be an obvious search word or phrase. Due to the IS-relatedness, the phrases *information technology* and *information systems* were likewise included as the two wordings are often used interchangeably (e.g. Schryen, 2013). After the search engine, the outlets as well as the search words were decided, the actual search was completed as outlined in Figure 2.2 below. Using Web of Science, sixty-three

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[11] MISQ 5-Year Impact Factor: 8.157 (2013 impact factor: 5.405). ISR 5-Year Impact Factor: 4.276 (2013 impact factor: 2.322). This was further supported by AIS including the two journals in their basket of eight (AIS website – Senior Scholars Basket of Journals).

[12] Webster & Watson further pinpointed that to publish and contribute with a literature review restricting the review to a few top outlets is not desirable (2002).

[13] An alternative to focusing on top IS journals to limited the pool of papers would have been to focus on diversity, e.g. by combining top IS journals with journals with small audiences.

papers were identified. As illustrated in the last part of the figure below these papers were then evaluated, primarily on an abstract level, based on three criteria (see below). A paper was deemed not relevant if one or more of the criteria fit.

- Not concerned with IS-related organizational change
- Did not focus on the *process* of change
- No attention was paid to what influences the change process

The criteria followed from the research questions presented in chapter 1, and their purpose was to ensure that the final pool of papers was within the intended scope. The first criterion indicated that IS-related organizational change must be a focus in the paper, meaning that the paper was not relevant if it only referred to IS-related organizational change, e.g. to the context or setting. The second criterion drew attention to the focus of the paper. If the paper did not focus on the *process* of change, but rather on e.g. the consequences of the change, then the paper was not relevant. The third criterion extended the second stating that if the paper did not pay attention to the factors influencing or driving the change process then the paper was not relevant. The last two criteria were necessary as the purpose of the literature review was to classify the papers according to which motor of change they drew upon and this would only be possible if the change process and its drivers were focused on the papers.

organizational change
[topic OR title]

5.625 hits

AND
(information systems OR information technology)
[topic OR title]

496 hits

AND
(mis quarterly OR information systems research OR european journal of information systems)
[publication name]

63 hits

Manuel screening of relevance
criteria #1, #2 and #3

29 hits
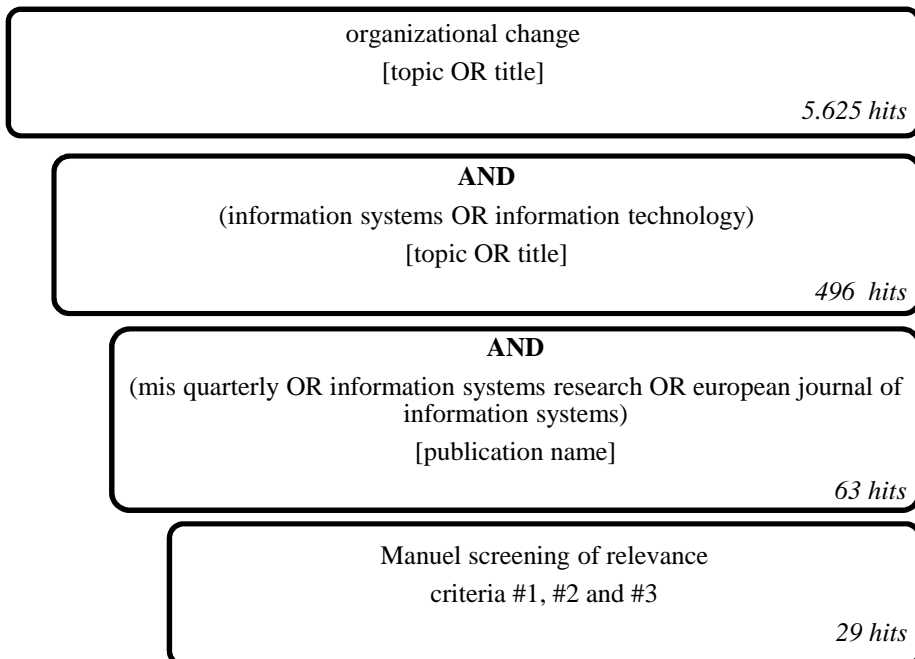
Figure 2.2: Identifying papers in MISQ, ISR and EJIS

The evaluation of the sixty-three papers led to the exclusion of an additional thirty-four papers, meaning that the final pool of papers consisted of twenty-nine papers. The distribution of the papers by outlet is displayed in Table 2.1 below.

Papers identified through search	MIS Quarterly	35
	Information Systems Research	12
	European journal of Information Systems	16
	In total	**63**
Not relevant papers		**34**
Relevant papers	MIS Quarterly	17
	Information Systems Research	6
	European journal of Information Systems	6
	In total	**29**

Table 2.1: The distribution of papers from MISQ, ISR and EJIS

A list of the sixty-three papers identified through the search along with lists of the excluded papers and the classified papers and linked reasons for the exclusion or classification respectively is included in Appendix A.

The twenty-nine relevant papers were then classified according to Van de Ven & Poole's (1995) typology of change motors. The typology was described in detail above (section 2.2), but for the sake of understanding the process in the literature review, Table 2.2 is included here stating the criteria for classifying papers as drawing from each of the four motors.

Motor of change	Criteria – The paper...
Life cycle motor	… focuses on stages of change … explains the movement between the stages with some sort of rules
Teleology motor	… presents the motivation and strategic focus among the actors in the entity … describes the process of analyzing and evaluating the right technology for the purpose
Dialectic motor	… identifies more than one actor or entity … stresses the conflict between the entities as a driver for change
Evolution motor	… includes a large number of actors or entities, e.g. an industry … highlights that change happens between entities and is driven by competition between them which follows an identifiable logic

Based on Van de Ven & Poole (1995)

Table 2.2: Criteria for classification

The papers were classified one at a time, according to which motor the paper drew upon. Following Ven de Ven & Poole, a paper might draw from more than one motor; this was included in the classification as well. An example of this classification is portrayed in the table below (see Table 2.3). The motor a paper drew upon was marked with an *X*, if a motor drew equally from two (or more) motors each motor was marked with an *X*. If the paper drew primarily from one motor and only secondarily from another motor, the secondary motor was marked with *(X)*.

The actual classification of the identified papers are presented in Table 2.5 in subsection 2.3.2 below.

Paper	Outlet	IS-related organizational change			
		Life cycle	Teleology	Dialectic	Evolution
Author, year					
Author, year					
Author, year					

Primary motor: X; Secondary motor: (X)

Table 2.3: Table for classification of papers

Along with the classification according to Van de Ven & Poole's motors of change, the papers were also briefly described with regard to their focus and approach (see Appendix A). A list of the classified papers is included in Table 2.4 below.

Paper	Title	Source
Aanestad et al., 2014	Infrastructuring Work: Building a State-Wide Hospital Information Infrastructure in India	ISR
Allen et al., 2013	How Should Technology-Mediated Organizational Change be Explained? A Comparison of the Contributions of Critical Realism and Activity Theory	MISQ
Ashurst et al., 2008	Improving the impact of IT development projects: the benefits realization capability model	EJIS
Avgerou & McGrath, 2007	Power, rationality, and the art of living through socio-technical change	MISQ
Bala & Venkatesh, 2013	Changes in Employees' Job Characteristics during an Enterprise System Implementation: A Latent Growth Modeling Perspective	MISQ
Cavaye & Christiansen, 1996	Understanding IS implementation by estimating power of subunits	EJIS
Cho et al., 2008	Contextual dynamics during health information systems implementation: an event-based actor-network approach	EJIS

Cooper, 2000	Information technology development creativity: A case study of attempted radical change	MISQ
Davidson & Chrismar, 2007	The interaction of institutionally triggered and technology-triggered social structure change: An investigation of computerized physician order entry	MISQ
El Sawy et al., 2010	Seeking the Configurations of Digital Ecodynamics: It Takes Three to Tango	ISR
Enns et al., 2003	CIO lateral influence behaviors: Gaining peers' commitment to strategic information systems	MISQ
Joshi, 1991	A Model of Users Perspective on Change - The Case of Information-Systems Technology Implementation	MISQ
Krell et al., 2011	Development of an IS change reason-IS change type combinations matrix	EJIS
Leonardi, 2011	When Flexible Routines meet Flexible Technologies: Affordance, Constraint, and the Imbrication of Human and Material Agencies	MISQ
Leonardi, 2013	When does Technology Use Enable Network Change in Organizations? A Comparative Study of Feature Use and Shared Affordances	MISQ
Loftin & Moosbruker, 1982	Organization Development Methods in the Management of the Information Systems Function	MISQ
Marble, 2000	Operationalising the implementation puzzle: an argument for eclecticism in research and in practice	EJIS
Markus & Benjamin, 1996	Change agentry - the next IS frontier	MISQ
Orlikowski, 1996	Improvising organizational transformation over time: A situated change perspective	ISR
Porra, 1999	Colonial systems	ISR
Porra et al., 2005	The history of Texaco's corporate information technology function: A general systems theoretical interpretation	MISQ
Reimers et al. 2014	An empirical evaluation of existing IS change theories for the case of IOIS evolution	EJIS
Robey & Boudreau, 1999	Accounting for the contradictory organizational consequences of information technology: Theoretical directions and methodological implications	ISR
Robey & Sahay, 1996	Transforming work through information technology: A comparative case study of geographic information systems in county government	ISR
Seidel et al. 2013	Sensemaking and Sustainable Practicing: Functional Affordances of Information Systems in Green Transformations	MISQ

Silva & Hirschheim, 2007	Fighting against windmills: Strategic information systems and organizational deep structures	MISQ
Tillquist et al., 2002	A representational scheme for analyzing information technology and organizational dependency	MISQ
Volkoff & Strong, 2013	Critical Realism and Affordances: Theorizing IT-Associated Organizational Change Processes	MISQ
Wei et al., 2005	Understanding misalignment and cascading change of ERP implementation: a stage view of process analysis	MISQ

Table 2.4: List of classified papers

2.3.2 Use of the four motors of change in the IS literature

Following the description of the method used for the initial literature review concerning how IS-related organizational change is studied in top IS journals; this subsection reports the findings from the review. As described above, the pool of papers identified in the initial literature review were classified according to which of Van de Ven & Poole's (1995) four motors each paper drew upon. This was done since the motor(s) a paper draws upon tells which part of an organizational change process is being studied and how it is understood. On an aggregate level, this provides insight about the focus of the research in the top IS journals included in the review.
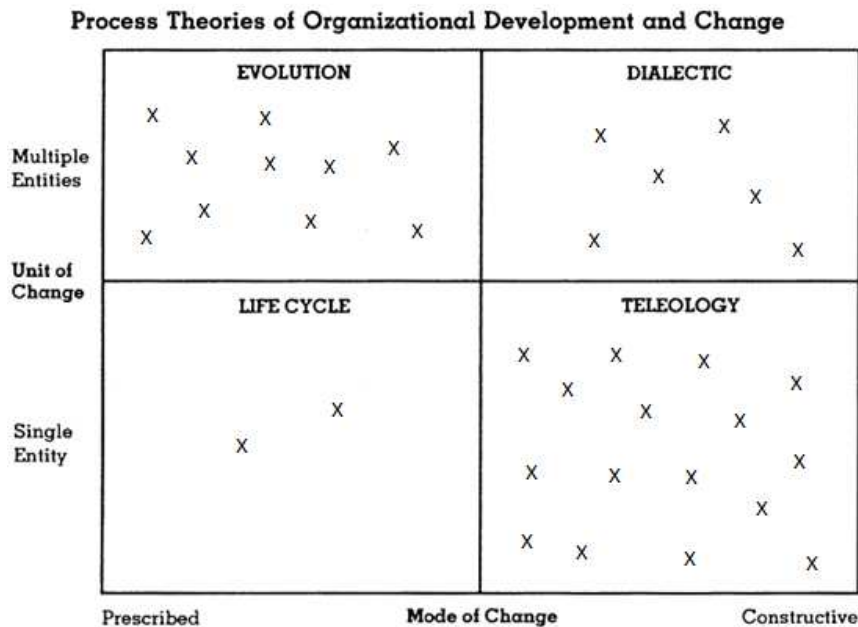
Figure 2.3: Classification of papers

Figure 2.3 above shows the classification the twenty-nine papers identified in MISQ, ISR and EJIS regarding to the motors they drew upon. The teleology motor was the most frequently used with sixteen papers utilizing this motor of change. The second most applied motor was the evolution motor of change as ten papers drew upon this motor, while six papers drew upon the dialectic motor and two from the life cycle motor of change[14].

To clarify further, the twenty-nine papers are also portrayed in Table 2.5 below according to which of Van de Ven & Poole's (1995) motor(s) of change they drew upon. Each of the four motors and the group of papers drawing upon them as the primary motor are presented. To highlight the characteristics of the motor of change, the examples of the use in specific papers are from papers solely drawing upon the motor of focus, meaning that the papers used in the examples do not draw upon more than one motor.

Paper	Source	IS-related organizational change			
		Life cycle	Teleology	Dialectic	Evolution
Aanestad et al., 2014	ISR		X		X
Allen et al., 2013	MISQ			X	
Ashurst et al., 2008	EJIS	(X)	X		
Avgerou & McGrath, 2007	MISQ		X	X	(X)
Bala & Venkatesh, 2013	MISQ	X	(X)		
Cavaye & Christiansen, 1996	EJIS		(X)	X	
Cho et al., 2008	EJIS				X
Cooper, 2000	MISQ	(X)	X		
Davidson & Chrismar, 2007	MISQ		X	(X)	X
El Sawy et al., 2010	ISR				X
Enns et al., 2003	MISQ		X	(X)	
Joshi, 1991	MISQ		X		
Krell et al.,	EJIS	(X)	X		

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[14] Six papers drew equally from two motors, which was the reason why the sum of the papers drawing on each motor is thirty-five and not twenty-nine.

2011					
Leonardi, 2011	MISQ			X	
Leonardi, 2013	MISQ		X		
Loftin & Moosbruker, 1982	MISQ		X		
Marble, 2000	EJIS		X		
Markus & Benjamin, 1996	MISQ		X		
Orlikowski, 1996	ISR			(X)	X
Porra, 1999	ISR				X
Porra et al., 2005	MISQ		X		X
Reimers et al. 2014	EJIS			X	X
Robey & Boudreau, 1999	ISR			X	
Robey & Sahay, 1996	ISR		X		
Seidel et al. 2013	MISQ		(X)		X
Silva & Hirschheim, 2007	MISQ				X
Tillquist et al., 2002	MISQ		X		(X)
Volkoff & Strong, 2013	MISQ		X		
Wei et al., 2005	MISQ	X			

Primary motor: x; Secondary motor: (x)

Table 2.5: Classification of papers

As seen in Figure 2.3 and Table 2.5 above, the teleological perspective was particularly used within the IS papers identified, as sixteen papers drew upon this motor as the primary motor (Aanestad et al., 2014; Ashurst et al., 2008; Avgerou & McGrath, 2007; Cooper, 2000; Davidson & Chrismar, 2007; Enns et al., 2003; Joshi, 1991; Krell et al., 2011; Leonardi, 2013; Loftin & Moosbruker, 1982; Marble, 2000; Markus & Benjamin, 1996; Porra et al., 2005; Robey & Sahay, 1996; Tillquist et al., 2002; Volkoff & Strong, 2013). This indicated that these papers perceived IS-related organizational change as a purposeful process where an organization or group within an organization envisions an end state and sets strategic goals, which are then followed up by evaluations of organizational needs and searches for the solution, which fit the needs. For instance, Marble (2000) reviewed the IS implementation field in regards to implementation models, research approaches, and

investigation methods and attempted to bring together potential implementation issues that managers need to consider. He thus stressed the deliberate and planned character of IS-related organizational change as he pointed to issues to consider implicitly in the planning process. Loftin & Moosbruker (1982) likewise focused on supporting managers in their efforts towards planning and controlling IS-related organizational change processes. In this paper, they focused on the potential usefulness of Organizational Development (OD) methods, which were studied through an empirical study on organizational change effort. Like the above-mentioned papers, their study led them to pinpoint issues that managers would benefit from paying attention to. A third paper stressing the role of (IS) managers as change agents was Markus & Benjamin (1996). In this paper they identified the currently dominating role of IS specialists acting as change agents (the traditional). Based on the identification of the role and in particular its limitations they further proposed two alternative roles, the facilitator and the advocate. Although the three change agent roles presented in the paper were different, they shared an understanding of the crucial role of IS change agents in IS-related organizational change processes. Robey & Sahay (1996) held a different perspective, but still drew upon the perception of actors as acting purposefully and an organization as one entity. In their paper, they reported on a comparative case study of two similar organizations implementing the same geographic information system. They perceived the organizations (or groups within them) as an entity and focused on the shared meaning and learning as a way of socially constructing the usefulness of the information technology. In one of the organizations, the implementation of the geographic information system led to organizational change, in the other organization it did not. In attempting to explain the difference, Robey & Sahay (1996) focused on information technology as an occasion for organizational change rather than a determining factor. With this, they stressed that the organization needs to learn about the technology to see and employ the potential.

The evolution approach was the second most applied motor with ten papers focusing on competition between entities when approaching IS-related organizational change as the primary driver or motor of change (Aanestad et al., 2014; Cho et al., 2008; Davidson & Chrismar, 2007; El Sawy et al., 2010; Orlikowski, 1996; Porra, 1999; Porra et al., 2005; Reimers et al., 2014; Seidel et al., 2013; Silva & Hirschheim, 2007). Competition was the focus and was highlighted as the explanation for the push towards change that the groups or organizations experienced. Within this perspective, changes in one organization could be understood in itself, as the dynamics driving the process were between the organizations or entities. The competition for scarce resources made the entities change to fit the conditions or environment better. Often some sort of rule or logic, typically theoretically founded, explained the direction of change, which then continued as an ongoing process.

One of the papers drawing upon this motor was El Sawy et al. (2010) who focused on the IS strategy area and proposed a perspective of theory building and testing.

More specifically, they proposed the concept of digital ecodynamics to describe the ecosystem unfolding from environmental turbulence, dynamic capabilities and IT systems. They focused on a turbulent environment as a driving factor when it came to IS-related organizational change. How well organizations then responded to the turbulent environment depended on dynamic capabilities and IT systems. The latter two however also affected the turbulent environment making it an interactive process. Another paper drawing upon the evolution motor to bring a new concept into the literature was Porra (1999). She proposed the concept of colonial systems as an alternative to the mechanistic and organic systems paradigms (which also drew upon the evolution motor). The colonial systems perspective draws upon evolutionary social history, species-level evolution and contextual factors to define a human system. Within this perspective IS-related organizational change, as well as other types of human changes, are linked to the influence of the context. A third paper highlighting the role of contextual factor in IS-related change processes was Cho et al. (2008), who studied IS implementation in a healthcare context. They reported on the phenomenon based on actor-network theory (ANT) and revealed how complex contextual dynamics had disruptive effects on the implementation process.

Six papers in the literature review drew upon the dialectic motor as the primary motor of change, which makes this motor the third most, or second least, applied (Allen et al., 2013; Avgerou & McGrath, 2007; Cavaye & Christiansen, 1996; Leonardi, 2011; Reimers et al., 2014; Robey & Boudreau; 1999). These papers paid attention to the role of power balance, conflicts and differences in IS-related organizational change processes. One such paper was Allen et al. (2013) who proposed activity theory as a relevant approach to explain IS-related organizational change and thus highlighted the contribution of activity theory to critical realism. Based on the activity theory perspective they perceived the tensions and contradictions within the activity systems to be the driver of IS-related organizational changes. Leonardi (2011) took another approach as he focused on the conflict between technology and individuals, in particular their routines, as the driver of IS-related organizational changes. In the paper, he reported on a study of this conflict and highlighted whether it led to changes in individual and organizational routines or in technology. The last paper drawing solely upon the dialectic motor was Robey & Boudreau (1999). They reviewed empirical studies of organizational consequences of IT and proposed the application of a logic of opposition to explain better the often inconsistent findings. More specifically, they pointed to four theories employing such a logic of opposition. These types of theories explained organizational change by identifying forces both promoting change and impeding change.

Lastly, two papers drew upon the life cycle motor as the primary motor of change (Bala & Venkatesh, 2013; Wei et al., 2005). These papers perceived IS-related organizational changes as consisting of a number of stages, generally assuming that

the stages in a process of IS-related organizational change follow a natural order and that the process is general to all or at least most organizations. This focus can be found in Wei et al. (2005) where they applied a stage view to the study of ERP adoption and in particular the misalignment between the functionalities offered by the package software and the functionalities required by the organization. More specifically, they attempted to identify the types of misalignments most common in specific phases by drawing upon the phases in Markus & Tanis' (2000) process model. The other paper drawing upon the life cycle motor likewise studied ERP systems, however with a focus on the implementation more generally and the related changes in job characteristic specifically. Bala & Venkatesh (2013)[15] understood ERP implementation as a cycle and like Wei et al. (2005) they drew upon Markus & Tanis' (2000) process model and its four phases a) chartering, b) project, c) shakedown, and d) onward and upward. In the paper, Bala & Venkatesh (2013) focused on the shakedown phases and the organizational changes related to IT in this phase.

2.3.3 Closing remarks on the use of the four motors in the IS literature

The literature review presented above identified twenty-nine papers concerned with IS-related organizational change in MISQ, ISR and EJIS. These papers where classified according to Van de Ven & Poole's (1995) typology of change process theories. This classification was applied since the motor(s) a paper drew upon tell us which part of an organizational change process it studies and thus how the authors approach IS-related organizational change in the papers. On an aggregate level, this provided insight on the focus and approaches to IS-related organizational change in the top IS literature, more specifically in MISQ, ISR and EJIS. Table 2.5 as well as Figure 2.3 above depicts the classification of the twenty-nine papers regarding the motors they drew upon. Based on the classification it was clear that all the four motors were applied as the primary motor of change in at least some papers. Thus, it seemed that all four motors of organizational change were considered relevant for studying IS-related organizational change. Some motors was used more frequently than others, but due to the limitations of the literature review, it is not possible to determine whether the variations is due to a general under prioritization of some motors or due to the choice to focus on top journals.

As the top IS literature approaches IS-related organizational change from different perspectives focusing on different aspects of the change process it leads to a fuller and richer understanding of IS-related organizational changes processes. Drawing upon the teleology motor of change (Aanestad et al., 2014; Ashurst et al., 2008; Avgerou & McGrath, 2007; Cooper, 2000; Davidson & Chrismar, 2007; Enns et al.,

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[15] As only two papers drew upon the life cycle motor as the primary motor, the paper by Bala & Venkatesh (2013) is included as an example even though they do not draw solely on the life cycle motor (draws upon the teleology motor as a secondary motor).

2003; Joshi, 1991; Krell et al., 2011; Leonardi, 2013; Loftin & Moosbruker, 1982; Marble, 2000; Markus & Benjamin, 1996; Porra et al., 2005; Robey & Sahay, 1996; Tillquist et al., 2002; Volkoff & Strong, 2013), we gained an understanding of change as a purposeful process, a process where an organization or group within an organization envisions an end state and sets strategic goals. The papers drawing upon the evolution motor of change (Aanestad et al., 2014; Cho et al., 2008; Davidson & Chrismar, 2007; El Sawy et al., 2010; Orlikowski, 1996; Porra, 1999; Porra et al., 2005; Reimers et al., 2014; Seidel et al., 2013; Silva & Hirschheim, 2007) on the other hand, gave us an understanding of change as taking place within a larger field of organizations. Change from this point of view was driven by competition for scarce resources, which led the organizations to change to fit the conditions or environment better. Approaching the change from the perspective of the dialectic motor (Allen et al., 2013; Avgerou & McGrath, 2007; Cavaye & Christiansen, 1996; Leonardi, 2011; Reimers et al., 2014; Robey & Boudreau, 1999) directed attention to the role of power balance, conflicts and differences in IS-related organizational change processes. Lastly, the life cycle motor was present in two papers (Bala & Venkatesh, 2013; Wei et al., 2005) informing us that change might also be perceived as consisting of a number of stages following a predefined order or logic, a process which presumably can unfold in all or most organizations according to the same logic.

Based on the initial insights into the empirical case, the present study applies a sensitizing device, which draws upon the dialectic motor as the primary motor, as it seems to be a valuable approach to further our understanding of the phenomenon of IS-related organizational change. Drawing on the initial literature review it is possible to relate the study to the IS literature on IS-related organizational change. It is for instance possible to highlight that the study help us understand how differences and the interaction between opposing values or approaches creates new values or approaches. Thereby is the paper related to the six papers identified in the review as drawing upon the dialectic motor (Allen et al., 2013, Avgerou & McGrath, 2007, Cavaye & Christiansen, 1996, Leonardi, 2011, Reimers et al. 2014, Robey & Boudreau, 1999). Drawing upon the dialectic motor of change leads to a focus on multiple entities, in contrast to the single entity focus of the teleology motor, but continues to perceive change as constructed by intentional activities in contrast to the understanding of change as prescribed held by the evolution and life cycle motors. According to Van de Ven & Poole (1995), constructive change tends to generate second-order change, whereas pre-scribed change tends to generate first-order change. Thus, drawing from the constructive mode of change (through the dialectic motor) directs the attention towards more radical change. This research focus is emphasized by research question 1 as described in section 1.5.

> **Research question 1: How can a case study sensitized by a theoretical perspective drawing upon the dialectic motor help us understand specific aspects of IS-related organizational change?**

To be able to specify the contributions made by the study, a closer understanding of the literature likewise drawing upon the dialectic motor is necessary. A second literature review was therefore conducted (see section 2.4 below).

2.4 The dialectic motor of change in the IS literature

Based on the findings from the initial review, drawing upon the dialectic motor seemed relevant (see subsection 2.3.2 and 2.3.3), as the sensitizing device (see Chapter 3) chosen based on the initial insight into the case (see section 4.2) draws upon the dialectic motor of change as the primary motor (see section 3.1). As this dissertation intends to contribute to the literature by drawing upon the dialectic motor, a literature review on the use of this motor was needed. Thus, a second review was conducted focusing on identifying a pool of papers drawing upon the dialectic motor. These papers were then classified according to the theoretical perspectives they applied.

2.4.1 Reviewing the dialectic motor and related theoretical perspectives

This second literature review focused on gaining insight into the IS literature that drew upon the dialectic motor. More specifically the purpose of this review was to obtain an overview and an understanding of the theoretical perspectives and related contributions within these papers. As the initial literature review only identified six papers drawing upon the dialectic motor, it seems relevant to broaden the outlets reviewed. Thus, the outlets included in this review were AIS Senior Scholars Basket of Journals (Basket of eight)[16]. The reason for focusing on these eight high quality IS outlets was parallel to the reason for focusing on the top IS outlets in the initial literature review, namely the assumption as pointed out by Webster & Watson (2002) that the major contributions in the field will be found in the leading journals. The limitations of the narrow focus is likewise the same despite the slightly boarder focus in this literature review (see subsection 2.3.1 for details on the limitations). Like in the initial review, the search engine Web of Science (https://webofknowledge.com/) was used.

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[16] European Journal of Information Systems, Information Systems Journal, Information Systems Research, Journal of the Association of Information Systems, Journal of Information Technology, Journal of Management Information Systems, Journal of Strategic Information Systems and MIS Quarterly (AIS website – Senior Scholars Basket of Journals)

To identify the pool papers, drawing upon the dialectic motor and focusing on IS-related organizational change, the search words used in the initial literature review were applied along with new and more specific search words. These new search words were identified during the initial literature review by screening the six papers classified as drawing upon the dialectic motor for relevant search words. The identified words were: a) dialectic, b) interact, c) conflict, d) contradict, e) constrain and f) power[17].

The search engine, the outlets as well as the search words used are outlined in Figure 2.4. Through Web of Science, forty-nine papers were identified. As illustrated in the last part of the figure below these papers were then manually evaluated, based on four criteria. The three criteria from the initial literature review were applied along with a new and fourth criterion. A paper was deemed not relevant if one or more of the criteria fit.

- Not concerned with IS-related organizational change
- Does not focus on the *process* of change
- No attention paid to what influences the change process
- Does not draw upon the dialectic motor of change

The three first criteria were described earlier in subsection 2.3.1. The fourth criterion was included to exclude papers, which might be included in the pool of papers without actually drawing upon the dialectic motor of change. This was necessary as the six new search words were regular words and might be used in other connections than the perspective on IS-related organizational change. For instance, one might describe the application of two somehow *conflicting* theoretical views in the paper.

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[17] In the search, a * was included to ensure, that over versions of the word was included (e.g. conflicts or conflictual in addition to conflict).

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      │  Information Systems OR Journal of Information         │
      │  Technology OR Journal of Management Information       │
      │  Systems OR Journal of Strategic Information Systems   │
      │  OR MIS Quarterly)                                     │
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Figure 2.4: Identifying papers concerning the dialectic motor

The evaluation of the forty-nine papers identified by the search in Web of Science led to the exclusion of a further thirty-seven papers, meaning that the final pool of papers consisted of twelve papers. The distribution of the papers by outlet is displayed in Table 2.6 below. As the outlets from the initial literature review were included in this search as well, the six papers identified in the initial review as drawing upon the dialectic motor were also among the twelve papers identified in this search. More specifically, two papers were from the European Journal of Information Systems, one paper from Information Systems Research and three papers from MIS Quarterly (see Table 2.6 below).

Papers identified through search	European journal of Information Systems	6
	Information Systems Journal	8
	Information Systems Research	6
	Journal of Information Technology	7
	Journal of Management Information Systems	3
	Journal of the Association for Information Systems	2
	Journal of Strategic Information Systems	2
	MIS Quarterly	15
	In total	**49**
Not relevant papers		**37**
Relevant papers	European journal of Information Systems	2
	Information Systems Journal	2
	Information Systems Research	1
	Journal of Information Technology	1
	Journal of Management Information Systems	1
	Journal of the Association for Information Systems	2
	Journal of Strategic Information Systems	0
	MIS Quarterly	3
	In total	**12**

Table 2.6: The distribution of papers

A list of the forty-nine papers identified through the search along with lists of the excluded papers and included papers and listed reasons for the exclusion or relevance respectively are included in Appendix A. A list of the classified papers is included in Table 2.7 below.

Paper	Title	Source
Allen et al., 2013	How should technology-mediated organizational change be explained? a comparison of the contributions of critical realism and activity theory	MISQ
Avgerou & McGrath, 2007	Power, rationality, and the art of living through socio-technical change	MISQ
Boddy, 2000	Implementing interorganizational IT systems: lessons from a call centre project	JIT
Cavaye & Christiansen, 1996	Understanding IS implementation by estimating power of subunits	EJIS
Koch et al., 2013	Digitally enabling social networks: resolving IT-culture conflict	ISJ
Leonardi, 2011	When flexible routines meet flexible technologies: affordance, constraint, and the imbrication of human	MISQ

	and material agencies	
McBride, 2005	Chaos theory as a model for interpreting information systems in organizations	ISJ
Reimers et al., 2014	An empirical evaluation of existing IS change theories for the case of IOIS evolution	EJIS
Robey & Bourdreau, 1999	Accounting for the contradictory organizational consequences of information technology: Theoretical directions and methodological implications	ISR
Sarker et al., 2006	Understanding business process change failure: An actor-network perspective	JMIS
Strong et al., 2014	A theory of organization-EHR affordance actualization	JAIS
Wagner et al., 2010	Understanding project survival in an ES environment: a sociomaterial practice perspective	JAIS

Table 2.7: Papers drawing upon the dialectic motor

The twelve relevant papers were classified according the theoretical perspectives they applied. More specifically this meant that the theoretical perspective was identified along with the contribution made to understanding IS-related organizational change based on a dialectic motor of change. Following the identification of the theoretical perspectives in the papers and the related contributions, three different focuses on power, conflict and differences were identified among the papers. The first group of papers focused on power, conflict and differences with regard to structures and the systems level. The second group of papers focused on power, conflict and differences between and within groups, whereas the third group of papers focused on power, conflict and differences between technology and people (individual or group). The different focuses or classifications were derived from the pool of identified papers as a way of highlighting the diversity in the small group of papers as well as a way of stressing which element of organizational life the contributions address.

2.4.2 Use of the dialectic motor and related theoretical perspectives

This subsection presents the twelve papers drawing upon the dialectic motor of change identified in AIS basket of eight as described above. The presentation focuses on the theoretical perspectives applied and the resulting contributions. In addition to applying different theories, the twelve identified papers also focus on power, conflict and differences regarding various elements of organizational life. As mentioned above, one group of papers focused on the structures and the systems level, another group of papers focused on the groups and the last group of papers focused on the interactions between technology and people (individual or group). An overview of the papers can be found below in Table 2.8, which includes a list of the twelve papers, the theoretical perspective each paper applied and the contribution to the IS literature on IS-related organizational change drawing upon the dialectic

motor of change. Further, the papers are grouped according to their focus on either change in structures/systems, changes between or within groups and changes between technology and people.

	Paper	Theoretical perspective	Contribution
Structures and systems level	Allen et al., 2013	Activity theory	Activity systems as a relevant unit of analysis Contradictions as driver of change
	McBride, 2005	Chaos theory	Organizations as non-linear systems Change as ongoing and non-proportional
	Reimers et al., 2014	Punctuated Socio-technical IS Change model	An eye for the many smaller punctuations of the equilibrium How tensions in the deep structures of subsystems might lead to changes
	Robey & Bourdreau, 1999	Logic of opposition	The role of IT as either supporting the transformative forces, supporting the persistence forces or supporting both forces
Between and within groups	Avgerou & McGrath, 2007	Foucault (power/knowledge + aesthetics)	Change depends on the interactions between three forms of rationality; technical rationality, bureaucratic rationality and rationality from individual's reflexivity
	Cavaye & Christiansen, 1996	Organizational politics	Stresses the role of power differences Develops a framework to determine the relative power of intra-organizational groups
	Sarker et al., 2006	Actor-network theory	Directs attention to the changing nature of networks and its role in change processes

Between technology and people	Boddy, 2000	The Integrationist model	Highlights the interactions between technology and people
	Koch et al., 2013	IT–culture conflict	Stresses conflict between culture and values as a ground for resistance towards change
	Leonardi, 2011	The imbrication metaphor	Changes in human and material happen in response to one another
	Strong et al., 2014	Affordance-based theory	Focuses on the materiality of the IT artifact and its specific affordances and actualizations Change is linked to the interplay between affordances and individuals or organizational goals and actions
	Wagner et al., 2010	Socio-material Practice Perspective	Practice is a negotiated phenomenon established over time

Table 2.8: Use of theory and contributions

Four papers focused on power, conflict and differences with regard to structures or the systems level (Allen et al., 2013; McBride, 2005; Reimers et al., 2014; Robey & Boudreau, 1999). The first of these papers was Allen et al. (2013) who applied activity theory and compared it with critical realism in the context of explaining technology-mediated organizational change. In the paper, they focused on understanding change through contradictions and congruencies within the activity systems. More specifically, they emphasized technology as a mediator in the change process and employed activity theoretic notions of contradiction, tension and development. The contribution made by Allen et al. in the 2013 paper was to stress activity systems as a relevant unit of analysis when studying IS-related organizational change processes, and to highlight contradictions, understood as anything within the system that contradict the purpose of the system as the driver of change.

Reimers et al. (2014) likewise focused on the structural/systems level. They evaluated two theories in regards to their explanatory power of inter-organizational IS evolution. More specifically, they evaluated Colonial systems (Porra, 1999) and Punctuated Socio-technical IS Change model (Lyytinen & Newman, 2008), which they described as a drawing upon the evolution motor and dialectic motor respectively. Thus, the latter was of interest here. Based on a study of the interacting practices in multiple organizations over a period of 30 years, they found Lyytinen & Newman's theoretical perspective helpful in explaining parts of the identified changes (as well as Porra, 1999). Specifically they highlighted the contribution of the theoretical perspective to be its focus on the many small punctuations of the

equilibrium and its focus on how these were driven by the "build-up" of tensions in the deep structures of the subsystems.

Like the other papers in this group, Robey & Boudreau (1999) focused on the system/structural level. They reviewed the existing knowledge of organizational consequences of information technology and proposed the relevance of using theories employing a logic of opposition. Employing a logic of opposition leads theories to understand and explain organizational change in regards to *both* forces promoting change and forces impeding change. According to Robey & Boudreau (1999), this was in contrast to the more common theories employing a deterministic logic, which primarily focused on the forces, which cause change and thus were unable to explain the opposing empirical results regarding the role of IT in organizational change. In the paper, they further presented four specific theories employing a logic of opposition: a) organizational politics, b) organizational culture, c) institutional theory, and d) organizational learning. The contribution was in particular the emphasis on the role of IT in organizational change processes as either supporting the transformative forces, supporting the persistence forces or supporting both forces.

The last of the four papers in the first group was McBride (2005) who applied selected concepts from chaos theory to the study of information systems in organizations. More specifically, McBride developed an interpretive framework based on chaos theory concepts and applied the framework to a case study of information systems strategy implementation in the UK probation service. He contributed by introducing chaos theory as a relevant conceptual approach thereby stressing an understanding of organizations (including the information systems within them) as non-linear systems, and of change as ongoing and non-proportional, meaning that small inputs might have large effects and vice versa. The author further highlighted that chaos theory was a part of complexity theory, which has become an accepted part of organizational and management studies, but have thus far been "a *neglected source of inspiration in information systems*" (McBride, 2005: 251).

The four papers focusing on power, conflict and differences in regards to the structures and the systems level applied four different theoretical perspectives. Allen et al. (2013) and Reimers et al. (2014) both stressed imbalance in the form of contradictions or tension in the system/structures as a driver of change. Robey & Bourdreau (1999) did not focus directly on imbalance but rather they highlighted the importance of focusing on forces both enabling and restraining change. McBride (2005) went one step further as he drew on concepts from chaos theory and pointed out that change was non-proportional which means that change cannot be predicted based on the events initiating the change.

The second group of papers concerned with power, conflict and differences within or between groups consisted of three papers (Avgerou & McGrath, 2007; Cavaye &

Christiansen, 1996; Sarker et al., 2006). The first of these four papers was Sarker et al. (2006) who applied ANT to the study of business process change and in particular the failure of such processes. With the paper, they contributed by directing attention to the changing nature of networks and thus the need to supplement the existing approaches to business process change with studies of these emerging processes.

Avgerou & McGrath (2007) focused on groups as well in their aspiration to understand the ambivalence in the IS field between the theoretical assumptions about rationality in IS practices and related organizational change and the empirical findings of less rational behavior. They drew on Foucault (power/knowledge and ethics) and developed a context-specific notion of rationality in IS innovation. Drawing upon Foucault and their empirical study, they contributed by stressing that whether change arises or not depends on the clash of three forms of rationality: technical rationality, bureaucratic rationality and rationality from individual's reflexivity.

The last paper focusing on the group level was Cavaye & Christiansen (1996) who like Avgerou & McGrath (2007) were interested in the role of power. They proposed a link between distribution of intra-organizational power and the course of implementation processes. More specifically, they drew on organizational politics and suggested a framework to measure subunit power. They further illustrated the framework's usefulness for mapping relative power distributions at different moments and the relevance of this in explaining implementation projects and possible difficulties. This contributed by stressing the role of power differences in relations to IS-related organizational change and by developing a framework, which clarified the rather abstract concept of power.

The three papers focusing on power, conflict and differences between and within group shared a perspective on change as a possibility rather than a certainty. Sarker et al. (2006) examined failure in the processes of business process change and focused on the changing nature of the related networks in these emerging processes. Avgerou & McGrath (2007) directed our attention to rationality in IS innovation and stressed that whether a process leads to change or not depends on the encounter of the different rationalities involved. Lastly, Cavaye & Christiansen (1996) emphasized the potential of focusing on subunit power when attempting to explain the success or difficulties in implementation projects.

The last group of papers focused on the relations between technology and people (Boddy, 2000; Koch et al., 2013; Leonardi, 2011; Strong et al., 2014; Wagner et al., 2010). The first of the five papers in this group was Koch et al. (2013) who investigated a global security company's efforts to implement a digitally enabled social network as part of a cultural change effort. They drew upon IT-culture conflict theory and highlighted the interplay between organizational culture and

technology. More specifically, they were interested in the potential conflict between the organizational culture and the culture embedded in the technology and in understanding the impact of the conflict between the two. The paper contributed by directing attention to the role of IT-culture conflict in implementation processes in particular with regard to understanding resistant towards such implementation processes.

Another paper in this group was Leonardi (2011) who studied how people decide whether to change the technology or their routines when they find themselves unable to achieve their goals in the current environment. The author used the *imbrication metaphor* to shed light on dilemma and its usefulness as illustrated through an empirical case. His contribution was directing attention towards the interactions and conflict between technology and routines. By applying the imbrication metaphor the author was able to study how "human and material agencies change in response to one another" (Leonardi, 2011: 165). Boddy (2000) likewise focused on human agency and its relations to technology. In the paper, he presented a study of a call center and the human and managerial issues related to it. He drew on the integrationist model (Kimble & McLoughlin, 1995), which suggests that the result of introducing new IT in an organizational setting depends on the interactions of both technology and people over time. The technology was designed and decided on by humans, however when introduced people were forced to react to the system which then again changes the system. Through the paper, he highlighted the role of the interactions between people and technology, in contrast to focusing on the role of technology by the *technological imperative tradition* and focusing on the role of people in the *strategic choice mode*l.

Similarly, Wagner et al. (2010) focused on the close relations between technology and people. They studied an implementation process of an off-the-shelf enterprise system, where they proposed a new perspective to understand the processes of mutual adaptation of the technical and social during system implementation based on a Socio-material Practice Perspective. According to Wagner et al. (2010), they were some of the first to introduce socio-materiality with its focus on the mutual adaptation of the technical and social in implementation processes. This approach led them to state that practice was a negotiated phenomenon established over time rather that the result of one or more specific decisions.

The twelfth paper and the last paper in this group was Strong et al. (2014) who studied IT-associated organizational change in the context of an electronic health record (EHR) system implementation using grounded theory methods. Their findings did not seem to fit well with the existing theories but better with the concept of affordances from ecological psychology, thus they developed an affordance-based theory of IT-associated organizational change. They took into account the materiality of the IT artifact and its specific affordances and actualizations. Furthermore, the authors pointed out that a key mechanism of IS-

related organizational change was the interplay between affordances and individual or organizational goals and actions[18].

The five papers described above focused on power, conflict and differences between technology and people contributing to our understanding of IS-related organizational change by highlighting how both technology and people adjust to each other over time to resolve conflict or differences between them. Koch et al. (2013) did so in regards to IT-culture conflict, whereas Leonardi (2011) attempted to understand how people change either their routines or the technology when met with such conflict or differences. Boddy (2000) and Wagner et al. (2010) studied the interactions and adjustments between technology and people in regards to a call center and the implementation of an off-the-shelf enterprise system respectively. Lastly, Strong et al. (2014) focused on the affordances of an electronic health record system and the interplay with individual or organizational goals.

2.4.3 Closing remarks on the use of the dialectic motor

This section presented the twelve papers drawing upon the dialectic motor identified in the review of journals from AIS basket of eight. The papers had in common their focus on power relations, conflict and differences as central issues in IS-related organizational processes. As described at the beginning of the section, the papers might be grouped according to their focus either on the systems/structural level, between and within groups or between technology and people (ether individuals or groups).

Generally, the twelve papers distanced themselves from an understanding of change as neatly planned and controllable. The first group of papers highlighted the role of power, conflict and differences in regards to the structures and the systems. These four papers remind us that change is not necessarily predictable or planned, but might arise from imbalance in the form of contradictions or tension in the systems/structures (Allen et al., 2013; Reimers et al., 2014) and that both forces enabling and restraining change are of interest in attempting to understand the process (Robey & Bourdreau, 1999). Further, based on McBride (2005) we are aware that change cannot be predicted based on the events initiating the change due to the non-proportional nature of change.

The second group of papers directed our attention to the power, conflict and differences between and within groups. The three papers in this group stressed that change is a possibility rather than a certainty and therefore studied difficult processes of IS-related organizational change. Based on Sarker et al. (2006) our understanding of the changing nature of networks in change processes are improved. The last two of the papers direct focus to the role of power: the power of different rationalities (Avgerou & McGrath, 2007) and the power of subunits in an implementation project (Cavaye & Christiansen, 1996).

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[18] Thereby the paper clearly draws on the teleology motor as well as the dialectic motor.

The third and last group of papers was concerned with bringing the technology back into the process of IS-related organizational change. These five papers therefore stressed the role of power, conflict and differences between technology and people. This group of papers reminds us that both technology and people adjust to each other over time to resolve conflict or differences between them. Therefore, we need to focus on both technology and people, and in particular their interactions to understand how a process of IS-related organizational change unfolds.

The twelve papers reviewed in regards to the use of the dialectic motor of change bring us insight into the role of power, conflict and differences in regards to IS-related organizational change as different levels and from different theoretical perspectives. The theoretical perspective, which the dissertation applies, likewise draws upon the dialectic motor of change. More specifically, the applied theoretical perspective focuses on the role of power, conflict and differences between and within groups like the three papers from the second group. The dissertation and its theoretical perspective focus more on the power, conflict and differences within groups as well as between groups. The focus of the three papers from the second group were however primarily on power, conflict and differences between groups whereby they also tended to focus on the group as the unit de-emphasizing the role of the individuals. Looking further into the three papers, two of them explicitly acknowledged the role of power. This acknowledgement was likewise included in the sensitizing device applied in this dissertation. The sensitizing device did however hold a slightly different understanding of power, as a phenomenon existing solely in the relations between people rather than something a person or group can possess. In addition to the focus on the role of power, Sarker et al. (2006) focused on the changing nature of the networks in the emerging change processes. This focus was likewise continued in this dissertation as the sensitizing device is occupied with the empirical interactions over time.

Despite the focus on power, conflict and differences in the identified papers drawing upon the dialectic motor, the role of conflict and differences as a *driver* of change seems to have received limited attention. For instance, Avgerou & McGrath (2007) focused on different rationalities, but even though conflict between the rationalities were uncovered in the paper, the focus was not as much on the role and relevance of these conflicts as it was on identifying and understanding the rationalities in themselves. In Cavaye & Christiansen (1996), the (power) differences only seemed to be able to complicate the implementation process and potentially hinder it. Differences and conflict only seemed to affect change negatively, not to be able to create or drive change forward Similarly, Sarker et al. (2006) focused on multiple actors and their different interests, however, the focus was not on conflict between those but rather on negotiations and consensus as an end-result. The limited focus on conflict and differences as drivers of change was a general tendency among the twelve papers drawing upon the dialectic motor. More specifically, like Avgerou & McGrath (2007) and Sarker et al. (2006), Boddy (2000), McBride (2005) and Strong

et al. (2014) paid limited attention to conflict. Additionally, Koch et al. (2013) and Wagner et al. (2010) in addition to Cavaye & Christiansen (1996) just mentioned conflict as a barrier for change rather than a driver. Hence, by applying a sensitizing device focusing more specifically at the role of conflict and differences as a driver of change, can be expected to direct attention to other aspects of IS-related organizational change processes than the once emphasized by the literature referred here. This potential for understanding other aspects of the process is addressed by the second research question as mentioned in section 1.5.

Research question 2: How can we more specifically understand IS-related organizational change based on a case study sensitized by the Complex Responsive Processes perspective?

This chapter reported a two literature reviews and did, despite the limitations in the reviews, in this way indicate potentials for contributing to the current understanding of IS-related organizational change by introducing a new theoretical perspective as a sensitizing device – more specifically the Complex Responsive Processes perspective. Thus, the following chapter revolves around this perspective, introducing it and stressing the relevance of applying it as a sensitizing device in the dissertation. The next chapter likewise reports from a literature review of the use of the Complex Responsive Processes perspective within the wider IS literature.

CHAPTER **3**
COMPLEX RESPONSIVE PROCESSES

Introduction

This chapter presents the Complex Responsive Processes perspective, which is applied as a sensitizing device in this dissertation. The first section examines, based on the case study and the literature review, the relevance of applying the sensitizing device. Subsequently the sensitizing device is introduced and described in some detail to enable the reader to follow the ideas from the sensitizing device as they are used in the analysis. The presentation includes a description of its background, the key concepts as well as its understanding of change. Following this presentation, the prior use of the Complex Responsive Processes in the IS literature is described to further support the relevance of introducing this rather unexplored sensitizing device. Lastly, the chapter ends with an outline of the use of Complex Responsive Processes in this dissertation. More specifically, the reflections on the role of the sensitizing device in this dissertation are presented (following Gregor (2006) and Walsham (1995)). Additionally the application of the theoretical concepts is made explicit and finally summarized in Table 3.2, which ends the chapter.

3.1 Choice of Sensitizing Device

The choice of sensitizing device is a significant choice as it holds a particular worldview and thus *offers only a partial account of a complex phenomenon* (Van de Ven & Poole, 1995: 511). In this study, the choice of sensitizing device was based on the first insights into the empirical case, meaning that the evaluation of the sensitizing device was based on empirical relevance. More specifically the preliminary empirical insights emerged from the first and explorative part of the case study. Through the first encounters with key people in the empirical process and my initial reflections about this, it became clear that a high number of people were involved in the process and that they held different perspectives. Furthermore, there seemed to be an inability or unwillingness to control the top-down process. Rather the local participants were included in the process. This probably led to higher levels of local ownership but also to an unpredictable process where means and even goals changed along the way[19].

The Complex Responsive Processes perspective seemed to be a relevant perspective to explore further the first experiences from the empirical processes. By drawing from both complexity science and social scientists such as Mead and Elias, the sensitizing device pays close attention to the unpredictability and the social nature of organizational processes (e.g. Stacey, 2003; Stacey & Griffin, 2005). More specifically the sensitizing device highlights the need to study actual organizational processes instead of developing prescriptions of how organizational life ought to be (Stacey, 2007; Stacey et al., 2000). Furthermore, the sensitizing device points out that it is helpful to understand organizations as the patterns of many local interactions (Stacey & Griffin, 2005). Thus, the sensitizing device attracts attention towards the interactions between humans and towards how these interactions form the organizational outcome e.g. organizational change (Fonseca, 2002; Stacey, 2005). When it comes to organizational change, the sensitizing device assumes that it happens when people change something in their own local interactions (Stacey, 2005). Furthermore, it is expected that change occurs when the people interacting differ (significantly) from each other; at the same time it should be emphasized that change processes, like other organizational or human processes, are considered to be unpredictable in nature (Stacey, 2005).

After reading the literature on the Complex Responsive Processes perspective, it became clear that the perspective contains concepts, which would be able to support an understanding of what seemed to take place in the case. Furthermore, drawing upon this perspective as a "*'sensitizing device' to view the world in a certain way*" (Klein & Myers, 1999: 75) supports ongoing attention towards specific potential drivers in the process and suggests places to look for potential explanations.

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[19] This process is further described in section 4.2

The classification of the IS papers identified in the literature reviews presented in the previous chapter indicated limited focus has previously been paid to understanding IS-related organizational change based on drives highlighted by the sensitizing device of Complex Responsive Processes. As pointed out by Van de Ven & Poole (1995), the motors each have their strengths and weaknesses and will enable us to study specific parts of change processes. Thus, it is positive, that the literature drew upon all four motors, as the diversity of the approaches strengthens our understanding of the phenomenon, IS-related organizational change. However, studying IS-related organizational change in the light of a novel perspective lets us see alternative aspects of a change process and helps us understand the process in a new way. By applying perspective or sensitizing device drawing upon the dialectic motor, the study will attend to the power, conflict and differences in the process. More specifically, the focus will be on the less rational and less planned aspects of the process including multiple actors. In this way, the study will focus on understanding of IS-related organizational change as second-order change. Further, selecting a sensitizing device with this focus provides an opportunity to address the practical challenges identified in Chapter 1.

The Complex Responsive Processes perspective introduced and applied in this dissertation draws upon the dialectic motor of change. The characteristics of the dialectic motor can be identified as the focus on several entities, their opposing values or interests and their competition as drivers of change (Van de Ven & Poole, 1995). More specifically, these characteristics can be observed e.g. in the analogy from complexity science that change occurs when the people interacting differ significantly from each other (Stacey, 2005). Furthermore, the sensitizing device emphasizes the need for individuals to interpret or particularize all social norms and generalizations. This can lead to conflict as the generalizations are shared whereas the interpretations or particularizations might differ significantly (Johannessen & Aasen, 2007; Stacey, 2005; Stacey, 2011). This likewise might lead to the misunderstandings about which Fonseca (2002) wrote. As a supplement to this Mowles drew upon the analogy of social interactions as games from Elias, and pointed out that people interact in game-like interactions where they form alliances based on which potential alliances will lead to mutual advantages. Further, he described the interactions as a *struggle to co-operate and compete* (Mowles, 2011a: 122). Drawing upon the dialectic motor, Complex Responsive Processes directs attention towards the role of power, conflict and differences as a driver of change. The multiple entities between which the conflict arises according to Van de Ven & Poole's typology are according to this sensitizing device the individuals within an organization.

Additionally it should be stressed that the sensitizing device in addition to the dialectic motor draws upon the teleology motor and the evolution motor as a secondary motors. The link to the teleology motor can be found in the understanding of individuals as setting goals and acting towards those. The evolution perspective

can be found in the understanding of organizational processes being affected by external pressures, e.g. values and norms. As suggested by Van de Ven & Poole (1995) applying a theoretical perspective which draws from more than one motor, strengthens the theoretical perspective's ability to explain complex multilayer processes of organizational change. Combining the dialectic motor with the often used teleology motor (and evolution motor) might furthermore support the possibility of integration between the extant knowledge and insight about the phenomenon in the literature and the insights from the present dissertation.

3.2 The Sensitizing Device – Complex Responsive Processes

Following the section above, the Complex Responsive Processes perspective seems to be a relevant choice for a sensitizing device when studying IS-related organizational change. This section thus describes the sensitizing device in some detail with regard to the background, its key concepts and lastly its perspective on change.

3.2.1 Background of Complex Responsive Processes

This section introduces the background of the Complex Responsive Processes perspective. As several theoretical perspectives draw from complexity sciences to understand organizations,[20] it seems reasonable to highlight what characterizes the specific perspective. Furthermore, the Complex Responsive Processes perspective distinguishes itself from many of these other sensitizing devices by departing from systems theory and by interpreting the ideas from complexity science based on insights from specific social scientists, which are specifically highlighted here.

Generally, the Complex Responsive Processes perspective is concerned with organizations and management within a complexity perspective. Ralph Stacey and his colleagues from the University of Hertfordshire introduced the sensitizing device in the book *Complexity and Management – Fad or Radical Challenge to Systems Thinking?* (Stacey et al., 2000) and further developed it in various books in the series *Complexity and Emergence in Organization* (Fonseca, 2002; Griffin, 2002; Shaw, 2002; Stacey, 2001; Stacey et al., 2000; Streatfield, 2001) and *Complexity as the Experience of Organizing* (Griffin & Stacey, 2005; Shaw & Stacey, 2005; Stacey, 2005; Stacey & Griffin, 2005; 2006). The starting point for Stacey et al. (2000) was the awareness that the use of complexity science within management and organizational science is spreading. Despite the shared subscription to "*the possibility of order emerging from disorder through processes of spontaneous self-*

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[20] For instance, Morgan (1997) uses chaos theory and complexity theories as the basis for his metaphor of organizations as flux and transformation. Sanders (1998) stress that chaos and complexity is everywhere in organizations and argue for drawing from complexity science for ways to handle this. Lewin & Regine (2000) approach organizations as complex adaptive systems. (See Stacey (2011) for additional examples)

organization in the absence of any blueprint" (Stacey et al., 2000: 1), the use of complexity science is however very diverse.

Stacey and his colleagues argued for combining insights from complexity science with insights from social scientists such as George Herbert Mead and Norbert Elias to adapt the originally natural science approach in complexity science (e.g. Stacey & Griffin, 2005). The fundamental premise within Complex Responsive Processes is that humans are social beings and that there exist no *structures* above human interactions (e.g. Stacey et al., 2000). Instead, the individuals and the social are considered two sides of the same phenomenon i.e. of human relating. This means that the mind, identity etc. of individuals as well as the social forms are formed by the interactions between humans (Stacey et al., 2000). In the words of Stacey and Griffin, they argued:

> "*that organizations are not systems but the on-going patterning of interactions between people. Patterns of human interaction produce further patterns of interaction, not something outside of the interaction. We call this perspective* complex responsive processes of relation." (Stacey & Griffin 2005: 1)

In continuation hereof, the authors understand organizations as ongoing processes of local human interactions, or communication, and the patterns these create and are created by (Stacey, 2005; 2007; Stacey et al., 2000). More explicitly, they stated that

> "*We think of an organisation as an evolving pattern of interaction between people that emerges in the local interaction of those people, with its fundamental aspects of communication, power ideology, and evaluative choices.*" (Stacey & Griffin, 2005: 19)

The paradoxical interdependence of human intentions and choice, local interactions and global patterns are one of the critical reasons for the complexity assumed to exist within organizations and human interactions (Mowles, 2011b; Stacey et al., 2000).

Overall, the point is that people only interact with a limited number of other people and that it is within these local interactions that patterns are created and identifiable. Thus, it does not make sense to consider or study the patterns interdependently of the local interactions, but simultaneously, the particularization or effect of patterns in the local interactions are important to fully understand the interactions and organizational life (Stacey, 2005).

3.2.1.1 Systems theory

The sensitizing device of Complex Responsive Processes was largely developed in opposition to systems theory, which Stacey and his colleagues found less helpful for understanding organizations and organizational life. Thus, it seems reasonable to stress their understanding of and objection towards systems theory. Furthermore it should be mentioned that also within the field of IS research, systems theory plays a large role, for instance Checkland (1999) highlighted the relevance of systems thinking particularly within MIS research (Management Information Systems research), meaning that the issue of systems theory or not is just as relevant regarding IS research as it is for organizational research.

The problem according to Stacey et al. (2000) is that systems theory brings the notion of causality from natural science into social science where it does not make much sense unless the possibility of human choices is eliminated (e.g. Stacey, 2005; 2007).

> "*Clearly, if one's actions have a deterministic 'if-then' cause there is no choice available. This is true too if a human is thought of as part of a system because a part only has meaning, as a part, if it fulfills the functioning of the system, not its own ends as an autonomous unit.*" (Stacey, 2007: 294)

A danger of systems thinking is that it is not only the way many theorist think but also the way many practitioners think (Stacey et al., 2000), thus it makes managers search for the causes that will produce the outcomes they wish for and to continue with the impossible task of designing the future (Stacey et al., 2000). The decisive issue according to Stacey et al. is however that:

> "*systems thinking cannot adequately explain how novelty arises in organizations or what the role of managers and leaders is in the emergence of such novelty. It is the basis of our call for a shift away from systems thinking about human organizations.*" (Stacey et al., 2000: 10).

Thus, Complex Responsive Processes distances itself from the notion of systems introduced by Kant where a system is "*a whole produced by its parts and separated by a boundary from other wholes*" and a part is "*only a part insofar as it is doing what is required to produce the whole*" (Stacey, 2005: 25). Understood in this way, individuals are parts of groups who are parts of organizations who are parts of supra-organizations in large-scale hierarchies where lower levels produce the higher levels and the higher levels enable and constrain the lower levels (Stacey, 2005). Thereby, systems theory places local human interaction at the bottom of the hierarchy of systems, sub-systems and supra-systems (Stacey, 2005) and according to Stacey, this has some unfortunate consequences:

> "*What happens in this way of thinking is that we begin to understand what is happening in terms of impersonal forces or systems that become increasingly divorced from ordinary human interaction as we move from the local to higher and higher global levels.*" (Stacey, 2005: 19)

Thus, what people go about doing in their everyday life is often not regarded as important; this leads most people to feel powerless, as the source of change is believed to lie on higher levels and to depend on being designed by the most powerful individuals. Systems theory thereby has a tendency to eliminate the possibility of human choices by regarding humans as functional parts of a larger whole (e.g. organizations) and by placing the responsibility at some higher level (e.g. Stacey, 2007). For instance, Stacey pointed out that:

> "*What is striking in the dominant management discourse is the absence of ordinary people as organizations are understood as positions in markets, bundles of resources, abstract cultures and charismatic, leaders with extraordinary power of envisioning.*" (Stacey, 2007: 298)

Consequently, Stacey and his colleagues rejected this belief and assumed the change happens when people change something in their own local interactions (Stacey, 2005). Instead of focusing on the systems, the sensitizing device of Complex Responsive Processes focuses on processes (e.g. Fonseca, 2002; Stacey et al., 2000) by directing attention towards the processes of interactions between humans.

3.2.1.2 Complexity science and social science

Rather than systems theory, Complex Responsive Processes turns to the complexity sciences (e.g. Gleick, 1988; Goodwin, 1994; Kauffmann, 1995; Prigogine & Stengers, 1984; Waldrop, 1992) and draws analogies from this area of knowledge. At the same time, Stacey and his colleagues highlighted the need for translating the ideas from complexity science when transferring them to organizational science, instead of transferring them directly as is often seen (e.g. Stacey et al., 2000; Stacey, 2005).

From complexity science, Stacey and his colleagues utilized the idea of large numbers of agents, in this case people, interacting locally without an overall plan and through those interactions creating patterns (Stacey, 2005). Two additional insights were drawn from complexity science; one is the understanding of change as a phenomenon, which can occur when different people meet and interact and second is the focus on unpredictability (Stacey, 2005).

According to Stacey and his colleagues, what characterizes human beings as opposed to e.g. the computer agents, in the computer simulations from many complexity theories, is that they do not blindly follow rules. On the contrary, humans are conscious and self-conscious, reflecting on their actions and thus possess at least some degree of choice with regard to how they react to the actions of others. Further, humans are social beings that engage in what is in their perception meaningful interaction (Stacey, 2005). Thus, proposing that we cannot understand humans by means of theories from natural science such as complexity science, Stacey and his colleagues drew upon theories from social psychology and sociology to translate the insights from complexity science (Stacey et al., 2000).

The two main sources of inspiration in the translation of complexity concepts into human and organizational science were the works of George Herbert Mead and Norbert Elias. Stacey and his colleagues found inspiration in Mead's work on humans as individuals as well as social beings in his book *Mind, Self and Society* (1934) (see e.g. Stacey & Griffin, 2005). In particular, what they found relevant was his descriptions of how individuals internalize the norms, expectations and reactions of others, and thus are able to anticipate, to some degree, the reactions of others in a communicative situation. Mead conceptualized this ability to *feel* in one's own body the response of not only the immediate other but also the *generalized other* (Stacey et al., 2000). It is through this process of internalization that humans are able to understand and communicate with others and simultaneously create an identity; an identity, which is thereby social in nature. Theses insights on the social nature of individuals from Mead are a crucial part of the foundation for the Complex Responsive Processes perspective.

Another crucial part of the foundation is the understanding of power, which they drew upon Norbert Elias. For instance, they drew from his work in *The Symbol Theory* (1989), where Elias theorized on power as a relational phenomenon. Elias' point was that power is co-created between humans in their interactions and not something that an individual can possess independent of others (e.g. Stacey et al., 2000). In their communication, both parties are enabled and constrained by the other and thereby they both depend on each other – but not equally. The one that depends less on the other is the most powerful. This implies that no one is in absolute power and no one is completely without power (Stacey et al., 2000; Stacey, 2005). From Elias, the Complex Responsive Processes perspective brings the insight of people as interdependent and of power as an element in all relations.

By combining insight about complexity from the complexity sciences with insight about humans and their relations from Mead and Elias, Stacey and his colleagues developed a sensitizing device, the Complex Responsive Processes perspective. Below is a presentation of the key concepts included in their sensitizing device.

3.2.2 Key Concepts

The sensitizing device of Complex Responsive Processes contains a number of significant concepts, some of which have been mentioned above, e.g. power. This section discusses in some detail these concepts, from now on referred to as key concepts. In the end of the chapter, a table (Table 3.2) is included, which contains an overview of these concepts, their definition and application in the analysis.

One of these key concepts is the concept of **patterns**, which Stacey and his colleagues understand as referring to the elements that are similar across different interactions. The concept is somehow similar to the focus in many organizational theories on the structures assumed to influence individuals, their interactions and more generally, how organizations develop. What separates patterns from structures is however that the patterns only exist and have an effect in the particularization of new local interactions (Stacey, 2005). Furthermore, people do not just repeat existing patterns they interpret them and change might thus occur over time. The patterns thus emerge from the interactions without an overall blueprint and they cannot be controlled or easily changed by a few people or managers. On the other hand, this does not mean that managers are powerless (Mowles, 2011a; b). They are often powerful individuals able to affect others, but it should be emphasized that they affect others through their local interactions just like everybody else. It is worth noticing that patterns are generalizations or abstractions of everyday life, thus it typically requires reflections to identify the patterns (Stacey, 2005). Therefore, paying attention to and reflecting upon the interactions are crucial when trying to identify patterns in organizational life and to understand organizational life.

This leads to another critical concept, more specifically the concept of **local interactions**. As mention earlier in this chapter, a fundamental premise within Complex Responsive Processes is that organizations are understood as ongoing processes of local human interactions with unknown durability (Stacey, 2007). Consequently, a researcher applying the sensitizing device as a lens needs to pay attention to the local interactions, understood as responsive communications between humans. More specifically, the authors behind Complex Responsive processes understand the local interactions as bodily and vocal **gestures and responses**, where the gesture evokes a response in others and simultaneously in oneself (Stacey et al., 2000; Stacey, 2005). Concepts, which Stacey drew from Mead, pointed out that humans have the ability to *feel* in one's own body the response to one's gesture, both of the immediate other and of the *generalized other* (Stacey et al., 2000). This capacity enables one to make a qualified guess about the response to one's gestures thus allowing us to interact with each other without constant insecurity and anxiety. These gestures and responses, which the local interactions consist of, are the most basic concept in the sensitizing device as the other concepts categorize patterns of processes of these gestures and responses. Furthermore, Stacey linked the understanding of interactions to the premise that it is the combination of gesture and response, which creates (social) meaning. Thus, a

gesture always calls for a response and jointly the patterns of those gesture-response processes are conversations (Stacey et al., 2000).

Conversations are another key concept within Complex Responsive Processes through which: "*forms of organizing are dynamically sustained and changed*" (Shaw, 2002: 10). People have a tendency to repeat the same patterns of conversations continuously, thus, creating familiarity and stability (Stacey, 2011). Stacey uses the concept fluid conversations to describe conversations that permit a breakaway from the previous pattern:

> "*[A] fluid conversation is not some pure form of polar opposition to repetition. Rather, 'fluid' conversations refer to thematic pattering, which is paradoxically repetitive and spontaneously transforming at the same time*" (Stacey, 2011: 344).

The conversational patterns can become **themes** in the organization. Stacey defined two types of themes within an organization, the legitimate themes and the shadow themes (Stacey, 2011).
Legitimate themes are the patterning of conversations that conform to the official ideology or dominating opinions and in which everybody can participate openly and freely. Shadow themes on the other hand are patterning the type of conversations that people only have in more informal settings and with people they trust; these patterns of conversations are typically contradicting or criticizing the legitimate themes (Stacey, 2011). Persistent themes within an organization take the form of **narratives**, through which people give accounts of their experience of participating in the organizational life, and connect reflections, comments etc. to the story. Stacey ascribed great significance to narratives (Stacey, 2011), as did Mowles who described the usefulness this way:

> "*paying attention to people's narrative accounts of what is happening, including the way that leaders and managers narrate their own experience of leading, is a powerful way of both understanding and influencing organisational life.*" (Mowles, 2011b: 255)

Two interesting concepts, which typically take a narrative form, are those of **social objects** and **cult values**, which Stacey drew from Mead. Both concepts represent a certain patterning of a dominating narrative (Stacey, 2005). Social objects refer to social acts such as buying and selling and are thus not objects in the physical sense. A social object evokes in people a particular range of responses based on experience. However, in the specific situation the individual still needs to interpret or particularize the social object, which can lead to conflicts (Johannessen & Aasen, 2007; Stacey, 2005; 2011). Social objects can take the form of cult values, which are idealized values that have emerged over time and present a possible and idealized future. Examples of general cult values are *democracy* or *treating others with*

respect; furthermore, cult values are often found in organizational vision and mission statements (Stacey, 2005). Like social objects, cult values need to be interpreted in the specific context.

In people's interactions, they cannot act freely as they depend on the response of others to create meaning; thus, **power** is a factor in all interactions. Based on this understanding, power is a relational phenomenon. This means that no one person *has* the power since it is located in the relationship; in this way nobody is completely powerless and no one is in complete power (e.g. Stacey, 2005; Stacey et al., 2000). However, power is not equally distributed, as one might depend more on the other, hence there exists a power relation (e.g. Stacey, 2005; Stacey et al., 2000). Thus, in their conversations, people simultaneously enable and constrain each other as both are engaging intentionally but neither is in control (Shaw, 2002). As Stacey described the process of enabling and constraining, he pointed to the role of **intentions** in the processes of gestures and responses:

> "*We inevitable both constrain and enable each other. So, each of us is continually forming intentions and making choices of our next action but because we are interdependent none of us can control the consequences of what we do. The consequences emerge in the interplay of all our intentions and those consequences prompt further action on the part of all of us, the consequences of which will also emerge, and so on in a process that has no beginning or end.*"
> (Stacey, 2007: 297)

Mowles, another of his colleagues, likewise stressed the issue of human intentions in his studies of the role of managers in organizations. He pointed out that even strong managers' intentions inevitably clash with the intentions of others and that within the process differences and conflict hence are naturally present (Mowles, 2011a).

A related concept is the matter of **choice**. According to Stacey and his colleagues, humans have some form of free will or at least a choice, which is present in the interpretation or particularization of the generalization in the specific situations. In order to exercise this opportunity humans evaluate the options more or less consciously based on norms (what they feel they ought to do) and values (what feels right) (Stacey, 2005). The concept of human choice is central in sensitizing one to the evaluations and interpretations of the individuals. The evaluations and the actual choices take place within local interactions in the present; they are however also affected by the expectations of the future and based on past experiences (Stacey & Griffin, 2005).

A last point made by the sensitizing device is the **paradox**, which is present in all human or local interactions and thus organizational life. Interactions are considered paradoxical since they are simultaneously stable and unstable, predictable and

unpredictable, certain and uncertain (Stacey, 2003). One can expect a particular response to a gesture, based on prior experience, but one cannot know for sure. Furthermore, familiar situations or activities can occasionally unfold in unfamiliar ways. These underlying paradoxes and interdependencies are what create complexity present in all human activities (Stacey, 2007).

3.2.3 Complex Responsive Processes and Change

In short, change is assumed to happen when people change something in their own local interactions (Stacey, 2005) and in particular, when the people interacting differ (significantly) from each other. This type of change is however unpredictable in nature (Stacey, 2005).

The understanding of change builds on the premise that humans are social beings, and that they thereby are restrained by the social norms. At the same time, however, humans as social beings meaning that they are reflective and intentional (e.g. Stacey et al., 2000), which means that individuals, e.g. managers, might wish to create change and act towards this goal. These intentions however inevitably clash with the intentions of others. According to Mowles, the *interweaving of everyone's intentions* is exactly what creates change (Mowles, 2011a: 119). Following a description of his interactions with a group of health care managers, Mowles pointed out that:

> "*They give an inadequate account of the change that occurs in organizations, which does so precisely as a result of managers acting with intention, which provokes counterintentions from those they manage, which in turn provokes the managers into further strategizing and efforts to control the outcome, ad infinitum.*" (Mowles, 2011a:120)

The idea is that the interaction of intentions enable and restrain potential change, but also that the change, which occurs, is not following any plan and is not controllable by anyone (Mowles, 2011a). At the same time, the sensitizing device focuses extensively on differences as a driver of change, as mentioned earlier. More specifically Fonseca, who wrote about Complex Responsive Processes in regards to innovation, pointed out that such differences take the form of misunderstanding (2002). Misunderstandings are both the foundation for change but at the same time an effect of change. Fonseca's point is that change can be understood as new meaning and that this new meaning emerges through interaction *characterized by a paradoxical dynamic of understanding and misunderstanding at the same time* (Fonseca, 2002: 8). In the process of change, misunderstanding is thus something to embrace rather than prevent. Fonseca also stressed the need for these interactions, which might seem unproductive in the moment:

> "*In other words, new order emerges in disorder, that is, diversity and what seems like wasteful interaction.*" (Fonseca, 2002: 8)

Furthermore, he pointed out that this type of interaction generates anxiety. Based on that, he highlighted the necessity of trust throughout such processes if people are to dare stay in the processes and unfold the differences and misunderstandings (Fonseca, 2002).

Mowles described the people participating in a change process as *caught up* in a conflictual process, and further stressed that the result is unpredictable and unplannable, ev*en by the most powerful individuals and groups* (Mowles, 2011a: 119). His point was that no one is in overall control of the process and that the change might even be change that no one expected and wanted. The reason for this is the mentioned understanding of change as originating from the local interactions rather than from a formally planned change process:

> "*Instead of reaching for mysterious explanations of how change emerges, Stacey is pointing the way in which it occurs as a result of the many, many interactions of people acting locally with others, however well-conceived, planned and executed the project of transformation is. What actually transpires will be unpredictable, Stacey claims, and will be a combination of the expected, the unexpected and the unwanted, the result of what everyone is doing in their local interactions with others.*" (Mowles, 2011b: 243)

In contrast to much of the mainstream literature, the Complex Responsive Processes perspective does not, according to Fonseca, attempt to downplay the messiness; rather they embrace and emphasize it (Fonseca, 2002).

3.3 Use of Complex Responsive Processes in IS literature

To the best of my knowledge, others have not previously applied the Complex Responsive Processes perspective to understanding IS-related organizational change. Furthermore, the perspective does not seem to have been applied either as a guiding framework or sensitizing device in other areas of IS research[21]. This assumption builds on a literature review revealing that the use of the of Complex Responsive Processes perspective within the IS literature is rather limited (se Appendix B).

The literature reviews reported in the prior chapter (Chapter 2) showed that none of the identified papers drawing upon the dialectic motor applied the Complex Responsive Processes perspective. The paper by McBride (2005) should however be mentioned, as he applied concepts from chaos theory a theoretical perspective from

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[21] Only Jones (2008) applied the perspective as a source of inspiration in her reflections regarding the potential for strengthening the field of knowledge management through interdisciplinarity.

the complexity science which the Complex Responsive Processes perspective also builds from. The two perspectives share an understanding of change as non-linear and non-proportional; McBride also stressed that:

> "*The importance of theories based on complexity theory, chaos theory and non-linear dynamics has grown in organizational and management studies, but remains a neglected source of inspiration in information systems.*" (McBride, 2005: 251)

However, McBride and the chaos theory hold onto the systems perspective which Complex Responsive Processes departs from, thereby McBride (2005) did not translate the insights from complexity science through insight on human nature appropriate for social science, according to Stacey and his colleagues (e.g. Stacey et al., 2000). McBride, did in fact refer to Stacey in his 2005-paper. The reference was however limited, as he only referred to Stacey (2003) as an example of authors suggesting the relevance of chaos theory as a basis for understanding business strategy and the generation of it.

As the Complex Responsive Processes perspective was not applied in the papers identified as drawing upon the dialectic motor, a third systematic literature review in quality IS outlets was conducted focusing on the use of Complex Responsive Processes in the IS literature in general (see Appendix B for details). More specifically, the literature was searched for papers referring to either Complex Responsive Processes or Stacey using the search engine Scopus as this search engine allowed the researcher to search specifically in the references of the papers. The search is outlined in Figure 3.1 below.

Stacey, R OR "complex responsive process"
[references]

37,072 *hits*

AND
(information systems OR information technology)
[Article title, Abstract, Keywords]

244 hits

Manuel limiting to IS quality outlets

37 hits
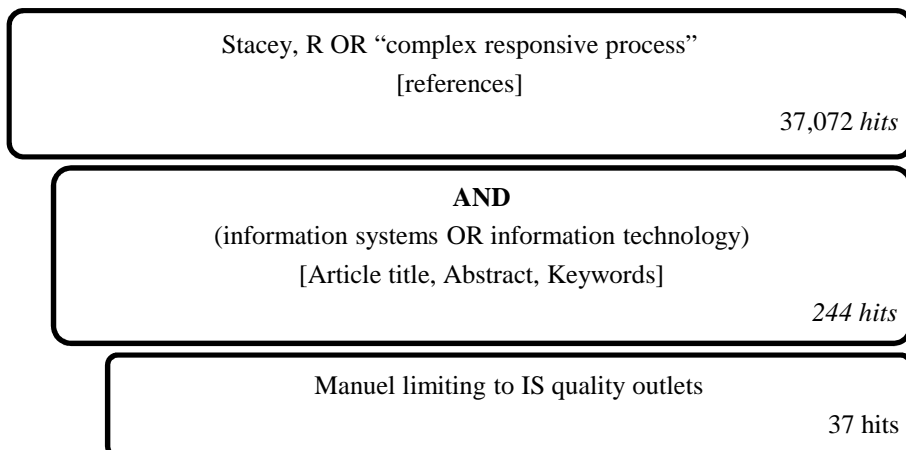
Figure 3.1: Identification of papers referring to Stacey

Through this review, thirty-seven papers referring to Stacey and/or Complex Responsive Processes were identified. Twenty-two of those papers cited Stacey's work prior to the development of the Complex Responsive Processes perspective[22] (see e.g. Table 3.1 below). According to Stacey himself, this part of his work remained within the sphere of systems theory, and his focus was mostly on how to apply complexity theory, primarily in the form of Complex Adaptive Systems theory and chaos theory, to organizational and management science (Stacey, 2012).

Fifteen of the IS papers referred to newer Stacey references (e.g. Stacey, 2001; 2003; Stacey et al., 2000) (see Table 3.1 below). Among those, the primary use was as a reference for concepts such as self-organizing, uncertainty and complexity (Breu et al., 2002; Ferratt et al., 2005; Kautz, 2012; Merali, 2002; 2006; Mohamed et al., 2010). Some of the papers also referred to Stacey as an example of e.g. raising doubts regarding planning, the relevance of chaos theory and anxiety in teams (Akgün et al., 2014; Boland et al., 2009; Ingawale et al., 2009; Intezari & Pauleen, 2012; Lea et al., 1998; McBride, 2005) or for a short comment about an alternative approach for future research (Howard et al., 2007; Vidgen & Wang, 2006). Jones (2008) did as the only identified paper use Stacey directly in her conference-paper on the research field of knowledge management. The purpose of the paper was to explore the need for an interdisciplinary approach to knowledge management, and more specifically to reflect on how this could be achieved. By drawing upon the Complex Responsive Processes perspective, Jones directed attention to the need for communication between the communities of knowledge management research. Primarily, she used the concepts of identity and power relations both related to the difficulties of communication. Overall, Jones (2008) drew upon the perspective for inspiration in her reflections of the future of knowledge management research and the academic communities within the field. She suggested moving towards an interdisciplinary approach characterized by communication between the communities and further suggested considering the field of knowledge managing as a boundary object supporting the communication. Based on the Complex Responsive Processes perspective she highlighted difficulties and conditions for successful interdisciplinarity. However, Jones (2008) did not apply the perspective as a guiding framework or sensitizing device in an empirical study, but only as a source of inspiration regarding the understanding of communication as more than transmission of information (Jones, 2006, p. 4).

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[22] It is primarily work published prior to 1996 that is cited

Use related to the purpose of the paper		
Jones, R. (2008)	Stacey, R. (2001) Complex Responsive processes in organizations: Learning and knowledge creation, Routledge Stacey, R. (2003) The Learning Organization, 10 (6), pp. 325-331.	Used related to the purpose of the paper (reflections on the potential for an interdisciplinary future for the field of knowledge management research) As a perspective on communication (incl. the related role of identity and power)
Limited use/general reference		
Akgün, A.E., Lynn, G.S., Keskin, H. & Dogan, D. (2014)	Stacey, R. (2001) Complex Responsive Processes in Organizations: Learning and Knowledge Creation. Routledge London	Limited use/general reference A reference and example of studies highlighting the positive effect of anxiety in teams
Boland, R.J., Goraya, T., Berente, N. & Hansen, S. (2009)	Stacey, R.D. (2002) Complexity and Creativity In Organizations. Berrett-Koehler Publishers, Inc., San Francisco	Limited use/general reference As an example of the primary focus on structures supporting individual creativity within research on organizational creativity
Breu, K., Hemingway, C.J., Strathern, M., Bridger, D. (2002)	Stacey, R. (2001) Complex Responsive processes in organizations: Learning and knowledge creation, Routledge	Limited use/general reference A reference for the concept of uncertainty
Ferratt, T.W., Agarwal, R., Brown, C.V. & Moore, J.E. (2005)	Stacey et al. (2000) Complexity and Management: Fad or radical challenge to systems thinking? Routledge	Limited use/general reference In the implications: Interplay of intentions/choices/actions affecting Human Resource Management
Howard, M., Vidgen, R., Powell, P. & Powell, J. (2007)	Stacey, R. (2003) Strategic Management and organizational Dynamics, Pearson	Limited use/general reference In their suggestions for further research: How QPID (qualitative politicized influence diagram) can work with other perspectives e.g. CRP

Ingawale, M., Dutta, A., Roy, R. & Seetharaman, P. (2009)	Stacey, R. (2000) Emergence, 2 (4), pp. 23-39.	Limited use/general reference Reference for knowledge as emerging from a 'web of relationships'
Intezari, A. & Pauleen, D. (2012)	Griffin, D., Stacey, R. (2005) Complexity and the experience of leading organizations. (Eds.). Routledge, London	Limited use/general reference A reference for complexity as the consequence of studying people which is the focus of social science
Kautz, K. (2012)	Stacey, R. (2003) Strategic Management and organizational Dynamics, Pearson	Limited use/general reference As a reference for Complex adaptive systems As a reference for situations being simultaneously stable and unstable
Lea, W., Uttley, P. & Vasconcelos, A.C. (1998)	Stacey, R.D. Strategic Management and Organisational Dynamics. Pitman, London	Limited use/general reference As an example of "Recent studies in different fields" that "raise doubts over the perception of planning as designing rational, orderly and intentional control structures, bearing in mind determined and foreseen environmental constraints."
McBride, N. (2005)	Stacey, R. (2002) Strategic Management and Organisational Dynamic: the Challenge of Complexity. FT Prentice Hall, London, UK.	Limited use/general reference As an example of authors suggesting the relevance of chaos theory as a basis for understanding business strategy and the generation of it.
Merali, Y. (2002)	Stacey, R. (2001) Complex Responsive processes in organizations: Learning and knowledge creation, Routledge	Limited use/general reference As a reference for the concept of self-organizing
Merali, Y. (2006)	Stacey, R. (2001) Complex Responsive processes in organizations: Learning and knowledge creation, Routledge	Limited use/general reference As a reference for: a) Complexity theory and b)

	(Stacey, R.D. (1992) Managing the Unknowable: Strategic Boundaries between Order and Chaos in Organizations, Jossey-Bass)	link between complexity theory and strategy
Mohamed, S., Coakes, E. & Leslie, A. (2010)	Stacey, R. (2003) Strategic Management and organizational Dynamics, Pearson	Limited use/general reference As a reference for defining *the structure of an organization*
Vidgen, R. & Wang, X. (2006)	Stacey, R. (2003) Strategic Management and organizational Dynamics, Pearson	Limited use/general reference Stacey critic of Brown and Eisenhardt (1998) understanding of complex systems theory – they convey it into traditional organizational theory
Use of Stacey-references prior to 1996		
Benbya & McKelvey (2006), Braa et al. (2007), Dhillon & Fabian (2005), Esteves et al. (2014), Falconer (2000), Flett et al. (2008), Hamilton (1999), Handyside & Light (1998), Hanseth & Lyytinen (2010), Hendriks (2003), Khoong (1997), Lanham & McDaniel (2008), Lee & Gough (1993), Littler et al. (2000), Nelson et al. (2003), Pillay et al. (2012), Sage & Rouse (1999), Samoilenko (2008), Schefe & Timbrell (2013), Tan et al. (2009), Tan et al. (2010)		

Table 3.1: The references to the Stacey in IS literature

As the use of Stacey's later work and more specifically the Complex Responsive Processes perspective was limited, the use of the perspective as a sensitizing device in an empirical study should be able to bring new insights to the IS field. This expectation is express in research question 3 as introduced in section 1.5.

> **Research question 3: How can the application of the Complex Responsive Processes perspective as a sensitizing device contribute to the understanding of other phenomenon within the broader IS literature?**

For instance, the Complex Responsive Processes perspective directs attention towards processes of gestures and responses within everyday life of organizations as the source of change – and stability at the same time. The perspective helps identify new aspects of the phenomenon; in particular, the interactive aspects and the role of differences and conflict have become clear as well as the emerging nature of the initiation processes.

3.4 Use of Complex Responsive Processes in the Dissertation

This section clarifies how the sensitizing device of Complex Responsive Processes is used in the dissertation by outlining the role of the sensitizing device and its use in regards to the way the case is approached and the way the empirical material is analyzed.

In this dissertation the Complex Responsive Processes perspective functions as a *sensitizing devise* (Klein & Myers, 1999; Walsham, 1995) both in regards to my interactions with the case in the second and more structured part of the case study (in contract to the explorative first part) and in the analysis and interpretation of the empirical material. Applying a theoretical perspective as a sensitizing devise means that the perspective sensitizes one to *view the world in a certain way* (Klein & Myers, 1999: 75). This is similar to what Gregor refers to as high-level theories of Type II: Theory for Explaining (2006). She also wrote about those theories as theories of understanding as these theories help the researcher by providing a particular view of the world and thus a way of understanding the phenomenon under study (Gregor, 2006). Examples of these types of theories are according to her e.g. Giddens's structuration theory and Latour's actor-network theory (Gregor, 2006). Similar to the Complex Responsive Processes perspective these theories suggest a particular way of understanding the world and provide expectations of how and why a phenomenon occurs.

Generally, the worldview incorporated in the sensitizing device of Complex Responsive Processes has influenced my understanding of the case and my interpretations of the process of IS-related organizational change. During the main part of the interactions with the case, the application of the sensitizing device had some consequence for the way I approached the case. This meant that the sensitizing device affected the way I thought about organizations, the way I met people and what I asked them about in the interviews. Thus, following the Complex Responsive Processes perspective, I looked for what people did in their local interactions, which gestures were made or responded to, the relations between people and how they explained or narrated what was going on. During the analysis of the empirical material, the sensitizing device was likewise critical, meaning that I focused on categorizing and describing the empirical processes with regard to the concepts from Complex Responsive Processes and paid attention to the insight these led me to. The more specific use of the sensitizing device in regards to the empirical material and the analysis of it will be elaborated in Chapter 4, which describes the case design.

However, to clarify the use of the Complex Responsive Processes perspective the remaining part of this section highlights the use of the theoretical concepts presented in subsection 3.2.2. The sensitizing device highlights the need to study actual organizational processes instead of developing a prescription for how organizational

life ought to be (Stacey, 2007; Stacey et al., 2000). Thus, this perspective attracts attention towards the interactions between humans (in the form of gestures and responses) and towards the organizational outcome of these interactions e.g. in the form of organizational change (Fonseca, 2002; Stacey, 2005).

Following the presentation earlier in this chapter (subsection 3.2.2), the Complex Responsive Processes perspective highlights the interactive and emergent nature of change rather than the rational elements. Due this understanding of change, attempting to understand change requires an eye for the differences between the involved people and the way their intentions and differences both enable and restrain each other. The overall strategic directions and change in an organization thus need to be understood at the basis of the differences and conflict among the people within the organization.

In the interactions with the case leading to the empirical material, the Complex Responsive Processes perspective as a whole sensitized me towards the specific elements of the change process, which this sensitizing device stresses as relevant. In the analysis process, the focus on and application of the concepts from the Complex Responsive Processes perspective is more specific. This means, that particular attention is directed towards the concepts included in Table 3.2 below. In the table, nine concepts are included, they are defined and references supporting the definitions are listed. Further, questions that each concept leads to are included. The nine concepts are divided into two categories in the table; concepts applied both within and across episodes and concepts of a more abstract nature only applied in the cross-episode analysis (see more on this division of the analysis in section 4.4.

The analysis takes as its starting point, the most basic theoretical concept of gesture and responses (which together are what the interactions consists of). The use of this concept in the analysis supports the relevance of rich empirical descriptions and further contributes with a theoretically meaningful structure for this. As this theoretical concept is basic and further encourages rich empirical descriptions it is only applied in the analysis of the five episodes and not in the following cross-episode analysis. The cross-episode analysis builds on the insight into the processes of gesture and responses and centers on the patterns, which can be identified across the processes of gesture and responses within the episodes.

Based on the description of gestures and responses, the patterns of these gesture-and-response processes are analyzed in regards to the conversations, theme and narratives. The concept of social objects, as mentioned in subsection 3.2.2 is not included separately in the analysis, as they are a specific form of narratives. Thus, if the narratives take the form of social object (or cult values) it will be included in the analysis of the narratives. The analysis further accounts for the way in which the process is influenced by the power in the relations, the intentions held by the participants and the resulting choices they make.

The two theoretical concepts not mentioned yet are the concept of patterns and the concept of paradoxes. These are not accounted for directly in the first part of the analysis, which focuses on the five empirically identified episodes. However, the following cross-episode analysis focuses on the patterns across the episodes. Here the patterns and paradoxes of continuation or disruption of the conversations, themes, narratives, power, choice and intentions across the episodes are analyzed.

As this chapter has introduced and described in some detail the sensitizing device including the use of the sensitizing device in the analysis, the following chapter focuses on the design of the empirical study in which the sensitizing device is used.

Concept	Description	References	Application in analysis
Concepts applied only in the analysis of episodes separately			
Gestures and responses	The most basic concept Processes of gesture and responses create *local interactions* or Both gesture and response might take either bodily and vocal form	Stacey et al., 2000 Stacey, 2005	- What initiates the episode (gesture) - Which reactions does this lead to (responses) - What is said and what is done – and by whom
Concepts applied both in the analysis of episodes and in the cross-episode analysis			
Conversations	Focus on processes of gesture and responses; can be either vocal, non-verbal or physical	Stacey, 2011	- What is the focus of the interactions
Themes	Patterns within conversations; can be either legitimate themes or shadow themes	Stacey, 2011	- Which larger topics emerge in the conversations
Narratives	Persisting themes within an organization; account people give of their experience of what is going on	Stacey, 2011	- How do people account for what they and others are doing
Power	A relational phenomenon In interactions one person depends more on the other, thus there is a power relation	Stacey, 2005 Stacey et al. 2000	- Who depends on who – and in what way
Intentions	Everybody forms intentions on an ongoing basis They are the foundation for choosing how to act (when people act consciously) However, since humans are interdependent no one is fully in control of what actually happens	Stacey, 2007	- What reasons do people give for their choices
Choice	Evaluation of different options based on norms and values Can be more or less conscious	Stacey, 2005	- What people do - What reasons do people give for their choices

Concepts applied only in the cross-episode analysis		
Patterns	Arises from the generalization of local interaction Only has an effect in the particularization in new local interactions	Stacey, 2005	- Which features seems to be repeated across episodes - What similarities and differences exist between episodes
Paradox	The presence of two opposing forces/ideas at the same time No possibility of choosing one over the other or locating them at different levels or spheres A situation that cannot be resolved	Stacey, 2003	- Which situations or interactions possess internal logical conflict

Table 3.2 Theoretical concepts

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CHAPTER 4
Case Design

Introduction

This chapter outlines the case design to allow the reader to follow the research process and consequently to assess the findings presented later in this dissertation. The purpose of this chapter is thus to outline in some detail the research design, the empirical case site and the practical methods applied in this study.

The first part of this chapter describes the research design, more specifically the approach to gaining insight into and understanding the phenomenon of IS-related organizational change. Firstly, this part of the chapter reflects upon the process that led to the actual study. This is followed by a subsection presenting the interpretive case study design and a section on the process perspective with which it is combined. Lastly, this first part of the chapter reflects on the consequences of applying this research design, both in regards to understanding the researcher's role and the quality criteria to comply with when doing this type of research. The second part of the chapter encompasses a presentation of the case site; this section describes the school digitalization program and the key stakeholders. To explicate the context this subsection likewise describes the school area in general and its municipality. The chapter ends with descriptions and reflections about the practical methods applied. More specifically this last part of the chapter presents the empirical material and clarifies the analysis of empirical material, thus giving the reader rather detailed information about the research process.

4.1 Research Design

This first part of the chapter presents and argues for the choice of research design, which is an interpretive case study with a process focus. The first subsection describes how the process of establishing the research focus unfolded in the specific study. Subsequently, the next subsection attends to the characteristics of an interpretive case study and argues for the usability in the present study. This is followed by a subsection on the relevance of applying a process perspective. More specifically, the focus is on how the process perspective is applied in the specific case study and on how this enables a study of the phenomenon as an ongoing process. Finally, the section ends with some reflections about the consequences of choosing this design. These last reflections are concerned with the researcher's role in an interpretive case study with a process focus as well as the quality criteria when conducting this type of research.

4.1.1 Establishing the research focus

The overall research approach is interpretive (see e.g. Walsham, 1995, 2006) with a hermeneutic angle. This approach has of course influenced my choice of research design, but at the same time, it has influenced my process towards a research focus. To make the research process as clear and open as possible this section will describe the process towards establishing a research focus briefly. Later in this chapter, the significance of the approach in regards to carrying out the study is discussed (see subsection 4.1.4).

Overall, this dissertation was driven by an interest in better *understanding* IS-related change in organizations. An interest developed through the last years of my master education where I began to focus on the role of IS in municipalities as part of an education in political science and public administration. A pre-understanding of the phenomenon was acquired through participation in a collaborative practice research (e.g. Mathiassen, 2002) [23] from 2009 to summer 2012 (prior to and during part of my PhD study). My research interest was thus partly driven by an empirical interest in the phenomenon but also by a seemingly limited understanding of the phenomenon in the literature. The early definition of the overall research interest (understanding IS-related change in organizations) was followed up by the identification of an interesting case. Later on, I narrowed in on the research focus and chose the sensitizing devices (see Figure 4.1). This means that the sensitizing devices was chosen after the case, however the sensitizing device directed my focus and helped me define the relevance of and boundaries for the case. Through the process of establishing the research focus, the case and the sensitizing devices did therefor interact and through the interactions between the early understandings of both the empirical case and the sensitizing device, the research focus evolved. Neither the case nor the sensitizing devices separately directed the process.

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[23] The DISIMIT-project (disimit.dk)

I learned about the case in the beginning of 2011 through a consultant who my colleagues and I collaborated with in the project previously mentioned. The consultant informed me about her perception of the case, and we discussed how it might be of interest to me. Afterwards, I got in contact with the IT-leader from the potential case, who was also a participant in the project. By talking with him, I derived some initial insight about the case, and he furthermore helped me to get in contact with some of the other key persons in the case (see the presentation of the case in section 4.2). After getting in contact with the right people, I set up some interviews with key individuals and got access to the official documents related to their change or digitalization program. These were approached in a very explorative manner trying to become acquainted with the case and to get closer to an understanding of the process so far.

Through this explorative process in the spring 2011, it seemed that the case might be of interest for a wider audience. The process further led me to move from my initial research interest to a more detail research focus (first version of the research question) based on a preliminary understanding of the case and process taking place within it.

	2010		2011	
Q3	Q4	Q1	Q2	Q3

Participation in DISIMIT-project			
Defining overall research interest	Identifying of an interesting case		Choosing a sensitizing device
	Learning about the case	Establishing contact with the case	First encounter with the sensitizing device
		Exploring process	PhD course on the sensitizing device
		Narrowing on the research focus	The beginning of the more systematic study

Figure 4.1: Establishing the research focus

After closing in on the research focus, I began in the fall 2011, to search for a sensitizing device that could help me in understanding the case by providing me with concepts and ideas about how organizations function. Coincidentally, I came across the Complex Responsive Processes perspective at a Ph.D. summer school on *Social Shaping of Innovation* I participated in to get inspiration by interacting with researchers outside the IS field. At that point (the summer 2011), I was however still

uncertain which type of sensitizing device I was looking for, which was also my reason for searching for inspiration outside the IS field. During summer school, I met a number of researchers applying the Complex Responsive Processes perspective in their work on creating change in organizations in different ways.

From this first encounter with the sensitizing device, it made sense to me and fit well with my initial understanding of the processes taking place in the case. To qualify the choice of the Complex Responsive Processes perspective as a sensitizing device for the study, I subsequently participated in a Ph.D. course focusing specifically on this perspective. During the course, the key founder of the Complex Responsive Processes perspective (Ralph Stacey) along with other researchers applying the perspective (Chris Mowles and the Danish researcher Henry Larsen) participated allowing for discussions with people highly familiar with the perspective. Further, I read extensively about the perspective during the fall 2011. As the sensitizing device was chosen, the empirical study moved from the explorative part to a more systematic approach to the empirical material during the fall 2011, which are described later in this chapter (see sections 4.3 and section 4.4). The insight from the sensitizing device led me to focus more specifically on the communications between the participants and on the conflicts and differences as potential drivers of change. The process from the overall definition of the research interest from the identification of the case to the choice of sensitizing device is portrayed in Figure 4.1 above showing each of the three processes and the elements taking place in these processes and the time over which the processes unfolded. Overall, the process of establishing the research focus led me to study an empirical process of IS-related organizational change, which unfolded between the beginning of 2009 and the end of 2014. I was however only able to follow the process from spring 2011 to the end of 2012[24].

4.1.2 An interpretive case study design

As mentioned above an interpretive case study design was applied in this study. This subsection presents the characteristics of this design, and later argues for this choice of design. One characteristic of a case study is that it captures and makes sense of the unique features of a phenomenon by studying a case *in a real-life context* (Flyvbjerg, 2006; Walsham, 1995). By focusing not only on the phenomenon itself but also on the context and the relationship between phenomenon and context, a more holistic understanding is enabled. This might be what leads Flyvbjerg to emphasize that case studies are particularly helpful when the focus is to gain understanding of *complex issues* (Flyvbjerg, 2006: 219).

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[24] The process was not followed to the end in 2014 as my maternity leave from 2013-2014 meant that I was not able to follow the process in this period. Furthermore, my good connections with the participants where limited due to the absence.

The research design is not only a case study but also an interpretive case study as opposed to a quantitative case study (Flyvbjerg, 2006; Klein & Myers, 1999, Walsham, 1995). Terms like qualitative or in-depth are likewise used by these authors for this type of case study. Being a qualitative study it draws upon the same logic as for instance Myers described on the web resource *Qualitative Research in Information Systems*:

> "*The motivation for doing qualitative research, as opposed to quantitative research, comes from the observation that, if there is one thing which distinguishes humans from the natural world, it is our ability to talk! Qualitative research methods are designed to help researchers understand people and the social and cultural contexts within which they live.*" (Myers, 1997)

Thus, qualitative research is concerned with communication and emphasizes individuals' expression of their interpretations though e.g. interviews.

Walsham pointed to another reason for conducting interpretive research, as he stressed that truly understanding a phenomenon under study builds on a detailed familiarity with the organizational setting and its people and processes (Walsham, 1995). To describe this necessary element in interpretive case studies Walsham borrowed the concept of *thick description* from Geertz (1973). Geertz highlighted the importance of capturing and communicating in detail what takes place in a situation as the basis for making sense of the situation. Thus, drawing from this design means that the resulting understanding of the case is based on an in-depth study of the case and the activities taking places there.

From the in-depth focus of the interpretive case study is a typical criticism that these studies lack generalizability beyond the boundary of the case site and thus lack relevance (Flyvbjerg, 2006; Walsham, 1995). Often, the researchers who raise this type of criticism subscribe to a natural science ideal within the social sciences and therefore strive for statistical generalizability (Flyvbjerg, 2006). However, statistical generalizability is not an objective within an interpretive or in-depth case study. Taking an interpretive approach (Walsham, 1995) the aim of an interpretive case study is to gain understanding of the unique processes in a specific case, and based on this understanding to make *theoretical* generalizations (Eisenhardt, 1989; Walsham, 1995) in the form of e.g. theoretical concepts, which might be identified in other contexts as well. In a similar line, Walsham stressed that although interpretive case studies truly lack statistical generalizability other forms of generalizability can be drawn from the convincing arguments based on interpretive case study findings (1995). In continuation hereof, Walsham considered generalizations within interpretive research to be *tendencies* rather than *predictions*, as structures in the social world are highly affected by the humans and their actions

(Walsham, 1995: 79). Walsham pointed to four types of generalization from interpretive case studies:

> - The development of concepts
> - The generalization of theory
> - The drawing of specific implications
> - The contribution of rich insight

From: Walsham, 1995: 79-80

To enable generalizations from a case study the selection of the case is of course important (Flyvbjerg, 2006; Stake, 1995). The overall criterion for the case selection is naturally that it can enrich our understanding of the phenomenon under study. Stake similarly pointed out that case studies are not representative however well we choose them. The case selection should then rather be guided by a focus on maximizing our opportunity to learn from the case. Furthermore, Stake stressed the need to select a case that enables easy access and is open towards our study (Stake, 1995).

Following in particular Myers' and Walsham's perspectives above, an interpretive case study would be an appropriate approach for my study. Firstly, interpretive case study supports the aim of gaining *understanding* of the process of IS-related organizational change, which is the purpose of the study cf., the research questions in section 1.5. Further, an interpretive case study allows one to study how the phenomenon unfolds empirically in its real life setting. In addition to this, this design fits well with the sensitizing device. Meaning, that as the study is sensitized by the Complex Responsive Processes perspective (see Chapter 3) the focus is on the interactions between the people involved. Attaining an understanding of the IS-related organizational change processes within this perspective requires a focus on the people, their differences, and they communicate and relations (see Chapter 3). Thus, an interpretive case study with its focus on people as a key source of empirical insight seems fitting. During the study, the focus was therefore on gaining insight into the individuals' interactions and interpretations and through that the process of IS-related organizational change. This was attempted through conversations with the relevant people and by trying to get a sense of their reality when spending time in the organization.

As described in the Research Focus (Chapter 1) and supported by the sensitizing device, the aim of the research was to gain an understanding of specific processes of IS-related organizational change in the case, and to use this understanding as the basis for conceptualizing the phenomenon. In this pursuit, an interpretive case study is a suitable research design, as this approach encourages a preoccupation with the unique features of the case and enables an open and in-depth study of the situation, while simultaneously holding the potential for theorizing about a larger relevance of the findings (Flyvbjerg, 2006; Walsham, 1995). More specifically the indented type of generalizations in the study is *development of concepts* about the process of IS-

related organizational change and *contribution of rich insights* into the process (Walsham, 1995). The argument for the specific choice of case is included in section 4.2 below.

4.1.3 A process focus

As the focus of the study is the *process* of IS-related organizational change, the study is constructed as a process study. This links naturally to a case study design as e.g., Walsham pointed out when he highlight that doing interpretive or in-depth case studies require spending a vast amount of time at the case site (Walsham, 1995). Thus, the time perspective resembles a longitudinal study (see e.g. Pettigrew, 1990). Meaning that the case is studied over a period of time as opposed to focusing on the outcome from the process as the focal point and studying *snapshots* in time.

According to Van de Ven (2007), a process study is a relevant approach for studying *how* questions. Further, he contrasted the process study with the variance study, which focuses on the antecedents or consequences of a change (Van de Ven, 2007). A process study is particularly helpful for gaining insight into how a change process unfolds and requires data covering a period of time. When it comes to process studies Van de Ven stressed the important role of the narrative in creating explanations:

> "*since a process question is not whether, but* how*, a change occurred, we first need a story that narrates the sequence of events that unfolded ...*" (Van de Ven, 2007: 146)

Thus, a process study requires a focus on the underlying mechanisms or reason for the way the change process unfolds rather than just a focus on which independent variables caused the change, as would be the focus in a variance study (Van de Ven, 2007).

Regarding the relevance of a process focus in this dissertation, it naturally coincides with a case study design and further the focus of this dissertation is on understanding *how* the process of IS-related organizational change unfolds, a process perspective would be a relevant choice based on the arguments by Van de Ven (2007) presented above. Additionally, it can be noted that the narratives about the process, which Van de Ven highlighted, are, in this dissertation, inspired by the Complex Responsive Processes perspective and determined by the empirical material. Furthermore, Van de Ven's stressing of the role of the narrative highlights the relevance of interpreting the empirical events (in light of a theoretical perspective or research interest) thus, identifying the narrative accounting for the events. In this dissertation, this is done by identifying episodes in the empirical process, by focusing on gestures and responses as suggested by the sensitizing device.

4.1.4 Implications of the research design

Applying an interpretive case study design with a process focus has some implications for the way a study is conducted to ensure its quality. Firstly, it naturally means studying a case in its real-life context, as mentioned above. In line with this, it also means conducting an in-depth study of the case and taking the interpretations or stories told by the individual into account. Further, it means studying the case overtime, as the basis for understanding the process through which the phenomenon unfolds. In addition to these methodological implications, the choice of design also carries some implications for understanding the role of the researcher and for the way the research might be evaluated. Thus, the two subsections below reflect on the role of the researcher and the quality criteria respectively.

4.1.4.1 The role of the researcher

When conducting qualitative research the researcher becomes a significant part of the study. For instance, Richardson, in *Handbook of Qualitative Research,* stressed the necessity to know the researcher in a qualitative study as compared to a quantitative study:

> "*The researcher – rather than the survey, the questionnaire, or the census tape – is the 'instrument'.*" (Richardson, 2000: 925)

Her point is that in qualitative research the researcher uses him or herself in the research process. In this way, the researcher makes a difference in the research as the specific researcher sees some things and misses others. Furthermore, the researcher will have a specific way of seeing things based on interests as well as prior knowledge and experience.

Walsham (1995) likewise stressed the need to pay attention to the role of the researcher, however in a slightly different way. He pointed to the close interaction between the interpretive researcher and the case under study and emphasized the importance of reflecting upon one's role as a researcher:

> "*Interpretive researchers are attempting the difficult task of accessing other people's interpretations, filtering them through their own conceptual apparatus, and feeding a version of events back to others, including in some cases both their interviewees and other audiences. In carrying out this work, it is important that interpretive researchers have a view of their own role in this complex human process.*" (Walsham, 1995: 77)

In this way, Walsham directed attention to the issue that the researcher in this type of research unavoidably affects the people under study. Therefore, researchers conducting qualitative research need to be aware of the affect their presence has and

to reflect about their role in the study. In this regard, Walsham distinguished between two researcher roles, that of the outside observer and that of the involved researcher (Walsham, 1995). The outside researcher is not part of the organization under study unlike the inside researcher. However, both researchers influence the case they study. The advantage of being an outsider is that the researcher most likely will not be perceived as having a personal stake in the outcome and interpretation of various situations, thus people might hold back a little less (Walsham, 1995). The prize paid, compared to the inside researcher, is that of absence; as an outsider one is able to spend less time on location (Walsham, 1995), and thus risk missing important information or insights.

In the PhD study, I have been aware of my role as a researcher as pointed out by both Richardson and Walsham. In regards to Richardson's point that the researcher is the *instrument* in qualitative research, I consider this a condition when conducting this type of research. The way I have handled this is by describing the research process in some detail without trying to cover-up the less systematic parts. Further, I provide a detailed overview of the case and the process of IS-related organizational change within it later in this chapter (section 4.2). The hope is that being explicit about both the research and the empirical process might help the readers judge the results for themselves.

The second dimension was Walsham's distinction between the outside researcher and the inside researcher. In this regard, I consider myself an outside researcher, since I do not see myself as part of the organization and am not regarded as one by its members either. However, as pointed out by Walsham even an outside researcher influences the case merely by being there and asking questions and thus affecting the mindset and interpretations of the people there (Walsham, 1995). As with the issue of the researcher being an instrument in the research, the researcher's influence on the case cannot be avoided in an interpretive case study where one interacts closely with the people in the case. The approach to handle the issue described above applies to the concern of affecting the research object as well.

Overall, I am aware that I influence the people in the case, and they influence me, therefore I do not consider the empirical material that my research builds on to be something I can just *pick-up*. Rather I consider the empirical material to be co-constructed together with the people with whom I interact. Therefore, the way I approach e.g. an interviewee and pose my questions influences the answers I obtain. For instance, I might ask questions that the person had not thought about beforehand and would not have thought about if I had not been there. Thus, I moved away from the idea of *collecting* empirical material as a neutral process and embraced the idea of *co-constructing* empirical material. I consider the process of co-constructing empirical material as a more active process where both I as the researcher and the people from the case plays an active and intentional part.

4.1.4.2 Quality criteria

This section highlights the criteria by which the quality of the research might be evaluated by drawing upon the seven principles introduced by Klein & Myers (1999) as principles for interpretive research, more specifically with a hermeneutic focus. First, the aim with the paper by Klein & Myers is highlighted along with the sources on which they developed their principles. Subsequently the seven principles are presented one at a time. Each of these seven presentations ends with reflections about how the specific principle is addressed in the dissertation. Finally, the section ends with a table summing up the seven principles and the way they are addressed in the dissertation (see Table 4.1).

In their paper from 1999, Klein & Myers stressed the need for principles by which the quality of interpretive field research can be evaluated. According to them this is necessary as this type of research cannot adequately be evaluated based on the same principles as positivistic research. As they pointed out, the purpose of the principles presented is to assist researchers, reviewers and editors, so that the work done in an article does not have to be repeated by each individual researcher:

> "*Without the principles proposed in this paper, each and every interpretive researcher would have to spend considerable time deriving the theoretical foundations for their research from diverse literature sources.*" (Klein & Myers, 1999: 87)

Further, they believed that the introduction and discussion of such interpretive research principles might be able to further the interpretive research approach. In the paper, they presented seven principles, which they have identified by searching for a particular philosophical stream of interpretive literature, namely the hermeneutic literature. By searching through this literature, seven principles or criteria for good hermeneutic research were derived. As suggested by Klein & Myers the principles can be applied as a post hoc evaluation by e.g. reviewers and editors but also by researchers during the research process to make sure all seven principles are considered. They do however point out that the principles cannot be applied mechanistically; rather it is up to the researchers, reviewers and editors to judge for themselves how the principles should apply in a specific study.

Principle #1 The Fundamental Principle of the Hermeneutic Circle
Klein & Myers drew their first principle more or less directly from hermeneutics and Gadamer. They highlighted that this principle is fundamental to any hermeneutic interpretation and that it is therefore a kind of meta-principle on which the other six principles expand (Klein & Myers, 1999). More specifically this principle stresses the need for iterative moves between generating understanding of the parts and using this understanding to gain an understanding of the whole, and then apply this understanding to improve prior understanding of the parts. The point being that

neither the parts nor the whole can be understood on their own. Only by moving between the two levels of understanding can we improve our understanding of both.

In my study, I have come to an understanding of the specific episodes, their gestures and responses as well as the conversations, themes, narratives, power relations and choices and intentions enlightened by the sensitizing device. This understanding was then applied as I developed an understanding of the whole process and the patterns across the episodes. The understanding of the process and the patterns further helped me to reach a better understanding of the episodes.

Principle #2 The Principle of Contextualization
The second principle is concerned with the need to make explicit the context of the phenomenon under study. The reason for this need is that the phenomenon that interpretive researchers study is highly influenced by its context and will in the future affect the context. A contextualized understanding of the phenomenon is an aim for researchers drawing form hermeneutic ideas. A number of different characteristics, e.g. historically, socially, politically, can be used to describe the context. However, which characteristics are relevant to describe depends on the focus of the study. Related to the need for clarifying the context Klein & Myers emphasized that one should not embrace the positivistic approach to history as a source of continually repeated patterns, rather the participants in the process should be approached as influenced by the past and the context generally but at the same time an active constructer of new patterns (1999).

To meet this principle the context of the case in focus in this dissertation is described in some detail in section 4.2 in this chapter. The description of the context is linked with a description of the case and the processes under study, as the interconnectedness of context and phenomenon is acknowledged. The context described is both the present context in the municipality and the prior (historical) situation at the area leading to the change process under study. As the Complex Responsive Processes perspective guides the study, attention is drawn towards the interactions between people, thus an essential part of the context to describe is how the people involved in the specific process are linked to each other.

Principle #3 The Principle of Interaction Between the Researchers and the Subjects
By introducing this principle, Klein & Myers highlighted that the interpretive research and the resulting understanding is co-created between the participants and the researcher. This means that by asking questions or by merely being present at the case site, the researcher influences the understandings and interpretations of the individuals at the case site. At the same time, however the individuals participating in the study also influence the understandings and interpretations of the researcher. It is thus relevant as a researcher to be aware on one's own role in the research

process as one is not a neutral observer standing outside the research process as well as the interactions between oneself and the participants.

In this dissertation, this principle is addressed in the section above on the role of the researcher. Within that section I reflected on my role as a researcher and on how I affect the people I study and on how they affect me. This is done in recognition that the empirical material I gather is actually co-created between the people from the case and me. During the study, this understanding was brought to my attention from the applied sensitizing device, which carries a similar understanding of everything being constructed through interactions and the awareness was to some extent captured in my analytical memos, which are described later in this chapter.

Principle #4 The Principle of Abstraction and Generalization
With this principle Klein & Myers stressed that even though interpretive research is very interested in the unique features of a situation and strives to understand those, it is likewise a focus to relate these particular insights to abstract concepts, which might apply to multiple situations (1999). To enable such abstractions Klein & Myers pointed to the relevance of applying theory (or theoretical concepts from a sensitizing device) in the process of moving from the unique understanding of the case towards a more abstract, general, or theoretical understanding of the phenomenon under study.

In this study, the Complex Responsive Processes perspective is applied to support the abstraction and generalization. More specifically the empirical insight and the preliminary understanding of the process taking place in the case (as described in the case description later in this chapter) is related with the theoretical concepts from the Complex Responsive Processes perspective. The abstraction and conceptualization resulting from this is presented in Chapter 5 (Case Analysis). Furthermore, these insights are related to the existing IS literature on IS-related organizational change in the discussion in Chapter 6.

Principle #5 The Principle of Dialogical Reasoning
According to Klein & Myers interpretivism, and hermeneutics in particular, emphasize understandings as building on one's preconceptions or pre-understanding (1999). Therefore, they stress the need for researchers to be aware of their own pre-understandings. Further, they stress the need to be critical towards incidences where the empirical material contradicts the pre-understanding and open towards moving from pre-understanding to a new understanding. According to this principle, the researcher should make the intellectual basis of the research clear to oneself as well as the reader.

The description of the process towards the current design of the study in subsection 4.1.1 is a step towards being explicit about the pre-understandings brought into the study and about the way they are transformed in the early encounters with the case.

Furthermore, it is briefly mentioned that I approached the study with an interpretive and more specifically hermeneutic mindset, which is also reflected in the literature to which I refer. In addition to these pre-understandings, the Complex Responsive Processes perspective likewise introduces a set of pre-understandings, which is why the perspective is described in detail in Chapter 3.

The second part of the principle suggests a critical eye for incidences where the empirical material contradicts the pre-understandings. I am aware of the risk of unintentionally covering up contradictions between the empirical material and the assumptions carried by me and/or the sensitizing device and strive to avoid this by firstly coding the empirical material solely according to the empirical events taking place in the case. In this way the empirical process, as presented in the case description in section 4.2 gets a voice as well before the systematic application of the theoretical concepts. The analysis is described in detail in section 4.4 in this chapter.

Principle #6 The Principle of Multiple Interpretations

This principle draws upon the understanding that human actions are *conditioned by a social context involving multiple agents* (Klein & Myers, 1999: 77). As this is the case, an interpretive researcher should search for multiple viewpoints and interpretations between the different people with whom one interacts. When differences are identified one should further look for reasons for these differences e.g. in regards to power, economics or values. Lastly, Klein & Myers pointed to the relevance of holding the potentially contradicting viewpoints or interpretations up against each other and using this to further one's understanding of the phenomenon.

As this study is guided by the Complex Responsive Processes perspective the focus when striving for an understanding of change is accordingly on identifying differences and maybe even conflict between the participants. The sensitivity required by principle six are thus curtailed in the study, as the potential differences and conflicts between the participants may not be expressed openly but may rather be identified as different stories emerging during the conversation with the participants. Thus, allowing people room to tell their story during e.g. interviews has had a high priority throughout the study.

Principle #7 The Principle of Suspicion

The principles described above focus on interpretation and finding meaning. This principle on the other hand focuses on discovering the presence of false consciousness and calls for suspicion towards underlying explanations. The assumptions in this principle draw heavily upon critical theory with its aim to uncover underlying mechanisms. Klein & Myers were thus open to the possibility that some interpretive researchers might *choose not to follow this principle in their work* (Klein & Myers, 1999: 78). The idea with the principle is however that the researcher should move beyond attempting to understand the empirical material to

also attempting to understand the social world hidden behind the explanations that people give themselves.

As mentioned, many of the differences and conflicts between in this case might not be expressed explicitly and might thus require some looking beyond the surface. This is for instance what is suggested by the theoretical distinction between legitimate and shadow themes. In this study, it is however not a goal in itself to uncover underlying social structures but rather to gain an understanding of an IS-related organizational change process and how it unfolds.

The principles	Addressed in this dissertation
1. The Fundamental Principle of the Hermeneutic Circle This principle suggests that all human understanding is achieved by iterating between considering the interdependent meaning of parts and the whole that they form. This principle of human understanding is fundamental to all the other principles.	Move back and forth between attempting to understand the episodes (and the parts with them) and the whole process. See section 4.4
2. The Principle of Contextualization Requires critical reflection of the social and historical background of the research setting, so that the intended audience can see how the current situation under investigation emerged.	The context is described in some detail, giving the reader insight into the process leading to the change process under study. See section 4.2
3. The Principle of Interaction Between the Researchers and the Subjects Requires critical reflection on how the research materials (or "data") were socially constructed through the interaction between the researchers and participants.	I reflected on an ongoing basis on my role as a researcher and on the way I as a researcher, influence the people I study and the way they influence me. A summary of these reflections are included in the dissertation. See subsection 4.1.4.1
4. The Principle of Abstraction and Generalization Requires relating the idiographic details revealed by the data interpretation through the application of principles one and two to theoretical, general concepts that describe the nature of human understanding and social action.	The empirical process is analyzed in the light of the theoretical concepts from the Complex Responsive Processes perspective. The findings from the study are further linked with the existing IS literature. See Chapter 5 and Chapter 6
5. The Principle of Dialogical	The description of the process towards

Reasoning Requires sensitivity to possible contradictions between the theoretical preconceptions guiding the research design and actual findings ("the story which the data tell") with subsequent cycles of revision.	determining the research focus is an approach explicit about the researcher's pre-understandings. Furthermore, attention has been paid to the empirical material before theoretical analysis, opening up to potential contradictions.
6. The Principle of Multiple Interpretations Requires sensitivity to possible differences in interpretations among the participants as are typically expressed in multiple narratives or stories of the same sequence of events under study. Similar to multiple witness accounts even if all tell it as they saw it.	An important principle due to the chosen sensitizing device's assumptions about change. Allowing people room to tell their version of what they are part of is therefore prioritized.
7. The Principle of Suspicion Requires sensitivity to possible "biases" and systematic "distortions" in the narratives collected from the participants.	Uncovering underlying social structures is not a focus in the study; however, it is recognized that the official stories should not always be taken at face value.

(from Klein & Myers, 1999)

Table 4.1: The seven principles

4.2 The Case Site

This section describes the case site with the purpose of better understanding the later analysis. Contextualizing the later understanding of the phenomenon is important as suggested by Klein & Myers' principle 2.

The chosen case site is a Danish municipality (the Municipality of Frederikshavn), more specifically however the focus of the study is the municipality's school area and the striving for digitalizing the schools. Therefore, the following subsections describe the choice of the case and access to it, the overall case site as the Municipality of Frederikshavn, the municipality's school area and more specifically the digitalization efforts. Finally, the section ends with some reflections on the choice of a public organization as the case site.

4.2.1 Choosing and accessing the case

In this section, I reflect briefly about how and why the particular case was chosen and what we might learn from the case. As access to the case is of high significance in any study not least a qualitative study, the section further includes some considerations in regards to this matter.

4.2.1.1 The choice of case

As is hopefully clear from the first section in this chapter, the choice of case was somewhat backwards compared to the approach described in much of the methodology literature, as I first chose the case and then nuanced the research focus and chose the sensitizing device. The case was chosen as some seemingly interesting processes regarding IS-related organizational changes were taking place. Furthermore, a prior relation to a key person at the case site existed (see the following section) and enabled access to the case.

What makes the specific case relevant for learning about the phenomenon of IS-related organizational change is the fact that they were going through a process of attempting to initiate a new approach for the role of IT in the hope of creating organizational development and change. In addition, the process was acknowledged internally as a significant process and both time and resources were allocated to it. On top of this, the people involved were open and positive towards the opportunity to communicate with me about what they were doing.

4.2.1.2 Access to the case

As Walsham stressed, access to the case is of high importance since the interpretive case study requires spending a vast amount of time at the case site (Walsham, 1995, 2006). In this particular case, the access was established based on prior collaboration with one of the key persons in the case. Prior to and during my initial work on my PhD study I participated in a collaborative practice research (e.g. Mathiassen, 2002) project called DISIMIT (*Digital Service Integration through effective Management of IT in Danish Municipalities*). In the project I and a group of other researchers worked together with eleven IT/IS leaders and their organizations for three years from 2009 to 2011 (disimit.dk).

Through a consultant likewise participating in the DISIMIT-project I learned that one of the eleven organizations were engaging in an effort to digitalize their schools, and that their school digitalization program might be of interest to me. This led me to contact the IT-leader for an informal conversation about their ideas and the possibility of gaining access to study the process over time. Based on the IT-leader's positive experience with the DISIMIT-project he was pleased to mediate contact with some of the other key people involved in the school digitalization program. Furthermore, the IT-leader supported my query for access by communicating with the others about his prior experience. This mechanism of people letting others know that I could be trusted seems to have helped me each time I needed to get in contact with others related to the process.

4.2.2 The Municipality

The Municipality of Frederikshavn is an above average size municipality in the northern part of Denmark. As a Danish municipality, the Municipality of Frederikshavn delivers a number of different services to the citizens in their geographical area; further, the delivery of many of those services requires close

interaction with the citizens. In Denmark, a municipality has the responsibility for delivering social services such as: elder care, childcare, public schools education[25] and social welfare. Further, a municipality is responsible for maintenance of the local roads, for local environmental and planning issues, for the supply of water, electricity and waste disposal, for libraries, music schools and other cultural initiatives as well as part of the employment end health efforts. The Municipality of Frederikshavn organizes these many tasks in seventeen administrative entities called centers each with a head of center. Above this level are the four directors in the board of directors, each responsible for a number of centers (see Figure 4.2 below).

The municipality employs approximately 6,000 and provides public services to the 61,000 citizens living in the area on the outskirts of the country. The geographical location along with the lack of institutions for higher education leads many young people to leave the area to study and later work elsewhere. Over time, this has resulted in an increase in the average age and a decrease in the municipality's attractiveness as a place to work and live (see e.g. www.kora.dk). Apparently, this external pressure has led the municipality to experience a need for proactive change. The hope was to neutralize some of the negative effects and improve the areas attractiveness.

Regardless of the motivation, a willingness to change and experiment has characterized the municipality for the last few years. One of the changes the municipality launched was a change in the organizational structures. During 2010 and early 2011 the municipality changed their organizational structures with the purpose of gaining a flatter and less silo separated organization (see Figure 4.2). This change process led to among other things the former IT department (now Center for IT, Digitalization & Welfare Technologies, hereafter Center for IT) gaining a wider responsibility for the organizational aspects of IT/IS in the municipality.

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[25] This includes both lower and secondary schools. Further, it should be noted that the Danish school system is primarily public.

Figure 4.2: Organizational chart

Another element in the process of re-structuring was the decision that the municipalities leaders and managers should be better able to embrace and support change. During 2011 and 2012, the 240 leaders and managers in the municipality therefore participated in one of a number of eight-day courses on leadership and approaches to leading future change. The idea was to support the leaders and managers in working with change in their part of the organization in a way that was progressive yet sustainable for both organization and employees. These changes at the municipality level suggest that preconditions made possible a process of IS-related organizational change. Understanding these preconditions is thus part of understanding the strategic effort at the school area to digitalize the schools area.

4.2.3 The school area and IS

Besides the preconditions at a municipality level, a number of challenges specific to the school area helped trigger the process of digitalizing as well. Thus, it is necessary to understand the school area and the specific situation prior to the decision to develop and implement a strategy about the digitalization of the school area. This section therefore describes the school area in general and the use of technology prior to the initiative.

4.2.3.1 The school area

Delivering public school education is a significant responsibility in a municipality. The school area employs more than 1,000 employees (a little more than half of which are teachers) and provides teaching for around 6,000 pupils. Along with teaching, the area also consists of some technical and administrative tasks as well as the after school daycare provided for the youngest pupils in close collaboration with the school (frederikshavn.dk – quality report 2012-13). The Center for Schools employs a few consultants along with the head of the center while the 16 schools placed throughout the 650 km^2 school district each employs somewhere between 14 and 250.

The purpose of Danish public schools is to teach children between 6/7 and 15/16 years old, who are all obliged to attend school (Law about public schools). There are however also private schools providing a similar education, but the public schools are the most widespread. This means that the schools provide education from kindergarten to 9/10 grade similar to lower and secondary schools. Financially the schools are funded by the municipality (through the general taxes) primarily based on the number of pupils. In parallel, the schools face a number of responsibilities and requirements derived from the national policies as well as local decisions in the municipality.

4.2.3.2 The use of IS

The central Center for Schools hold the overall responsibility for the local public schools and therefore also for the use of technology. The school does however have a high degree of freedom and local authority; hence, in practice the schools are individually responsible for the use of IT/IS. At the school, the school leader and/or vice leader is responsible at the strategic level, on a daily basis three other actors are responsible at a more practical level: these are the pedagogical school-IT counselors, the technical school-IT counselors and the school librarian, who are responsible for the teaching aids (including digital ones). The counselors are teachers at the school who combine teaching obligations with the role of counselor; in this role, they assist their colleagues when it comes to the pedagogical and/or technical side of using IT in the teaching. The counselors do however not cover the technical service and maintenance, which is handled by the central Center for IT, which also handles the purchase of new equipment.

4.2.4 Striving for 'The Digital School'

This section describes the challenges experienced by the schools in regards to IT (see in the following subsection) and how these were handled. More specifically that is how the process of IS-related organizational change unfolded including the development of a new strategy for digitalizing the schools and the later attempt to implement it. Furthermore, the organization of the work towards implementing the strategy is laid out and the key actors are introduced.

4.2.4.1 Preconditions at the school area

Prior to the school digitalization program, the level of IT equipment varied a lot between the schools, as their enthusiasm and prioritization of the area had varied. Most schools had either computer rooms or a collection of laptops that the teachers could book. Furthermore, every school had at least one smart board from a prior central purchase. Some of the schools had even participated in a national IT/IS related project and some considered the use of technology as an ongoing objective at the school. Despite these differences a pre-analysis of the use of IT at the schools (conducted in 2010 as part of the school digitalization effort) showed no clear link between the prior focus on, or investments in, IT and the level of use and satisfaction. For instance, some schools had above average level of equipment, probably due to management prioritization, since the use of IT in the teaching were no higher than the average.

In 2007, the municipality decided to implement a new, shared system throughout the municipality to allow the IT function easier support for the equipment. This affected the school area as well, and the implementation process at the schools in 2008 was experienced as invasive and very problematic. The new system caused breakdowns, which lead to high levels of frustration at the schools. One school even made an official decision not to use IT in their teaching any more. The high levels of dissatisfaction at the school level and decreasing trust in the central administration, which had adopted the implementation of the new system, raised a question at the central level of how to proceed. The situations were problematic and only seemed to escalate over time raising the dissatisfaction to higher levels.

4.2.4.2 The process

The process of striving to digitalize the schools or for IS-related organizational change toke of in 2009 and continued until the end of 2014. The process is visualized in Figure 4.3 on the next page and described in more detail in the text included in this subsection.

2009 — Q3, Q4 | **2010** — Q1, Q2, Q3, Q4

Decision to benchmark

Political support for strategy process

Participation in benchmarking

Strategy process

Political approval of strategy and funding

Steering committee

Vision group

Project group

Infrastructure project

2011 — Q1, Q2, Q3, Q4 | **2012** — Q1, Q2, Q3, Q4

Presentation of strategy

Project funding decision

Pre-analysis

Pre-analysis presented at schools

Theme day

Evaluation of strategy

Schools develop focus areas

School applications

School projects

Figure 4.3: The empirical process

In the hope of showing, that the dissatisfaction and criticisms were taken seriously it was decided that the municipality would **participate in benchmarking** on the use of IT and satisfaction with IT at the schools along with a similar benchmark for the administrative areas. In addition, it was the hope that the results from the school-IT benchmarking would create a shared understanding of the problem and thus support the development of a solution. The benchmarking was completed in the fall 2009. The school-IT benchmarking clearly showed the dissatisfaction at the schools but it also showed signs of communication problems and misunderstandings. On top of this, it showed generally lower spending on school-IT in the municipality compared with the other municipalities participating in the benchmarking. When comparing the school-IT benchmarking and the administrative-IT benchmarking it suggested that maybe the problem was not (only) to be found in the Center for IT as the satisfaction with the administrative-IT was generally high.

After the benchmarking was completed, the results were presented to the political committee of Children & Youth, showing them how severe the problems were. Following the presentation of the results an approach to overcoming the problems were suggested to them. More specifically, it was suggested: a) to develop a strategy of digitalizing the school area and b) to launch an infrastructure project to overcome some of the worst problems within a short time frame. In the beginning of 2010, the politicians decided to **initiate a strategy process** and to approve and allocate founding for the infrastructure project. The hope was that the infrastructure project would improve the situation on a short-term basis, and that the strategy process and the later implementation process would improve the situation for a longer time. Further, it was hoped that the strategy development would bring new ideas and pursue the work with school-IT in the municipality.

During 2010, **the strategy was developed** through a process including vision workshops with a wider **vision group** of stakeholders as well as intense work with the ideas from the workshops in smaller groups. The groups transforming the ideas into the actual strategy was a **steering committee** (which later became the program steering committee) and a **project group**. The project group was assigned specific tasks e.g. the development of business cases for different parts of the strategy. The participants in this group were stakeholders from the areas with knowledge about the specific topic. The steering committee on the other hand was responsible for directing the overall process. To support them, and to assist the process in general, an external consultancy firm was hired. After the strategies were developed it was **politically approved** and a four year-budget of 25 m Danish kroner (from 2011 to 2014) was allocated by the politicians in the city council by the end of 2010 (frederikshavn.dk – school digitalization strategy).

The vision that was developed and presented in the strategy was to create *The Digital School by 2014 and have everybody engaged in it*. More specifically the aim of the strategy was to improve the public school teaching and education by rethinking the use of IT and technology and enable transformation or change in the teaching methods, communication forms and general service delivery. The vision was divided into six topics, each with a number of indicators as well as more specific targets to clarify further the aims (frederikshavn.dk – school digitalization strategy). The six topics are listed in Figure 4.4 below and the indicators and targets might be found in Appendix C.

Competences – *focuses on the development of digital competences and knowledge sharing*

Digital teaching aids – *focuses on digital teaching aids as a natural, flexible and accessible part of the teaching*

Leadership & management – *focuses on balancing expectations, establishing clear setup for managing school-IT and evaluating and adjusting the effort*

Technology and operations – *focuses on the technology being accessible and stable, and that the facilities allow everybody to bring their own devices*

Culture – *focuses on working towards a culture where everybody helps each other, where the approaches to the pupils are holistic, and where the leaders/managers lead the way*

Communication – *focuses on working towards all written communication being digitalized and aiming for better coordination of the communication strategies between the schools and in the municipality generally*

Figure 4.4: The six topics

After the approval of the strategy, it was **presented to the schools** both in the form of written material and in the form of on oral presentation at the schools. The idea was that not only the people who had participated in the process should be familiar with the strategy, rather it should be known by everybody at the school area. At the same time, a need to concretize the somewhat intangible strategy was recognized.

In parallel with the strategy development, the approved **infrastructure project** was carried out. The purpose of the project was to improve the prior situation with some outdated equipment and generally poor wireless network coverage. More

specifically this meant replacing old computers, establishing additional hotspots as well as checking and updating equipment.

As a first step in the implementation of the strategy an analysis of the current level of use, capabilities, culture etc. at schools were conducted during the spring 2011. The evaluation was known as **the pre-analysis** and was conducted by the same consultancy firm, which had supported the strategy development. The idea was to establish a foundation for later evaluations of whether the efforts had improved the situation. Meanwhile, the results from the pre-analysis as well as discussions in the program steering committee led the committee to move away from the original plan of investing in smart boards as developed in the strategy. Instead, they concluded that there was a need for local involvement and ownership, and that furthermore the needs at the schools were too different to be met by a few central initiatives. Thus, a **project funding structure** was created, where large amounts of the funding for the implementation of the strategy were allocated to a pool from which the schools could apply for funding a specific project. More specifically a structure was established for the use of these funds including a setup for the school project applications and their evaluation.

To support the schools in creating local IS-related organizational change project a **theme day** was arranged by the program steering committee in the beginning of 2012. During the day, school leaders, school-IT counselors and school librarians from all the schools were invited along with three external speakers. The speakers were a combination of practitioners and researchers and their speeches were intended to inspire but also to provoke the participant a little. In addition to the speeches, a creative workshop was planned to enable the participants to discuss their insights from the speeches and their ideas for creating change at their school. The day ended with an exhibition with presentations of different technologies in use at other schools and open to all the personnel at the schools.

In the spring 2012, the schools were asked to develop **local focus areas** describing how they intended to improve their evaluation score from the pre-analysis and meet the goals in the strategy. Later as the schools began sending **project applications** for funding of specific projects, the focus areas were used as evaluation criteria when deciding which projects were relevant to fund and which were not. Funding for the first projects was allocated late spring 2012 and the projects started up with detailed planning right after that, however the actual launch of the project required the delivery of the new technology the project should explore and were thus typically launched after the summer holiday 2012. The applications and projects continued throughout 2012 and into 2013.

Along with the first project applications in the spring 2012, an **evaluation of strategy** and the work towards the vision within it were completed. The evaluation took place in the program steering committee and was communicated in a condensed

form to the political committee of Children and Youth. This gave room for both shared understandings of changes made to the original plan and discussions about parts of the strategy, which had unnoticeably been de-emphasized, such as e.g. a more formalized approach to knowledge sharing. Following the evaluation was among other things a plan to begin using the municipality's website not only for communicating about the projects but as a starting point for increased knowledge sharing.

4.2.4.3 The organization

The steering committee from the development of the strategy proceeded after the approval of the strategy, now as a program steering committee with the role as central coordination and decision forum. The committee held the responsibility for the realization of the strategy including the coordination of common objectives and the allocation of funding. Thus, the program steering committee was a focal point in the strategic efforts to realize *The Digital School*. More specifically, the committee was the driver behind the evaluation, initiated the development of a service level agreement with the Center for IT, established the set-up for the funding applications and arranged the theme days. The committee consisted of six members (see also Figure 4.5 below):

> - The director covering among other things Center for Schools (hereafter the director)
> - The Head of Center for Schools (hereafter the Head of Schools)
> - The Head of Center for IT (hereafter the IT-leader)
> - The school-IT consultant
> - A school leader from one of the schools
> - The program manager
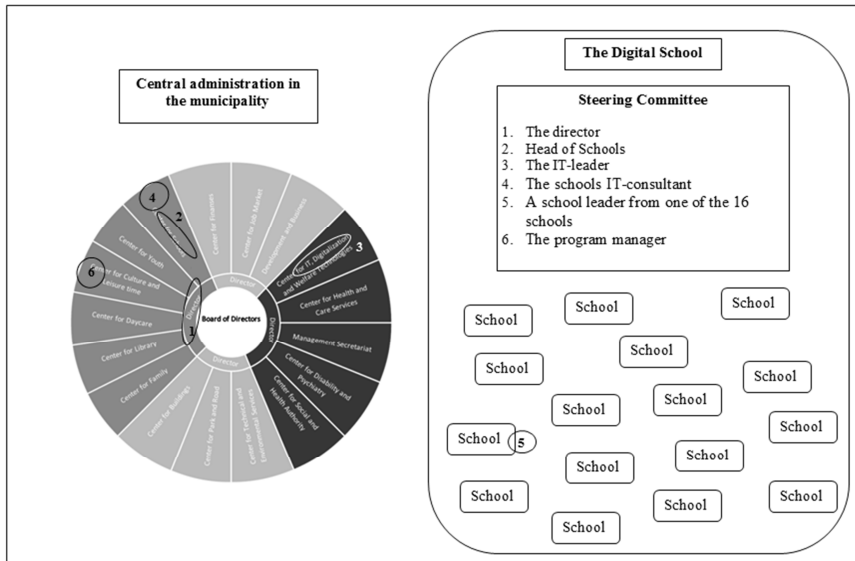
Figure 4.5: The members of the program steering committee

The members of the program steering committee thus represented the central school system in the municipality (Center for Schools), the Center for IT and the sixteen schools in the municipality (with a school leader from one of the schools). Furthermore, the committee comprised leaders from different levels (a director and two center heads) as well as others with relevant insights and competences. This was probably chosen to signal the importance of the work and to ensure actual decision-making authority.

Over time, a project committee was established below the program steering committee to assist the evaluation of the schools project applications. This committee, consisted of:

- The program manager
- The school-IT consultant
- The school library consultant
- The pedagogical administrative consultant
- An IT-employee working with school-IT

The program manager and the school-IT consultant participated from the program steering committee, the two other consultants were internal consultants from the Center for Schools and the last member of the committee was participating due to his competences regarding the technical side of IT (from the Center for IT).

The last group of important participants in the digitalization program was the individual schools. Taking the evaluation of the current level of use, capabilities, culture etc. as a starting point each school was asked to define a minimum of five focus areas they intended to work on for the following year. The schools were then able to apply for funding for specific projects intended to address one or more of the focus areas. The hope at the central level was that this type of involvement at the local level might lead to an improved sense of ownership as well as to less standardization than a top-down project would. Typically the primary actors at the school level were the school leader, the school-IT counselor(s) and the librarian (who had the responsibility for teaching aids), although the teachers, pupils and parents were also important stakeholders, and could be the drivers of specific projects.

The empirical setting described here is the case, which was studied. The following sections describe how the case was approached regarding the co-creation of empirical material and later regarding the analysis of the material.

4.3 Empirical Material

To enable the reader to follow the process of co-creating the empirical material and consequently to assess the research findings this section presents the methods used. Empirical material can be co-constructed in a number of ways within interpretive case study methodology, and it is assumed that combinations of several methods strengthen the research (e.g. Walsham, 1995). The present study builds on the combination of qualitative interviews, observations and the study of internal documents. The combination of these different empirical sources contributes with different kinds of material and illuminates different issues of interest.

The research aim and more specifically the research questions guided the co-construction of empirical material. Further, the Complex Responsive Processes perspective functioned as a sensitizing devise (Klein & Myers, 1999; Walsham, 1995) in my interactions with practice and likewise was influential in the analysis and interpretation process. With regard to the empirical material, this meant that the theoretical concepts directed my attention towards specific elements of the phenomenon, those elements of focus during the interviews, observations etc.

As mentioned, Ven de Ven emphasized the need for basing a process study on empirical material covering the process over time. More specifically, he pointed to the relevance of both *historical archival files* and *real-time field studies* (2007: 195). In this dissertation, I included empirical material from a real-time field study but as no historical archival files existed about the process, I supplemented the real-time empirical material with retrospective material from both interviews and internal documents. More specifically, this meant that I followed the processes in the case

over time[26], but that the use of retrospective data was necessary since it is often not possible beforehand to know if a process would be interesting or not (Leonard-Barton, 1990; Van der Ven, 2007). One accesses the case at one point in time where events of high importance for the way the process unfolds might have happened. It does however raise some methodical issues since people's present insights often affect their memory of past events. In this way, their interpretations of past events might disclose as much about the present as the past. The study of documents may support the understanding of past events and when the interpretation of the past primarily tells something about the present.

At this point it should be noted that the initial part of the case study was highly explorative, attempting to identify the relevant issues to focus on. The methods presented below do primarily cover the later and more systematic part of the empirical material, however the material from the explorative part are included in Table 4.2 below. In the sections below the entire empirical material from Spring 2011 to the end of 2012 are included under the headline covering the specific type of empirical material.

Time	Type	Source	Duration
2011			
Marts	Un-structured interview	External consultant	Approx. 1 hour
April	Un-structured interview	IT-leader	Approx. 1½ hour
May	Semi-structured interview	Program manager	Approx. 1 hour
	Semi-structured interview	Internal school-IT consultant	Approx. 1 hour
	Semi-structured interview	Head of Schools	Approx. ¾ hour
June	Un-structured interview	Program manager	Approx. 1 hour

Table 4.2: The explorative part

One of the few difficulties I experienced during the empirical part of the study was from time to time the difficulty of conducting a study and establishing contacts within an organizational setting characterized by high levels of local autonomy. Even though the people at the central level had granted me access and supported my study, there was no guarantee that the people at specific schools would be interested in giving me access to their part of the process. The central level proved very helpful in assisting my communication with e.g. the schools by encouraging them to

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[26] The process of IS-related organizational change in the municipality takes place from the beginning of 2009 to the end of 2014. However, I only followed the process from spring 2011 to the end of 2012.

participate, but they had every right to choose for themselves. This meant that I needed to work on establishing contact with each different group of people that I wanted to include in the study. Luckily, most of the time people were willing to talk with me about their experience and perception of the process.

4.3.1 Interviews

Interviews are considered a key method for empirical material within the qualitative research tradition (e.g. Kvale, 1996; Walsham, 1995). The term interview is used in a wide sense to cover both formal semi-structured interviews and the more informal un-structured interview. The former is an interview in a classical sense and is what will be described in this section. The informal un-structured interview on the other hand gives access to some of the same empirical material as the formal interview; however, the informal un-structured interview is not audio-recorded and thus requires the researcher to take extensive notes afterwards. Furthermore, the un-structured interviews have a secondary purpose besides contributing directly to the empirical material, which is to establish and maintain good relations.

Generally, the purpose of an interview is to gain insight into the way people interpret what is going on; this interpretation is of course affected of the researcher being there and asking questions. The weakness of the method is clearly compensated for by the possibility to study the account people give for their interactions and the reasons behind it; likewise, this method can bring insights to issues people think about but do not bring into the meetings, frustrations they experience and whether or not the outcome of e.g. meetings fit their expectations.

During the study various people were interviewed e.g. the IT-leader, the program manager, the Head of Schools, school leaders, teachers etc. Each person interviewed was chosen due to his or her role in the process and considered an important source of information about the way the process unfolded. The interviewees were selected throughout the process, meaning that a key person was identified as evident key people and thus relevant interviewees from the outset, but most were identified along the way. Further, some of the key people were interview both in the beginning and later in the process. In total twenty-two interviews were conducted (see Table 4.3 below).

Time	Type	Source	Duration
2011			
September	Un-structured interview	Program manager	Approx. ½ hour
2012			
January	Un-structured interview	Program manager	Approx. 1 hour
May	Semi-structured	Internal School-IT consultant	Approx.

	interview		2½ hours
	Semi-structured interview	School leader (from program steering committee)	Approx. 1 hour
	Semi-structured interview	IT-leader	Approx. 1 hour
June	Semi-structured interview	Program manager	Approx. 1¾ hour
	Semi-structured interview	Head of Schools	Approx. ½ hour
August	Semi-structured interview	School leader and school-IT counselor at School X	Approx. ¾ hour
September	Semi-structured interview	Vice school leader and school-IT counselor at School Y	Approx. 1 hour
	Semi-structured interview	Vice school leader at School Z	Approx. 1 hour
	Semi-structured interview	Teacher at School T	Approx. 1 hour
November	Semi-structured interview	Group of teachers at School Z, project a	Approx. 1 hour
	Semi-structured interview	Group of teachers at School Z, project b	Approx. ¾ hour
	Semi-structured interview	School library consultant, member of the project committee	Approx. 1 hour
	Semi-structured interview	Pedagogical administrative consultant, member of the project committee	Approx. ½ hour
	Semi-structured interview	External consultant (from consultancy firm)	Approx. ¾ hour

Table 4.3: Interviews

The formal interviews were semi-structured (Kvale, 1996) meaning that an interview guide was created before the interview, but that the interview guide did not determine the specific questions or the order of the questions, rather the interview guide stated the topics or themes that the interviewer should make sure were covered during the interview. As the study included interviews with many different people, the focus of the interviews was of course different as well. This meant that different interview guides were needed and the interview might differ. For instance, interviewing managers might require showing that you were well-informed and very specific with regard to the knowledge of interest, on the other hand interviewing a local teacher might be an intimidating situation for the teacher and it might thus be helpful to come across as more open and un-familiar with the topic. Examples of interview guides for the different interviews are included in Appendix D. Despite the different interview guides the overall approach was similar, for instance, all the semi-structured interviews were audio-recorded and later transcribed. Furthermore, all the interview guides were similar in that the

Complex Responsive Processes perspective directed attention towards potentially relevant elements in addition to a few more factual questions the interview guides contained. During the interviews, I did however pose mostly open-ended questions, which I then followed up with further questions, an approach supported by e.g. Kvale (1996). Further, I tried to imitate a natural conversation as much as possible and therefore I commented on the interviewees' interpretations and related to their perceptions. This made the situation feel natural to the interviewees. I did however keep my comments as general as possible, to avoid influencing the interpretation more than my mere presence and my questions did. The un-structured interviews were not guided by an interview guide and were not audio-recorded or transcribed. These informal un-structured interviews unfolded as a conversation initiated only by the researcher's question about what the interviewee had being doing, how it was going or what she/he was thinking about it.

4.3.2 Observations

Another useful approach to empirical material is observations, which enables one to spot what people are doing in real life. As Mason stated observations are helpful for gaining insight into "interactions, actions and behaviors and the way people interpret these, act on them and so on (Mason, 2009: 85). Observations thus gave me the opportunity to pay attention to some of the theoretical concepts presented in Chapter 3, e.g. how people interact and with whom, what they say and do, who gets in their way. Furthermore, according to Mowles it is reasonable to pay attention to strong emotions as they typically reveal that something important is in play (Mowles, 2011b).

In practice, I was only able to observe meetings at the central level, meaning observations of meetings in the program steering committee, observations of theme days etc. The ten observations made are included in Table 4.4.

Time	Type	Source	Duration
2011			
October	Observation	Program steering committee meeting	Approx. 2 hours
	Observation	DISIMIT workshop with school people (and others) discussing digitization	Approx. 7 hours
December	Observation	Interaction between representative from Center for Schools and representatives from a school	Approx. 2½ hours
2012			
January	Observation	Program steering committee meeting	Approx. 3 hours
	Observation	Theme-day	Approx. 5

		– with school leaders, school-IT counselors and school librarians; external presentations and workshop activities (incl. informal conversations with people to get a sense of their experience)	hours
April	Observation	Program steering committee meeting	Approx. 4½ hours
May	Observation	Program steering committee meeting	Approx. 2 hours
June	Observation	Program steering committee meeting	Approx. 1 hour
September	Observation	Program steering committee meeting	Approx. 2 hours
October	Observation	Program steering committee meeting	Approx. 2 hours

Table 4.4: Observations

The local level was thus only covered by the other types of empirical material presented in this part of the chapter. When observing meetings I considered my role as an observer only and did not participate in the meetings; during breaks as well as before and after the meeting, I did of course interact with the participants and talk with them about what was going on. My passive role had two purposes, firstly it enabled me to focus on observing what took place and to take extensive notes. The second reason was the initial skepticism towards my presence at the meetings and the fear that the participants would restrain themselves. To comply with the concerns I explicitly described my role and made sure to follow it throughout the process, for their sake as well as mine.

4.3.3 Internal documents

The use of documents as a source of empirical material in qualitative research is according to Mason considered *meaningful and appropriate* by many qualitative researchers (2009: 103). The documents included in a study can be of different kinds (Mason, 2009). In my study, the documents gathered were all internal documents from the municipality. Some of the documents used were different editions of the school digitalization strategy, strategic documents from the schools, e-mails, minutes from various meeting, etc. (see Appendix E).

As a Danish public organization, the municipality has an obligation to document their work and on request make this available (unless there are good reasons not to, e.g. personal information). Due to my access to the organization, a formal request was not needed. Around 500 documents were gathered covering the period between June 2008 and October 2012. The documents included minutes from meetings,

working documents, presentations and agendas for meetings, press releases, e-mails, official information, strategic documents etc. After the documents were accessed, they were sorted according to their relevance for the study, e.g. duplicates were excluded and so were some technically oriented documents. The documents were used to become acquainted with the context, to figure out which topics to talk with people about and to support or contest the account individuals gave of the processes.

As documents only represent a negotiated agreement at one point in time and do not reveal the process behind it, the documents were used in combination with other types of empirical material and not on their own. My approach to handling this was to bring insight from the documents into context by discussing them with people or to view the documents as part of the context within which people interact.

4.3.4. Research notes

Another source of empirical material derived from my interpretations of situations. Thus, a curial part of my empirical material consisted of my own notes. These notes can be divided in two: those that reflected my experience of what happened (a summary of what happened) which I call field notes, and those which were more analytical and contained my spontaneous interpretations of the situations which I call analytical memos. Following each interaction with practice, I took both kinds of notes and attempted to keep them separate.

4.3.4.1 Field notes

Mason pointed out that field notes can be understood either as just representing the field observations etc., or include personal and analytical reflections as well (2009). In this regard, I made a distinction between the two types of notes and only included the more or less direct observations in my field notes, whereas the more reflective and analytical notes were documented in the analytical memos (see below). Field notes are considered important when doing fieldwork or interpretive case research as they enable the researcher to go back to the notes and work with them and conceptualize the topic (Mason, 2009). Furthermore, Mason drew upon Emerson et al., and quoted their understanding of the role of field notes:

> "*Fieldnotes are a form of representation, that is, a way of reducing just-observed events, persons and places to written accounts. And in reducing the welter and confusion of the social world to written words, fieldnotes (re)constitute that world in preserved forms that can be reviewed, studied and thought about time and time again. (2001: 353)*" (Mason, 2009: 98)

In the study, the field notes are a way of compensating for the fact that I did not record the meetings I observed or the informal un-structured interviews and thus, I needed a way of capturing these situations. However, even when I recorded e.g. an interview, the notes were valuable as they captured the context dependent meaning

or non-vocal communication. Furthermore, the notes were easier to access than audio recordings or full transcriptions and thus encouraged ongoing comparisons across the material and the search for patterns. The process of writing the notes was also helpful in itself as it gave me time to step back for the practice, and remember and think about what had happened. From time to time, this enabled me to pay attention to paradoxes or similarities between different interactions as well as values and norms that seemed peripheral but were referred to repeatedly. This was then included in the analytical memos described below.

4.3.4.2 Analytical memos

According to Mason, the other part of taking field notes, which might be kept separate from the first part, is the documentation of the researcher's ongoing understanding of the setting and as a place for developing analytical ideas (2009). She pointed out that:

> "*You may incorporate your own perceptions, everyday interpretations, experiences and so on into your fieldnotes, or alternatively you might feel that you should keep these separate from your observations of others.*" (Mason, 2009: 99)

According to her, both kinds of notes might be relevant in the process of analyzing the empirical material.

The initial point with writing the analytical memos was to make my own unavoidable interpretations explicit along the way enabling me to keep them separate from the empirical material gathered. Along the way however, the memos proved very helpful in kick starting the analysis, as I had noted various reflections and comparisons in a short and condensed form.

The analytical memos included all the reflections I had following interactions with practice, and thus functioned as a type of debriefing as well. I noted thoughts about how I understood the process, comparisons across the different parts of the process or the information from different sources and the first ideas about potential patterns. These memos also included more methodological elements like issues I wanted to look into further or critical thoughts about an interview that did not go well and the potential consequences of this.

4.4 Analysis of the Empirical Material

The research question presented in the Chapter 1 directed the analysis of the empirical material. The sensitizing device described in Chapter 3 further guided the analysis. Throughout the analysis the empirical material was primarily organized according to patterns derived empirically, an approach supported by e.g. Coffey & Atkinson (1996). Afterwards the organized empirical material was then interpreted based on the concepts introduced by the sensitizing device.

According to Coffey & Atkinson, the focus of all qualitative analysis is:

> "*transforming and interpreting qualitative data – in a rigorous and scholarly way – in order to capture the complexities of the social world we seek to understand.*" (Coffey & Atkinson, 1996: 3)

This can however be accomplished in a number of different ways, leading to different results each with its merits. Thus, this section presents the process through which the understanding of the process of IS-related organizational change was obtained. Being explicit about the process enables the reader to follow the move from the raw and unstructured empirical material to the resulting understanding, and thus highlights the conditions of the findings.

4.4.1 Analytical strategy

There exist a number of recognized ways of approaching an analysis, each ascribing particular importance to either the systematical or the creative nature. For instance, Coffey & Atkinson pointed to the heterogeneous use of the term *analysis*:

> "*For some authors, analysis refers primarily to the task of coding, indexing, sorting, retrieving, or otherwise manipulating the data (…). From such a perspective, the task of analysis can be conceived primarily in terms of data handling. (…) For others in the field, analysis refers primarily to the imaginative work of interpretation, and the more procedural, categorizing tasks are relegated to the preliminary work of ordering and sorting the data. For such authors, perhaps, analysis is essentially imaginative and speculative.*" (Coffey & Atkinson, 1996: 6-7)

Within the PhD study, both approaches are regarded as valuable. As the study contained large amounts of empirical material with a diverse nature, the *data handling* or *ordering* were crucial and analytical in nature. This understanding of the process of ordering the empirical material was similar to the understanding presented by Mason who pointed out that ordering is however not *simply technical or administrative* as it will enable and restrain the later analysis and interpretation (Mason, 2009: 171).

In the analysis the empirical material was ordered through coding, which helps keep the analysis close to the empirical process. The approach to coding was what Richards (2005) would call *topic coding*. This means that the empirical material is coded according to its subject or topic, requires little interpretation but as Richards stated it is obviously important to gather everything said (or written) about a specific topic (Richards, 2005). The relevant topics should be decided based on the research focus and design and/or identified in the empirical material. As the purpose of the

coding is to stay close to the empirical process, the empirical material is searched and coded for empirical activities. The continually written analytical memos (as described in subsection 4.3.4.2) enabled the identification of a number of empirical activities and their chronological order (see table 4.5 in subsection 4.4.2.1 below).

After the ordering of the empirical material a less structured and more creative and holistic process was required to move from ordering to sense making or understanding. This is what Coffey & Atkinson captured by describing the analysis process as *imaginative, artful, flexible, and reflexive* (Coffey & Atkinson, 1996: 10), and what Weick termed *disciplined imagination* (Cornelissen, 2006; Weick, 2002). One approach to support the imagination and reflection is through *writing as a method of inquiry* (Richardson, 2000). She understood writing as a process that leads to new insight and understanding, rather than just the final product of the research, a position that Coffey & Atkinson (1996) supported.

In the PhD study, the purpose of this part of the analysis was to conceptualize the empirical process inspired by the sensitizing device. In this process, writing was used as a creative tool supporting me in the process of moving from the ordered empirical material to the theoretical conceptualization. More specifically, to support the conceptualization, five episodes where identified based on the coding as well as the analytical memos. The separation of the empirical activities into episodes follows the empirical activities closely, but also takes into account how the empirical activities are related. Furthermore, the different empirical activities were linked to the theoretical concepts from the Complex Responsive Processes perspective (e.g. which conversations take place, which themes pattern the conversations etc.).

The applied analytical technics are described in more detail in the sections below.

4.4.2 Parts of the analysis

The analysis consisted of two parts, as touched upon above. Firstly, the raw empirical material was ordered through coding. Even though the research aim (as presented in the research question) was to arrive at a conceptualization of the phenomenon, understanding in detail the empirical process is an important foundation for the conceptual understanding. Working with and coding the empirical material facilitated a better and more detail understanding of the empirical process. This understanding was then used as input in the second part in the analysis. This part included the interpretation of the empirical material in relation to the theoretical concepts, facilitating an understanding of how the links between the empirical process and the theoretical concepts might be understood and generalized: firstly, episodes were identified and later the theoretical concepts were used to support a conceptualization of the process.

Through the process, the analysis moved towards higher levels of abstraction. The more specific and less abstract steps were however needed to be able to reach an understanding at a higher level of abstraction without losing sight of the empirical process one attempts to understand.

The subsections below present the parts of the analysis in more detail.

4.4.2.1 Ordering the empirical material

The first step in the analysis was the initial ordering of the material. As the theoretical conceptualization should draw from an understanding of the empirical process, the first ordering of the empirical material closely followed the empirical process. The notion that the conceptualization should be based on empirical insight can be found in both the Complex Responsive Processes perspective and in the interpretive case study design. According to the perspective staying close to the empirical interactions and the everyday life in an organization is crucial when trying to understand what is happening (e.g. Stacey, 2007). The interpretive case study design likewise emphasizes the need for understanding the particular case and its context when trying to generate understand from a case study (e.g. Walsham, 1995). To enable this understanding of and keeping in contact with the empirical process, the empirical material was ordered chronologically by coding the material.

Coding is a natural part of most qualitative research. The overall purpose of coding is *data retention* rather than data reduction, which is often the purpose of quantitative coding (Richards, 2005). However, the type of coding might vary. Richards distinguished between three types of qualitative coding, *descriptive*, *topic* and *analytical coding* (Richards, 2005). According to her, no matter the type of coding, reviewing the coded material has the potential of surprising the researcher however familiar s/he is with the material. This potential relates to Richards' understanding of coding as much more than labeling the entire empirical material according to different topics. Coding is as much about bringing together the different parts of the empirical material and allowing the researcher to review them together and develop an understanding of the topic.

Richards described topic coding as the type of coding focused on ordering the empirical material according to a number of topics. Thus, this coding focused on organizing the material and bringing separated bits of information together. The interpretation of the ordered material is typically not part of the process.

Employing the type of coding described above allowed me to close in on the empirical activities in the case and bring together the various details about each of the activities. Thus, topic coding was a helpful step towards utilizing the empirical material and building a conceptualization closely linked to the empirical process.

The coding followed the chronological order I developed based on a first and more explorative reading of my field notes and analytical memos. This resulted in the activities listed in Table 4.5 below and have later been developed into Figure 4.3

which is part of the description of the empirical process in the case description (see section 4.2.4.1).

A code was ascribed to each of the activities and the empirical material was then examined one piece at a time coding the material according to their relevance to one or more of the chronological activities. The use of the IT tool NVivo supported this process. Using NVivo enabled an easy way of linking together large amounts of material for instance by providing the opportunity to go back and forth making adjustments[27]. The coding of the comprehensive material was approached bearing in the mind the need to ensure that all the nuances in the material were attended to and that this happens in a systematical and explicit manner.

Time	Activities	
2009	Decision about participating in benchmarking	
	Participation in benchmarking	
2010	Use of the DEK SIP results to obtain political support and funding	
	Strategy process	Steering committee
		Vision group
		Project group
	Infrastructure project	
	Political approval and founding of the Strategy	
2011	Presentation of the strategy at all the schools	
	Analysis of competences, culture and knowledge sharing	
	Decision to let schools apply for project founding	
	The analysis is presented at the schools	
2012	Theme day	
	School applications	
	Evaluation of the strategy	
	School projects	

Table 4.5: Empirical activities

4.4.2.3 Interpreting and conceptualizing

The last part of the work with the situational maps overlaps partly with the more interpretive part of the analysis. However, moving to the interpretation part of the analysis, a more creative and holistic process is required, as mentioned earlier. This called for an approach, which Coffey & Atkinson would describe as *imaginative, artful, flexible, and reflexive* (Coffey & Atkinson, 1996: 10). One needs to keep an open mind, and play with the ideas and preliminary insight to move towards more thorough insights (Coffey & Atkinson, 1996). This is somewhat similar to what Weick described as *disciplined imagination* (Cornelissen, 2006; Weick, 2002). His

[27] All the applied codes along with selected screen-prints from the actual coding can be found in Appendix F.

idea was however more focused on conceptualizing by introducing an abstract concept. He pointed out that we need to give room for the hidden and less pleasant matters in the world and for the contradictions in our material. Further theory or metaphors can be used to help discipline one's imagination to take these overlooked elements when theorizing about empirical findings (Cornelissen, 2006; Weick, 2002).

In this process, I was inspired by *writing as a method of inquiry* (Richardson, 2000), hence approaching writing as an ongoing process attempting to achieve a better understanding of the process. Richardson highlighted that in contrast to quantitative research, which can be interpreted based on tables and summaries, qualitative research *carries its meaning in its entire text* (Richardson, 2000: 924) and cannot be understood based on a summary alone. She considered writing as a method of finding out about one's topic, for instance she pointed out that:

> "*Although we usually think about writing as a mode of "telling" about the social world, writing is not just a mapping-up activity at the end of a research project. Writing is also a way of "knowing" – a method of discovery and analysis.*" (Richardson, 2000: 923)

Coffey & Atkinson supported this understanding of writing, by stating:

> "*We also argue that writing and representing is a vital way of thinking about one's data. Writing makes us think about our data in new and different ways. Thinking about how to represent our data also forces us to think about the meanings and understandings, voices, and experiences present in the data. As such writing actually deepens our level of analytic endeavor. Analytical ideas are developed and tried out in the process of writing and representing.*" (Coffey & Atkinson, 1996: 109)

I do not take the creative elements pointed out by Richardson very far, as this is not an ethnographic dissertation; rather I use her approach to sensitize me to the analytical possibilities to work more creatively and openly in the process of writing.

In this dissertation, I used the method in the process of identifying episodes in the empirical activities and linking the theoretical concepts of Complex Responsive Processes to these episodes and the process of which they are part. Regarding the first matter, the coding of the empirical material according to the empirical activities still left me with a fragmented and confusing image of the process. To attain an overview of the large amount of empirical material further ordering of the empirical material was needed. Identifying episodes in the process helped structure both the understanding of the process and the presentation of the process. Furthermore, the hermeneutic approach emphasizes the movement between the parts and the whole in

the process of understanding a phenomenon as described by Klein & Myers (1999). An identification of the parts of the process was thus logical. By beginning to write about the empirical activities, I began to identify patterns and links between the activities. The writing was done in Danish (as the empirical material was in Danish) and in cues or short sentences at first moving towards a full description of the episodes. Some activities were obviously linked (e.g. the decision to participate in the benchmarking and the actual participation) other activities turned out to be of limited focus themselves (e.g. the theme day). By describing the activities in some detail, their connections and similar or differentiating focus became clear. Based on the links between activities, identified through the writing process, activities were grouped with other activities, to which they were linked. Inspired by the Complex Responsive Processes perspective the concept of gesture and responses was used to support the identification of the groups of activities or episodes. This meant that through the writing process it became clear that some activities functioned as a gesture, to which other activities responded. By explicitly identifying the gestures and the related responses, the boundaries of the episodes became clearer. More specifically, the boundaries were established by focusing on the gesture. Based on the gesture, the responses were identified. Activities that could be identified as responses to the initiating gesture, was included in the episode, activities that were not responses to the gesture were not included. An activity could, however functioned as response in one episode and as a gesture in a later episode. Despite some overlaps between the episodes regarding to the empirical activities they consisted of, and the time they unfolded over, the identification of episodes helped bring clarity in the large amount of empirical material. The process of writing about the activities thus led to the identification of five episodes (see section 5.1 for an introduction of the episodes). In this way, each of the episodes included a specific group of empirical activities from the process. Thus, both the growing understanding of the empirical process and the theoretical insight supported the identification of episodes.

Following the identification of the episodes the writing process continued by linking the concepts from the Complex Responsive Processes perspective to the empirical material. This part of the analysis focused on both the episodes as parts and the process as a whole, moving back and forth between the parts and the whole thus moving the understanding of both forward. In this process, I again began the writing in Danish and in cues and short sentences, focusing on one concept at a time first within an episode and later across the episodes. After reflecting on the empirical presence of the concepts across episodes I went back to the separate episode writing in detail (and in English) about the concepts within each episode and then across the episodes.

In general, I rewrote and experimented with the descriptions of the relations between the elements in an attempt to understand the relations better. Furthermore, I wrote personal notes or analytical reflection in parallel with the analysis, using those as an

input in the next iteration with the text. Throughout this work with the texts, the Complex Responsive Processes perspective inspired me; naturally, when focusing on the theoretical concepts, but also in identifying the episodes, as the inspiration to focus on gestures and responses is found in the perspective. The aim of the analysis and this part in particular was to develop a conceptualization of the phenomenon of IS-related organizational change drawing from both the empirical process and the Complex Responsive Processes perspective. The focus of this part of the analysis was thus on moving from the initial empirical description of the process towards more abstract or theoretical descriptions. The final product of the writing process was included in the next chapter, where a rich description of the process of IS-related organizational change is presented in five episodes. The episodes were further conceptualized in regards to the theoretical concepts both within the episodes (parts) and across the episodes (the process as a whole. The analysis thus led to both a rich description and a more condensed abstract description of the process drawing upon the theoretical concepts and addressing central patterns characterizing the phenomenon. The process of moving back and forth between the descriptions of different parts of the process and its conceptualization and the writing of text pieces helped me move towards an understanding of the phenomenon and to make room for details relevant for understanding a complex empirical phenomenon.

During this chapter, the case design was presented, thus allowing the reader to follow the process and evaluate the findings based on insights into the process, which lead to these specific findings. To support further this transparency of the research, the case analysis in the next chapter includes rich empirical descriptions of the processes as they unfolded in the case.

CHAPTER

CASE ANALYSIS

5

Introduction

This chapter presents the analysis of the case or more specifically the analysis of the empirical process of IS-related organizational change. This chapter is structured according to the five episodes in the process as well as the process as a whole. This was done as a hermeneutically based understanding of a phenomenon, which requires understanding the parts to understand the whole, and vice versa.

The chapter begins with a short introduction of the five episodes. Then, the chapter presents the analysis of each of the five episodes separately. These five sections open with a rich empirical description of the gesture initiating the episode and the related responses, which are summarized at the end of each subsection. Following the rich description, the section presents the analysis of the episode in light of the theoretical concepts presented in Chapter 3 (section 3.2.2). After the analyses of the five episodes, each episode separately is summarized in Table 5.6 in section 5.7. Then, the chapter presents the cross-episode analysis, or the analysis of the process as a whole. Following the same structure, the first subsections attends to the gestures and responses, whereas the following five subsections focus on the five theoretical concepts, and the final subsections summarize the cross-episode analysis in Table 5.7. The presentation of the analysis of the process as a whole focuses on the elements crossing the episodes whereas the elements unfolding within only one episode are presentenced in the first part of this chapter.

5.1 The Five Episodes

The first part of the analysis of the empirical process of IS-related organizational changes is structured according to the five episodes identified in the empirical material (see section 4.4). This section gives a short overview of the five episodes before the following sections present the analysis of the episodes separately.

The first episode *Benchmarking* focused on the attempt to develop an understanding of the problems with school-IT through participation in a school-IT benchmarking. The episode was initiated by the IT-leader's suggestion to participate in a benchmarking in the beginning of 2009 (the gesture) and the responses included interactions regarding the suggestion, participation in the benchmarking and ended in the beginning of 2010 with the interactions following the participation in the benchmarking.

The second episode *Strategizing* followed episode one directly. The episode focused on the process of strategizing regarding the digital school. The episode was initiated by the political adoption of the plan of action (suggesting strategizing) in February 2010 (the gesture). A number of responses were related to the gesture including the activities in three fora established as part of the process and the final political approval of the resulting strategy for school-IT in the municipality in December 2010.

The third episode *Improving infrastructure* unfolded in parallel with episode two. The episode focused on more technical matters in particular an infrastructure improvement project. The episode was initiated by the IT-leader's suggestion of an infrastructure improvement project in the beginning of 2010 (the gesture) and the responses included the acceptance of the suggestion by different participants, the implementation of the project and later the establishment of a technical working group in September 2011.

The fourth episode *Analyzing* followed episode two chronologically. The episode focused on the process of analyzing competences, culture and knowledge sharing related to school-IT and was initiated by the formal decision to complete the analysis in the beginning of 2011 (the gesture). The responses related to the gesture included the development and completion of the analysis as well as the communication of the results back to the school participants in the end of 2011.

The fifth and last episode *Re-organizing* focused on the re-organization of the program through the establishment of a project structure. The episode was initiated by a suggestion to the program steering committee to create a new structure in September 2011 (the gesture). Meaning that the gesture occurred during episode four (Analyzing), thus, the first part of the fifth episode unfolded in parallel with the last part of episode four. The responses related to the gesture included the adoption of the suggestion, the actual re-organization, as well as the local submission of

project applications and the adoption or rejection of these during the remaining part of the program (running until the end of 2014).

As the five episodes have been introduced, the analysis of the episodes separately is included in the sections below.

5.2 Episode #1: Benchmarking

This episode was concerned with developing an understanding of the problems concerning school-IT identified by participating in a schools-IT benchmarking. Both the interactions leading to the participation, the participation itself and the interactions following the participation are covered. The episode proceeded from the initiating gesture in early 2009 to the approval of a subsequent suggestion to initiate a strategizing process in February 2010. As described in the introduction to this chapter, this episode appears to have initiated the IS-related organizational change process within the municipality's school area. In addition to the gesture initiating this episode, the episode as a whole served as a gesture initiating the overall change process, where the other episodes can be understood as responses to the gesture made by this episode.

5.2.1 The benchmarking gesture and the responses

Based on the situation in 2008 characterized by frustration and dissatisfaction (see section 4.2 for a case description) the IT-leader suggested the need for a shared understanding of the problems. More specifically, he suggested that the municipality participate in a school-IT benchmarking called DEK SIP[28]. The DEK SIP benchmarking is a benchmarking between a group of Danish municipalities supplied by the consultancy part of a firm called KMD[29]. Furthermore, the DEK SIP benchmarking is parallel to another benchmarking, in which the municipality was already participating. The other benchmarking was called DEK TIP[30] and examined administrative IT in the municipality. In raising his suggestion, the IT-leader highlighted that there was widespread dissatisfaction with the school-IT, but that the roots of the dissatisfaction were unclear and potential solutions would therefore only be speculative.

> "*We were bold, in our own opinion. We had a type of user survey created in the fall 2009, a benchmarking. (…) The general muttering of dissatisfaction was well supported by the survey. However, it also showed that there were limited grounds for the dissatisfaction. (…) It*

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[28] "Den Effektive Kommune – Skole It Performance" in Danish, which in English means: The effective municipality – School-IT performance.
[29] The firm is also a technology supplier
[30] "Den Effektive Kommune – Total It Performance" in Danish, which in English means: The effective municipality – Total IT performance.

created a, how to put it, great foundation – for moving on." (IT-leader, May 2012)

The first response to the suggestion made by the IT-leader (the gesture) was skepticism expressed by e.g. the Head of Schools and the School-IT consultant. They wondered why the IT-leader would deliberately bring further attention to the poor performance of the school-IT.

> "*In my perspective, it was suicidal. As it could only end badly. (…) Later I found out that [the IT-leader] was fully aware of what he set in motion. As he was well aware that it would reveal poor results.*" (School-IT consultant, May 2012)

As the IT-leader argued for the relevance of a shared and substantiated understanding of the problems as the foundation for attempting to improve the situation, he obtained acceptance from, most importantly, the Head of Schools. The initial acceptance, and second response, seemed to be partially based on a perception that if bringing attention to the problems led to criticism (e.g. politically) the blame would primarily be directed towards the IT-leader and his Center.

> "*It was a 'bold' move by the Center for IT to suggest such a benchmarking.*" (Head of Schools, in e-mail to text writer, February 2011)

Following the acceptance of the suggestion to participate in the school-IT benchmarking, the actual participation took place in the fall 2009 (the participation being the third response). A large consultancy firm, KMD, consulting and delivering IT-solutions for the public sector, facilitated the benchmarking. A specific consultant (hereafter the external consultant) handled the process in the municipality and supported the further process through later acquisition of related services from the consultancy firm (see e.g. section 5.5). In the benchmarking, the municipality was benchmarked against eight other Danish municipalities, as well as the benchmarking of the school-IT compared to the municipality's benchmark on the administrative IT. The school-IT benchmarking was based on an economic evaluation, a self-evaluation of the complexity and a user survey of school personnel (primarily teachers), pupils and the IT support function. It led among other things to the following insight:

> "*The users do know where to turn to for support, but they are not satisfied with the support they get and the time it takes to get help.*" (Executive summary by the external consultant, December 2009)

After the benchmarking was completed, the results were presented to the political committee of Children & Youth in December 2009. The presentation was given by

the external consultant, and included the main results and focused in particular on the results from the survey. Among other things, the external consultant emphasized the low level of spending on school-IT and the large variation between the schools. Furthermore, she emphasized that the general level of satisfaction was below the benchmark whereas satisfaction with the pedagogical school-IT counseling was above the benchmark.

Ideas for how to proceed were presented and discussed at a meeting with the administrative board at that time department of Children & Culture[31] in January 2010. They supported the intention, by the Head of Schools, to develop a plan of action in collaboration between the Center for School, the Center for IT and the external consultant.

Following the development of a plan of action, a second presentation was made for the political committee of Children & Youth in February 2010. At this meeting, the external consultant gave a more detailed presentation of the benchmarking results. The presentation included a comparison of the school-IT benchmarking and the administrative-IT benchmarking revealing a link between spending and satisfaction. The school-IT benchmarking showed low spending and low satisfaction whereas the administrative-IT benchmarking showed higher spending and higher satisfaction. Following these results, the obvious conclusion was a need for action and specifically for additional spending.

> "*The school-IT benchmarking shows the need for significant effort to improve the area.*" (Suggestion for plan of action for school-IT)

Based on the validation of a need for change following the benchmarking, the Head of Schools presented two suggestions for action. One, a plan for an infrastructure improvement project, presented in more detail by the IT-leader (see episode 3, section 5.4) and a plan for a strategy development process (see episode 2, section 5.3). The purpose of a strategy process was stressed:

- Deciding on the level of ambition
- Matching expectations
- Improving satisfaction
- Making IT an integrated part of teaching

The purpose was associated with a project plan for the strategizing process during spring 2010, ending with the political approval of the strategy before the summer

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[31] More specifically, the administrative board of the department consisted of the director of Children & Culture, the administration manager, the head of the family unit, the head of the institutions, the head of schools, the head of culture and leisure time and a secretary. Later the departments were split up into smaller administrative centers.

holiday 2010. The politicians accepted the suggestion including the emphasis that the implementation of the strategy would require additionally funding.

> "*It was made explicit to them that the implementation of such a strategy would cost – they should therefore consider if this was something they would be ready to fund. Otherwise, 'now' would be a good time to say no.*" (IT-leader, April 2011)

The actual strategizing process is a separate episode described on its own in section 5.3 later in this chapter.

Gesture: the IT-leader suggests participation in school-IT benchmarking			
	Time	**Responses**	**Who**
Response 1	Spring 2009	Skepticism	E.g. the Head of Schools and the School-IT consultant
Response 2	Spring 2009	Acceptance of the suggestion to participate in benchmarking	Primarily by the Head of Schools
Response 3	Fall 2009	Participation in school-IT benchmarking	The consultancy firm KMD (in particular the external consultant) The Center for School, school participant (the user survey)
Response 4	December 2009	Presentation of results for political committee	Political committee of Children & Youth, external consultant, Head of Schools
Response 5	January 2010	Discussions and planning of the way to proceed	The administrative board of the department of Children & Culture, the external consultant, the H Head of Schools, the IT-leader, participants from the Center for School including the School-IT consultant
Response 6	February 2010	Political approval of the initiation of a strategy process	Political committee of Children & Youth, external consultant, Head of Schools, IT-leader

Table 5.1: Responses to the benchmarking gesture

5.2.2 Benchmarking in a Complex Responsive Processes perspective

5.2.2.1 Conversations

Three central conversations shaped this episode:

a) The move from skepticism to acceptance in the conversations between the IT-leader, the Head of Schools and the School-IT consultant
b) Discussions and interpretations of the results from the benchmarking in the benchmarking club
c) Presentation and approval of the results and plans of action in the political committee

At the beginning of the episode, the conversations between the IT-leader, the Head of Schools and the School-IT consultant were crucial. Initially after the gesture made by the IT-leader, the conversations between these three central participants were characterized by the different perspectives between them. The Head of Schools and the School-IT consultant were very skeptical about the purpose of participating in the benchmarking as proposed by the IT-leader. Despite their different perspectives on the suggestion, they shared an understanding of the current situation, but their understandings of where the problems originated and the formulation of solutions differed. A path forward was agreed upon, through the conversations. The conversations between them did however not end here but continued throughout the entire process of IS-related organizational change in various forms. Following the agreement to participate in the benchmarking, the conversations revolved around the benchmarking results and in particular the development of an action plan including the plan for a strategy process. In these later conversations, a fourth party was included, namely the external consultant. In these conversations, the differences were limited and the participants worked with a shared goal.

During the participation in the benchmarking, other conversations arose. At this time, new participants came into play. In particular, the external consultant from the consultancy firm KMD was crucial throughout this episode (as well as episodes two and four). Furthermore, participants from the other eight municipalities participating in the school-IT benchmarking, participated in conversations relevant for understanding this episode. These conversations took place in a so-called benchmarking club facilitated by the consulting firm KMD. The conversations in this club regarded the discussions and interpretations of the results from the benchmarking. The different results were linked to specific internal processes and prioritizations, and the potential ways forward were discussed. In the municipality of Frederikshavn, these discussions fed into the local conversations mentioned above regarding a plan of action. However for the local participants the conversations in the benchmarking club seemed to have had limited significance, as the conversations with the external consultant were emphasized repeatedly.

The third conversations were those with the politicians, as well as the IT-leader, the Head of Schools and the external consultant (the School-IT consultant did not participate directly in these conversations). These conversations became relevant due to the choices made in the plan of action. The intention with the plan was to invest in infrastructure improvements and to complete a strategy process as well as a later implementation of the strategy. For these purposes, political involvement was necessary in order to approve the prioritizations and in particular the funding. As the conversations took place at a meeting in the political committee of Children & Youth, the topic became one among twelve items on the agenda. This meant that the conversations primarily took the form of an approval of the results and the plan of action respectively. However, this approval in itself was an important signal to school leaders and teachers and other participants that the area received attention and priority from the politicians. Thus, the setting (at a meeting in the political committee of Children & Youth) enabled the conversation, by making the engagement with the politicians possible, but also restrained the conversations through time limits etc.

5.2.2.2 Themes

The conversations were patterned by three themes, which are the focus of this subsection:

a) From considering the gesture "crazy" to considering it bold
b) Considering digitalization of the schools as the future
c) Considering the level of satisfaction as a direct result of the level of spending

The first of these themes was a pattern of the way the initial gesture was made by the IT-leader as described above. At first, the gesture was perceived as "crazy" and more specifically the IT-leader was considered suicidal to make the suggestion. The logic was that a benchmarking would reveal the poor performance of school-IT and low level of satisfaction among the users, which would not serve the interest of the IT-leader (presumably keeping his position and reputation). As described above the IT-leader was however able to convince the School-IT consultant as well as the Head of Schools to accept the suggestion. The acceptance was not rooted in a new understanding of the rationale; they still considered it rather counterintuitive. However, they seemed to assume that any negative effect of highlighting the poor performance of the area would primarily reflect back on the IT-leader himself and his Center for IT. This assumption was at the point in time a shadow theme, which only patterned the conversation characterized by mutual trust.

Over time, the theme did however evolve as the episode unfolded. The articulation moved from the perception of the gesture being "crazy" or "suicidal" to a perception of the gesture as "bold." Along with this change in perception, the theme moved

from being a shadow theme to being fully legitimate. Interestingly, the former perception of craziness was included in the legitimate theme, meaning that they now spoke openly about originally considering the suggestion rather crazy, followed by the statement that they later realized that the IT-leader probably had good reasons, and thus was bold rather than crazy.

> "*And it led to a much closer dialogue between the Center for Schools and the Center for IT. So I think [the IT-leader] and the Center for IT deserves great credit for throwing themselves into that DEK SIP benchmarking.*" (Interview with the Head of Schools, June 26 2012)

Another theme reflected in the conversations during this episode was the understanding of digitalization as the future, which one should strive for regardless of personal opinion. This applied to the school-IT as well, making the use of IT in the schools a goal or priority in itself. In the central administration (the Center for Schools and the Center for IT) it was not discussed whether the poor performance and low satisfaction with school-IT should be improved or whether IT should be part of the teaching at the schools. Only the path towards obtaining this was discussed. The necessity was also tied to the national regulations for the schools; around the same time (2009/2010) a national regulation (Shared goal 2009) stated as part of the goals that IT should be an integrated part of the subjects in the schools (Shared goal 2009 – IT and media competences in the public schools). Similar perspectives were found elsewhere in the public debate[32]. The theme in the administration was thus likely affected by the national theme, it was however interesting that the same theme did not seem to pattern the conversations locally at the schools, where the first priority was the topics they taught and the didactic and pedagogical approaches. Later in the process, the theme did include the conversations at the schools as well (or at least some of them).

Lastly, the third theme concerning the logic between spending and performance should be mentioned. In the conversations regarding the benchmarking results, the correlation between spending and satisfaction (as a proxy for performance) was emphasized. This was for instance clear regarding the comparison between the school-IT benchmarking and the administrative-IT benchmarking, where the former showed relatively low spending and relatively low satisfaction and the later showed relatively high spending and relatively high satisfaction. Based on this correlation, a need for investing in school-IT was stressed – and more interestingly accepted by e.g. the politicians. This was particularly interesting as the focus in general in the municipalities was on delivering better (or equally good) services for less money (Danish Government et al., 2011).

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[32] E.g. a book by the national information center on teaching aids concerned with electronic teaching aids, IT and the didactics (Gynther, 2010)

5.2.2.3 Narratives

The most important and at the same time rather persistent narrative about what was going on at the time of this episode, was the following narrative:

  a)   The account people gave of the poor performance

The central participants mentioned in this section[33] drew upon various versions of this narrative when they talked about the episode, and according to them, it was widespread in the organization. The narrative was also reflected in the accounts given by other participants (e.g. other members of the steering committee and teachers).

> "*It [school-IT] influences a lot of people, you can say. So, it can easily take up a lot of attention if it does not work well. And it didn't, I can say for sure.*" (IT-leader, May 22 2012)

The narrative was a central motivation for the initial gesture. This was so since the approach to school-IT was not just characterized by sporadic dissatisfaction but by a consistent narrative of poor performance, breakdowns, outdated equipment and delay. The narrative therefore led the IT-leader to conclude that something more radical than dialogue meetings and slight improvements were needed. After the gesture and throughout the episode the rather negative narrative functioned as a driver or motivator towards changing the situation and even later on when change began to be made the narrative proved to be very persistent.

5.2.2.4 Power

Two power relations were of interest in this episode

  a)   The power relation between the IT-leader and the Head of Schools
  b)   The power relation between the administrative organization and the political organization

For the first, the IT-leader was the head of Center for IT, meaning that he and the Head of Schools h held similar positions in the organization. Further, the IT-leader could request funding for improving school-IT on his own. However, as he wished for more than just increased funding he needed the Head of Schools. The Head of Schools is responsible for the school area and his approval was thus needed to participate in the benchmarking, as it was employees from the school area (both locally and centrally employed) who was supposed to participate in the benchmarking[34]. Furthermore, for change to take place at a later time, the IT-leader needed the Head of Schools to communicate his support for the initiatives and

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[33] The IT-leader, the Head of Schools and the School-IT consultant
[34] Both in the self-evaluation of complexity and the user survey

maybe even require change (e.g. by including new elements in the quality reports evaluating the status at the schools). Clearly, the IT-leader depended on the support of the Head of Schools. On the other hand, the Head of Schools also depended on the IT-leader. The IT-leader is head of the center employing the people, which provided the IT-services throughout the municipality (including the help desk). As it was evident for the Head of Schools that the school-IT performed poorly, he needed the IT-leader to stay engaged with the situation and to help improve the situation. Thus, the Head of Schools also depended on the IT-leader, which might incline him to be more positive towards the suggestion made by the IT-leader (the gesture). Hence, as the suggestion made by the IT-leader was accepted by the Head of Schools, despite his doubts, it would seem that the IT-leader was the most powerful in this specific relation. There might however be other elements to take into account. Like the perception that negative consequences would primarily reflect back on the IT-leader or the lack of an alternative approach to proceed. As the relation between these two crucial participants continued throughout the IS-related organizational change process, so did the power relation between them.

Similar to the power relation between the IT-leader and the Head of Schools, the power relation between the administrative (primarily the IT-leader and the Head of Schools) and the political participants (here specifically the political committee of Children and Youth) was multifaceted. Formally, the politicians held the overall responsibility, which was for instance clear in relations to financial issues, as the politicians negotiated and adopted the budget. Thus, the employees in the administration depended highly on the politicians for their yearly budget. Generally, the employees answered to the politicians as well, but the dependence was most clear in regards to financial issues. On the other hand, the politicians were not employed by the municipality[35]. This meant that they generally held a fulltime job and acted as a politician in their spare time. As they furthermore participated in more than one political committee, their time and focus were limited. Compared to that, the employees in the administration possessed time and extensive knowledge of the area. When the politicians made decisions, they did so based on information and recommendations made by the administration. Therefore, the politicians depended on the employees in the administration for knowledge and time dedicated to preparing a topic. Furthermore, if the administration claimed, based on their knowledge and hands-on information, that something was strictly necessary, it was difficult for the politicians to question that claim. They might choose to prioritize differently, but room for questioning the claim was limited.

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[35] The mayor being an exception

5.2.2.5 Choice and intentions

Two decisions were essential in regards to this episode.

a) The decision to suggest participation in the school-IT benchmarking
b) The decision to accept the suggestion and participate in benchmarking

The first of these decisions was made by the IT-leader as he suggested that the municipality participated in the school-IT benchmarking (the gesture). The IT-leader was convinced that participating in the benchmarking would help the school-IT area by establishing clarity and common grounds regarding the proportions of the problem. In addition, to the participation being a positive step for the school-IT area it would be a positive step for the Center for IT, which he was in charge of at the same time. It was fair to assume that the benchmarking regarding administrative-IT would be fairly positive (as it had been earlier), thus highlighting the relevance of other elements than poor performance by the Center for IT. During the problematic period in 2008 and 2009 the Center for IT had already in early 2009 attempted to defend themselves by demonstrating how their tasks had grown without similar growth in resources (at the presentation during a meeting with the political committee of Children & Youth in January 2009). It thus seems plausible that the IT-leader's intentions were related to both the potential for possible improvement within the area of school-IT and avoidance of political blame for his Center.

The other choice to mention here was the choice made by the Head of Schools to accept the suggestion made by the IT-leader. As mentioned in an earlier subsection, this choice was made even though the Head of Schools was skeptical about the purpose of participation in the benchmarking and about how it could benefit the area of school-IT. His general intention was to benefit the municipality's school area and the potential for a positive contribution to school-IT as participation in the benchmarking trumped the risk of drawing negative attention to the poor performance of the area. In particular, the potential negative effects would primarily be directed towards the IT-leader. Furthermore, even though it was not considered sensible to draw attentions to one's shortcomings, The Head of Schools placed great value in being an open and responsive leader.

5.2.3 Closing remarks

This section described the process leading to and following from the participation in the benchmarking. This was done regarding the initiating gesture made by the IT-leader and the responses to the gesture as well as the conversations, themes, narratives, power relations and choices patterning the episode. The background for the gesture of the episode was the dissatisfactions at the schools based on mismatch between the expectations at the schools and the services the Center for IT was able to deliver. Furthermore, the episode was characterized by the different perceptions between the IT-leader and the Head of Schools and the school-IT consultant on the way to handle the challenges. This difference in perceptions of the right response to

the challenges was an essential part of what led to a change in the situation – the decision to participate in the benchmarking.

Following the decision to participate in the benchmarking, the good collaboration between the IT-leader and the Head of Schools continued. Thus, the differences and small disagreements did not lead to larger divergences or to a weakening of the collaboration.

5.3 Episode #2: Strategizing

This episode was concerned with the strategizing in the municipality and began directly after the last episode ended. More specifically, the episode followed the process from the decision to initiate a strategizing process in February 2010 over the activities in the three fora established as part of the process to the political approval of the resulting strategy for school-IT in the municipality in December 2010. The initiating gesture was directly linked to the last response described in episode one. Further, the last response to the gesture of this episode was where episode four and five began[36].

5.3.1 The Strategizing gesture and the responses

The last response in episode one described how a plan of action had been developed and was presented for the political committee of Children & Youth in February 2010. It began with a presentation of the school-IT benchmarking (by the external consultant) and followed up with a presentation of the actual plan of action (by the Head of Schools). More specifically the plan of action contained two elements, a project plan for improving the infrastructure (see episode 3) and a suggestion to initiate a strategy process along with a plan for the intended activities. The decision made by the politicians in the committee to adopt the proposal was the gesture initiating this episode.

The intention expressed with the plan was that the strategy process should lead to the development of visions, goals and boundaries for school-IT in the municipality. Furthermore, the process should:

▪ Clarify the level of ambition for school-IT
▪ Ensure that IT supports the school of the future, and that expectations between school leaders, school-IT counselors, teacher and pupils are matched/clarified
▪ Ensure that the satisfaction with the performance and services are improved significantly
▪ Ensure that IT becomes an integrated part of the teaching

Presented for the political committee of Children & Youth, February 2010

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[36] The gesture of episode three followed from the last response in episode one – parallel to this episode.

The plan for the development of a strategy for school-IT was adopted in February 2010 and was intended to be carried out during the spring 2010, and thus was presented to the political committee just before the summer holiday 2010.

The first response to the political adoption for the plan was the establishment of a steering committee. This group of people would ensure progress in the strategizing process, oversee the planning of the relevant activities, and make sure that the right people were included in the process.

The steering committee consisted of eight people:

- The director[37]
- The Head of Schools
- The Administration manager[38]
- The IT-leader
- A representative of the school leader
- The project manager to be[39] (later the program manager)
- The external consultant
- A second external consultant

The steering committee met at four steering committee meetings[40] and two workshops. The first steering committee meeting was a start-up meeting in March where they worked on creating a shared understanding of e.g. the current situation, the challenges and the approach to use in the strategizing process. For instance, they agreed that IT was crucial for the business of the schools and that the output of the strategizing process should be a short and easy access strategic document (ten pages tops and a condensed one-page version as well). In addition, the steering committee evaluated the project plan and defined the content of the workshops to be held during the spring. After this start-up meeting, the external consultant met with the project manager to be and the School-IT consultant to plan the workshops in detail.

The next activities in the steering committee were the two workshops (March 17 and 23rd). During these occasions, the committee discussed, planned and evaluated the different roles and responsibilities with regard to school-IT. More specifically the workshops led to the development of an IT-governance matrix portraying the relations between the identified fourteen decision areas and ten potential decision makers. The matrix further stated who made the decisions, who was obligated to take the initiative and who the crucial contributors were (see Figure 5.1 on the next page).

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[37] More specifically, the director of School, Youth, Culture & Leisure time, Daycare, Library & Citizen Service and Family. The individual holding the position at this point in time was not that as the one holding the position and participating in the program steering committee later in the process (see episode 5, section 5.6).

[38] This position existed prior to the reorganization of the organization structure for the municipality's administration. At that time, a department for Children & Culture existed in which he was managing the administration and secretary function.

[39] She was not officially the project manager at this point, but participated as she was intended to hold that position later on.

[40] March 8th, March 23, April 23 and June 9.

Roles

Decision areas		Pol. Com. of children & Youth	The board of Directors	Center management board	Head of School	The group of School leaders	The school leader	Center for IT	School cons. (IT and Library)	Pedagogical school-IT counselors	Daycare leader
Digitalization strategy	Digitalization strategy for school-IT	D		P	I		P		P		
	Local focus areas						D/I			P	
IT management	Governance decisions			D	I	P					
	Allocation of resources for school-IT				D/I						
	Security level for school-IT (policy, rules)		D		I			P			
	Supplier collaborations for school-IT				D			I			
Managing the scope	Matching of expectations for IT-services (yearly)				D/I	P		D	P		
	Matching of expectations for financial scope (yearly)				D/I	P		P	P		
	Portfolio management of school-It projects				D/I	P		P	P		
IT-initiatives within financial scope	Central infrastructure							D/I			
	Shared hardware/software				D	P		P	P		
IT-initiatives outside financial scope	Shared purchase hardware/software					D		P		P	D
	Local purchase hardware/software				D	I	D	P		P	D
Systems use	Communication tools	P			D						

D: Decision maker, I: initiator, P: primary contributor; (my translation)

Figure 5.1: Decision matrix for School-IT

In continuation of the second workshop, the steering committee held a regular steering committee meeting where they planned the second phase of the process and decided on the members of the vision group and the project group respectively.

The purpose of the last two steering committee meetings (April 23 and June 6) was to follow the work of the two other groups and to approve the documents developed (the strategy document and later the plans of action and the recommendation to the politicians).

The vision group was appointed by the steering committee (formally by the Head of Schools), and the purpose of this group was to ensure inclusion and generation of ownership among a variety of stakeholders. Thus, the group was rather large and met only two times. More specifically, the vision group consisted of nearly forty individuals:

> - 20 school leaders from each of the schools[41]
> - 3 representatives from the after school care
> - 3 representatives for the pupils
> - 2 politicians from the political committee of Children & Youth
> - 2 teachers
> - 2 school-IT counselors
> - 2 representatives from the Center for IT
> - The school-IT consultant
> - The school library consultant

In total, the vision group consisted of thirty-six people. The first time the group met was at a strategy workshop at April 6. Here the steering committee and the project group participated as well. The workshop was launched with a presentation on the need for linking IT and education made by an associate professor from Århus University (department of education and pedagogy). Hereafter the day was spent developing the goals and vision for school-IT in the municipality. First, a large number of issues related to developing school-IT were generated by the participants. These issues were then condensed into six topics by the external consultant, her co-worker and e.g. the school-IT consultant. During the afternoon, the six topics were then discussed and unfolded in six informal sessions where the people participated in those interesting them the most.

The second time the vision group met was June 2; at this workshop, the strategy document was evaluated and potential steps to ensure a successful implementation were discussed. In addition to the vision group, the steering committee and the project group participated in this event as well.

The third group mentioned above and in Table 5.2 was the project group. Like the vision group, this group was appointed by the steering committee at their meeting on March 23. This group was responsible for developing the topics and discussion from the strategy seminar into an actual strategy. The group therefore consisted of the

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[41] Later the number of schools was reduced to sixteen.

external consultant and key persons for the school-IT in the municipality. More specifically the group consisted of:

- The external consultant
- A second external consultant
- The project manager to be (contact person)
- A school leader
- Two vice school leader
- Two school-IT counselors
- The school-IT consultant
- The school library consultant
- Two employees from the Center for IT

The project manager to be was at this point appointed as the contact person to the external consultant and the consulting firm in general and as the municipality's day-to-day project manager for the strategy process.

The project group participated in four workshops (in addition to the two with the vision group) and furthermore developed the business cases accompanying the strategy. The first two workshops were held on April 12, and on this day, they evaluated the strategy workshop with the vision group. More specifically, they developed objectives for the vision and indicators (the first workshop) and more specifically focus areas (the second workshop).

In May the group met for another workshop (May 4); here the focus established a prioritization between the focus areas developed in the previous workshop. Furthermore, the group decided on which initiatives would be relevant to initiate in 2010 and 2011 and which thus required them to develop business cases.

During the rest of May, the members of the project group developed twelve business cases[42] at various levels of detail. Many of those involved experienced this task as difficult and frustrating.

> "*It was so frustrating. Well, at one time I was ready to throw in the towel.*" (The school-IT consultant, interview May 2012)

According to the school-IT consultant, the problems were related to the teachers being very practically minded whereas developing business cases required more abstract thinking. The IT-leader expressed a similar point of view, stating that there were clear differences in prior experience between the school employees and the administrative employees. Generally, this part of the process was considered less satisfactory for all involved.

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[42] The focus of the twelve business cases was: 1) IT architecture, 2) communication strategy, 3) participation in research project on knowledge sharing, 4) competency development for managers, 5) cultural change, 6) the digital toolbox (teaching aid), 7) infrastructure, 8) IT friendly class rooms design and interactive media in the class rooms, 9) management of program and projects, 10) security (policy), 11) service level, 12) competency development

The last workshop was held on June 1 and focused on prioritizing the initiatives based on the developed business cases. Additionally, they developed action plans for the initiatives and finally they discussed the recommendation to be made to the politicians.

Based on the output from the workshop the external consultant in collaboration with the project manager wrote the school-IT strategy document. The final document was sixteen pages and included the overall vision, indicators, which elaborated on the vision, measurable objectives as well as an action plan including descriptions of subprojects. The strategy covered the period from 2010-2014 and was guided by the vision: The digital school is a reality in 2014 and everybody is committed to it. The indicators, related measurements and the plans of action were then divided into the following six topics (for more details see Appendix C):

- Competences
- Technology and services
- Digital teaching aids
- Culture
- Leadership and management
- Communication

The final document was presented to the members of the political committee of Children & Youth at a separate theme meeting in August 2010. In addition to the strategy, an overview of the needed resources to implement the strategy was presented. The politicians were further informed that it would be possible to lower the funding, but that would mean lowering ambitions as well. They were however determined to choose the ambitious approach, but did not have the authority to fund an initiative of the suggested magnitude. Therefore, the program became part of the political budget negotiations in the municipality during the fall. After the resources (25m Danish crones) were allocated to the program, the political committee of Children & Youth approved the school-IT strategy in December 2010, thereby formally launching the implementation program[43].

Gesture: The political adoption of the plan of action (suggestion to strategize) by the members of the political committee of Children & Youth in February 2010			
	Time	**Responses**	**Who**
Response 1	March - August 2010	The activities of a "steering committee"	The steering committee
Response 2	April 6th + May 4th	The activities of the vision group	The vision group

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[43] An overview of the meetings in this episode (steering committee, vision group and project group) are included in Appendix G)

	2010		
Response 3	March – August 2010	The activities of the project group	The project group
Response 4	March – June 2010	Development of the school-IT strategy document	Steering committee, Vision group, project group, external consultants
Response 5	August and December 2010	Political approval of the school-IT strategy document	The political committee of Children & Youth

Table 5.2: Responses to the strategizing gesture

5.3.2 Strategizing in a Complex Responsive Processes perspective

5.3.2.1 Conversations

This second episode was characterized by the following conversations:

a) Conversations between the external consultant and the program manager and the school-IT consultant
b) Conversations within the steering committee
c) Conversations within the vision group
d) Conversations within the project group

The conversations between the external consultant and two of the key persons from the administration (the program manager and the school-IT consultant) were concerned with the more detailed planning including the planning of the workshops, as well as writing parts of the strategy document. The external consultant was in charge of the process and she therefore took a rather controlling role in the conversation. By participation in these detailed conversations about the strategizing, the program manager and the school-IT consultant developed insight into the rationales and began to develop an ownership of the process.

Regarding the first conversations of the new fora, the steering committee was at the beginning linked to the definition of their role, and later to the evaluation of the process and progress. The participants in this forum were primarily managers in the organization, used to participation in steering committees and overseeing the work of projects groups. This might be the reason why the conversations were generally neutral and characterized by consensus. The responsibility for appointing members for the two other fora lay with this forum as well. In the conversation regarding the appointment of participants for the vision group, the focus was to include not only

those already supporting the school-IT agenda but also individuals with a more skeptical point of view.

In the vision group, this attempt to create diversity in the group did not seem to affect the conversations much. The focus in the conversations was on visions for the future and the path to reach them. The participants were generally able to focus constructively on this to-be aspect rather than being caught up in the problems of the present situation. Thus, the process was experienced as positive and the level of conflict was very limited.

Within the project group, many different conversations took place, for instance, related to the work of the vision group (elaboration on the vision and indicators, and prioritization of the focus areas). The most distinctive conversations were however related to the development of business cases. This process was considered very difficult and the conversations were affected by misunderstandings and differing interpretations of the purpose. More specifically, the project manager and the external consultant expected the topics of the business cases to be divided between small groups of member from the project group who would then be able to develop the business case based on a template. The difficulties and the level of frustration therefore surprised them. Many of the other participants in the project group were however puzzled by the purpose and form of the business cases. They considered the form too abstract. Further, they were initially convinced the purpose was to develop project plans. The conversations regarding the focus of the business case was overall considered frustrating and characterized by misunderstandings. The school-IT consultant described the process as a regular crisis, where he lost part of his motivation and focus on the general purpose of the strategizing. Some of the frustrations however addressed at the meeting were a project manager from the Center for IT and the external consultant who helped exemplify the purpose and the format.

5.3.2.2 Themes

Two themes were included in this subsection, both related to the way digitalization and school-IT was articulated in the conversations of this episode.

a) Considering digitalization as a necessary future for the schools
b) Considering digitalization as a matter of technology as well as softer organizational issues

The first theme was concerned with digitalization of the schools as the future, which one should strive for regardless of personal opinion. During the episode, the theme seemed to pattern the conversations among the involved local participants as well. Particularly the conversations in the vision group were of relevance here, as this group was established specifically to ensure inclusion of the local stakeholders both pro digitalization and the more skeptical. However, they apparently adopted the

theme in their conversations from the first workshop in which they participated. As described earlier the first part of this workshop was a presentation by an associate professor on the future importance of creating the strong link between IT and education at schools. This position taken by an external expert might have convinced the participants of the significance of the issue. Furthermore, the workshop was not designed to include discussions of the relevance of digitalizing the schools, but to focus solely on difficulties to overcome and topics to focus on.

The other theme influencing the episode was an understanding of the digitalization process as related to a number of topics besides further distribution of technology. In the strategy workshop with all the participants, six topics were identified. Two of which were closely linked to technology (Technology and services and Digital teaching aids). The remaining four topics (Competences, Culture, Leadership and management, and Communication) had a softer and more organizational focus. However, the softest topic, Culture, was created as a topic primarily as way of condensing the suggestions, which could not be linked to one of the other five topics. Furthermore, despite the apparent understanding of the relevance of other element than technology, the majority of the funding requested (and allocated) was related to technology.

5.3.2.3 Narratives

Two narratives were of interest during this episode.

  a) The account for the benefits and necessity of involvement
  b) The account for their exceptional situation and the dedication among employees and politicians

The first narrative of the benefits and necessity of involvement affected the process of appointing members to the groups. The steering committee was mainly composed of people with authority (director, Head of center etc.) but also included a school leader due to the involvement narrative. Thus, even in that group involvement affected the composition of the group. In the project group, the importance of involvement was deemed a higher priority. The project group ended up consisting of 11-12 people (depending on whether the external consultant was accompanied by her colleague). Among those, one-two was/were from the consultancy firm, two were from the Center for IT, three were from the central administration (including the school-IT consultant who had his office at one of the schools) and five represented the schools as either leaders or school-IT counselors.

Moving on to the vision group, one of the purposes of this group was to ensure involvement:

> "*The criteria of success for the vision workshop are to create ownership, ensure involvement and to get good inputs from the participants*" (minutes from the start-up meeting in the steering committee, March 8 2010)

More specifically this group consisted of two politicians, two employees from the Center for IT, two employees from the Center for Schools, and thirty representatives from the schools. The school representatives were primarily leaders from the schools and after school care but also teachers, pupils, and school-IT counselors.

The second narrative related to this episode was a narrative, which developed at the end of this episode and unfolded throughout the IS-related organizational change process – a narrative of their exceptional situation and the dedication among employees and politicians. More specifically, the narrative focused on the fact that the politicians allocated a large amount of money for the program without earmarking the money to a specific investment, but rather in confidence to the employees. The narrative can for instance be identified in mail from the Head of Schools:

> "*What is new, is probably that here, the politicians have allocated 25 m crones over a period of 4 years without earmarking them specifically – in confidence that the administration and schools in collaboration will be capable of spending the funding to fulfill the vision. We will administrate this freedom and trust with great respect and enthusiasm.*" (Mail from the Head of Schools to text writer of a case description regarding school-IT in Denmark, February 2011)

This narrative seems to have been developed during this episode and to have motivated the participants during later parts of the process by creating a feeling of community and importance.

5.3.2.4 Power

Two persons and their (power) relations to others were of interest in this episode.

a) The power relations between the external consultant and the steering committee and the project group
b) The power relations between the program manager and other participants in the strategizing process

Looking first at the relations with the external consultant and her relations to the steering committee and in particular the project group, it is clear that since she was not a member of the organization, she did not hold any formal authority. Further, she depended on the organization and its members to pay for her services and evaluate her positively to her employer and to their colleagues in other municipalities. However, the organization and its members depended significantly more on her. They depended on her knowledge on strategizing and in particular on her competences as a process consultant. For instance, the project manager, as agreed with the Head of Schools, hired the external consultant for an extra day to help

support the development of business cases. Furthermore, the external consultant was generally driving the process, controlling the agenda at the meeting etc.

The program manager was the other key person. She was new to the area of school-IT and introduced into the process in this episode[44]. She was appointed the role of local contact person for the external consultant and daily project manager. As mentioned above the external consultant was rather powerful in relation to the participants from within the municipality; this applied to the project manager as well. Generally, the project manager started with limited power in most of her relations. She was new to the area and thus possessed limited insight into the functioning of the schools and school-IT. The other participants did however depend on her spending a large amount of her time on the project. Through the time she spent participating in the process, she developed knowledge of the process, school-IT and the other participants. This gave her significant ownership of the strategy and the further process and knowledge as well as ownership with a stronger position in relation to the other participants. At the end of the episode, she did not depend as much on the other participants, but she was still less powerful in most of her relations.

5.3.2.5 Choice and intentions

Two choices and the related intentions were of interest in relation to this episode.

a) The choice to suggest a strategizing process to the politicians
b) The political choice to initiate the strategizing process and to adopt and fund the strategy and the plans for its implementation

The first choice was as mentioned to suggest a strategizing process to the politicians. A number of participants played a part in this choice. Central participants in the choice were in particular the Head of Schools and the IT-leader. At the end, the Head of Schools made the final decision, as he was responsible for the area and his employees were the ones who made the recommendations to the politicians. His intentions were not surprisingly to improve the poor results of the benchmarking. The IT-leader was also highly influential in this choice. As described in episode one, he made the gesture initiating the benchmarking process, his intentions with the gesture was to create the ground for fundamental changes and in particular enhance local ownership.

Another participant who influenced the decision to initiate the strategizing process was the external consultant. As her power in relations to e.g. the Head of Schools and the IT-leader was significant, her intentions played an important role. Being employed by the consultancy firm KMD, her job was to sell additional services to her clients (in addition to the participation in the benchmarking). By helping the participants in the municipality with a potential way to resolve the issues identified

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[44] Having a communication background and having worked with IT in regards to day care (younger children, another center)

through the benchmarking, she was able to both sell additional services and to retain her reputation as a good and valuable collaborator.

The other choice influencing the episode was the political choice – first to initiate the strategizing process and later to adopt and fund the strategy and the plans for its implementation.

The Head of Schools later described this choice as exceptional and characterized by trust as mentioned earlier in regards to this episode. The head of the political committee later described the choice (and the process) this way:

> "*We have created an ambitious vision, which at the same time is realizable. We know that digitalizing is the way forward for the school area, as well as the other welfare areas. Here we have a carefully worked out a vision strategy and plan of action for how the school system of the municipality of Frederikshavn might strengthen the schools by pro-active application of IT – and we have contributed with the necessary funding to implement the strategy.*" (The Head of the political committee of Children & Youth in a press release related to the municipalities participation in the Welfare innovation day, January 2011)

As seen from the quote above, the choice made by the politicians was affected by the theme of digitalization of the schools as the future, which one should strive for regardless of personal opinion, as described in subsection 5.3.2.2. Perceiving digitalization as the future, they reacted to the dissatisfaction with the current situation among the school leaders and teachers, dissatisfaction present in the benchmarking result as well.

5.3.3 Concluding remarks

This section described the strategizing process in regards to the initiating gesture and the responses to the gesture as well as in regards to the conversations, themes, narratives, power relations and choices patterning the episode. Generally, the participants experienced the activities taking part in this episode as positive and constructive. Compromises were of course made, but the differences and conflict were not in focus. Even within the vision group, the discussions were characterized by consensus. This was surprising as the vision group included many different participants with varying intentions and in particular as the group was compiled with a wish to include critical voices as well as positive voices. A potential explanation of the limited level of conflict in the vision group was the setting for the strategy workshop. The setting was not really intended for disagreements, but rather focused on creating output. The workshop started out with a presentation concerned with the necessity of digitalizing the school area. This presentation set the agenda for the rest of the workshop, which was structured with idea generation and later discussions of the six topics developed based on the generated ideas. This set-up was very helpful for generating output from a meeting, but according to the Complex Responsive

Processes perspective of limited relevance, if the purpose is to creating change as strict agendas restricts creativity and fluidness of the conversations (see e.g. Shaw, 2002; Stacey, 2011).

Differences and misunderstandings played a role in one part of the process, more specifically the development of business cases, as described in subsection 5.3.2.1. The differences and misunderstandings assisted the participants in getting to know each other better. In particular, the project manager and the school-IT consultant, who did not know each other well before, learned about each other and the ground for their further collaborations.

5.4 Episode #3: Improving infrastructure

The third episode focused on the infrastructure improvement project. The episode followed the process from the suggestion to initiate the project in the beginning of 2010 over the acceptance of the suggestion by different participants to the implementation of the project and later the establishment of a technical working group in September 2011. The gesture initiating the episode was made by the IT-leader and took place simultaneously with the gesture of the second episode. More specifically, this episode took place partly in parallel with episode two.

5.4.1 The improving infrastructure gesture and the responses

The gesture initiating this episode was made by the IT-leader during the discussion and planning of how to proceed after the benchmarking (response 5, episode 1). Where the Head of Schools focused on the possibilities of a strategizing process, the IT-leader was aware of the need for technical improvements as well. Thus, he suggested the need for funding and implementing improvements in the infrastructure.

The first response to the suggestion was the support expressed by the Head of Schools and the other participants participating in the planning of the strategizing suggestion. Thus, as this group developed the strategizing plan of action, the IT-leader and other employees from the Center for IT developed the details of an infrastructure project. A project, which would be presented to the political committee of Child & Youth at the same time as the plan for strategizing as part of a comprehensive handling of the poor benchmarking.

The suggestions focused on:

- Extensions and improvements of the wireless internet at the schools (to bring it up to date and to adjust the capacity to the many devices the pupils bring themselves)
- Investments in new and replacement of old equipment (primarily PCs)
- Partial renovations of the oldest parts of the local networks (approx. 20 % were brought up to date during 2010)

The second response to the gesture was the adoption of the suggestion by the political committee of Children & Youth. At the meeting of the political committee in February 2010, the results from the benchmarking were presented and the plan of action for a strategizing process was presented and adopted. In addition to this, the suggestion of the infrastructure project was made. The motivation was stressed as being related to the poor benchmarking and a hope to overcome the worst technical challenges emphasized by the benchmarking. Included in the presentation was also a description of the initiatives taken so far. The economic demands of the infrastructure project were primarily related to the following years as the largest part of the project was intended financed through a technology leasing agreement. The funding need in 2010 was already allocated to the school area but just not earmarked for anything specifically. More specifically the needed funding was estimated to be approx. 13 m Danish crowns.

> - 10 m financed through a technology leasing agreement. Requiring a yearly funding of 2.7 m Danish crowns, the yearly payment was suggested to be defrayed by the regular school-IT budget (financing new equipment, specifically 1,000-1,250 PCs in 2010)
> - The 2.7 m need for the leasing agreement in 2010 was suggested to be financed with funding allocated for quality improvements in the schools
> - 3 m for upgrading the wireless internet, funded through the surplus of the quality improvement funding from 2009 (plus maybe additional funding)

The suggestion of an infrastructure project was adopted by the politicians as the second response to the gesture made by the IT-leader. However, the political committee of Children & Youth did not hold the budgeting authority but made a positive recommendation to the financial committee (as suggested by the administration). The financial committee adopted the suggestion as part of the budgeting process in the fall.

Following the political approval of the project, the infrastructure project was carried out by the Center for IT. The activities were divided into three packages: a) replacement of PCs, b) renovation of local networks and c) extension of the wireless internet.
Their role in the first package was to collect data on the current situation, support the decision by the Head of Schools about which schools needed the new PCs the most and to coordinate the replacement process. An external supplier accomplished the actual replacement, meaning that their role in the later part of the process was coordinative only. The collection of information and planning took place during the spring 2010 and the replacements began after the summer holidays.
As for the second package, the focus was again on collecting information regarding the current situation, experiences from the schools and other renovation projects

taking place at the schools during the summer holidays. A project group from the Center for IT carried out an analysis of the current situation in collaboration with the local technical school-IT counselors. The information identified was then used as the foundation for both packages two and three. The limited renovation deemed necessary was then carried out internally.

Package three, built on the same information and further included communication with their supplier. Based on an overview of the needed extensions a number of electrical contractors were invited to a review of the needs for each of the schools, and were then invited to make an offer.

In the fall 2010 and spring 2011 as the infrastructure improvements began to take effect, the initiators expected improvements in the satisfaction among the teachers and school leaders. This however did not seem to happen. In their interactions with the local participants, they (e.g. the school-IT consultant) still experienced the same dissatisfaction with the infrastructure and equipment, even though the infrastructure and equipment was factually improved. The same tendency was partly identified in the analysis of competences, culture and knowledge sharing presented in the fourth episode. The initiators were puzzled about why the expected reaction was not identifiable e.g. in the analysis. The reason for the limited changes might be found in the poor matching of expectations identified through the benchmarking.

The fifth and last response in this episode was the establishment of a technical working group in the fall 2011. The group was established as part of the re-organization of the strategy implementation program (see episode five), and was intended to handle the technical projects and questions related to the strategy implementation. Besides handling the technical projects from the strategy implementation[45], the group attended to the overall technical implications, including the infrastructure and the technical questions arising from the other projects in the program. At the beginning of 2010 when the strategizing process and the infrastructure project were suggested to the politicians, the two were deliberately separated as two distinct and equally important parts of a solution to the poor benchmarking. However, in the fall 2011, the situation had changed, and the two were considered as two sides of the same process (of IS-related organizational change) where the cultural and didactic perspective took the creative lead and the technical supported this development. The earlier infrastructure project was likely to have enabled this change, as the infrastructure was no longer an obstacle. Later this balance might become more equal again, as the local ownership grew stronger and thus enabled the technological perspective to challenge and inspire.

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[45] The scope of the digital tool box, school-IT security, determination of IT architecture, analysis regarding interactive board, analysis of needed updates of class room arrangements and local networks

Gesture: The IT-leader's suggestion to improve the infrastructure (January 2010)			
	Time	**Responses**	**Who**
Response 1	January 2010	Support for the suggestion	The Head of Schools
Response 2	February 2010	Political funding for improving the infrastructure	The members of the political committee of Children & Youth
Response 3	Remaining 2010	The infrastructure projects	Project groups consisting of employees from the Center for IT, the technical school-IT counselors, external suppliers
Response 4	Fall 2010 – spring 2011	Unchanged local behavior	School leaders and teachers
Response 5	September 2011	Establishment of a technical working group	The (strategy implementation) program steering committee

Table 5.3: Responses to the improving infrastructure gesture

5.4.2 Improving infrastructure in a Complex Responsive Processes perspective

5.4.2.1 Conversations

The relevant conversations within this episode were two conversations at the beginning of the episode and the conversations among a small group of participants during the rest of the episode.

a) The conversations between the IT-leader, the Head of Schools and the external consultant
b) The conversations between the IT-leader, the Head of Schools, the external consultant and the politicians
c) The conversations among the participants of the project groups (from the Center for IT), the IT-leader, the technical school-IT counselors (to some extent) and the external supplier (to some extent)

The first conversations were the ones between the IT-leader (and his Center), the Head of Schools (and his Center) and the external consultant. These conversations followed from the benchmarking (see episode one) and evaluated the here-and-now need for improvements of the infrastructure. These conversations were partly

intertwined with the conversations regarding the suggestion for a strategizing process, but focused on the technical side. In the conversations, the resources needed were likewise evaluated. In these conversations, the dissatisfaction captured in the benchmarking was utilized as an argument for the need for improvements here and now. The point being that in particular the Head of Schools needed to be convinced of the relevance of the IT-leaders suggestion, as he was formally making the recommendations to the political committee of Children & Youth. One could assume this would be conversations with conflict potential, as the Head of Schools might have a number of other areas in need of resources. However, the shared understanding of the necessity of improvements led to conversations characterized by consensus. The Head of Schools supported the suggestion from the beginning and assisted the development of a detail suggestion towards the politicians. His support can be found in the official recommendation in the political agenda (to adopt the suggestion) and in the fact that the necessary resources were identified within the budget of the Center for Schools.

The second conversation was between the IT-leader, the Head of Schools, the external consultant and the politicians at the meeting of the committee of Child and Youth. At the meeting the external consultant set the agenda by presenting the results from the benchmarking, the Head of Schools presented the plan of action for a strategizing process and the IT-leader presented the plans for an infrastructure improvement project. The politicians already being aware of the seriousness of the situation affected the conversations at the meeting. They were oriented earlier (December 2009) about highlights from the benchmarking, and they were also informed about the problems with school-IT in the period leading up to the participation in the benchmarking both officially and unofficially. Hence, the conversations were of formal character and led to the political adoption of both the strategizing process and the infrastructure improvement project.

After the political adoption of the project, conversations regarding the topic primarily took place among the participants of the project groups (from the Center for IT), the IT-leader, the technical school-IT counselors (to some extent) and the external supplier (to some extent). Later the steering committee in the implementation of the strategy participated briefly. These conversations were not of particular interest; rather the lack of conversations about this matter at the schools was interesting. Despite the dissatisfaction with the current functioning of the area and the critics of the services delivered by the Center for IT, a project attempting to improve this situation received limited interest.

5.4.2.2 Themes

Three closely related themes were significant for this episode.

a) Considering the technological poor performance
b) Considering the lack of improvement in satisfaction puzzling
c) Considering technical improvements only a partial element in digitalizing the schools

The first was the theme patterning the limited conversations responding to the infrastructure project locally. As mentioned above these conversations were limited, however the significance of the theme patterning them was not. The conversations were patterned by the continued theme that the technology functions poorly and that the services delivered by the Center for IT were unsatisfying. The theme was developed based on the previous situation and proved persistent despite the infrastructure improvement project. The theme repeated by their colleagues was described by the technical school-IT counselors to the school-IT consultant and by him to other central participants e.g. the IT-leader and the Head of Schools.

The second and resulting theme was that patterning the conversations among the participants in the administration. This theme was concerned with the apparent lack of response from the local participants. They were puzzled by the persistence of the before mentioned theme and frustrated that their effort did not seem to have an effect. However, over time an understanding (the third theme) developed, stressing that it was not the technical improvements in themselves that would change the situation, something else – and more was needed. This might be one of the rationales behind the re-organization of the strategy implementation program (see episode five) and the establishment of the technical working group. At this point in time, the participants in the administration began to focus on elements such as local ownership, competences and cultural changes and simultaneously leave the technical issues to the working group. This did not mean that the technical issues were not considered relevant or important but rather that they were not a strategic focus at the time.

5.4.2.3 Narratives

No new narratives arose in this episode, but the narrative from episode one regarding the poor performance of the school-IT, including breakdowns and poor services continued to be repeated by the local participant during this episode. As mentioned earlier in regards to this episode the local participants did generally not experience improvements in the performance of the school-IT. The theme was however limited to the local participants, whereas the participants from the administration were aware of the infrastructure improvements initiative and the measures made by the Center for IT to document the improvements.

5.4.2.4 Power

As the Center for IT played a large part in this episode, one particular power relation was of interest for understanding the episode.

    a)   The power relation between the IT-leader and the Head of Schools

The IT-leader as mentioned earlier in regards to this episode depended on the Head of Schools. For instance, the IT-leader depended on his support for the suggestion to initiate infrastructure improvement project and for his collaboration in preparing the plan and related financial issues to be presented for the politicians. However, the Head of Schools (and the rest of the Center) depended more on the IT-leader (and his Center) for his knowledge of the technical side of the school-IT. It would be difficult for any in the Center for Schools to argue against a recommendation made by the IT-leader. On top of this, the knowledge of the IT-leader's power in the relation further strengthened by the benchmarking highlighted the relevance of his suggestion to initiate an infrastructure improvement project. The power balance was logically reflected in the conversations as the Head of Schools right from the beginning supported the suggestion made by the IT-leader. The Head of Schools seemed to believe that if the IT-leader considered this step the right one for improving the technical aspect of the situation, then it was probably right.

5.4.2.5 Choice and intentions

One primary choice was of interest within this episode:

    b)   The choice to initiate the infrastructure improvement project

More specifically, the choice of the IT-leader to suggest the project and the choice of the Head of Schools to accept and support the suggestion were of interest. The official purpose behind the project was to achieve an improvement of the infrastructure and through that to improve the general satisfaction with school-IT and to ensure that IT was included in the education as the national regulations prescribed. The official purpose intentionally linked the infrastructure improvement project to the improvement of the situation pinpointed by the benchmarking (low satisfaction). As the IT-leader and the Head of Schools knew of the poor performance and low satisfaction before the benchmarking, the timing of the infrastructure improvement project was not motivated by the benchmarking results themselves. Rather the benchmarking results were employed to legitimize the need for resources in a context with a focus on cutting costs (Danish Government et al., 2011).

5.4.3 Closing remarks

This section described the infrastructure improvement project in regards to the initiating gesture and the responses following the gesture. Furthermore, the conversations, themes, narratives, power as well as the choices and intentions were

the focus. The episode was generally characterized by consensus, as there was a shared understanding that the "problem" identified through the benchmarking needed to be handled. Further, the other participants trusted the IT-leader and his judgment of an appropriate (partial) solution. Related to that, it was worth highlighting that the episode was characterized by a theme of confusion regarding the lack of changes (in the perceptions and conversations locally). Additionally, the episode supported the development of an understanding that what were needed were not primarily technical improvements or changes, but rather changes in the culture, mindset or interactions. This was supported by the gesture of technological changes (investments in infrastructure) only leading to responses of continued behavior (conversations and narratives).

5.5 Episode #4: Analyzing

This episode was concerned with the process of analyzing the competences, culture and knowledge sharing related to school-IT. More specifically, the episode followed the process from the formal initiation of the analysis in the beginning of 2011 over the development and completion of the analysis to the communication of the results back to the school participants investigated in the analysis at the end of 2011. The episode followed episode two chronologically and the first intentions for an analysis were expressed during the strategizing process in episode two. Furthermore, the last part of the analysis took place simultaneously as the first part of episode five.

5.5.1 The analyzing gesture and the responses

The analysis of competences, culture and knowledge sharing was formally included as an element in the strategy document adopted by the politicians in August 2010. The decision that an analysis should be completed was made during the strategizing process. The actual initiation of the analysis (the gesture) was however made by the program steering committee in January and February 2011. The program steering committee was established as part of the plan for the implementation of the strategy with the purpose of ensuring overall coherence and progress in the implementation of the strategy[46].

The analysis was initiated at a program steering committee meeting at the beginning of February with the adoption of a mandate defining the purpose, links to other projects, organization, tasks and time perspective (written at the end of January). The purpose of the analysis had two sides. First, it should help establish a foundation for launching the most relevant projects by building on knowledge of the current situation. Furthermore, the analysis should be the grounds for comparison for a later evaluation of the value of the implementation of the strategy. As part of the initiative, a project group was established:

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[46] For a more detailed description of the program steering committee, see the case description in Chapter 4, section 4.2.

- The program manager
- The pedagogical administrative consultant
- The school-IT consultant
- The school library consultant
- A school leader
- Two school-IT counselors
- A consultant for special needs education
- A teacher
- A participants form the after school care

The role of this group was to define the scope of the analysis in more detail, and to later work with the external supplier on the developing topics and questions for the surveys and interviews and later work with the external supplier on the analysis of the data.

Shortly after the analysis project was initiated, a new collaboration with the consultancy firm KMD and more specifically with the external consultant from the strategizing process was established. The external consultant was a large part of the strategizing process and of the formulation of business cases at the end of the strategizing process. The members of the program steering committee were therefore familiar with her and confident that she knew their goals, approaches and needs. Thus the program manager, with the support of the program steering committee and the Head of Schools, reached out to her shortly after the establishment of the project group (end of February) asking the external consultant to develop a proposal including a potential process and estimations on the price.

After a formal agreement was enter into by the consultancy firm KMD and the Center for Schools, the preparation of the analysis began in April 2011. The group also met in March to kick-off and define the analysis project. The preparation of the analysis took place at two workshops both on April 13. On this day, the external consultant and a colleague of hers presented the relevant data from the benchmarking and the insight by the members of the project group into the current situation was discussed. Furthermore, the scope of the analysis as defined and suggestions regarding questions or topics were passed on to the external consultant.
The preparation of the analysis was completed at a third workshop, which took place May 3. At this workshop, the external consultant and her colleague presented their suggestion for data collection methods, and the specific content based on the first two workshops. After the presentation, their suggestion was discussed and adjusted, ending with a final set-up for the analysis.

From May 6-17, the analysis was carried out. A survey was sent out to each school (the school leader) to be distributed to all teachers, leaders and pedagogues. The survey was open for responses from May 6 to May 13 and then the deadline was

prolonged to May 17 in the hope of improving the response rate.[47]. The qualitative part of the analysis was two interviews at each school. An interview with the school leader and after that a group interview with pedagogical school-IT counselors and up to four other teachers or pedagogues. The interviews were carried out between 9th and 16th of May by the external consultant and her colleague.

After the data were collected, the external consultant and her colleague analyzed the data in regards to the intentions discussed at the three workshops in the project group. Following the analysis of the data, the preliminary results were presented for the project group at the fourth workshop on May 30. The presentation included an aggregated status for the all the schools, a status for the individual schools and suggestion for further work. At the workshop, the results were discussed along with the first ideas for a plan of action. This was followed up at the fifth and last workshop two weeks later (June 14) where a plan of action was developed. Furthermore, the project group evaluated the analysis project and the scope of a follow up analysis after the strategy period was discussed.

After the last meeting in the project group, the external consultant presented the output of the process at a meeting in the program steering committee on June 23. Her presentation included the main results from the analysis as well as the suggested plan of action. Based on the presentation the program steering committee decided that the aggregated results should be presented to the school leader meeting in August, that a dialogue team should be established to handle the presentation of the school specific results at the schools individually and that the schools should develop focus areas based on their results (as suggested). The established dialogue team consisted of six people, which were the same as the members of the project group except for the participants from the schools and the consultant for special needs education:

- The program manager
- The school-IT consultant
- The pedagogical administrative consultant
- The school library consultant
- Two school-IT counselors

During the analysis, some dissatisfaction with the project and the role of the external consultant and her colleague developed. The program manager in her evaluation of the consultants mentioned the issues. She emphasized that they (the project group) experienced the process as confusing as the possibilities of the chosen tool for the analysis was unclear. Further, she emphasized that the process regarding the formulation of questions did not impress them; a part of the process they had made clear from the beginning was difficult for them. Here the experienced problems in

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[47] The final response rate of 82 pct. was achieved.

the analysis progressed as many answers led to discussions regarding the interpretation of the questions. She further stated:

> "*We did therefore most likely receive what we paid for, but it was not impressive, which we have experienced earlier* [implying the strategy process]." (The program manager in the official evaluation of the product purchased from the consultancy firm KMD, August 2011)

The school-IT consultant was considerably less satisfied. He described the process as frustrating and dominated by time pressure. Furthermore, he experienced the questionnaires as less than optimal and the analysis tool as problematic. It ended with him carrying out his own analysis on the collected data between mid-August and September 2011. In his opinion, these results challenged in some cases the results reached by the external consultant. The preparation of the data by the school-IT consultant was the one used in the later presentations at the schools.

During fall 2011, the results from the analysis were presented at each of the schools. The presentation included only the results for the specific school and the aggregate level was only included as a comparison (e.g. higher or lower than the average). The dialogue team established by the program steering committee at their meeting in June, planned the presentations from August to October[48] and made the presentations at the schools in October-December 2011. More specifically, they split the schools between them, meaning that only one or two members of the group participated at each school. In cases where special circumstances made it relevant, the Head of Schools participated as well[49]. At the presentation meetings one or two members of the dialogue team participated together with the school leader (school leader team), the technical school-IT counselor, the pedagogical school-IT counselor (the two school-IT counselors might be the same person), the librarian and potentially others, however no more than eight participants. The purpose of the meetings was to present the current situation at the school (results from the analysis) and in this way inspire the people participating from the school about ways to handle the challenges identified and to build on their strengths. The meeting was therefore also a possibility for the participants from the schools to discuss their ideas on how to implement the strategy at their school with somebody from outside the school.

Gesture: The initiation of the analysis by the program steering committee in January/February 2011			
	Time	**Responses**	**Who**
Response 1	February/ March 2011	New contract with the consultancy firm KMD and the	The program steering committee Specifically the Head of

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[48] As the school-IT consultant was re-analyzing the data from mid-August to ultimo September, much of the planning took place in the month between ultimo September and ultimo October.
[49] In particular, with the schools being merged during the same period.

		external consultant	Schools, the program manager and the external consultant (and KMD)
Response 2	April – May 2011	Preparing the analysis	Project group (The program manager, the pedagogical administrative consultant, the school-IT consultant, the school library consultant, a school leader, two school-IT counselors, a consultant for special needs education, a teacher, an participant form the after school care)
Response 3	May – June 2011	Carrying out the analysis, survey, interviews, analysis	The external consultant and her colleague Teachers, school leader, pupils and other school participants attended
Response 4	June 2011	Presentation of results at a program steering committee meeting	The program steering committee, the external consultant
Response 5	June – August 2011	Dissatisfaction with the process	The project group, in particular the school-IT consultant
Response 6	August – December 2011	Presentation of results at the schools	Approx. five participants from the school (the school leader, the school-IT counselor(s), the school Liberian and maybe others) One-two member from the dialogue team (The program manager, the school-IT consultant, the pedagogical administrative consultant, the school library consultant, two school-IT counselors)

Table 5.4: Responses to the analyzing gesture

5.5.2 Analyzing in a Complex Responsive Processes perspective

5.5.2.1 Conversations

Of relevance for this episode were in particular two conversations:

a) The conversations regarding the scope of the analysis within the project group
b) The conversations regarding the results of the analysis between school representatives and the dialogue team

The first mentioned conversation took place in the project group and initially in the program steering committee. The program steering committee stressed three topics: a) competencies, b) culture and c) knowledge sharing and gave the project group mandate to elaborate further on them. The project group then developed these topics further:

> **Competencies**
> - Use of technology (several special system mentioned)
> - Level of competencies for teachers, school leaders, school-IT counselors, pedagogues
> - Needs for updating competencies
>
> **Culture**
> - Are the positive tales told
> - Asking for help (positive/negative/acceptable)
> - Habits
> - Support from school leader and school-IT counselors
>
> **Knowledge sharing**
> - Extend
> - Types
> - Within the team
> - At the school
> - Between schools

Following the elaboration on the focus of the analysis the consultancy firm KMD, the external consultant was included in the process. As described above three workshops were then arranged with the participation of the project group members as well as the external consultant and a colleague of hers. At these workshops, the conversations regarding the scope of the analysis continued with a focus on the details. At the first workshop, the focus of the conversations was the participants' compiled knowledge about the current situation. At the second workshop, later that day, the conversations moved on to focus more specifically on the scope e.g. the discussion of what the analysis should and should/could not include. Additionally,

suggestions for questions or focus areas were discussed. The focus of the conversations at the third workshop concentrated on the specific methods and set-up for the analysis. Generally, the members of the project group experienced the conversations taking part in this process as rushed or even dissatisfactory (see the description in section 5.5.1 above or the theme describe below in section 5.5.2.2). A partial explanation, given e.g. by the program manager was the limited time allocated for the process. Time restraints might have been what led the external consultants to control the focus of the conversations heavily. The focus of the first two workshops was fairly open; after a presentation by the external consultants of results from the benchmarking, the other participants were invited to contribute with their knowledge of the situation and the scope of the analysis was discussed. Based on these insights the external consultants developed an initial method and content for the analysis. At the third workshop, the method and content were presented and discussed by the participants. However, as this part of the process was unfamiliar for the members of the project group, the related conversations remained focused on rather practical details and minor adjustments, such as the use of terminology, how to call attention to the survey and the ambition for the response rate and how to potentially improve it. The limited conversations at workshop three might further explain the later dissatisfaction with the process (and the results).

The conversations regarding the results of the analysis took place at the schools between representatives from the school and representative(s) from the dialogue team (see e.g. Table 5.4 above for details). Prior to the meetings at the school, the school leader had received a document describing the school results. At the meeting, the representative(s) from the dialogue team presented the results by highlighting selected results. This approach was a gesture in the conversations made in the hopes of generating discussions of the results as well as reflections among the participants from the school (potential responses). At most of the meetings, the school participants did however respond by listening respectfully to the presentation, maybe asking some questions but generally considering the productivity of the conversation as limited. The representative(s) from the dialogue team pushed a bit for specific reactions and reflections on the results. This approach was motivated by the re-organization of the program, taking place around the same time (see section 5.6 on episode five). Related to the re-organization the schools should take a more proactive role in the implementation of the strategy, more specifically by developing and implementing local projects of IS-related organizational change. In the short term, this meant that the schools would be asked to develop focus areas partially by drawing on the results from the analysis. Thus, the members of the dialogue team (and the program steering committee to whom the team reported) hoped to inspire and challenge the current approaches through the conversations regarding the results of the analysis.

5.5.2.2 Themes

Three themes patterned the conversations in this episode.

a) Considering the establishment of a baseline of the school-IT situation a necessity
b) Considering an evaluation with a purely technical focus of limited relevance
c) Considering the role of the external consultants less satisfactory

The first was concerned with the necessity of establishing a baseline of the school-IT situation to be able to evaluate the project later. The program steering committee emphasized that part of the purpose of the analysis was to provide a standard of comparison for the later evaluation. Based on this theme the participants in the project group and the external consultants attempted to develop questions comparable across time and at the same time relevant for understanding and addressing the current situation. This was a difficult task and the later dissatisfaction with some of the questions leaving room for interpretation was linked with these difficulties and the theme. This theme further led to the second theme within this episode. The second theme stressed the relevance of being able to evaluate the softer benefits rather than focusing of the number of e.g. smart boards and PCs per pupil or classroom. Thus, this theme followed the theme from episode two regarding the digitalization process as related to a number of topics besides further distribution of technology. As the theme from episode two highlighted other topics than the technological, the evaluation needs would understandably also include softer topics. In this way, the technical focus was downplayed further compared to the strategizing process and the prior dissatisfaction with the performance of school-IT. This was similar to the result of episode three, which likewise stressed the need for changes in the culture, mindset or interactions rather than technical improvements or changes.

The third theme was concerned with the limited satisfaction with the role of the external consultants. The external consultants entered the process to assist with developing the analysis, carrying out the interviews and analyzing the collected data. As the satisfaction with the external consultant in the benchmarking and strategizing process respectively was high it was natural for the program manager supported by the program steering committee to bring in the same consultant (another colleague of hers participated along with her). The satisfaction with their services regarding the analysis process was however considerably lower. The theme concerned with this situation consisted of an official theme and a shadow theme. The official theme emphasized that the frustrations and limited satisfaction were probably caused by themselves. More specifically, the problems were linked to a short timeframe rushing the process and to limited focus on matching expectations. The shadow theme was more critical towards the work of the external consultants. This theme was for instance identifiable in the school-IT consultant's conversations about the process. As mentioned earlier (in subsection 5.5.1) the school-IT consultant

described the process as frustrating and experienced the questionnaires as less than optimal and the analysis tool as problematic. Furthermore, he ended up re-analyzing the data, a rather harsh criticism in itself. The school-IT consultant felt that his teaching colleagues were not represented fairly by the results and thus misunderstood at times. For instance, he defended the responses related to poor technical performance. At first, these responses had been interpreted as the teachers "living in the past," but the school-IT consultant looked into it and thus stressed that there actually was a short time period of challenges with the internet connections just prior to the survey, which might explain the responses. He thus went to great effort to ensure that the teachers and school leaders would consider the results relevant and representative of their everyday life.

5.5.2.3 Narratives

One narrative was relevant to mention in regards to this episode.

a) The account of decision-making as a rational process

This narrative focused on how decisions were made. More specifically the narrative highlighted decisions as rational processes, where a decision was made based on the foundation of knowledge of which decision was the best, e.g. leads to the most benefits. More specifically, the narrative can be identified in the way e.g. the members of the program steering committee described the purpose of the analysis as a standard of comparison for a later evaluation and more importantly here as the necessary knowledge foundation for making good decisions about future initiatives in the strategy implementation process. Thus, the right way to make decisions was stressed as knowledge based decision-making.

5.5.2.4 Power

One power relation was relevant to attend to in regards to this episode.

a) The power relation between the external consultant and the program manager and the program steering committee

Within this relation, the internal participants (program manager, program steering committee and project committee) depended highly on the external consultant. Most importantly, the program manager and the program steering committee depended on the external consultant for her competences as a process consultant to structure and driving the analysis process. Further, they depended on her to carry out the analysis (develop questions, interviewing and analyzing the data). In addition to these two dependences on her resources, the program manager and the program steering committee also depended on her to legitimize the analysis. The acceptance of the results by the local participants as well as the politicians was strengthened by the analysis being designed and performed by an outsider. In this way, it was not the leaders from the Center for Schools interfering with or overseeing the schools but

rather a neutral analysis of the status. Thus, the program manager and the program steering committee depended on the external consultant in a number of ways. The external consultant did not depend on the program manager and the program steering committee to the same extent. She of course depended on her customers to be satisfied with the services she and her colleagues delivered and to return with new problems to be solved. However, she did not depend as much on the program manager and the program steering committee as they did on her. The unequal power distribution between the external consultant on one side of the relation and the program manager and the rest of the program steering committee on the other might be part of the explanation for the dissatisfaction with the external consultant in the last part for the episode. As the program manager and the program steering committee were less powerful than the external consultant in the relation, they trusted her judgment regarding the process. This might be why they failed to put forward their own standards.

5.5.2.5 Choice and intentions

Two opposing intentions patterned the episode.

    a)   The choice to complete the analysis within a short time period
    b)   The choice to re-analyze the data

Firstly, the program steering committee, and in particular the program manager and the Head of Schools, decided that the analysis should to be completed within a short time period. The intentions behind this choice were that they wished the program to move on to the actual implementation projects quickly, thereby presenting the schools and the politicians with signs of progress. Due to these intentions, a strict deadline for the analysis project including a short planning period was important. Later they realized that this decision might have been a contributing factor in the relatively low satisfaction with the services delivered by the external consultant and her colleague (a realization included in the official theme of the limited satisfaction).

In opposition to the intentions of allocation a short time period for the analysis, was the school-IT consultant's intentions. According to him, it was more important that the analysis be performed properly and thus provided a reliable foundation to build the later projects on. This intention of his was what led to his choice to challenge the external consultants' results and to conduct a small scale analysis on the collected data himself.

The two intentions and the related choices being opposing did not mean that the school-IT consultant did not wish for the program to move on to the implementation project quickly or that the program manager or the Head of Schools did not value a proper analysis and reliable results. Rather they gave priority to one of the issues partly at the expense of the other.

5.5.3 Closing remarks

This section described the analysis process in regards to the initiating gesture and the responses following the gesture. Furthermore, the conversations, themes, narratives, power as well as the choices and intentions were a focus. The element of conflict within this episode was the dissatisfaction with the process and the role of the external consultant. This dissatisfaction was described as a theme patterning the process. Both an official and a shadow version existed of the theme focusing on dissatisfaction. The official theme highlighted the prior great satisfaction with the external consultant, implying that this might have led to unrealistic high expectations. Further, the official theme went on to stress, that the external consultants had delivered what they had paid for, and that their dissatisfaction was probably due to poor matching of expectations and to a limited time period. The shadow theme regarding the dissatisfaction was primarily related to the school-IT consultant. He criticized the methods applied and distrusted the findings or more specifically the conclusions. Consequently, he conducted his own analysis of the collected data, which was used in the presentation of the results to the schools. Related to this the particular role of the school-IT consultant should be mentioned. He was on the one hand part of the Center for Schools, participating in the processes and meetings here, but on the other hand he was also part of the local context, being trained as a teacher and holding an office at one of the schools. This split identity in the process might be an explanation for his strong reaction in regards to performance of the external consultants. As he was part of the central program steering committee, he felt a need to be able to vouch for information and decisions made centrally. On the other hand, his insights into the life at the schools made him question the results of the analysis. Due to his close link to the schools, he further felt obligated to ensure the fairness of the results and to tone down the conclusions he found a bit too crafty. The school-IT consultant in this way engaged to make sure the analysis and its results would be considered meaningful among the school participants, and consequently that they would build on the results in their further digitalization processes.

The extent to which the analysis results were utilized in the process further might however be questioned. First of all the schools developed focus areas for their local ambitions in regards to improving school-IT, but the link to the findings of the analysis was limited. This might have been considered the easy way, as the program steering committee did not pressure for closer links to the analysis findings. However, it might also be caused by an analysis deemed of limited relevance by the schools participants, either due to inappropriate design and execution or due to too much focus on the purpose of being the baseline for a later evaluation. Related to the second purpose of creating baselines for a later evaluation, this might be difficult to succeed with as well as the program was evolving on an ongoing basis. The question was therefore whether it was possible at the beginning of a project to determine which parameters would be meaningful and relevant for a later evaluation. On the other hand, an evaluation needs a baseline, and evaluating based on parameters of

culture, competences and knowledge sharing assumed relevant in the beginning of the program would probably be more relevant than evaluation solely based on technology distribution or something similar.

5.6 Episode #5: Re-organizing

This fifth and last episode was concerned with the process of establishing a new project structure. More specifically, the episode followed this re-organization of the program implementation from the formal suggestion in the program steering committee to create a new structure in September 2011 to the adoption of the suggestion and the actual re-organization to the local submission of project applications and the adoption or rejection of these during the remaining part of the program. The gesture initiating the episode occurred during episode four (the analysis process) and the first part of this fifth episode thus took place in parallel with the last part of episode four.

5.6.1 The re-organizing gesture and the responses

The gesture initiating the establishing of a project structure, typically referred to as a re-organization, was less clear-cut than the gestures initiating the other episodes. However, the formal suggestion to reorganize the program was emphasized as the gesture. Prior to this event, the program steering committee discussed at a meeting in May 2011 how the program could support innovation within school-IT at the schools. The topic was not formally on the agenda, but introduced as a topic to be discussed at another meeting. It was decided that the program manager should work on describing a possible solution for the following meeting in the program steering committee. At the following meeting in June 2011, the results from the analysis were presented by the external consultant and the progress of the strategy implementation program was discussed e.g. in regards to schedule of the action plan and the financial possibilities. Related to these discussions, the issue of supporting local innovations was a focus. More specifically, a small pool specifically to fund innovation initiatives was created. The school-IT consultant was asked to develop further a suggestion for the scope of the pool for the next meeting.

At the following meeting, in September 2011, a suggestion to reorganize the program in general was presented instead of a suggestion for the scope of an innovation pool. Between the two meetings, the formal suggestion to re-organize the program was developed by the program manager, a key employee from the Center for IT, the school-IT consultant and the Head of Schools. More specifically, the program manager described it like this:

> "[employee from the Center for IT] and I tried to be smart one day and later we discussed it with first [the school-IT consultant] then [the Head of Schools], who both found it to be smart too, so it is close to being decided." (Mail from the program manager, September 2011)

The idea of creating a pool to fund innovative projects thus transformed into a reorganization of the program itself. In the strategy, the implementation was planned to include as much as twenty-six projects primarily centrally controlled with involvement of the schools if relevant. The funding allocated for the implementation of the strategy was primarily based on calculations on the cost of purchasing smart boards for all the classrooms at the schools. However, the funds were not specifically tied to that purpose. The idea was therefore to create pools from which the schools could apply for money for local projects. The projects should be targeted at meeting the vision in the strategy, the goals from the five focus areas the schools developed based on the results from the analysis. The formal suggestion was made at a program steering committee meeting in mid-September 2011 and in the agenda the program manager wrote:

> *"To create progress in the implementation of the strategy it is suggested that we re-organize the program, so that we in the future will have a smaller number of centrally initiated joint projects for all the schools, a technical working group which continuously launches technical projects already decided in the strategy and finally that we establish a larger pool which the individual schools can apply for funding for ..."* (Agenda for meeting in the Program steering committee, September 16 2011)

Further, it was suggested that a baseline for the allocation of funds should be developed ensuring each school a fair share of the funding. In addition, a smaller amount of the funding was suggested placed in a small pool intended for special cases (not further described at the time).

The first response to the gesture (the formal suggestion to re-organize) was the adoption of the suggestion by the program steering committee. This was not surprising, as one-half of the members of the committee had participated in the prior discussions and the development of the suggestion. Some of the arguments for adopting the suggestion voiced at the meeting were that it would open the program up for locally meaningful solutions and that they could not be sure that investing in smart boards would prove to be the right technology for the future.

Following the adoption of the re-organization a project committee was established. The purpose of the committee was to process the many project applications, expected to be handed in by the schools, to remove some of the workload from the program steering committee enabling them to focus more on actually steering the program. It was further prioritized that the group cover both technical knowledge, pedagogical and didactic knowledge as well as an overview of the overall program. This led to the following group of people being included in the project committee:

- The program manager
- The pedagogical administrative consultant
- The school-IT consultant
- The school library consultant
- An employee from the Center for IT (who had worked closely with the Center for Schools prior, including the strategizing process)

In practice, the role of the project committee was to process the applications, approve the smaller projects and make recommendations for the program steering committee regarding the larger project. This meant that the committee from April 2012[50] forward met once a month to discuss the applications. Prior to the meetings, the members had received and reviewed the applications. Hence at the meetings the group discussed the ideas, the link to the schools' focus areas and the strategy, if the school had the right to the funds (according to the baseline for allocation the funds) and whether the project was properly rooted in the school[51]. If a project application was partial or fully rejected, the project committee would prioritize providing the applicants with a proper explanation. A partial rejection meant that the applicants should improve the application according to further outlined instructions. This might be due to a poor application (e.g. missing links to the school's focus areas or limited focus on the pedagogical benefits) but it might also be due to the committee's evaluation that the applicants could benefit from discussions with resource persons e.g. in regards to the technology in question.

During the fall the program steering committee and in particular the project committee developed details of the new project structure. More specifically, the baseline for allocating the fund from the 80 % pool was developed[52], the condition for applying for funds from the smaller 20 % pool for special cases was determined[53] and information material for the schools were developed including application guidelines and templates. Two versions of the information material were developed: a short flyer (both sides of an A5 document) for all the teachers and a longer brochure (10 pages, approx. same size) of which each school would receive four or five. The school leaders were informed about the new project structure and the possibility to apply for project funding in November 2011. Furthermore, in January 2012 a theme day was arranged with the purpose of inspiring the schools in regards to the possibilities of school-IT. On the theme-day, the first half of the day was for the school leaders, school-IT counselors and school librarians only and focused on inspirational presentations and discussions among the participants

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[50] When the applications began to be submitted
[51] E.g. that the relevant teachers had been involved in the application, in contrast to the application being developed solely by the school leader
[52] The funds were allocated to the schools based on the number of pupils. More specifically a small sum was allocated per pupil per year, in 2012 that meant 675 D.kr/pupil
[53] Applications for this pool should either have an inter-school focus or a special needs focus. If schools applied for the 80 %-pool for projects complying with the conditions for the 20 %-pool the projects would be funded by the 20 %-pool.

regarding the characteristics of good digital teaching aids and media. The second half of the day was for all interested school employees, and was organized as an exhibition with stands presenting different technologies in use at other schools. The developed information material, intended to inform a broader group of school participants on how to apply for funding, was distributed to the schools in early spring 2012.

In spring 2012, the applications from the school began to be submitted. As the program was re-organized to a project structure, these local projects were the activities, which would implement The Digital School as described in the strategy. The intentions were that the schools develop projects and project applications based on knowledge of their current IT situation in regards to both the technical and the cultural elements, and with respect for the pedagogical life at the school, develop didactically grounded digital projects school-IT projects. To ensure these intentions were followed, the applications needed to be described in a template, highlighting the information need by the project committee to evaluate the relevance of the project. Besides the scope of the project including the didactic goals and the needed technology, the applicants were asked to describe the links to the schools' focus areas, evaluation criteria and plans as well as plans for knowledge sharing[54].

The processes for the development of projects and applications varied between the schools. At some schools, the school leader managed the process by initiating a process focusing on which goals and projects would be relevant for the school. Based on a shared decision (or sometimes a school leader decision) on the focus, specific projects were developed and the relevant people were involved. In contrast, other schools had a completely open process where all employees could develop projects of their interest. However, as the funding for each school was limited (and decided by the number of pupils), this meant direct competition between the teachers, which at some schools had temporary consequences for the work environment. Many schools developed their applications through processes that mixed these two choices together.

At the beginning of the process, some frustrations were experienced among the teachers regarding the requirement of developing formal applications. The formality was experienced as a limitation of the motivation to develop projects. This issue was raised at a project committee meeting in April 2012 and brought up at the following program steering committee meeting in May by the school-IT consultant. At that time, the issue had resolved itself. The school-IT consultant explained that there had been an extensive negative focus and that he therefore began to fear that the new project structure established an administrative jungle that the schools could not be bothered to participate in. He further explained that, at the time of the meeting the

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[54] A translated version of the template is included in Appendix H

situation had changed, many applications had been submitted also from the schools that had been the most negative, and the negative tone had ended.

At the project committee meeting in April 13 2012, the first school applications were evaluated. At the following meeting in the program steering committee at May 24, applications needing the consideration of the program steering committee were included. Following these meetings, applications were evaluated at each of the project committee's monthly meetings and at the relevant meetings in the program steering committee. At the end of 2012, funding had been allocated for thirty different projects covering all sixteen schools and a number of different topics[55].

Gesture: The suggestion to reorganize by the program manager and a key employee from the Center for IT in September 2011			
	Time	Responses	Who
Response 1	September 2011	Adoption of the re-organization	The program steering committee
Response 2	September 2011	Establishment of the project committee	The program steering committee The project committee (the program manager, the pedagogical administrative consultant, the school-IT consultant, he school library consultant, an employee from the Center for IT)
Response 3	Fall 2011	Detailed planning of the project structure	The program steering committee
Response 4	Spring 2012 →	Development of projects and project applications	Participants from the schools, teachers, school leaders, school-IT counselors Resource persons from the administration
Response 5	April 2012 →	Approval of the projects	Project committee Program steering committee

Table 5.5: Reponses to the re-organizing gesture

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[55] E.g. cross-disciplinary projects, reading support projects, pupil inclusion projects and many others

5.6.2 Re-organizing in a Complex Responsive Processes perspective

5.6.2.1 Conversations

Four conversations were relevant for this episode:

a) Conversations within the program steering committee regarding the re-organization
b) Conversations within the program steering committee regarding the practical matters of the re-organization
c) Conversations at the schools regarding the development of project applications
d) Conversations within the project committee regarding the evaluation of the projects

At the beginning of the episode, conversations took place within the program steering committee regarding the desirability of moving the program from being organized around a few centrally controlled projects to being organized around many smaller local projects. Initially, these conversations were characterized by consensus that it was an appropriate re-organization and that a project structure would be more suitable for the motivation behind the program. The focus of these conversations was on the possibility of implementing locally meaningful projects and at the same time initiating experimentation with technology in different situations. Further, it was continually highlighted as way of creating local involvement and ownership. The involvement and ownership elements were deemed essential as the vision of the strategy was to strive for The Digital School and have everybody engaged in it. To accomplish this, the local participants needed to be involved. Additionally, during the year between the strategizing process (June 2010) and the decision to re-organize in September 2011 the involvement of the local participants had been limited due to the preoccupation with the political approval and funding of the strategy as well as the analysis process.

Following the decision to re-organize the program, the conversations in the program steering committee moved on to focus on the more practical matters of the re-organization such as the baseline for the distribution of the funds and the requirement for the applications. In these conversations, it became clear that some of the members of the program steering committee were part of the daily life at the schools whereas others had a closer link to the administrative side of the matter. These differences led to conversations about a reasonable level of documentation requirement. In these conversations, the school-IT consultant and the school leader represented in the committee argued for lowering the formal requirements to the lowest acceptable level. Other members such as the program manager, the Head of Schools and the IT-leader argued for the need to steer the process through

evaluations of the applications and further kept in mind that documentation should apply to the standards of official auditing.

Later the dominating conversations within the episode were the conversations at the schools, where the focus of the conversations was at first how to handle the invitation to apply for funding, e.g. who had the strongest claim for a project, those with the most interesting/creative idea or those with the worst current status in regards to school-IT. Further, frustrations with the requirement for describing the projects and its links to the schools' focus areas, IT evaluation etc. were voiced. However, at most schools it was only a limited number of teachers who participated in the conversations, the most passionate ones. The conversations at the schools thus presented the school leaders with some challenges. How to engage the relevant employees? How to establish a fair selection of projects to be submitted to the project committee? At some schools, this led to the collective decision at the pedagogical meetings, at others it led to a management decision by the school leader and at other schools, it led to a laissez-faire approach.

As the project applications were received by the project committee, conversations in the committee were initiated. The conversations were concerned with the evaluation of the projects. The mandate given by the program steering committee defined a set-up, e.g. by highlighting the relevance of a project's links to the schools' focus areas, the plan and criteria for evaluating the project and the plans for sharing the knowledge acquired through the project. These criteria were evaluated in detail in the conversations in the project committee; however, other issues were discussed as well. For instance, the project committee members engaged in conversations regarding the appropriateness of specific technology related to the purpose of projects, the proper rating of projects in the relevant group of teachers, awareness of ongoing operational costs etc.

5.6.2.2 Themes

Four partly interrelated themes influenced the conversations of the episode:

a) Considering local initiatives and differences in quality
b) Considering communicating the new structure to the schools important
c) Considering the re-organization as an opportunity to experiment with different technologies in different contexts
d) Considering didactical relevance a focus rather than the technology in itself

The first of these was the theme patterning the initial conversations regarding the re-organization taking place in the program steering committee. The theme focused on the need for local initiatives and room for differences. Earlier during e.g. the strategizing process this was not a direct focus in the conversations. However, at the beginning of this episode this theme was significant in the process of suggesting and adopting the new project structure. Linked to the local initiatives and differences the

theme also included a focus on the need for the implementation program to be flexible and dynamic enough to adjust to the emerged need for enhanced local ownership.

As the re-organization was adopted, a new but related theme arose. This theme focused on the importance of communicating the new structure to the schools in a way to motivate them to participate. The importance of communication between the program steering committee and the school was logically linked to the intention to engage the school participants more, and to have these local participants drive the implementation of the program. Within this theme, a lot of attention was directed to the issue that with the new structure the schools needed to apply to receive money allocated for them. The members of the program steering committee feared resistance from the schools as they were asked to apply for "their own money." In an attempt to avoid such resistance, the program steering committee emphasized the need to communicate the movement in the re-organization from a centrally controlled implementation process to local projects. By stressing that the money would not have been transferred to the schools in the original plan, but would have been used by the Center for Schools to purchase equipment for the schools, they hoped to limit the resistance. In practice, no resistance was experienced in regards to the need to apply for money already intended for the school. The school participants did not draw parallels to the regular distribution of money but rather considered the opportunity to apply for money an extraordinary situation. If the absence of resistance was due to the focus in the communication being unclear, the theme stressed the necessity of the focus.

In addition to the first mentioned theme regarding the need for local involvement, two additional themes patterned the conversations regarding the purpose of the re-organization. The first of these themes highlighted that the re-organization created opportunity to experiment with different technologies and their relevance in different contexts. Thus, this theme was oriented towards the potential for organizational innovation (through IT). Actually, the theme was already present in the discussion prior to the initiating gesture (the formal suggestion to re-organize). These discussions or conversations on how the implementation program could support innovative initiatives took place in the program steering committee in spring 2011 as described at the beginning of subsection 5.6.1, and was thereby an essential part of the foundation for the gesture and the initial responses of the episode.

The last theme was likewise related to the arguments for the re-organizing. This theme concerned the focus on technology versus didactic in the local projects. It was considered important by the program steering committee that the funding was not just used to purchase technology for the sake of technology. Rather their intention was that the projects should be motivated by didactical consideration, where the technology was a means to realized didactical goals in a new way. However, as the program was financed through construction means the money should primarily be spent purchasing technology or other physical objects. The needed cultural change

or improvements of competences should be financed (if required) by the schools themselves and only partly by the funding from the program.

5.6.2.3 Narratives

Two narratives were relevant for understanding the episode.

    a)   Accounts for changes as a re-organization
    b)   Accounts for the positivity of decentralization

The first of these narratives was concerned with the account people gave of the new project structure as a re-organization of the program. They described how the new structure was more dynamic, flexible and involving. The point being that the members of the program steering committee stressed the rethinking of the implementation of the program as a significant decision, still supporting the intention behind the program, but radically changing the implementation process. Through this narrative, the time spent re-organizing the program was time well spent as it helped better accomplish the goals and intentions described in the strategy.

The second narrative within this episode was the narrative of the positivity of decentralization. In regards to the re-organization a narrative of the process was developed, stressing the positive effects of local involvement and initiatives. The accompanying negative articulation of the opposing force (centralization or central activities) can be identified in descriptions of the local projects as contrary to standardization. An alternative and more positive perspective on centralization could be common goals and economy of scale. The decentralization was however not described in regards to the less positive elements after the decision to re-organize was made and the narrative of what they were doing arose.

5.6.2.4 Power

Two power relations were relevant in regards to this episode:

    a)   The power relations between the program steering committee and the project committee
    b)   The power relations between the local school participants and the members of the two committees

Attending to the relations between the program steering committee and project committee, the former establishment of the later and the involved mandate gave the program steering committee formal authority over the project committee. At the same time, the establishment of the project committee demonstrated that the program steering committee needed the project committee. Furthermore, the program steering committee included the Head of Schools and his superior the director. As the members of the project committee were employees in the Center for

School and Center for Daycare also formally belonging under the director[56], the members of the project committee depended on some of the members of the program steering committee because of their formal organizational authority. In the day-to-day activities, the program steering committee depended on the project group to review and evaluate the project applications as the members of the program steering committee did not have the time. The members of the project committee on the other hand had time and various resources relevant for evaluating the applications[57]. The project committee did however depend on the program steering committee to formally adopt their recommendations regarding more complex applications or applications related to the 20 %-pool. Furthermore the project committee was not able the make decisions beyond the mandate given by the program steering committee, meaning that issues developing at the meetings in the project committee might need to be transferred to the program steering committee (e.g. initial frustration regarding the requirement of the applications). The project committee did however work with the applicants to further develop and improve their project (and application) if needed. This important task, which the program steering committee again was not able to perform on its own depended on the project committee. All in all the power in the relationships was balanced. Taking a narrow perspective, focusing on the relations between the two groups of people within the digitalization program, disregarding the larger context, the project committee appeared to depend less on the program steering committee. However, as the program was part of a larger context, where the members of the project committee depended on e.g. their leaders regarding e.g. task allocation the project committee seemed less powerful.

The other power relations to be highlighted were the relations between the local school participant and the participants in the central administration. As the program was re-organized to be implemented primarily through local projects, the central participants depended largely on the local participants. They depended on the local participant to be engaged, to develop projects (and project applications), to comply with the requirements for the applications and to strive to realize the strategy as well as their local focus areas. If the local participants all decided not to participate (in the intended manner), the strategy would not be implemented (at least in the manner suggested through the new structure). The central participants did however hold the authority to re-organize the program once again limiting the focus to local projects and thus their dependence on the local participants. Furthermore, the local participants depended on the central participants to approve the funding for the project applications they submitted. Without the funding, the projects would

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[56] The program manager was the only one employed in the Center for Daycare belonging under the director present in the program steering committee. The IT employee was employed in the Center for IT, which did not belong under the present director, the center was however headed by the IT-leader, who was also a member of the program steering committee.
[57] Technical knowledge, pedagogical and didactic knowledge as well as an overview of the overall program

typically not be implemented, as the individual schools were not able to fund them within their regular budgets.

Besides the dependence between the two groups related to the program implementation and the local projects, the local participants also depended on the central participants (particularly the Head of Schools) more generally. This dependence was based on the local participants' need for the central participants to interpret new legislation regarding the schools and to negotiate with the politicians on their behalf in regards to budgeting. In these general matters, the central participants did however depend on the local participants, as they were the ones giving plans and decisions in the daily life at the schools. Both groups thus depended on one another; however, the central participants primarily depended on the group of local participants. Local participants on their own would therefore not be particularly powerful in relation to the central participants.

5.6.2.5 Choice and intentions

One primary choice and the related intentions were of interest for this episode.

    a)   The choice to involve and engage the teachers and school leaders

This choice was based on the intention to engage the local participants; it was moreover linked to the intention to support innovative local experimentation with different technologies in different settings. These intentions led to the choice to re-organize the implementation program, by moving from an implementation through a limited number of centrally controlled projects to implementation to many smaller local projects supported by central funding. More specifically, the funding was pooled in two pools from which the schools could apply for the funds. The largest of the pools contained 80 % of the project funding whereas the smaller pool contained 20 %. To ensure a fair distribution of the resources the funds from the 80 %-pool were allocated according to an a priori baseline for the distribution (based on the number of pupils). The funds from the other pool were allocated for special need projects and other projects which could not be funded based on the baseline linked to the 80 %-pool due to a limited number of pupils being involved.

Initially the 20 %-pool was also intended to support innovative projects, in contrast to the 80 %-poll whose primary focus was intended to raise the level of digitalization from the bottom up or at least from the large middle group. This focus on a small group of innovative projects and a larger group of ordinary projects was however eliminated over time. The choice to change the focus of the 20 %-pool was not based on the program steering committee abandoning the intention to support innovation. Rather the choice was based on the realization that it would be difficult for the program steering committee (or the project committee) to evaluate beforehand which projects would be innovative and that in principle all the projects should be innovative but judged on their own terms (e.g. context and prerequisite).

5.6.3 Closing remarks

This section described the establishment of a new project structure in regards to the initiating gesture and the responses following the gesture. Both the conversations, themes, narratives, power and the choices and related intentions were presented. The first responses to the initiating gesture were characterized by consensus rather than conflict. The members of the steering committee shared the understanding of the desirability of re-organizing the program. During the episode it did however became evident that the members of the program steering committee represented different parts of the organizations and thus approached topics from different angles. This was for instance visible in regards to the different weighting of the administrative demands e.g. related to auditing in contrast to the motivation and convenience of the local participants and their intent to engage. The difference was however productive and led to further discussions and potentially better decisions.

The episode was generally characterized by a focus on involving the local participants. By focusing on involving the local participants, the episode also opened the implementation of the strategy to take different forms at the different schools. The involvement was thus linked to a theme of decentralization as opposed to standardization. With the re-organization, the program steering committee demonstrated an appreciation of the need for a new initiation gesture in regards to the local participants. Some of these local participants took part in the strategizing process, but as a year had passed without their involvement[58], a clear invitation to participate was needed. Furthermore, the re-organization generated space for the differences to manifest; the differences between the schools, but also the difference within a school. A space was generated enabling the initiation of both large and small projects, of both ambitious trails and minor improvements. Re-organizing the program did however also restrain the management of the program implementation. For instance, in regards to the management of the appropriate application of the resources or in regards to avoiding the same mistakes being repeated with each new project. Some of the ways in which these difficulties were handled by the program steering committee were by focusing on knowledge sharing between the projects and between the project committee and the new applicants. Further, it was assumed that the school leader and the teacher best determined the appropriate allocation of resources locally. This assumption was linked to the narrative of the positive nature of decentralization. In addition, the assumption was linked to the strategy and its vision of a digital school in 2014 with everybody engaged in it. Hence, it was not the ambition to create the most innovative digital school, but rather the ambition to create widespread ownership to the digital school.

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[58] During that year the local participants did participate in the program through the analysis (the survey and for some an interview), but this was experienced as an administrative maneuver rather than as a step towards implementing the strategy – and the digital school.

5.7 Summary of Episode Analysis

The above five sections of this chapter presented the analysis of the five episodes of the IS-related organizational change process. Each section analyzed an episode in regards to the five theoretical concepts: conversations, themes, narratives, power and choice & intentions, based on the rich description of the initiating gesture and the related responses. The five episodes and the analysis of the episodes separately, are summarized in Table 5.6 on the following pages.

Episode	#1: Benchmarking	#2: Strategizing	#3: Improving infrastructure	#4: Analyzing	#5: Re-organizing
Focus	Developing of an understanding of the problems with school-IT through benchmarking	The strategizing process	Improving the infrastructure	Analyzing the competences, culture and knowledge sharing related to school-IT	The process of re-organizing the program and establishing a new project structure
Conversations	Between the IT-leader and the Head of Schools and the school-IT consultant Within in the benchmarking club Involving the politicians	Between the external consultant and the program manager and the school-IT consultant Within the steering committee Within the vision group Within the project group	Between the IT-leader, the Head School and the external consultant Between the IT-leader, the Head of School, the external consultant and the politicians Between the participants of the project groups, the IT-leader, the technical school-IT counselors and the external supplier	Within the project group Between school representatives and the dialogue team	Within the program steering committee (on re-organizing) Within the program steering committee (on practical matters of re-organizing) At the schools Within the project committee

Themes	From a crazy to a bold gesture Digitalization of the schools as the future Level of spending leads to level of satisfaction	Digitalization of the schools as the future Digitalization as a matter of technology and organizational issues	Poor technological performance Puzzled by the lack of improvement in satisfaction Technical improvements as only a partial element in digitalizing the schools	The necessity of establishing a baseline of the school-IT situation Evaluating with a purely technical focus is of limited relevance Limited satisfaction with the role of the external consultants	Local initiatives and differences as quality The importance of communicating the new structure to the schools An opportunity to experiment with the technologies Didactical relevance as a focus rather than technology itself
Narratives	Poor performance	The benefits and necessity of involvement The exceptional situation and dedication	Poor performance (continues)	Decision-making as a rational process	The changes as a re-organization The positivity of decentralization

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|	Power				
Power	IT-leader versus the Head of Schools The administrative organization versus the political organization	The external consultant versus the steering committee and the project group The program manager versus other participants in the strategizing process	The IT-leader versus the Head of School	The external consultant versus the program manager and the program steering committee	The program steering committee versus the project committee The local school participants versus the members of the two committees
Choice & Intentions	Suggestion of benchmarking Participation in benchmarking	Suggestion of strategizing process Initiation, adoption and funding of the strategizing process/strategy	Initiation of the infrastructure improvement project	A short time period Re-analyzing the data	Involvement and engagement of teachers and school leaders

Table 5.6: Summary of episode analysis

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5.8 Cross-episode Analysis

While the sections above analyzed the episodes separately, this section examines the five episodes as parts of a whole, thus analyzing the whole process of IS-related organizational change and the patterns within it. Firstly, the section considered the gesture initiating the process, and the gestures and responses proceeding throughout the process. Subsequently, the section moves on to the five theoretical concepts with five subsections presenting the cross-episode analysis in regards to each of the five concepts. More specifically, the subsections focus on how the concept unfolds or changes across episodes, or on how the concept in one episode contrasts with its presence in another episode. The cross-episode section ends with a table summarizing the cross-episode analysis in regards to the theoretical concepts continuing or changing through the five episodes in the process of IS-related organizational change.

5.8.1 Gesture and responses

As mentioned earlier, the gesture initiating episode one also initiated the process as a whole, as the other episodes were responses to the first episode. The IT-leader's suggestion to participate in the benchmarking in the beginning of 2010 initiated episode one. The last response to this gesture was the political approval of the initiation of a strategy process in February 2010. This response was then the initiating gesture of episode two (Strategizing) and the second response to the IT-leader's initiating gesture to improve the infrastructure in episode three (Consolidating technical foundation). In regards to the chronological order, this meant that episode one took place first, and that episode two and three began at the same time (beginning of 2010) and unfolded in parallel until the end of 2010 where episode two ended and episode three continued until September 2011. Episode four overlapped with episode three as well. The first ideas for the analysis of episode four were developed during episode two, however, episode four was not actually initiated before the formal suggestion in the program steering committee in the beginning of 2011 (the gesture). During episode four, the initiating gesture in episode five took place in September 2011, as the program manager and a key employee from the Center for IT suggested a re-organization of the program. The first response in episode five was the adoption of the suggestion made by the program steering committee at their meeting in September. At that same meeting the last response in episode three took place as well (the establishment of a technical working group). Both episodes three and five thus overlapped partially with episode four. The unfolding of the episodes throughout the process of IS-related organizational changes is displayed in Figure 5.2 below.
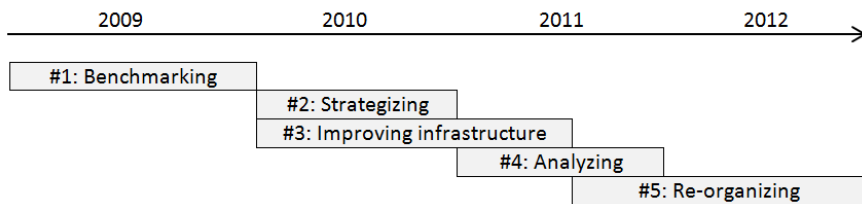
Figure 5.2: The episodes in the process

The establishment of the problem in episode one did in this way provide the necessary basis (a shared and substantiate understanding of the problem) to continue the process. As the problem was established, the need to respond to the problem arose. This led to the suggestion of a solution in two parts as the last response to the gesture in episode one. The first part of the solution was a strategizing process, which unfolded in episode two, and the second part was a consolidation of the technical foundation in particular improvements of the infrastructure, which unfolded in episode three. The strategizing process defined the vision for digitalizing the schools; the indicators intended to direct the focus of the later implementation which episode four, and five were parts. In this way, episode two defined the direction of the later work in the program and initiated the actual digitalization by creating a shared goal (the digital school). The second part of the solution to the problem defined in the first episode was the consolidation of the technical foundation in episode three. At the beginning, it was primarily the infrastructure, which was improved, but at the end of the episode, a technical working group was established to handle the technical projects and questions on which the rest of the digitalization program was built. The focus in this part of the process was thus to improve the technical foundation and in this way limit the negative associations linked to IT due to the poor performance prior to the IS-related organizational change process. It took time to accomplish this, which was probably the reason for the duration of episode three, but towards the end of the episode, the focus was no longer on the performance of the technology. Following the strategizing process (in episode two), an implementation of the strategy was initiated by analyzing the competences, culture and knowledge sharing at the schools (in episode four). The focus here was that choosing the right initiatives for an implementation of the digitalization of the schools required a knowledge base of the current situation. Further, the knowledge base was intended as the baseline for a later evaluation of the progress made towards a fully digital school. Episode four thus built heavily on intentions developed during the strategizing in episode two, at the same time the insights from the analysis contributed to the decision to re-organize the program (episode five). The re-organization of the program thus followed the analysis, as the analysis showed no direct relationship between smart boards and use of and satisfaction with the technology. The decision to suggest and adopt a re-organization of the program was however not solely built on the results from the analysis. It was also a clear purpose with the re-organization to re-involve the school participants

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and thereby to support the local ownership. The last episode still built on the problem benchmarking at the beginning of the process (episode one) and the intentions developed in the strategizing process (episode two), further it was made possible by the improvements in regards to the infrastructure (episode three) and drew from the insights from the analysis (episode four).

The re-organization of the program in episode five highlighted how the key participants (the members of the program steering committee) realized during the process that digitalizing the schools required local engagement and ownership to create actual changes in the local practices. To support the development of such local engagement and ownership they attempted different approaches, thus continually initiating new activities or making proactive gestures. In episode one the IT-leader attempted to engage the Center for Schools in establishing a shared understanding of the problem. In episode two, the IT-leader, the Center for Schools and the external consultant attempted to engage relevant stakeholders both locally and centrally. Locally it was school leaders in particular but also teachers, pupils, school-IT counselors and librarians, and centrally, it was politicians as well as the internal consultants from the Center for Schools. In episode three the focus was not directly on engaging local participants (to a limited extent the technical school-IT counselors), but the purpose of consolidating the technical foundation to eliminate an obstacle for the local engagement, more specifically the dissatisfaction with the poor performance. In episode four, the purpose of creating a knowledge base was also linked to local relevance. Thus, the engagement of local participants was assumed to require a local perception of relevance, which was attempted built through the analysis. Finally, in episode five it was realized that the engagement through a few large central projects would not lead to the intended local engagement and ownership, thereby leading to the re-organization of the program.

5.8.2 The process in a Complex Responsive Processes perspective

5.8.2.1 Conversations

The conversations in the process of IS-related organizational change primarily took place within the episodes focusing on elements related to the specific episode. These were described in detail in the sections above presenting the episodes separately. However, a few participants should be mentioned here as they participated in conversations throughout the process: the IT-leader, the Head of Schools, the program manager, the school-IT consultant and the external consultant.

The IT-leader initiated episode one and three and participated in many conversations in both of those episodes. Later he was part of the steering committee during the strategizing and the program steering committee during the implementation of the program including episodes four and five. However, the IT-leader was particularly active in the conversations at the beginning of the process, whereas he in the later part of the process had a more passive and reactive role in the conversations. This

was linked with the purpose of local engagement as described above. The IT-leader's goal was that the Center for Schools took the ownership, and as this slowly happened, he toned down his role.

The second participant was the Head of Schools who participated in many conversations during the process and had a special role, as he was the leader of the Center for Schools. His participation was therefore needed in many conversations to ensure his support for the decisions and signal the significance of the digitalization. On the other hand, he had a number of other responsibilities besides the digitalization of the schools, and his time was thus limited.

The program manager came into the process at the beginning of the strategizing process (episode two) where she participated in most of the conversations, as she was the contact person for the external consultant and the day-to-day project manager in the municipality. Her participation in conversations during episode three were limited, whereas her participation in the implementation of the program in episodes four and five were extensive as she was the program manager. She was a member of most of the groups and committees (except for those in episode three) both at a strategic and at an operational level. Of note, she spent most of her working hours focusing on the digitalization of the schools, at least in the implementation part of the process.

The school-IT consultant participated in conversations regarding school-IT prior to the IS-related organizational change process including the period of dissatisfaction just prior to the initiation of episode one. During the process, he continued to participate in many conversations due to his insight into the local processes and situations. Furthermore, similar to the program manager, the school-IT consultant had the digitalization of the schools as a focus (in combination with other sides of school-IT).

The last participant of particular relevance for the process was the external consultant. As she was hired by the municipality, to contribute with specific competences she logically participated in many conversations and took a distinctive role in many of those. For instance, she had a driving or facilitating role in many of the conversations, and further she was generally perceived as an expert by the other participants in the conversations. Her engagement with the municipality was temporary due to her role as an external consultant. This meant that she participated in the conversations in episodes one, two and four. The technical focus in episode three was not her area of expertise (and the Center for IT held the competences internally) and in episode five, the municipality continued the implementation of the program on their own.

5.8.2.2 Themes

As seen in Table 5.7 eleven themes patterned the process, these themes were all described in detail in the section regarding the episode to which they relate. Therefore, only the two themes patterning the process across episodes are mentioned here.

The first of these was the theme of digitalization as the future of the schools. This theme patterned the conversations in particular episodes one and two. The theme emphasized digitalizing the schools as a goal in itself thus limiting the discussions of the relevance of the digitalization process. In the first episode, the theme was primarily present in the conversations among the employees in the administration. It was for instance not discussed among the participants in the Center for Schools and the Center for IT whether the poor performance and low satisfaction with school-IT should be improved or whether IT should be part of the teaching at the schools. At that time, the theme did not pattern the conversations at the schools, where many were dissatisfied with school-IT and the focus was on the topics they taught and the didactic and pedagogical approaches.

During the second episode, the theme seemed to pattern the conversations in the strategizing process among the involved local participants as well. Particularly the conversations in the vision group were interesting, as this group was established specifically to ensure inclusion of the local stakeholders both pro digitalization and the more skeptical. Apparently, the vision group adopted the theme of digitalization as the future in their conversations from the first workshop. Thus, the theme extended through both episodes one and two, developing from a central theme to a more widespread theme. The theme was also present during the rest of the process of IS-related organizational change, where it became even more widespread; this was however not a focus as the influence of the theme was primarily during episodes one and two.

The second theme influencing the process across the episodes was the theme stressing the non-technical sides of the digitalization. The theme was present in all episodes but the first. However, the theme took slightly different forms as it developed across the episodes. The theme was first particularized in episode two where it was stressed that digitalizing the schools was not solely a matter of technology but also a number of other issues. This meant that e.g. culture, competences and management were included as topics in the strategy. Despite the focus on these other issues in the strategy, the funding of the strategy was primarily linked to investments in technology. This might be due to the budgeting principals[59] or due to the high cost of distributing technology compared with lower cost of e.g. changing culture and approaches to knowledge sharing. The difficulty and magnitude of these softer changes did however seem slightly underestimated or

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[59] The project is financed with construction means

under-prioritized. During improvement of the infrastructure in episode three, an understanding developed stressing that it was not the technical improvements in themselves, which were going to change the situation, something else – and more was needed. Thus, during the third episode, this theme developed as the importance and difficulties of the non-technical elements of the digitalization were highlighted. At the time of analysis of competences, culture and knowledge sharing in episode four, the theme stressed the need to ensure that the program could be evaluated on softer issues than technology. In this episode, the emphasis was on balancing the focus between technical and non-technical elements. As the re-organizations took place in episode five, the theme developed further stressing a non-technical element (didactics) as primary. Through the process, it seemed that the participants built on their experience and slowly realized that the difficult and challenging part of digitalizing the schools was not the technology itself but the related non-technical elements, such as culture, competences, knowledge sharing, management and the didactical appropriation of the digitalization.

5.8.2.3 Narratives

As with the themes in the section above, only the narratives crossing the episodes are included here. More specifically, this means that three narratives are described in this section.

The first of these cross-episode narratives was the narrative of poor performance present in episodes one and three. In episode one, the narrative of poor performance was a central motivation for the initial gesture. The narrative influenced the perception of school-IT throughout the organization and led the IT-leader to conclude that something more radical than dialogue meetings and slight improvements were needed. The narrative proved to be rather persistent, thus also relevant during episode three (following chronologically after episode one, in parallel with episode two).

The second narrative relevant across episodes was the narrative of the benefit of involvement in the strategizing process in episode two and the opposing narrative of decision-making as a rational process as an argument for the analysis in episode four. In episode two, the narrative focused on the benefits and necessity of involvement in regards to appointing members of the three fora, particular the vision group. The narrative seemed to be linked to an understanding of good decisions being made by involving and engaging the relevant stakeholders. In contrast to this understanding of decision-making, a narrative of decision-making, as a rational process was present in episode four. In episode four, the right way to make decisions according to the narrative was through a rational process of knowledge-based evaluation of alternatives. Despite the highly different focus in the narrative of episodes two and four, the two narratives were not necessarily opposites as one could use involvement to acquire knowledge. However, the two narratives told paradoxically different stories about the way they made decisions in the municipality. A possible reason for the two different approaches to decision-making

accounted for in the narratives might be that that rational decision-making process and the involving decision-making process created different kinds of legitimacy.

The last narrative relevant across episodes was the narrative of the exceptional situation and dedication in episode two and the somehow conflicting narrative of the changes as a re-organization in episode five. At the end of the strategizing in episode two people accounted for the situation as being exceptional due to the politicians allocating a large amount of money for the strategy without earmarking the money to a specific investment. In episode five, the new project structure was accounted for as a re-organization of the program, creating a more dynamic, flexible and involving structure. Despite the strength of the re-organizing narrative in episode five, the earlier narrative concerning the exceptional situation and dedication in the strategizing episode was not lost. The members of the program steering committee still accounted for the strategizing process in the same positive way. They still considered the decision to allocate the funding without earmarking it to be significant. The two narratives were therefore not in opposition but rather supported one another, as the narrative within the fifth episode built on the motivation and commitment from the narrative in episode two.

5.8.2.4 Power

Two power relations were relevant across episodes, and thus included here. The first was the power in the relations between the IT-leader and the Head of Schools. This power relation was particularly relevant in regards to episodes one and three. Generally speaking, the two participants both depended heavily on each other in their relations regarding the digitalization of the schools. In episode one, the power seemed to be fairly even between the two and it was not possible to pinpoint one of them as more powerful in their relations. In episode three, on the other hand, the picture was a bit clearer, as the Head of School depended more on the IT-leader for his knowledge of the technical side of the school-IT; further the IT-leader was supported by the results of the benchmarking. All in all, it led the Head of Schools to support the suggestion made by the IT-leader (of an infrastructure improvement project) in episode three from the beginning. The difference of power in their relation was clearly linked to the changed focus of the relationship between the two episodes. In episode one, the focus was on the benchmarking, in which the IT-leader wanted the municipality to participate. Thus, both parties were actively engaged in the process and had an opinion on benchmarking. In episode three on the other hand, the Head of Schools was not an active participant and further he did not have a clear opinion on the infrastructure improvement, as it was outside the scope of his knowledge.

The second power relation affecting the process was the power in the relations between the external consultant on the one side and internal participants on the other. In episode two, the external consultant related to the steering committee and the project group in the strategizing process. It was clear that the steering committee

and in particular the project group depended significantly more on the external consultant than she did on them. This dependency was primarily based on the need for her knowledge on strategizing and in particular on her competences as a process consultant. The unequal power distribution continued in episode four, where the external consultant engaged with the program manager and the rest of the program steering committee in the analysis of competences, culture and knowledge sharing. Similar to the situation in episode two, they depended on her for her competences as a process consultant to structure and drive the analysis process; additionally, they depended on her to carry out and legitimize the analysis. In both episodes, the internal participants depended highly on the external consultant. In episode two, the dependence did not seem to lead to any problems, however in episode four the dependence on the external consultant might be part of the reason why the episode ended with dissatisfaction with the role of the external consultants as the internal participants felt they did not get what they expected.

5.8.2.5 Choice and intentions

The choices and intentions in the process of IS-related organizational changes unfolded primarily within the episodes. They logically affected the process as a whole, but did so through the gestures and responses as described with regard to the whole process in subsection 5.8.1 and in regards to the episodes separately earlier in the chapter. For instance, the IT-leader's intention to establish a shared understanding of the problem led to his choice to suggest participation in the benchmarking, which as mentioned initiated the process. In a similar manner, other choices and intentions affected the process, but as they are described elsewhere, they will not be repeated here[60].

5.8.3 Summary of cross-episode analysis

Above the process of IS-related organizational change was analyzed as a whole. The focus was firstly on the initiating gesture and the unfolding of the process through gestures and responses. Later the section analyzed the process in regards to the five theoretical concepts, focusing on the similarities and differences across the episodes. In Table 5.7 on the following pages, the analysis of the process as a whole (or across episodes) is summarized.

Overall, this chapter presented the analysis of the empirical process of IS-related organizational change. The chapter focused on the identified episodes (parts) as well as the process as a whole, and gave room to both empirical richness and conceptualizations. The following chapter builds on the insight into the empirical process established in this chapter as a basis for discussing the contributions to which this leads.

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[60] See subsection 5.8.1 for a description of the gestures and responses in regards to the process and subsections 5.2.2.5, 5.3.2.5, 5.4.2.5, 5.5.2.5 and 5.6.2.5 for descriptions of the choice and intentions (related to the episodes separately).

Conversations	2009	2010	2011	2012
	Between the IT-leader and the Head of Schools and the school-IT consultant (ep. 1)			
	Within the benchmarking club (ep. 1)			
	Involving the politicians (ep. 1)			
		Between the external consultant and the program manager and the school-IT consultant (ep. 2)		
		Within the steering committee (ep. 2)		
		Within the vision group (ep. 2)		
		Within the project group (ep. 2)		
		Between the IT-leader, the Head School and the external consultant (ep. 3)		
		Between the IT-leader, the Head of School, the external consultant and the politicians (ep. 3)		
		Between the participants of the project groups, the IT-leader, the technical school-IT counselors and the external supplier (ep. 3)		
			Within the project group (ep. 4)	
			Between school representatives and the dialogue team (ep. 4)	
				Within the program steering committee (on re-organizing) (ep. 5)
				Within the program steering committee (on practical matters of re-organizing) (ep. 5)
				At the schools (ep. 5)
				Within the project committee (ep. 5)

Themes	
From a crazy to a bold gesture (ep. 1)	
Digitalization of the schools as the future (ep. 1&2)	
Level of spending leads to level of satisfaction (ep. 1)	
Digitalization as a matter of technology and organizational issues (ep. 2)	Evaluating with a purely technical focus is of limited relevance (ep. 4)
	Didactical relevance as a focus rather than technology in-self (ep. 5)
Technical improvements as only a partial element in digitalizing the schools (ep. 3)	
Poor technological performance (ep. 3)	
Puzzled by the lack of improvement in satisfaction (ep. 3)	The necessity of establishing a baseline for the school-IT situation (ep. 4)
	Limited satisfaction with the role of the external consultants (ep. 4)
	Local initiatives and differences as quality
	The importance of communicating the new structure to the schools
	An opportunity to experiment with the technologies

Narratives	
Poor performance (ep. 1&3)	
The benefits and necessity of involvement (ep. 2)	Decision-making as a rational process (ep. 4)
	The positivity of decentralization (ep. 5)
The exceptional situation and dedication (ep. 2)	The changes as a re-organization (ep. 5)

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The IT-leader vs. the Head of Schools (ep. 1&3)

The program steering committee vs. the project committee (ep 5.)

Power

- The administrative organization vs. the political organization (ep. 1)
- The external consultant vs. the steering committee and the project group (ep. 1)
- The program manager vs. other participants in the strategizing process (ep. 1)
- The external consultant vs. the program manager and the program steering committee (ep. 4)
- The local school participants vs. the members of the two committees (ep. 5)

Choice & Intentions

- Suggestion of benchmarking (ep. 1)
- Participation in benchmarking (ep. 1)
- Suggestion of strategizing process (ep. 2)
- Initiation, adoption and funding of the strategizing process/strategy (ep. 2)
- Initiation of the infrastructure improvement project (ep. 3)
- A short time period (ep. 4)
- Re-analyzing the data (ep. 4)
- Involvement and engagement of teachers and school leaders (ep. 5)

Table 5.7: Summary of cross-episode analysis

CHAPTER

CONTRIBUTIONS

6

Introduction

The purpose of this chapter is to discuss the findings from my study and thereby the contributions made. More specifically, the chapter combines the insights from Chapter 5 with insights from Chapter 2 and Chapter 3 by linking the findings from the case analysis to the knowledge on the theoretical background and the sensitizing device. The chapter does so in three separate sections each discussing the contribution to a specific part of the literature. Firstly, the focus of the dissertation is highlighted. Subsequently, three sections discuss the contributions to the understanding of IS-related organizational change, to the understanding drawing upon the dialectic motor and finally to the broader IS literature.

6.1 A Complex Responsive Processes Perspective

This dissertation revolves around the phenomenon of IS-related organizational change, attempting to contribute to the understanding of the phenomenon. More specifically, the dissertation introduces the Complex Responsive Processes perspective, which draws upon the dialectic motor of change as defined by Van de Ven & Poole (1995). This dissertation further applies the perspective as a sensitizing device in an interpretive case study of an empirical process of IS-related organizational changes in a Danish municipality. Through the case study an understanding of IS-related organizational change was achieved, which supplements our current understanding in a number of ways. The following sections discuss the contributions in detail, focusing on A) the understanding generate by applying a theoretical perspective drawing upon the dialectic motor, B) the improved understanding generated by specifically applying the Complex Responsive Processes perspective and C) the relevance of the Complex Responsive Processes perspective for a broader IS literature.

6.2 Contributions to IS Research on IS-related Organizational Change

This section focuses on the contributions to our understanding of IS-related organizational change gained by drawing upon the dialectic motor of change in an empirical study; more specifically the application of the Complex Responsive Processes perspective. The contributions are thus linked to the first research question: *How can a case study sensitized by a theoretical perspective drawing upon the dialectic motor help us understand specific aspects of IS-related organizational change?*

The literature review reported in section 2.3 showed that the top IS literature had studied IS-related organizational change based on each of the four motors of change proposed by Ven de Ven & Poole (1995). Some papers (Aanestad et al., 2014; Ashurst et al., 2008; Avgerou & McGrath, 2007; Cooper, 2000; Davidson & Chrismar, 2007; Enns et al., 2003; Joshi, 1991; Krell et al., 2011; Leonardi, 2013; Loftin & Moosbruker, 1982; Marble, 2000; Markus & Benjamin, 1996; Porra et al., 2005; Robey & Sahay, 1996; Tillquist et al., 2002; Volkoff & Strong, 2013) approached IS-related organizational change as a purposeful process. A process where an organization or group within an organization envisions an end-state and sets strategic goals, which are then followed up by evaluations of organizations needs and searches for the solution, which fits the needs, thus meaning, that these papers drew upon the teleology motor of change. Other papers (Aanestad et al., 2014; Cho et al., 2008; Davidson & Chrismar, 2007; El Sawy et al., 2010; Orlikowski, 1996; Porra, 1999; Porra et al., 2005; Reimers et al., 2014, Seidel et al., 2013; Silva & Hirschheim, 2007) focused on competition between entities when approaching IS-related organizational change, thus drawing upon the evolution

motor of change. Another group of papers (Allen et al., 2013; Avgerou & McGrath, 2007; Cavaye & Christiansen, 1996; Leonardi, 2011; Reimers et al., 2014; Robey & Boudreau, 1999) directed the attention to the role of power, conflict and differences in IS-related organizational change processes, as those papers drew upon the dialectic motor of change. The last papers (Bala & Venkatesh, 2013; Wei et al., 2005) approached the change process as a number of stages following a predefined order or logic, which was related to the life cycle motor of change. Generally, it was very positive, that the literature drew upon all of the four motors as the motors directed attention to different aspects of the change processes. Thus according to Van de Ven & Poole, based on the diversity of the approaches, our understanding of the phenomenon, IS-related organizational change, will be stronger.

My study presented in this dissertation applied the Complex Responsive Processes perspective and thereby drew upon the dialectic motor. In this way, attention was directed to the role of power, conflict and differences in processes of IS-related organizational change, as mentioned above. This means that my study contributes by identifying and highlighting dialectic aspects of the IS-related organizational change process unfolding in the case. More specifically, three aspects are identified: A) the organization is not one uniform unit, B) change is unplannable and uncontrollable and C) the role of power (as a relational phenomenon). The three aspects, or contributions, are discussed below and summed up in Table 6.1 in the end of the section.

The first of the three aspects or contributions related to drawing upon the dialectic motor of change in a study IS-related organizational change is that the organization is *not one uniform unit*. More specifically, based on my case study it was found that it was not meaningful to perceive the organization or even the program steering committee as one uniform unit. Rather the study showed that the organization, as well as the program steering committee, consisted of individuals (and groups) with separate intentions, values and interest as the basis for their choices. This was for instance reflected in the disagreement present in the conversations in the program steering committee regarding the formal requirements to the project application in episode five (see section 5.6). An understanding of the diversity within the organization is the foundation for directing attention to the role of power, conflicts and differences in IS-related organizational change processes.

As this insight relates to the dialectic motor, the papers likewise identified as drawing upon the dialectic motor in the literature review supported the position that an organization is not one uniform unit (see e.g. Allen et al., 2013; Avgerou & McGrath, 2007; Cavaye & Christiansen, 1996; Leonardi, 2011; Robey & Boudreau, 1999). The literature reviewed further showed that the papers drawing upon the teleology motor and the life cycle motor generally perceived the organization (or group) in focus as one unit (see e.g. Ashurst et al., 2008; Bala & Venkatesh, 2013; Joshi, 1991; Krell et al., 2011; Leonardi, 2013; Loftin & Moosbruker, 1982; Tillquist et al., 2002; Volkoff & Strong, 2013; Wei et al., 2005). The papers drawing upon the evolution motor on the other hand, did not focus specifically on this aspect,

rather these papers focused on a larger community of organizations (see e.g. Aanestad et al., 2014; Cho et al., 2008; El Sawy et al., 2010; Orlikowski, 1996: Porra, 1999; Porra et al., 2005; Seidel et al., 2013; Silva & Hirschheim, 2007). It might not be particularly surprising that an organization consists of many individuals and groups, the interesting element, is whether it is meaningful to study the organization as one unit or not. The point made by my case study is, that significant elements of the change process will be overlooked if one studies the organization as one uniform unit possessing a shared understanding and making mutual choices.

The second aspect or contribution is that the change process is *unplannable and uncontrollable*. More specifically, during my case study it became clear over time that the change process could not be controlled and that it was not realistic to expect the process to unfold according to plans made in advance. Instead, the study showed ongoing changes in the focus and direction of the IS-related organizational change process and the related plans. The change process was ongoing and the committee was not able to plan the change process before they were in the middle of it, but they continuously tried to affect the change process in the direction they found most desirable. This aspect was evident through the empirical process as a whole, where my study observed that the focus of the project changes continuously. However, it became particularly clear as the program steering committee realized that they needed to engage the local participants and thus re-organized the program. The implementation of the digital school then came to depend on the local projects, and the program steering committee had no real authority over the process.

The unplannable and uncontrollable nature of change processes was supported by most of the other papers drawing upon the dialectic motor, likewise stressing, that leaders and managers cannot expect to be able to plan and control the process of change (see e.g. Avgerou & McGrath, 2007; Cavaye & Christiansen, 1996; Reimers et al., 2014; Robey & Bourdreau, 1999). In contract, many of the papers identified as drawing upon the teleology motor assumed, more or less explicitly that if planned changes were not realized through the implementation process, leaders and managers needed better planning or better tools (e.g. on how to handle resistance) (see e.g. Ashurst et al., 2008; Cooper, 2000; Joshi, 1991; Krell et al., 2011; Loftin & Moosbruker, 1982; Robey & Sahay, 1996; Tillquist et al., 2002). In the papers drawing upon the life cycle motor and the evolution motor the question of whether change can be planed and controlled did not seem to be relevant as the change process was directed by prescribed rules, thereby it was forces outside the human or organizational control which controlled the process. Overall, the point made by my study regarding this aspect of IS-related organizational change is, that accepting that the process is unplannable and uncontrollable will move the attention from the explanations of failed plans and lacks of control to what processes actually unfolding in the case (cf. Stacey et al., 2000).

The third and last aspect or contribution to be discussed in this section is *the role of power* in the process as well as its relational nature. More specifically, my study identified power relations as significant for the manner in which the change process unfolded. It became clear that the hierarchical position played a role in the power relations, for instance, the other members of the program steering committee often turned to the director and the Head of Schools to hear their positions regarding a conflict. However, power based on other dependences than hierarchical position was also highly influential, for instance close connections to the schools (and influence there) as well as insight and experience in the area acted as a power base for e.g. the school-IT consultant. As the role of power regarding IS-related organizational change is related to the dialectic motor of change, at least some of the other papers identified in the literature reviews as drawing upon this motor supported the relevance of focusing on power related to change (see e.g. Avgerou & McGrath, 2007; Cavaye & Christiansen, 1996; Robey & Boudreau, 1999). Only Avgerou & McGrath (2007)[61] perceive power as a relational phenomenon (drawing upon Foucault). They directed attention to the relationship between power and rationality and highlighted that knowledge and rationality are not universal phenomena but rather determined by power relations and historical development. Thus, their focus was on the link between power relations and rationality.

In the papers drawing upon the teleology, evolution and life cycle motors power were not a focus in explaining or understanding IS-related organizational change (Aanestad et al., 2014; Ashurst et al., 2008, Bala & Venkatesh, 2013, Cho et al., 2008, Cooper, 2000, Davidson & Chrismar, 2007; El Sawy et al., 2010; Enns et al., 2003; Joshi, 1991; Krell et al., 2011; Leonardi, 2013; Loftin & Moosbruker, 1982; Marble, 2000; Markus & Benjamin, 1996; Orlikowski, 1996; Porra, 1999; Porra et al., 2005; Seidel et al., 2013; Silva & Hirschheim, 2007; Robey & Sahay, 1996; Tillquist et al., 2002; Volkoff & Strong, 2013; Wei et al., 2005). The point made with this aspect is that to understand IS-related organizational change processes influenced by conflict, attention should be directed towards the role of power relations in the process. Power not as something one person or group can possess, but as something influencing every relation due to variation in the dependence between the participants.

Overall, my case study contributed to the IS literature by drawing upon the dialectic motor of change. More specifically, the study pointed to three specific aspects of the phenomenon which drawing upon the dialectic motor helped direct attention towards, namely, that the organization was *not one uniform unit*, that the change process was *unplannable and uncontrollable* and that *the role of power* was relational in nature. The three contributions are summarized in Table 6.1 below.

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[61] Cavaye & Christiansen (1996), studied the role of the relative power of sub-units, and focused in particular on how to measure the power of sub-units looking into their ability to cope with uncertainty, the sub-units centrality, and the non-substitutability of the sub-unit. Robey & Boudreau (1999) pointed to organizational politics as one among four suggested theories applying a logic of opposition.

	Existing IS literature		Contribution
Not one uniform unit	Leaders (as a group) decide on and plan the change – which is then implemented	Ashurst et al., 2008; Bala & Venkatesh, 2013; Joshi, 1991; Krell et al., 2011; Leonardi, 2013; Loftin & Moosbruker, 1982; Tillquist et al., 2002; Volkoff & Strong, 2013; Wei et al., 2005	An organization (and its leadership) is not one unit, rather it consists of individuals with different goals, values and intentions.
	Organizations consist of multiple entities (individuals or groups)	Allen et al., 2013; Avgerou & McGrath, 2007; Cavaye & Christiansen, 1996; Leonardi, 2011; Robey & Boudreau, 1999	
Unplannable and uncontrollable	If planned changes are not realized during the implementation process, leaders and managers need better tools (e.g. on how to handle resistance)	Ashurst et al., 2008; Cooper, 2000; Joshi, 1991; Krell et al., 2011; Loftin & Moosbruker, 1982; Robey & Sahay, 1996; Tillquist et al., 2002	The process of IS-related organizational change, changes over time due to a number factors unknown at the beginning and
	Leaders and managers cannot expect to be able to plan and control the change	Avgerou & McGrath, 2007; Cavaye & Christiansen, 1996; Reimers et al., 2014; Robey & Bourdreau, 1999	
The role of (relational) power	Generally not a focus, except in some papers drawing upon the dialectic motor	Avgerou & McGrath, 2007; Cavaye & Christiansen, 1996; Robey & Boudreau, 1999	Power influences the change process. Change is however not something individuals or groups possess rather it exists in the relations between people or groups.

Table 6.1: Contributions to literature on IS-related organizational change

6.3 Contributions to the Dialectic Perspectives

This section focuses on the contributions to the dialectic perspectives on IS-related organizational change. Meaning that the focus is on the contributions made by applying this specific sensitizing device compared to other perspectives likewise drawing upon the dialectic motor of change. The contributions are thus linked to the second research question: *How can we more specifically understand IS-related organizational change based on a case study sensitized by the Complex Responsive Processes perspective?*

The second literature review (presented in section 2.4.) focused on papers published in AIS basket of eight, which drew upon the dialectic motor of change. These papers applied a number of different theoretical perspectives (see section 2.4.2) and even thought all the papers drew upon the dialectic motor and thus shared a focus on the role of power, conflict and differences, they approached IS-related organizational change in different ways. Some of the papers focused on the power, conflict and difference related to structures or at the systems level (Allen et al., 2013; McBride, 2005; Reimers et al., 2014; Robey & Boudreau, 1999). Some papers focused on the power, conflict and difference within and between groups (Avgerou & McGrath, 2007; Cavaye & Christiansen, 1996; Sarker et al., 2006), and some focused on the power, conflict and difference in the interactions between technology and people (individual or group) (Boddy, 2000; Koch et al., 2013; Leonardi, 2011; Strong et al., 2014; Wagner et al., 2010).

My study applied the Complex Responsive Processes perspective and thereby drew upon the dialectic motor. However, as suggested above there are significant differences among papers drawing upon the dialectic motor. Applying the specific sensitizing device led to a study focusing on gestures and responses, communication, themes, narratives, power and choices and intentions. As the Complex Responsive Processes perspective, had not previously been applied in studies of IS-related organizational change (see section 3.3) it was therefore interesting how this perspective differed from other studies drawing upon the dialectic motor and how the perspective could contribute to the understanding of the phenomenon. Particularly three aspects of the IS-related organizational change process differed from the understanding presented in the papers identified in the literature review as drawing upon the dialectic motor. These three aspects are: A) Conflict as productive, B) The need for ongoing initiation and C) Change as local change. The three aspects or contributions are discussed below and summed up in Table 6.2 in the end of the section.

The first of the three aspects or contributions related to studying IS-related organizational change sensitized by the Complex Responsive Processes Perspective is that it is helpful to consider *conflict as productive* during such change. More specifically, my case study showed that conflict could be productive and a driver of

change. For instance, it was observed how different opinions and values led to conflicts in the program steering committee (e.g. related to whether extensive documentation of projects could fairly be expected of the teachers, see episode 5), which resulted in ongoing discussions and the development of new ideas and solutions. Sometimes both parties seemed to evaluate and change their original stand; in other situations, the one part of the relation was more powerful and where therefore able to enforce their opinion.

The majority of the literature identified through the literature review as drawing upon the dialectic motor did not emphasize conflict as a driver of change. Rather these papers paid limited attention to the role of conflict (Avgerou & McGrath, 2007; Boddy, 2000; McBride, 2005; Sarker et al., 2006; Strong et al., 2014) or they addressed conflict as a barrier for change and not as a driver (Cavaye & Christiansen, 1996; Koch et al., 2013; Wagner et al., 2010). Four papers did however focus on the role of conflict in IS-related organizational change processes in various ways. Allen et al. (2013) focused on conflict and contradictions in activity systems. Leonardi (2011) focused on the conflict between technology and work routines. Reimers et al. (2004) focused on conflict and tension in the deep structures. Lastly, Robey & Boudreau (1999) focused on identifying an overall logic (logic of opposition) and mentioned four theoretical perspectives where the logic could be found, including organizational politics, which focused on power and conflict. Robey & Boudreau (1999) did however only pay limited attention to this aspect, as their main purpose, was to establish a logic of opposition. Overall, the four papers focusing on the role of conflict as a potential driver of changes focused on different element, but none of these papers focused specifically on conflict between individuals or groups.

The literature review showed that the papers identified as drawing upon the dialectic motor did generally not focus on conflict as a driver of change. Instead, the papers drew upon the other elements of the dialectic motor, more specifically the role of power and differences regarding IS-related organizational change processes. In this way, studying the phenomenon sensitized by the Complex Responsive Processes perspective directed direct attention to the productive role of conflict and more specifically, to how conflict or the clash of differences and differing intentions was where the potential for change arose.

The second of the three aspects or contributions related to studying IS-related organizational change sensitized by the Complex Responsive Processes Perspective is the relevance of multiple or *ongoing initiation* throughout the process of IS-related organizational change. More specifically, my case study showed that even though the change process could not be planed or controlled (ct. the second contribution to IS research on IS-related organizational change) the program steering committee, who formally led the process, kept attempting to direct the process in the direction they found desirable through new initiatives or gestures. The process was initiated intentionally by the first gesture (the IT-leader's suggestion to participate in a school-IT benchmarking, see section 5.2), but the responses, and thus the related

actual change, were unplanned and not fully expected. However, the members of the program steering committee evaluated the responses and adjusted their own responses (which then functioned as new gestures leading to new responses) – all on an ongoing basis.

Among the papers identified through the literature review as drawing upon the dialectic motor, there was a general focus on change as an emergent process (Allen et al., 2013; Leonardi, 2011; McBride, 2005; Reimers et al., 2014; Robey & Boudreau, 1999; Sarker et al., 2006; Strong et al., 2014). Following the dialectic motor the papers drew upon, they understood change as a process unfolding over time. A few of the papers directed attention to the possibility for individuals or groups to interfere intentionally in the change process. Koch et al. (2013) highlighted ways to address the IT-culture conflict the paper revolved around. They distinguished between policy-based, socialization-based and leadership-based mechanisms as ways of addressing and potentially resolving the conflict between cultural values and social media site values. Another paper focusing on the possibilities of interfering in the change process was Wagner et al. (2010), who focused on iterative planning and potential strategies to support project survival in their study of the implementation of an off-the-shelf enterprise system. Both these papers perceived intentionally interfering in the process as a way of reducing conflict and thereby furthering the change process.

The literature review showed that even though most of the papers drawing upon the dialectic motor perceived change processes to be emerging, only a few of the papers focused on the possibility to influence the process intentionally. This was probably due to the inspiration drawn from the teleology motor regarding the intentional element of this aspect. It is only an inspiration from the teleology motor, as change is still perceive as emerging rather than planed and controlled. Overall, studying the phenomenon in a study sensitized by the Complex Responsive Processes perspective directed direct attention to the relevance of ongoing initiation (or multiple gestures) throughout an IS-related organizational change process. Further, my study points to the uncertainty of the process, and thus that the group or individuals initiating an IS-related organizational change process must evaluate the responses and adjust their own responses on an ongoing basis.

The third and last aspect or contribution related to studying IS-related organizational change sensitized by the Complex Responsive Processes Perspective is the necessity of *local change* to realize actual change in a process of IS-related organizational change. More specifically, my case study showed that only when the intended changes spread from the initiator to the local participants and their communication actual change happened. In the case, the program steering committee became aware of this aspect and made a gesture attempting to engage the local participants in the process in the re-organization episode (episode 5). The members of the program steering committee hoped that they could encourage the school participants to develop and implement projects related to realizing the digital school, if the committee provided funding for such projects.

The literature review on papers drawing upon the dialectic motor of change showed that a number of papers focused on the importance of local change in IS-related organizational change processes (see e.g. Koch et al., 2013; Leonardi, 2011; Sarker et al., 2006; Strong et al., 2014; Wagner et al., 2014). The papers focused on different elements, but generally, the papers perceived local change as closely related to and necessary for organizational change. The papers did however also stress that local change was not sufficient for organizational change. For instance, Strong et al. (2014) pointed out that change was related to local interactions between technology and other structures and people and their affordances. However, they simultaneously highlighted that this was not enough to talk about organizational change, but under certain conditions the individual *journeys* could be aggregated to an organizational level.

Wagner et al. (2014) assumed that a process of resistance would be followed by a process of negotiation where new practices were negotiated through *processes of use*. In this way, change was local, but negotiated rather than individual. Sarker et al. (2006) presented a somewhat similar understanding, as they drew upon ANT and directed attention to the role of translation by actors in change processes, a translation, which needed to be examined for each specific actor. However, the focus was that the focal actor needed to convince other relevant actors to engage with an issue to achieve change. Leonardi (2011) held a similar position as he stressed the local nature of change processes by pointing out that individuals decided to change either their routines or the technology, the choice was however based on a shared perception of the technology. Koch et al. (2013) likewise focused on perceptions of technology, more precisely the values ascribed to the technology. They emphasized that conflict between values held by individuals and values ascribed to the system might challenge the implementation. Thus, their focused is more on the role of local changes as resistance than as a needed aspect of organizational change.

The literature review showed that some of the paper drawing upon the dialectic motor also perceived change processes to be strongly linked to the local changes. However, the papers also stressed that local change was not sufficient for organizational change. Some focused on the local changes as unfolding in a way allowing for aggregation (Strong et al., 2014). Other focused on the shared elements (perceptions, negotiations) (Leonardi, 2011; Sarker et al., 2006; Wagner et al., 2010) and some focused on the local element as a source of resistance (Koch et al., 2013). Studying the phenomenon in a study sensitized by the Complex Responsive Processes perspective directed attention local changes as the fundamental nature of organizational change. The point is that a gesture made by the initiating individual(s) might lead to other responses than the intended change or to no change in behavior (both responses to the gesture). Therefore, it is necessary to study the responses in the form of local change/no change to be able to understand the IS-related organizational change process.

Overall, my case study contributed to the dialectic perspectives on IS-related organizational change in the IS literature by applying the Complex Responsive

Processes perspective not previously used to study the phenomenon. More specifically, three specific aspects which a study sensitized by the Complex Responsive Processes perspective directs attention towards have been pointed out. My study highlighted that approaching *conflict as productive* are helpful for understanding the phenomenon, that *ongoing initiation* was necessary if one hoped to affect the change process and that *local change* was the fundamental nature of IS-related organizational change. The three contributions are summarized in Table 6.2 below.

		Existing IS literature	**Contribution**
Conflict as productive	Limited attention is paid to conflict	Avgerou & McGrath, 2007; Boddy, 2000; McBride, 2005; Sarker et al., 2006; Strong et al., 2014	The clash of differences and differing intentions and goals was where the potential for change arose
	Conflict perceived as a barrier for change	Cavaye & Christiansen, 1996; Koch et al., 2013; Wagner et al., 2010	
Ongoing initiation	Change was understood as emergent (but unfolded in some way without intentional interference)	Allen et al., 2013; Leonardi, 2011; McBride, 2005; Reimers et al., 2014; Robey & Boudreau, 1999; Sarker et al., 2006; Strong et al., 2014	As the process unfolded new initiatives attempted to direct the process in the desirable direction
	Focused on the possibility of intentionally interfering in the change process	Koch et al., 2013; Wagner et al., 2010	
Local change	Local change was closely related to organizational change but not sufficient	Koch et al., 2013; Leonardi, 2011; Sarker et al., 2006; Strong et al., 2014; Wagner et al., 2014	Organizational change depended on individuals interpreting the initiatives and changing their own behavior

Table 6.2: Contributions to dialectic perspectives

6.4 Contributions to the General IS Literature

The above sections described how this dissertation contributes to the literature on IS-related organizational change. Firstly, section 6.2 demonstrated how my study contributes with a dialectic perspective on IS-related organizational change specifically by stressing that the organization is not one uniform unit, that change is unplannable and uncontrollable and that power (as a relational phenomenon) is related to IS-related organizational change. As the Complex Responsive Processes perspective, naturally has its own specific characteristics differing from other perspectives drawing upon the dialectic motor, section 6.3 described how my study contributes to the literature drawing upon the dialectic motor in the approach to IS-related organizational change. More specifically this perspective highlights conflict as productive, the need for ongoing initiation and change as local change. These contributions are based on my study introducing an alternative perspective to IS-related organizational change. During my study it became clear that the perspective had not previously been applied as a sensitizing device in an empirical study in the broader IS literature either. In this way, the introduction of the Complex Responsive Processes perspective turned out to be a spin-off contribution to the general IS literature. Regarding this contribution, my case study functioned as an illustration of how the perspective could be applied. Thus, the contribution builds primarily on the presentation of the perspective and the review of its prior use both included in Chapter 3. However, considering the introduction of the Complex Responsive Processes perspective a contribution does only make sense after the perspective has been shown to be useful in an IS setting through in an empirical study. Thus, based on the presentation of the contributions to the literature on IS-related organizational change, it would seem that the usefulness of the perspective has been illustrated. Therefor it seems like a suitable opportunity to stress the contribution made to the general IS literature by introducing the Complex Responsive Processes perspective.

As described in section 3.3 the use of the Complex Responsive Processes perspective in the IS literature was limited. Only few papers referred to either Stacey or *Complex Responsive Processes* and none of those applied the perspective as a sensitizing device or in other ways as a guiding framework in an empirical study. Fifteen papers referred to newer Stacey references, meaning references after 2000 where the first publication on the Complex Responsive Processes perspective was published (Akgün et al., 2014; Boland et al., 2009; Breu et al., 2002; Ferratt et al., 2005; Howard et al., 2007; Ingawale et al., 2009; Intezari & Pauleen, 2012; Jones, 2008; Kautz, 2012, Lea et al., 1998; McBride, 2005; Merali, 2002; 2006; Mohamed et al., 2010; Vidgen & Wang, 2006). A single paper specifically applied the Complex Responsive Processes perspective in a conference-paper reflecting on the relevance and potential for an interdisciplinary future for the field of knowledge management research (Jones, 2008). She drew upon Stacey (2001; 2003) for inspiration on how communication could move the research field closer to interdisciplinarity. More specifically, the perspective was used to highlight the potentials of focusing on communication (e.g. the transformative nature) as well as the difficulties (e.g. the close connection to identity and power relations). Despite

the heavy reliance on the Complex Responsive Processes perspective for inspiration, Jones (2008) did not apply the perspective in an empirical study. The remaining fourteen papers referred to fragmented concepts or positions from the Complex Responsive Processes perspective such as uncertainty, self-organizing, anxiety and the limitations of planning. In addition to the use of a single aspect of the perspective, the use of references to Stacey-texts were not directly linked to the framework used in a study but rather as part of describing related insights or alternative approaches.

The limited use of the Complex Responsive Processes perspective in the IS literature stresses the contribution made by the introduction of the perspective and the related illustration of the perspective's usefulness as a sensitizing device in an empirical study. According to the authors behind the Complex Responsive Processes perspective, the perspective distinguishes it-self from other perspectives drawing upon complexity science in two fundamental ways. Firstly, the perspective distances it-self from systems theory, which many perspectives drawing upon complexity science are still associated with (see e.g. Stacey et al., 2000). Furthermore, the Complex Responsive Processes perspective uses the insights from complexity science to move away from systems theory thinking and combines it with insight from sociology and social psychology to interpret the complexity science insight into a social science context (see e.g. Stacey, 2005; Stacey et al., 2000; Stacey & Griffin, 2005). More specifically, these insight led to a focus within the Complex Responsive Processes perspective on organizations as ongoing processes of local human interactions, or communication, and the patterns these create and are created by (Stacey 2005; Stacey 2007; Stacey et al. 2000). Further, the Complex Responsive Processes perspective directs attention to the importance of focusing on what is unfolding in the organization specifically the interactions or communications between different individuals. In this way, the perspective directs the attention to the people, which an organization consists of, suggesting a focus on the activities of those people rather than *positions in markets, bundles of resources, abstract cultures and charismatic, leaders with extraordinary power of envisioning* (Stacey, 2007: 298). Lastly, the perspective stresses that the patterns, which are created and repeated in the processes of communication, are only identifiable through studies of the specific processes and at the same time, the specific processes can only be understood fully if one also understands the patterns.

The chapter discussed the contributions made by this dissertation, in particular the contributions to the literature on IS-related organizational change, dialectic IS-related organizational change and the wider IS literature. In this way, the chapter stressed the understanding of IS-related organizational change developed through my case study. Hence, the chapter serves as foundation for following chapter, which ends the dissertation with a conclusion on my study and the answers to the research questions.

CHAPTER 7

CONCLUSION

Introduction

This final chapter concludes the dissertation by summarizing the study and its contributions as well as reflecting on the relevance of the study. More specifically, the chapter begins with stressing the focus of this dissertation as well as the highlights of the case study. Based on this, the contributions to the IS literature are summarized and thus the research questions are answered. Further, the answers lead to a number of implications for practice, which is therefore pinpointed. Subsequently, the limitations of the study as well as its quality criteria are addressed. Lastly, the chapter ends with reflections on avenues for the future research.

7.1 Summarizing

As emphasized in Chapter 1, the phenomenon of IS-related organizational changes has been studied from a number of different perspectives in the IS literature (see e.g. Ashurst et al., 2008; Cooper, 2000; Robey & Boudreau, 1999; Schryen, 2013). The literature review showed that all four motors of change introduced by Van de Ven & Poole in their 1995 typology of change process theories had been applied in the study of IS-related organizational (see Chapter 2). According to Van de Ven & Poole (1995) it was very positive that the literature drew upon all four motors in attempting to understand the phenomenon, as each motor directed attention to specific aspects of a change process. Thus, the diversity in the approaches to IS-related organizational change in the top IS literature[62] should be considered a strength based on the worldview presented by Ven de Ven & Poole (1995). However, even among the papers drawing upon the dialectic motor, the focus on conflict as a driver of change was limited (see section 2.4). This led to an interest in whether, conflicts taking place during IS-related organizational change would be influencing the unfolding process positively as Van de Ven & Poole (1995) suggested. To research this relation a case study was conducted. By applying the Complex Responsive Processes perspective as a sensitizing device (Klein & Myers, 1999; Walsham, 1995), the study focused on the role of communication as well as power, conflict and differences in the process of IS-related organizational change. Furthermore, the studied case was a municipality; political of nature and similar to other public organizations it was characterized by multiple vague and often conflicting goals as well as the individual leaders' relatively weak authority (see e.g. Heffron, 1989; Kettl, 2012). Therefore, it seemed reasonable to expect a certain level of conflict during the process of IS-related organizational change unfolding in the municipality. The combination of case site and sensitizing device thereby enabled a study of the role of conflict in processes of IS-related organizational change. The purpose of the study was to find out *how the Complex Responsive Processes perspective can contribute to the understanding IS-related organizational change*. More specifically the purpose was elaborated by the following three research questions.

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[62] It is likely that the same diversity can be found in the wider IS literature; it was however not reviewed during the literature.

RQ1: How can a case study sensitized by a theoretical perspective drawing upon the dialectic motor help us understand specific aspects of IS-related organizational change?

RQ2: How can we more specifically understand IS-related organizational change based on a case study sensitized by the Complex Responsive Processes perspective?

RQ3: How can the application of the Complex Responsive Processes perspective as a sensitizing device be of relevance for the broader IS literature?

The three research questions guided the study, and were answered through the combinations of literature reviews of the IS literature, a thorough review of the Complex Responsive Processes perspective and the interpretive case study. The goal of the study was to gain *understanding* of IS-related organizational change. The study was more specifically designed as an interpretive case study thus leading to understanding (or generalizations) based on *development of concepts* about the process of IS-related organizational change and *rich insights* into the process (Walsham, 1995). The rich insights as well as the conceptualization were unfolded in the case analysis in Chapter 5, and discussed related to the contributions in Chapter 6.

The case studied was a Danish municipality in the middle of a process intended to realize the digital school by 2014 with everybody engaged in it. The process was initiated by a gesture made by the IT-leader (suggesting that the municipality should participate in a school-IT benchmarking). A gesture, which was a response to a period of conflict and dissatisfaction related to school-IT. To provide an overview of the empirical process of IS-related organizational change unfolding in the case over a period of six years, the process was analytically divided into five episodes, Be*nchmarking, Strategizing, Improving infrastructure, Analyzing* and *Re-organizing.*

The process was initiated by the IT-leader's suggestion to participate in a benchmarking in the beginning of episode one, based on the existing conflict between the schools and the Center for IT. Following the suggestion, it became clear that the IT-leader and the Head of School together with the school-IT consultant held different perspectives of the way to handle the dissatisfactions at the schools. In the conversations regarding the benchmarking, the individuals' intentions and their choices were based on their own specific perception of the situation. The conflict regarding school-IT played an important role as a motivation for suggesting a benchmarking and for accepting the suggestion, based on different viewpoints as they were.

The second episode covered the strategizing process and it was initiated by the political adoption of the plan for a strategizing process. The activities in the episode was generally experienced as constructive and characterized by consensus. This was quite surprising as e.g. the visions group included many different participants with varying intentions and as it was constructed to include critical voices as well as the positive voices. The limited role of conflict in the episode could maybe be explained by the setting of most of the meeting (in particular those related to the vision group), as the setting did not intend for disagreements, but rather focused on creating a constructive output and establishing agreement and shared understanding.

The third episode unfolded in parallel with episode two and focused on improving the infrastructure and in this way attempted to eliminate the technical dissatisfaction. The episode did not receive much attention at the schools, and it turned out, that eliminating the technical problems did not in it-self eliminate the dissatisfaction. Like episode two, the third episode was characterized mostly by consensus.

In episode four, the focus was on the analysis of competences, culture and knowledge sharing regarding school-IT. The episode was initiated by a decision in the program steering committee and a lot of time and resources were spent planning, conducting and communicating the analysis. In this episode, the element of conflict related to the dissatisfaction with the process and the role of the external consultant. The dissatisfaction led the school-IT consultant to conduct his own analysis of the data and generally led the program steering committee to separate from the external consultant and develop their ownership of the process.

The fifth and last episode revolved around the re-organization of the program. The first responses to the suggestion to re-organize were characterized by consensus rather than conflict. There seemed to be an agreement of the relevance of re-organizing the program. Later conflict and differences did however became clear based on the members of the program steering committee representing different parts of the organizations and thus holding different values and priorities. The differences were however productive and lead to further discussions and potentially better decisions. Furthermore, the re-organization generated space for local differences regarding implementing the digital school by 2014.

Looking at the process of IS-related organizational change as a whole, conflict and differences played a significant part, in particular in the part of the process leading to actual change. What was interesting was especially the productive nature of conflict and differences. Conflict did not result in participants redrawing from the conversations or deciding to work against their opponents. Potentially due to the political nature of the organization where professional conflict is inscribed in the organizational set-up, conflicts seemed to lead to further communication, continued collaboration and potentially new ideas and solutions.

Before turning to the contributions made by this dissertation, it should be mentioned, that even though it has continuously been emphasized that the Complex Responsive Processes perspective draws upon the dialectic motor of change, the perspective also draws upon the teleology and evolution motors as secondary motors (see section

3.1). Drawing upon the teleology motor the process was perceived as intentional where a group of people within the municipality found the current situation problematic this led them to initiate a process, which they expected to lead to IS-related organizational change. The inspiration from the evolution motor directed our attention to the role of external pressure for change. In the municipality, this was specifically clear regarding the overall pressure to digitalize the school area present in national agendas and general norms (see e.g. the theme in episode two, subsection 5.3.2.2). Furthermore, the Complex Responsive Processes perspective's combination of strong ties to the dialectic motor with links to the teleology and evolution motors might support the possibility of introducing the Complex Responsive Processes perspective into the IS field. The point being that it will allow researcher drawing upon the teleology and evolution motors as well as researcher drawing upon the dialectic motor to be able to relate to the Complex Responsive Processes perspective and the use of it in this dissertation.

7.2 Answering the Research Questions

Overall, applying the Complex Responsive Processes perspective as a sensitizing device in the case study helped direct the attention towards the local communication and the role of power, conflict and differences. More specifically, the study generated a rich description of the empirical process of IS-related organizational change in the municipality. Exploring this empirical process with the Complex Responsive Processes perspective enriched the understanding of IS-related organizational change in a number of ways, which are summarized below (see Chapter 6 for a detailed description).

Regarding the first research question: *How can a case study sensitized by a theoretical perspective drawing upon the dialectic motor help us understand specific aspects of IS-related organizational change?,* my study directed attention to the role of power, conflict and differences in a process of IS-related organizational change. My study answered this research question by identifying three specific aspects of the process, which we need to understand. Firstly, it was found that the municipality, as well as the program steering committee was not one uniform unit. Thus, bearing in mind that an organization is not one unit should lead to a focus on the multiple participants influencing the process. Further, the IS-related organizational change process was found to be unplannable and uncontrollable, which suggest a need for a different approach to the phenomenon by managers as well as researchers. Lastly, power was identified as a relational phenomenon influencing the process, which would suggest awareness towards power relations and the different forms it might take.

Moving on to the second research question**:** *How can we more specifically understand IS-related organizational change based on a case study sensitized by the Complex Responsive Processes perspective?,* my study identified three aspects which differed from the understanding found in other studies drawing upon the

dialectic motor. Firstly, conflict was found to play a productive role as a potential driver of IS-related organizational change. In this way, the study directed attention to conflict and further suggested that it should not necessarily be avoided without further reflections. Secondly, my study identified a need for ongoing initiation. As the process could not be planned or controlled, the possibility for influencing the way the process unfolded was found to be in ongoing initiatives or gestures. Lastly, I found that IS-related organizational changes unfolded as local changes in the case, which further stressed the need for ongoing initiatives. This suggested that IS-related organizational change should be understood over time as the process unfolded, not according to a detailed plan but still influenced by key participants among others.

Finally, regarding the third research question: *How can the application of the Complex Responsive Processes perspective as a sensitizing device be of relevance for the broader IS literature?,* my study found that introducing the Complex Responsive Processes perspective as a novel perspective on IS-related organizational change would be a contribution to the a wider IS literature. The limited use of the perspective in the IS literature suggested that a contribution could be made by introducing the perspective. However, considering the introduction of the Complex Responsive Processes perspective relevant required more than lack of prior use, it required the perspective to be useful in an IS context. Thus, my case study illustrated the relevance of the perspective by providing an example of the usefulness of the perspective as a sensitizing device in an empirical study.

7.3 Implications for Practice

Based on the contributions to the IS literature stressed above, this section stresses briefly how my study might be of relevance for practitioners. Even though the study is an interpretive case study and it cannot be said that IS-related organizational change processes will unfold in the same way in other organizations, some tendencies can be identified and inspiration can be drawn from the unique example. As described in the beginning of the dissertation, the literature showed a strong focus among practitioners on the link between IT/IS and business value (see e.g. Kappelman et al., 2014). In addition to the focus on the importance of IT/IS contributing with business value, there seemed to be an awareness that realizing the value or benefits required organizational change in addition to IT/IS investments. Further, changing organizational processes was pointed out as a challenging task, for instance by IT in practice (2014). This publication pointed out that the complex and digitalized world challenged traditional approaches to change managements such as planning and strategy processes. Thus, an example of how a process of IS-related organizational change unfolded and an emphasis of aspects to be aware of might be helpful for practitioners. In particular, it might help them to let go of the traditional notion of IS-related organizational change as planned and controlled by a small group of people.

Based on my study the process of IS-related organizational change was comprehended as unpredictable and impossible to control. The process involved many different people and their communications, differences and conflicts were what drew the change process. The following insights for practitioners were derived from the study. Firstly, my study showed that the changes originally intended by key participants did not occur. More specifically, during the strategizing process the intended change revolved around smart boards in all classrooms or at least centrally controlled projects ensuring a certain level of digitalization at all schools. Over time, the members of the program steering committee changed their approach and focused on promoting local engagement hoping that this would lead the schools closer to the digital school the overall vision described. Combining this empirical insight with insights from the Complex Responsive Processes perspective led to an implication for practice. This suggested that rather than continuously striving to plan and control the unpredictable process of IS-related organizational change one should accept that even as a leader it is not possible to know in advantage, which changes the process will lead to and furthermore one can only guide the process not control it.

Secondly, my study showed the productive role of conflict and differences. For instance, in episode four, the conflict revolving around the analysis and the role of the external consultants led the school-IT consultant to conduct his own analysis of the data and to challenge the findings from the analysis. He attempted to give room to the nuances and limit what he found to be simplifications of the situation at the schools. This process seemed to contribute to the realization in the program steering committee that the approach to the digital school needed to be more divers and more including to enable the development of a digital school making sense at all the schools. The inspiration or implication, which can be derived from this, is that rather than simply considering conflict and differences as a barrier for change (e.g. in the form of resistance) one should be open to the constructive side of conflict and differences as a potential driver of change. For instance, one could involve multiple participants covering different interests, values and knowledge.

An additional implication for practice based on my study is the potential for guiding the process of IS-related organizational change by means of ongoing initiation. The study showed that at the beginning of each episode a new gesture (or initiative) was made by key participants to bring forward the process. For instance, the process of IS-related organizational change was initiated in the first place by the IT-leader's suggestion to participate in a benchmarking. In this way, he hoped to establish a general understanding of the problem and thereby create a foundation for improving the situation. During the first episode, it became clear that others shared this hope (e.g. the Head of Schools) and as the benchmarking was completed they therefore used the benchmarking results as a starting point for their next initiative (or gesture) namely the strategizing process. The inspiration or implication, which can be derived from this, is that rather than attempting to plan the process at one point in time and expect the process to unfold according to the plan, one should be aware of

ongoing initiation as an efficient approach to influence the process towards the intended goals or visions.

As this dissertation directs attention to the IS-related organizational change as unpredictable and uncontrollable, to conflict and differences as valuable aspects of the process and to ongoing initiations as the way to affect the process, the role of the CIO or IT-leader should probably be reconsidered. This was not a focus in my study; however, the study showed that the IT-leader following his initiating gesture withdrew to a more passive role[63] giving room to the other participants. It seemed as if he attempted to initiate the process and then give the other participants the opportunity to take ownership of the process. This seemed to be similar to the suggestion to focus on facilitating interactive processes as made by IT in Practice (2014) (see section 1.2) and this approach could potentially be relevant for others practitioners as well.

7.4 Limitations

As the above sections have attended to the contributions and practical implications, this section focuses on the limitations related to my study, as these should be taken into account regarding the contributions and implications. It is in particular the limitations related to the case design and the limitations regarding the empirical application of the sensitizing device, which are in focus.

Regarding the case design, two issues are of particular relevance, the possibilities of generalizations from a unique case and the retrospective nature of some of the empirical material. Interpretive case studies are often criticized for their lack of generalizability, as multiple cases would enable cross-case comparisons and thus stronger generalizability. This approach to generalizability mimics the quality criteria of quantitative analysis striving for statistical generalization. However, interpretive case studies strive for a different kind of generalizability. According to Walsham (1995), the purpose of interpretive studies is to contribute with *theoretical* generalizations based on an understanding of the unique processes in a specific case. Walsham further points out, that generalizations from interpretive studies should be understood as *tendencies* rather than *predictions* (Walsham, 1995). To convince the audience that the tendencies observed in the specific case is of relevance in other cases, the dissertation describes the research process in detail and thus ensures transparency (see section 7.5 below for further reflections on the application of the seven principles for interpretive studies as suggested by Klein & Myers (1999)).

Another limitation is the retrospective nature of some of the empirical material. A retrospective study leads to the risk of interviewees not recalling details or primarily recalling the outcome of an activity (see e.g. Van de Ven, 2007). To minimize this risk, a number of steps were taken; firstly, internal documents were studied to

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[63] He continued to be highly involved in the more technical matters

provide the researcher with insight into the process and the specific activities as a foundation for the interviews. Further, as the key participants[64] were interviewed more than once they were asked to describe the process several times. In this way, I was able to ask more specific questions in the later interviews based on insights into the process and its activities; thereby I supported the interviewees in describing the process in detail. Lastly, several different participants were interviewed thus providing a number of different perspectives on the process, either supplementing each other or highlighting the differences and conflicts in the process. So the shortcomings of the retrospective approach in parts of the study were attempted minimized. Further, Van de Ven (2007) points out, that it is often not possible to know beforehand if a process will be interesting, which makes it difficult to study e.g. change as it unfolds without knowing what it leads to.

Turning to the limitations related to the application of the sensitizing device in an empirical study it should be noticed, that choosing a sensitizing device naturally means directing attention to specific aspects of the phenomenon rather than others. Furthermore, it is most likely that an alternative sensitizing device could have been identified, likewise directing attention to conflict and differences as drivers of change (drawing upon the dialectic motor). However, an alternative sensitizing device would focus on slightly different aspects than the Complex Responsive Processes perspective's focus on communication, power relations and the local and emergent nature of the change process.

The Complex Responsive Processes perspective is in some ways rather abstract as a sensitizing device as the perspective focuses much on developing its theoretical and philosophical position. Thus, the sensitizing device functioned more as a mindset than as a guiding framework. The study was therefore structure based on inspiration from the sensitizing device and not as a direct consequence of the Complex Responsive Processes perspective. As the application of the perspective required some interpretation, others might apply the perspective differently giving priority to other concepts. For instance, within this dissertation the concept of gesture and responses were given a central role in the study as these concepts are fundamental in the Complex Responsive Processes perspective, however other studies might choose to focus on power relations or narratives or even to draw more heavily upon some of the other authors within the Complex Responsive Processes perspective[65]. Despite the abstract nature of the perspective and the challenges associated with applying it, it functioned well as a mindset or sensitizing device directing the attention towards specific aspects of the process.

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[64] Primarily the program manager, the IT-leader and the school-IT consultant
[65] For instance, Shaw's writings on creativity in communication (see e.g. Shaw, 2002) or Mowles's writings on the role of leaders and managers (see e.g. Mowles, 2011a;b)

7.5 Complying with the Quality Criteria

During the presentation of the limitations above, it was simultaneously stressed how the limitations were addressed. This section continuous with a similar focus, as it recaptures Klein & Myers (1999) seven principles for interpretive research and focuses on how these were addressed in the dissertation. In this way, the study is highlighted as sound and the strength of the contributions is supported (see Table 7.1 below).

The principles	Addressed in this dissertation
1. The Fundamental Principle of the Hermeneutic Circle	*Move back and forth between attempting to understand the episodes (and the parts with them) and the whole process.* This ensured an understanding of IS-related organizational change based on a detailed understanding of the empirical process. Further, the understanding of the episodes as well as the process as a whole are communicated in Chapter 5 (Case Analysis), thus allowing the reader to follow the process towards the understanding presented in Chapter 6 (Contributions) and the present Chapter 7.
2. The Principle of Contextualization	*The context is described in some detail, giving the reader insight into the process leading to the change process under study.* This provided the reader with insight into the context of the case study and in this way allowed the reader to assess the generalizability of the findings to other context.
3. The Principle of Interaction Between the Researchers and the Subjects	*I reflected on an ongoing basis on my role as a researcher and on the way I as a researcher, influence the people I study and the way they influence me. A summary of these reflections are included in the dissertation.* Reflections regarding my role as a researcher helped me become aware of my role and the way I affected the process with my bare presence. Further, reporting these reflections and highlighting the interactive influence on e.g. the empirical material provides the reader with insight into the research process and thus supports the transparency of my study.
4. The Principle of Abstraction and Generalization	*The empirical process is analyzed in the light of the theoretical concepts from the Complex Responsive Processes perspective. The findings from the study are*

	further linked with the existing IS literature.
	Including rich empirical descriptions as well as abstractions or generalizations in the dissertation connected the understanding achieved through my study to existing knowledge (in the IS literature as well as within the sensitizing devices). Furthermore, presenting both the rich descriptions and the abstractions enables the reader to evaluate the abstraction process.
5. The Principle of Dialogical Reasoning	*The description of the process towards determining the research focus is an approach explicit about the researcher's pre-understandings. Furthermore, attention has been paid to the empirical material before theoretical analysis, opening up to potential contradictions.* The transparency of the research process provided through Chapter 4 (Case Design) allowed the reader to evaluate the research process on his or her own. Further, including the rich descriptions of the empirical process provided an opportunity to identify aspects of the empirical process, which contradicts the expectations based on the sensitizing device. The applied sensitizing device is however fairly inclusive as it draws upon the dialectic motor as well as the teleology and evolution motors.
6. The Principle of Multiple Interpretations	*An important principle due to the chosen sensitizing device's assumptions about change. Allowing people room to tell their version of what they are part of is therefore prioritized; these can e.g. be found in the parts of the analysis focusing on themes and narratives.* Both Klein & Myers (1999) principle and the Complex Responsive Processes perspective stressed the focus on multiple interpretations. Including different accounts of the situation in the dissertation provided a more thorough understanding of the process, and at the same time, allowed the reader to evaluate the abstractions based on the process.
7. The Principle of Suspicion	*Uncovering underlying social structures is not a focus in the study; however, it is recognized that the official stories should not always be taken at face value.* The role of this principle has been limited in my study, as the focus due to the choice of sensitizing device was on the communication between the participants as well

	as their own understanding of the process. However, it became evident during my study that the role of the participants within the organization influenced their understanding, participation, intentions etc. Therefore, it was a focus in the dissertation, to clarify the organizational role of the participants, in the case presentation as well as during the analysis where the title or role of the participants is mentioned.

Table 7.1: Compliance with the quality criteria

Overall, it has been a priority to communicate my study in a form, which provides the reader with opportunity to evaluate the research process and assess the generalizability of the findings to other context on their own. I hope that this strive for transparency allows the reader to appreciate the research on its own terms and to recognize the contributions made by this dissertation.

7.6 Future Research

This subsection takes the contributions made by this dissertation as well as the limitations into account and suggests avenues for future research. More specifically, aspects, which were observed as interesting and related but not included in the research focus, are pointed out as potential topics for future research.

As this dissertation introduces the Complex Responsive Processes perspective as a sensitizing device, it can only be considered an initial step in understanding the possibilities of applying the perspective to IS research. Applying the Complex Responsive Processes perspective in additional studies of IS-related organizational change maybe in other context would improve our understanding of the phenomenon as well as strengthen our understanding of the usefulness of the perspective. Furthermore, applying the perspective in studies of other phenomena might uncover additional possibilities of the perspective and more importantly potentially improve our understanding of these phenomena. The study also indicates that the process of IS-related organizational change is a process of learning, as the participants initially expected to be able to implement centrally controlled change but over time realized the necessity of engaging the local participants and embracing the local differences thus allowing change to emerge. It would therefore be relevant to examine whether the identified episodes during which the learning unfolded are unique to the case or more generic, which would link the understanding of the phenomenon to the life cycle motor as an additional motor of change. Further, the process of IS-related organizational change described in this dissertation resembles exploration as described by March (1991) as the participants attempted to find out how the schools might be digitalized. It would thus be a relevant avenue for future research to explore if a process of exploitation follows, and which role power, conflict and differences would play in that process if any. Finally, in the case, the process of IS-related organizational changes was influenced by the general agenda

of digitalization within the municipality and at national level. As digitalization seems to be a rising focus if would be interesting to investigate if processes of organizational change related to digitalization would unfold in a similar way and would be influenced by the same aspects.

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APPENDIXES

Appendix A – Perspectives on IT-related Organizational Change – Literature Reviews

Initial literature review – the four motors of organizational change

To get an initial understanding of how the phenomenon of IT-related organizational change has been studied in top IS journals a literature review was conducted. The purpose of the review was to identify papers and classify them according to the motor of change they drew from (following Van de Ven & Poole's framework (1995).

Identifying the papers

The literature review was conducted within three top IS journals, MIS Quarterly, Information Systems Research and European Journal of Information Systems. This approach was chosen since it would enable me to identify the *trends* in the literature while limiting the numbers of papers in a comprehensive stream of literature (Webster & Watson, 2002). The search was conducted using the search engine *Web of Science* (https://webofknowledge.com/) latest at June 17 2015. As the focus of the search is IT-related organizational change, *organizational change* seems an obvious search word or phrases. Due to the IT-relatedness the phrases *information technology* and *information systems* is likewise included. The argument for including both information systems and information technology in the search is that the two wordings are often used interchangeably.
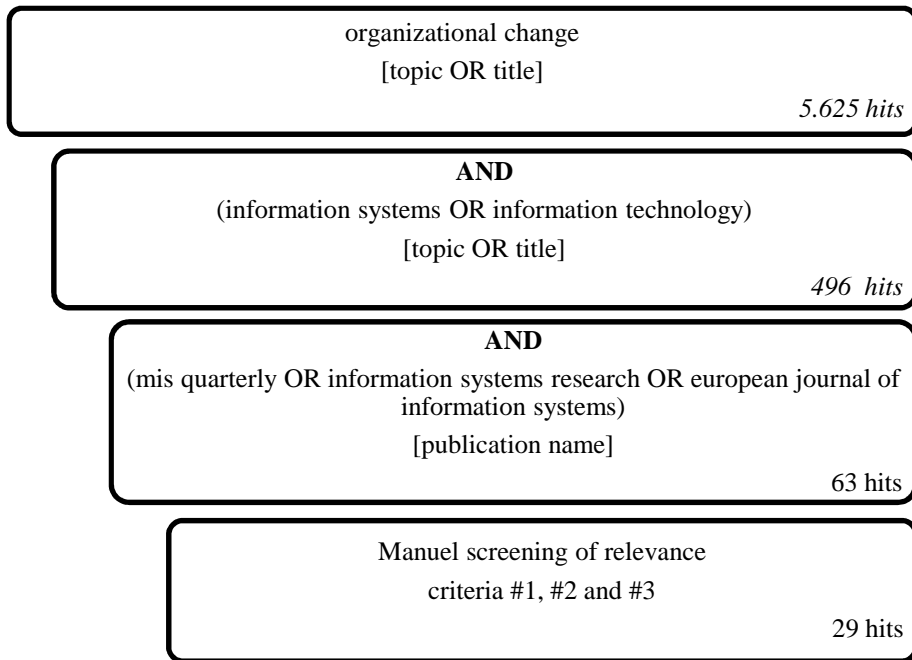
Figure A.1: Identifying papers in MISQ, ISR and EJIS

The search in web of science led to the identification of sixty-one papers. A list of these papers are included below in Table A.1. However further screening was needed, thus a manual screening was completed; excluding papers one the basis of one or more of the following three criteria

- Not concerned with IT-related organizational change
- Did not focus on the *process* of change
- No attention was paid to what influences the change process

The purpose of the criteria was to ensure that the final pool of papers was within the intended scope of the dissertation. The first criterion pointed out that if IT-related organizational change was not central in the paper but only mentioned as e.g. a context or setting, then the paper was not relevant. The second criterion drew attention to the focus of the paper. If the paper did not focus on the *process* of change, but rather on e.g. the consequences of the change, then the paper was not relevant. The third criterion extended the second and stated that if the paper do not pay attention to the factors influencing or driving the change process then the paper was not relevant. The last two criteria were necessary as the purpose of the literature review was to classify the papers according to which motor of change they drew upon and this would only be possible if the change process and its drivers were a focus in the papers.

Author(s)	Title	Journal
Salge et al., 2015	Investing in Information Systems: On the Behavioral and Institutional Search Mechanisms Underpinning Hospitals' IS Investment Decisions	MISQ
Aanestad et al., 2014	Infrastructuring Work: Building a State-Wide Hospital Information Infrastructure in India	ISR
Mazmanian et al. 2014	Dynamic Reconfiguration in Planetary Exploration: A Sociomaterial Ethnography	MISQ
Jones, 2014	Matter of Life and Death: Exploring Conceptualizations of Sociomateriality in the Context of Critical Care	MISQ
Reimers et al. 2014	An empirical evaluation of existing IS change theories for the case of IOIS evolution	EJIS
Sykes et al. 2014	Enterprise System Implementation and Employee Job Performance: Understanding the Role of Advice Networks	MISQ
Bala & Venkatesh, 2013	Changes in Employees' Job Characteristics during an Enterprise System Implementation: A Latent Growth Modeling Perspective	MISQ
Seidel et al. 2013	Sensemaking and Sustainable Practicing: Functional Affordances of Information Systems in Green Transformations	MISQ
Leonardi, 2013	When does Technology Use Enable Network Change in Organizations? A Comparative Study of Feature Use and Shared Affordances	MISQ
Volkoff & Strong, 2013	Critical Realism and Affordances: Theorizing IT-Associated Organizational Change Processes	MISQ
Allen et al., 2013	How Should Technology-Mediated Organizational Change be Explained? A Comparison of the Contributions of Critical Realism and Activity Theory	MISQ
Njihia & Merali, 2013	The Broader Context for ICT4D Projects: A Morphogenetic Analysis	MISQ
Im et al., 2013	Do Large Firms Become Smaller by Using Information Technology?	ISR
Schryen, 2013	Revisiting IS business value research: what we already know, what we still need to know, and how we can get there	EJIS
Vaast & Walsham, 2013	Grounded theorizing for electronically mediated social contexts	EJIS
Davison et al., 2012	The Roles of Theory in Canonical Action Research	MISQ
Rivard & Lapointe, 2012	Information Technology Implementers' Responses to User Resistance: Nature and Effects	MISQ
Ply et al., 2012	IS Employee Attitudes and Perceptions at Varying Levels of Software Process Maturity	MISQ
Galliers & Huang, 2012	The teaching of qualitative research methods in information systems: an explorative study utilizing learning theory	EJIS
Street & Ward,	Improving validity and reliability in longitudinal case study	EJIS

2012	timelines	
McLeod & Doolin, 2012	Information systems development as situated socio-technical change: a process approach	EJIS
Krell et al., 2011	Development of an IS change reason-IS change type combinations matrix	EJIS
Oborn et al., 2011	Unity in Diversity: Electronic Patient Record Use in Multidisciplinary Practice	ISR
Nan, 2011	Capturing Bottom-Up Information Technology Use Processes: A Complex Adaptive Systems Model	MISQ
Leonardi, 2011	When Flexible Routines meet Flexible Technologies: Affordance, Constraint, and the Imbrication of Human and Material Agencies	MISQ
El Sawy et al., 2010	Seeking the Configurations of Digital Ecodynamics: It Takes Three to Tango	ISR
Yoo, 2010	Computing in Everyday Life: A call for Research on Experiential Computing	MISQ
Sankaranarayanan & Sundararajan, 2010	Electronic Markets, Search Costs, and Firm Boundaries	ISR
Morris & Venkatesh, 2010	Job Characteristics and Job Satisfaction: Understanding the Role of Enterprise Resource Planning System Implementation	MISQ
Cho et al., 2008	Contextual dynamics during health information systems implementation: an event-based actor-network approach	EJIS
Pries-Heje & Baskerville, 2008	The Design Theory Nexus	MISQ
Ashurst et al., 2008	Improving the impact of IT development projects: the benefits realization capability model	EJIS
Bhattacherjee & Hikmet, 2007	Physicians' resistance toward healthcare information technology: a theoretical model and empirical test	EJIS
Davidson & Chrismar, 2007	The interaction of institutionally triggered and technology-triggered social structure change: An investigation of computerized physician order entry	MISQ
Malhotra et al., 2007	Leveraging standard electronic business interfaces to enable adaptive supply chain partnerships	ISR
Clark et al., 2007	The dynamic structure of management support systems: Theory development, research focus, and direction	MISQ
Avgerou & McGrath, 2007	Power, rationality, and the art of living through socio-technical change	MISQ
Silva & Hirschheim, 2007	Fighting against windmills: Strategic information systems and organizational deep structures	MISQ
Butler & Gray,	Reliability, mindfulness, and information systems	MISQ

2006		
Madsen et al., 2006	A framework for understanding how a unique and local IS development method emerges in practice	EJIS
Wei et al., 2005	Understanding misalignment and cascading change of ERP implementation: a stage view of process analysis	MISQ
Porra et al., 2005	The history of Texaco's corporate information technology function: A general systems theoretical interpretation	MISQ
Lapointe & Rivard, 2005	A multilevel model of resistance to information technology implementation	MISQ
Luna-Reyes et al., 2005	Information systems development as emergent socio-technical change: a practice approach	EJIS
Levina & Ross, 2003	From the vendor's perspective: Exploring the value proposition in information technology outsourcing	MISQ
Enns et al., 2003	CIO lateral influence behaviors: Gaining peers' commitment to strategic information systems	MISQ
Tillquist et al., 2002	A representational scheme for analyzing information technology and organizational dependency	MISQ
Marble, 2000	Operationalising the implementation puzzle: an argument for eclecticism in research and in practice	EJIS
Simon, 2000	The reorganization of the information systems of the US Naval Construction Forces: an action research project	EJIS
Cooper, 2000	Information technology development creativity: A case study of attempted radical change	MISQ
Robey & Boudreau, 1999	Accounting for the contradictory organizational consequences of information technology: Theoretical directions and methodological implications	ISR
Porra, 1999	Colonial systems	ISR
Lyytinen et al., 1998	Attention shaping and software risk - A categorical analysis of four classical risk management approaches	ISR
Pinsonneault & Rivard, 1998	Information technology and the nature of managerial work: From the productivity paradox to the Icarus paradox?	MISQ
Cavaye &Christiansen, 1996	Understanding IS implementation by estimating power of subunits	EJIS
Markus & Benjamin, 1996	Change agentry - the next IS frontier	MISQ
CampbellKelly, 1996	Information technology and organizational change in the British census, 1801-1911	ISR
Orlikowski, 1996	Improvising organizational transformation over time: A situated change perspective	ISR
Robey & Sahay, 1996	Transforming work through information technology: A comparative case study of geographic information systems in county government	ISR
Silver et al., 1995	The Information Technology Interaction-Model - A Foundation for the MBA Core Course	MISQ

Sahay et al., 1994	A relativist approach to studying the social construction of information technology	EJIS
Joshi, 1991	A Model of Users Perspective on Change - The Case of Information-Systems Technology Implementation	MISQ
Loftin & Moosbruker, 1982	Organization Development Methods in the Management of the Information Systems Function	MISQ

Table A.1: Papers identified through Web of Science

After the manual screening, a pool of twenty-nine relevant papers remained. The distribution of papers on the three journals are portrayed in Table A.2 below. A list of the twenty-nine papers is included in Table A.3 in the following subsection.

Papers identified through search	MIS Quarterly	35
	Information Systems Research	12
	European journal of Information Systems	16
	In total	**63**
Not relevant papers		**34**
Relevant papers	MIS Quarterly	17
	Information Systems Research	6
	European journal of Information Systems	6
	In total	**29**

Table A.2: Distribution of papers

Analyzing the papers
The papers were classified according to which motor of change the paper draws from (see Table A.4 below). The criteria for the classification was based on Van de Ven & Poole (1995) and summarized in Table A.3.

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Motor of change	Criteria – The paper...
Life cycle motor	… focuses on stages of change … explains the movement between the stages with some sort of rules
Teleology motor	… presents the motivation and strategic focus among the actors in the entity … describes the process of analyzing and evaluating the right technology for the purpose
Dialectic motor	… identifies more than one actor or entity … stress the conflict between the entities as a driver for change
Evolution motor	… includes a large number of actors or entities, e.g. an industry … highlights that change happens between entities and are driven by competition between them which follows an identifiable logic.

Based on Van de Ven & Poole (1995)

Table A.3: Criteria for classification

In Table A.4 below, the twenty-nine papers are listed and a short description of the paper as well as an argument for the classification of each paper are included.

Paper	Source	Focus	Motor of change
Aanestad et al., 2014	ISR	The paper studies the challenges faces by organizations in resource-constrained contexts which are different to thus faces by organizations in high-income countries	Evolution + Teleology The focus is on infrastructures and how they shape changes. The change is intended and the result of decisions made. The technology as well as the context enables and constrains the opportunieis for change but it is a choice (by management or +) whether the opportunity is taken or not.
Reimers et al. 2014	EJIS	Studies Inter-Organizational Information Systems (IOIS) evolution in a case study and evaluate two models of long-term IS change (an evolutionary model (Porra 1999) and a dialectic model (Lyytinen & Newman, 2008)), which leads to suggestions for developing more comprehensive theoretical models within each of	Evolution + dialectic Tests the explanatory power of two theories an evolutionary (Porra 1999) and a dialectic (Lyytinen & Newman, 2008) to find out how well the can explain IOIS evolution Draws explicitly on the Van de Ven & Poole framwork

		the two classes of theories.	
Bala & Venkates h, 2013	MISQ	Changes in job characteristic during ERP implementation Develops and tests Job Characteristics Change Model (JCCM)	Life cycle + teleology Describes enterprise systems implementation as a cycle with four phases: chartering, project, shakedown, and onward and upward following Markus and Tanis (2000)
Seidel et al. 2013	MISQ	The role of information systems in sustainability transformations (going green). They identify the functional affordances IS can provide to assist organizations in establishing green work practices (develops framework)	Evolution + Teleology It is a decision made by the organization to employ (or not) the potentials embedded in IS to create organizational change (change work practices in a greener direction) However the organizations are adapting due to external forces
Leonardi, 2013	MISQ	The importance of shared affordances in regards to network changes within organizations related to newly implemented technologies.	Teleology Draws on the theoretical perspective of affordances – but stress that his level of focus is the *shared affordances* – focusing on the group as one unit (a shared interpretation of the affordances offered by the new technology is necessary for changes in the advice network to happen) Focus on *when* changes in advice networks (a form of organizational change) are likely to follow from the implementation of new technology.
Volkoff & Strong, 2013	MISQ	Use critical realism to argue how affordances arise and are relevant to explain IT-associated organizational change	Teleology Focus on organizational level affordances. Their idea is that it is the organizational (or group) level affordances that can lead to organizational change, the actors are goal oriented and perceived as a unit.
Allen et al., 2013	MISQ	The paper compares critical realism and activity theory in the context of	Dialectic

		explaining technology-mediated organizational change. It is further illustrated empirically how activity theory makes a significant contribution to critical realism	The motor in processes of change is tensions and contradictions with in the activity system
Krell et al., 2011	EJIS	Develops a matrix of the combination of IS change reasons and IS change types. Further suggest that some combinations are more likely to lead to successful IS change implementation.	Teleology + life cycle Change is a decision which is made by the organization as a unit (teleology) different decisions are made in different phases of a change process (life cycle) – the decision of change type is one such decision (made in the beginning) However the paper focuses on 4 different IS change types and only 3/2 of them are associated with high to medium process redesign (organizational change)
Leonardi, 2011	MISQ	The paper studies how people decide whether to change the technology or their routines when they find them-selves unable to achieve their goals in the current environment. The author conclude that a perception that the technology constrains their ability leads to a change of technology whereas a perception of affordance leads to a change of routines	Dialectic Focuses on changes at the individual level and on the conflict between technology and individual and their routines
El Sawy et al., 2010	ISR	The paper proposes a perspective of theory building and testing (along with appropriate methods) relevant for the IS strategy area. They propose the concept of digital ecodynamics to describe the ecosystem unfolding of environmental turbulence, dynamic capabilities and IT systems, and suggest configurational theories as a lens.	Evolution Focuses on the turbulent environment as a driving factor (evolution) How well organizations respond to the turbulent environment depend on dynamic capabilities and IT systems. These two do however also affect the turbulent environment.
Cho et al., 2008	EJIS	The paper study IS implementation in a healthcare context through actor-network theory. Their study reveals how complex contextual dynamics had disruptive effects.	Evolution Due to the focus on context and on how the contextual factors influence the implementation (change)

		process.	
Ashurst et al., 2008	EJIS	The paper develops a conceptual model of benefits realization capabilities based on a literature study. Further, they apply the model in an empirical study and find no evidence of benefit realizations practices are being applied in any consistent manner.	Teleology (+ Life cycle) Focuses largely on change as an intentional activity, which it is possible to plan and control. The process all so takes place in phases
Davidson & Chrismar, 2007	MISQ	The paper studies how institutionally triggered and technology triggered change interacted to influence social structures. They draw on Barley's (1990) role- and network-based model for technology and structure alignment.	Teleology + evolution (+ dialectic) The change is planed but often as a response to changes in the institutional environment (evolution) The paper also studies how the technology triggers change by focusing on the micro-level of actions (dialectic). Their main focus is however to highlight the institutional macro-level.
Avgerou & McGrath, 2007	MISQ	The paper focuses on the ambivalence in the IS field between the theoretical assumptions about rationality in IS practices and organizational change and the empirical findings of less rational behavior. They draws on Foucault (power) and develop a context-specific notion of rationality in IS innovation	Dialectic + teleology (also some Evolution) Focus on multiple entities (groups and individuals). Take both different forms of rationality and conflicting interests and logics into account.
Silva & Hirschheim, 2007	MISQ	The paper studies how implementing strategic information system (SIS) might lead to organizational changes such as change in core values, power distributions and mechanisms of control. They highlight that an understanding of a SIS implementation requires focus on the changes in the organizational deep structures as well as on the implementation of the technical elements.	Evolution Focus on internal and external disturbance as the sources of change (the reasons for implementing SIS) – draws on punctuated equilibrium and explains change and stability through "rules"…
Wei et	MISQ	Attempts to understand the	Life Cycle

al., 2005		misalignment of ERP adoption and the associated change dynamics form at stage view	Applies a stage view, attempting to identify generic steps in the change process
Porra et al., 2005	MISQ	The paper uses general systems theory (GST) to explain continuing misalignment between the resources and tasks in Texaco's corporate IT function. Three systems perspectives are applied, mechanic, organic and colonial.	Evolution + teleology The context is very influential but also management and management decisions are a focus in understanding the changes.
Enns et al., 2003	MISQ	The paper examines CIO influence behavior in regards to convincing their top-management peers about strategic information systems	Teleology (+dialectic) The change process is intentional (by the CIO). However there is also a dialectic element (as there are multiple entities (CIO and peers)) they are however assumed to need to reach an agreement before change can happen
Tillquist et al., 2002	MISQ	Presents a new representation methodology (dependency network diagrams (DNDs)) The intention is to take into account the organizational factors when designing information systems (an attempt to stop "black boxing" the organizational context)	Teleology + evolution A change process is perceived as planed and intentional (it just needs better information to base the plans on) Part of the pressure for change is assumed to be external (primarily due to competition)
Marble, 2000	EJIS	The paper presents a survey of implementation models, research approaches, and investigation methods that have surfaced in the literature of the IS implementation field.	Teleology Attempting to include in one model all the implementations issues which needs to be considered (considering indicate a deliberate and planed process)
Cooper, 2000	MISQ	The paper attempts to understand creativity during IT-enabled reengineering (specifically during the requirements and logical design phases). Adapts a creativity model from the organizational literature	Teleology + Life cycle Change is intentional and the focus is on the organization as a unit The focus on different phases suggest a life cycle perspective as well.
Robey &	ISR	The paper reviews the various	Dialectic

		empirical knowledge of organizational consequences of information technology, and proposes the use of theories employing a logic of opposition, which explains organizational change by identifying forces both promoting change and impeding change. As a contrast to the deterministic logic, which are unable to explain the opposing empirical results regarding the role of IT in organizational change.	Focuses on different forces as crucial in understanding IT-related organizational change.
Boudreau, 1999			
Porra, 1999	ISR	The paper introduces the colonial systems perspective as an alternative to the mechanistic and organic systems paradigms.	Evolution Changes in colonial systems happen to better fit with contextual factors.
Cavaye &Christiansen, 1996	EJIS	The paper proposes a link between distribution of intra-organizational power and course of implementation processes. Draws on organizational politics and suggests a framework to measure subunit power. They further illustrate the frameworks usefulness for mapping relative power distributions at different moments and the relevance of this in explaining implementation projects and possible difficulties.	Dialectic + Teleology The power (and political) perspective is used to highlight which groups supported the change and which oppose it – and in this way explain which the implementation took six years (three years for the technical implementation and six for the organizational implementation which only happened after some power changes at the top management level. In a way it is a perspective on resistance to change, but more extreme. However the initiative to the change (the decision to develop and implement the new system was taken by top management (thus teleology)
Markus & Benjamin, 1996	MISQ	Identify the dominating role of IS specialist acting as change agents (including its limitations) and propose two alternative models of what it means to be an (IS) change agent (including potential	Teleology Focus on change agents, using factors such as: how the change is designed, described, how people, facilities,

		consequences and structural conditions) (traditional, facilitator, advocate)	structures, and processes are prepared etc. to manage the change process The two new change agent roles stresses the need to direct others attention towards change possibilities
Orlikows ki, 1996	ISR	Reports from a study of an organizations use of a new information technology over a two-year period. Outline a perspective on organizational transformation which proposes change as enacted through the situated practices of organizational actors as they improvise, innovate, and adjust their work routines over time. (Situated change)	Evolution + dialectic Evolution as change is not discontinuity, but an ongoing process with local adjustments (emergent unplanned change) Dialectic because different intentions form the emergent change
Robey & Sahay, 1996	ISR	A comparative case study of the consequences of implementing a system in two organizations The radically divergent outcomes are associated with differences in: initiation, transition, deployment, and spread of knowledge. (introduces Organizational Learning as a guide for future research) The main point is that the shared interpretation of the system is significant in determining the consequences of implementing the system – the consequences are socially constructed.	Teleology The paper describes a planned implementation (and change process) with active choices (regarding structure, purpose, central elements etc.) However the paper focus on several actors in the process and the perceptions of groups (however the present of conflict are not used to explain the changes directly only to explain difficulties in the change process – differencies seemed not to lead to change but rather to the lack of change)
Joshi, 1991	MISQ	Study employees' resistance to change. He proposes that employees evaluate change and resist only the changes they evaluate as unfavorable. The paper introduces a theory-based model (The equity-implementation model) of how employees evaluate changes.	Teleology The focus is not on organizational change specifically but on change in a broader sense. Further, the papers does not focus on the change perspective but rather on the resistance during implementation processes. However categorizes as teleology since the need for managing the

			change process is highlighted suggesting that change is planned (the organization is considered one, however the employees are considered a barrier).
Loftin & Moosbruker, 1982	MISQ	A study of an organizational change effort (in a data processing firm), focus on the (potential) usefulness of Organizational Development (OD) methods and how they can be relevant for IS managers	Teleology

Change are perceived as planed and a phenomenon which the IS manager can plan to alter the current behavior. |

Table A.4: The relevant papers and their classification

Through the classification sixteen papers was identified as drawing upon the teleology motor. Ten papers was identified as drawing upon the evolution motor of change r, while six papers drew upon the dialectic motor and one upon the life cycle motor of change.

Focused literature review – Use of the dialectic motor of change
Following the finding from the initial literature review presented above a second literature review was conducted with a focus specifically on the use of the dialectic motor of change. This literature review was relevant as this dissertation applies a sensitizing device, which draws upon the dialectic motor of change. Understanding prior approaches based on this motor of change were therefore helpful in identifying the contributions made by the study presented in this dissertation.
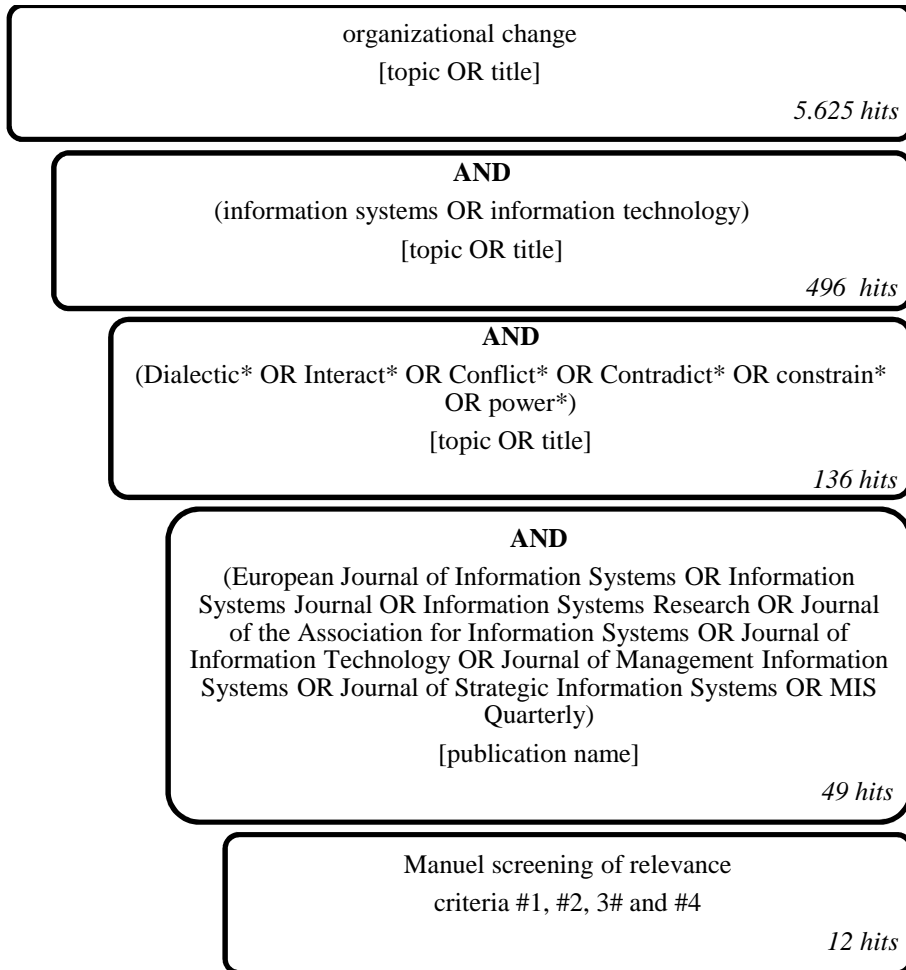
Identifying the papers
Like the initial literature review, this review focused on top IS journals. However due to the limited number of papers classified as drawing upon the dialectic motor in the initial review a few more journals were included in this review. More specifically, the outlets were limited to the AIS Senior Scholars basket of 8:

- European journal of Information Systems
- Information Systems Journal
- Information Systems Research
- Journal of AIS
- Journal of Information Technology
- Journal of Management Information Systems
- Journal of Strategic Information Systems and
- MIS Quarterly

Again the search was conducted using the search engine *Web of Science* (https://webofknowledge.com/) and the search words *organizational change* as well as *information technology* and *information systems* was likewise applied again. The search words from the initial search were combined with new search words

regarding the dialectic element. These new search words were identified as central words in the abstracts of the six papers classified as drawing upon the dialectic motor in the initial literature review. More specifically, these new search words were: a) dialectic, b) interact c) conflict d) contradict, e) constrain and f) power (used with a wildcard to included other inflections). The search process is portrayed in Figure A.2 below.

organizational change
[topic OR title]
5.625 hits

AND
(information systems OR information technology)
[topic OR title]
496 hits

AND
(Dialectic* OR Interact* OR Conflict* OR Contradict* OR constrain* OR power*)
[topic OR title]
136 hits

AND
(European Journal of Information Systems OR Information Systems Journal OR Information Systems Research OR Journal of the Association for Information Systems OR Journal of Information Technology OR Journal of Management Information Systems OR Journal of Strategic Information Systems OR MIS Quarterly)
[publication name]
49 hits

Manuel screening of relevance
criteria #1, #2, 3# and #4
12 hits

Figure A.2: Identifying papers concerning the dialectic motor

The search in *Web of Science* led to the identification of fourth-nine papers. A list of these papers are included below in Table A.5. However further screening was needed, thus a manual screening was completed. The basis for excluding papers was the three criteria applied in the initial literature review combined with a fourth

criterion for this specific review. A paper was excluded based on one or more of the following fourth criteria

- Not concerned with IT-related organizational change
- Does not focus on the *process* of change
- No attention paid to what influences the change process
- Does not draw on the dialectic motor of change

The fourth criterion was included to excluded paper which might be included in the pool of papers without actually drawing upon the dialectic motor of change. This was necessary as the six new search words were normal words and might be used in other connections than the perspective on IT-related organizational change. For instance, one might describe the application of two somehow *conflicting* theoretical lenses in a paper.

Paper	Title	Journal
Salge et al., 2015	Investing in Information Systems: On the Behavioral and Institutional Search Mechanisms Underpinning Hospitals' IS Investment Decisions	MISQ
Aanestad et al., 2014	Infrastructuring Work: Building a State-Wide Hospital Information Infrastructure in India	ISR
Reimers et al. 2014	An empirical evaluation of existing IS change theories for the case of IOIS evolution	EJIS
Lempinen &Rajala, 2014	Exploring multi-actor value creation in IT service processes	JIT
Sykes et al., 2014	Enterprise System Implementation and Employee Job Performance: Understanding the Role of Advice Networks	MISQ
Strong et al., 2014	A Theory of Organization-EHR Affordance Actualization	JAIS
Huber et al., 2013	A Process Model of Complementarity and Substitution of Contractual and Relational Governance in IS Outsourcing	JMIS
Koch et al., 2013	Digitally enabling social networks: resolving IT-culture conflict	ISJ
Allen et al., 2013	How Should Technology-Mediated Organizational Change be Explained? A Comparison of the Contributions of Critical Realism and Activity Theory	MISQ
Im et al., 2013	Do Large Firms Become Smaller by Using Information Technology?	ISR
Vaast & Walsham, 2013	Grounded theorizing for electronically mediated social contexts	EJIS
Currie, 2012	Institutional isomorphism and change: the national programme for IT-10 years on	JIT
Selander & Henfridsson, 2012	Cynicism as user resistance in IT implementation	ISJ

Ply et al., 2012	IS Employee Attitudes and Perceptions at Varying Levels of Software Process Maturity	MISQ
McLeod & Doolin, 2012	Information systems development as situated socio-technical change: a process approach	EJIS
Nan, 2011	Capturing Bottom-Up Information Technology Use Processes: A Complex Adaptive Systems Model	MISQ
Leonardi, 2011	When Flexible Routines meet Flexible Technologies: Affordance, Constraint, and the Imbrication of Human and Material Agencies	MISQ
Iivari & Iivari, 2011	Varieties of user-centredness: an analysis of four systems development methods	ISJ
El Sawy et al., 2010	Seeking the Configurations of Digital Ecodynamics: It Takes Three to Tango	ISR
Sabherwal & Grover, 2010	A taxonomy of political processes in systems development	ISJ
Sankaranarayan an & Sundararajan, 2010	Electronic Markets, Search Costs, and Firm Boundaries	ISR
Wagner et al., 2010	Understanding Project Survival in an ES Environment: A Sociomaterial Practice Perspective	JAIS
Lyytinen et al., 2009	Institutionalizing enterprise resource planning in the Saudi steel industry: a punctuated socio-technical analysis	JIT
Hussain & Cornelius, 2009	The use of domination and legitimation in information systems implementation	ISJ
Cho et al., 2008	Contextual dynamics during health information systems implementation: an event-based actor-network approach	EJIS
Davidson & Chrismar, 2007	The interaction of institutionally triggered and technology-triggered social structure change: An investigation of computerized physician order entry	MISQ
Chu & Smithson, 2007	E-business and organizational change: a structurational approach	ISJ
Hu et al., 2007	The role of external and internal influences on information systems security - a neo-institutional perspective	JSIS
Avgerou & McGrath, 2007	Power, rationality, and the art of living through socio-technical change	MISQ
Silva & Hirschheim, 2007	Fighting against windmills: Strategic information systems and organizational deep structures	MISQ
Sarker et al., 2006	Understanding business process change failure: An actor-network perspective	JMIS
Madsen et al., 2006	A framework for understanding how a unique and local IS development method emerges in practice	EJIS
Lapointe & Rivard, 2005	A multilevel model of resistance to information technology implementation	MISQ

McBride, 2005	Chaos theory as a model for interpreting information systems in organizations	ISJ
Neville et al., 2005	A case in customizing e-learning	JIT
Tingling & Parent, 2004	An exploration of enterprise technology selection and evaluation	JSIS
Choe, 2004	Impact of management accounting information and AMT on organizational performance	JIT
Tillquist et al. 2002	A representational scheme for analyzing information technology and organizational dependency	MISQ
Tillquist, 2000	Institutional bridging: How conceptions of IT-enabled change shape the planning process	JMIS
Boddy, 2000	Implementing interorganizational IT systems: lessons from a call centre project	JIT
Davis et al., 1999	Relationship marketing in electronic commerce environments	JIT
Robey & Boudreau, 1999	Accounting for the contradictory organizational consequences of information technology: Theoretical directions and methodological implications	ISR
Lyytinen et al., 1998	Attention shaping and software risk - A categorical analysis of four classical risk management approaches	ISR
Pinsonneault & Rivard, 1998	Information technology and the nature of managerial work: From the productivity paradox to the Icarus paradox?	MISQ
Chang & Powell, 1998	Towards a framework for business process re-engineering in small and medium-sized enterprises	ISJ
Cavaye &Christiansen, 1996	Understanding IS implementation by estimating power of subunits	EJIS
Silver et al., 1995	The Information Technology Interaction-Model - A Foundation for the MBA Core Course	MISQ
Joshi, 1991	A Model of Users Perspective on Change - The Case of Information-Systems Technology Implementation	MISQ
Loftin & Moosbruker, 1982	Organization Development Methods in the Management of the Information Systems Function	MISQ

Table A.5: Papers identified through Web of Science

After the manual screening, a pool of twelve relevant papers remained. The distribution of papers on the eight journals are portrayed in Table A.6 below. A list of the twelve papers is included in Table A.7 in the following subsection.

Papers identified through search	European journal of Information Systems	6
	Information Systems Journal	8
	Information Systems Research	6
	Journal of Information Technology	7

	Journal of Management Information Systems	3
	Journal of the Association for Information Systems	2
	Journal of Strategic Information Systems	2
	MIS Quarterly	15
	In total	**49**
Not relevant papers		**37**
Relevant papers	European journal of Information Systems	2
	Information Systems Journal	2
	Information Systems Research	1
	Journal of Information Technology	1
	Journal of Management Information Systems	1
	Journal of the Association for Information Systems	2
	Journal of Strategic Information Systems	0
	MIS Quarterly	3
	In total	**12**

Table A.6: Distribution of papers

Analyzing the papers

The twelve papers were then read in more detail, as the basis for the analysis of the papers (see Table A.7 below). The papers were analyzed according to the theoretical perspective they applied (as all the papers drew upon the dialectic motor of change). For each paper the theoretical perspective as well as the contribution made by the paper, and related to the theoretical perspective and the link to the dialectic motor, was identified.

Paper	Source	Theory	Application	Contribution
Allen et al., 2013	MISQ	Activity theory	Focuses on understanding change through contradictions and congruencies within the activity systems	Activity systems as a relevant unit of analysis Contradictions as driver of change
Avgerou & McGrath, 2007	MISQ	Foucault (power/knowledge + aesthetics)	Draws on Foucault) with particular focus on the relationship between power and rational/technical knowledge and develops a context-specific notion of rationality in IS innovation.	Change depends on the interactions between three forms of rationality; technical rationality, bureaucratic rationality and rationality from individual's reflexivity
Boddy, 2000	JIT	The Integrationist model	Suggests that the result of introducing new IT in an organizational setting	Highlights the interactions between technology and

			depends on the interactions of both technology and people over time.	people
Cavaye & Christiansen, 1996	EJIS	Organizational politics	Proposes a link between distribution of intra-organizational power and the course of implementation processes. Draws on organizational politics and suggests a framework to measure subunit power.	Stress the role of power differences Develops a framework to determine the relative power of intra-organizational groups
Koch et al., 2013	ISJ	IT–culture conflict	Study implementation of digitally enabled social network as part of a cultural change effort. Highlights the potential conflict between the organizational culture and the culture embedded in the technology and the impact of the conflict between the two.	Stresses conflict between culture and values as a ground for resistance towards change
Leonardi, 2011	MISQ	The imbrication metaphor	Studies how people decide whether to change the technology or their routines when they find them-selves unable to achieve their goals in the current environment.	Changes in human and material happens in response to one another
McBride, 2005	ISJ	Chaos theory	Applies selected concepts from chaos theory to the study of information systems in organizations, and develops an interpretive framework based on this.	Organizations as non-linear systems Change as ongoing and non-proportional
Reimers et al., 2014	EJIS	Punctuated Socio-technical IS Change model	Evaluates the explanatory power of two theories, one of which is Punctuated Socio-technical IS Change model to find out how well they can explain Inter-organizational IS evolution	An eye for the many smaller punctuations of the equilibrium How tensions in the deep structures of subsystems might lead to changes
Robey &	ISR	Logic of	Reviews the empirical	The role of IT as

Bourdreau, 1999		opposition	knowledge of organizational consequences of IT, and proposes the use of theories employing a logic of opposition, which explains organizational change by identifying forces both promoting change and impeding change	either supporting the transformative forces, supporting the persistence forces or supporting both forces
Sarker et al., 2006	JMIS	Actor-network theory	Studies business process change (BPC) and in particular they strive for better explanations of BPC failure	Directs attention to the changing nature of networks and its role in change processes
Strong et al., 2014	JAIS	Affordance-based theory	Uses grounded theory methods to study IT-associated organizational change in the context of an electronic health record (EHR) system implementation and develops an affordance-based theory of IT-associated organizational change	Focus on the materiality of the IT artifact and its specific affordances and actualizations

Change is linked to the interplay between affordances and individual or organizational goals and actions |
| Wagner et al., 2010 | JAIS | Socio-material Practice Perspective | Propose a new perspective to understand the processes of mutual adaptation of the technical and social during system implementation and maintenance of large scale systems | Practice is a negotiated phenomenon established over timer |

Table A.7: The relevant papers and their theoretical perspectives

The papers excluded in the two analysis
The criteria for excluding papers were presented above under the headlines *Identifying the papers*. For the first initial literature review, it was the following three criteria

- Not concerned with IT-related organizational change
- Did not focus on the *process* of change
- No attention was paid to what influences the change process

And for the second literature reviews focusing on the dialectic motor of change, a fourth critaria was added:

- Does not draw on the dialectic motor of change

The excluded papers can be found below in Table A.8 (for the initial literature review) and Table A.9 (for the dialectic literature review).

Paper	Source	Focus	Reason for excluding
Bhattacherjee & Hikmet, 2007	EJIS	The paper develops a theoretical model of physician resistance of healthcare information technology (HIT) by drawing on the literatures on technology acceptance on one side and the resistance to change literature.	The focus is on resistance towards HIT among physicians, not on the related organizational change processes
Butler & Gtheray, 2006	MISQ	The paper focuses on how firms and individuals create, manage, and use technology to attain reliability. More specifically, they draw on mindfulness theory to explain efforts to achieve reliability.	Focuses on efforts towards reliability rather than on organizational change
CampbellKelly, 1996	ISR		The focus is not on organizational change and HOW it happens but rather on WHICH organizational changes are related to the historical development (primarily changes to the work force)
Clark et al., 2007	MISQ	The paper develops a conceptual model of the entire class of management support systems (MSS) based on the literature on the phenomenon (covering both: decision support systems, executive information systems, knowledge management system and business intelligence systems. They further highlights the gaps in the literature (which have become visible due to the integration of the various streams in the	The focus is a literature study and a condensation of the literature concerning MMS.

		MMS-literature)	
Davison et al., 2012	MISQ	Methodological paper on canonical action research (CAR)	Methodological paper on canonical action research (CAR)
Galliers & Huang, 2012	EJIS	An exploratory study on the teaching of qualitative methods in IS and the related possibilities of undertaking and publishing qualitative research	Focus on methodological challenges
Im et al., 2013	ISR	Examines the causal relationship between firm size and IT use (increased firm size → increased coordination cost → increased IT → decreased coordination costs → decreased firm size)	The focus is on the relationship between IT use end firm size. The papers focuses on which affects which (the direction, and potential mediators), but not on HOW one affects the other. Further IT-related organizational change is not studied as a process
Jones, 2014	MISQ	The paper studies the relevance of socio-materiality and the various concepts/elements within the perspective in IS research through an empirical study (and a literature study) and offers insights into the necessity of employing the packet rather than selected elements.	Focus on socio-materiality and not organizational change
Lapointe & Rivard, 2005	MISQ	The paper strives for a better explanation of resistance to IT implementation.	Focus on resistance, not organizational change
Levina & Ross, 2003	MISQ	The paper studies the IT outsourcing from a vendor perspective, more specifically the vendor strategy and practices.	Focus on outsourcing rather than organizational change
Luna-Reyes et al., 2005	EJIS	Studies information systems development (ISD) and explores the dynamics of the social and organizational factors that leads to either success or failure. Based on that the propose an understanding of ISD as emergent and dynamic	Focuses is on ISD and not the potential related organizational change processes
Lyytinen et al., 1998	ISR		Focuses on risk management rather than organizational change

			processes. (They only refer to organizational change as they use Leavitt's (1964) socio-technical model of organizational change as departure in their analysis of the content of risk management approaches)
Madsen et al., 2006	EJIS	The paper explores how an information systems development (ISD) method emerges and what influences and shapes the development of such a local and unique ISD method.	The focus is on the development of an ISD method, and not on how organizational change develops.
Malhotra et al., 2007	ISR	The paper places it-self in the literature on adaptive extended enterprises, more specifically they study how the use of standard electronic business interfaces (SEBIs) enable supply chain partnerships to become more adaptive.	Focus on the statistical relationship between SEBIs and adaptive supply chain partnerships and not the related organizational change processes (and what drives them)
Mazmanian et al. 2014	MISQ	The paper explores "how physical, social, material, technological, and organizational arrangements dynamically reconfigure each other" and suggests	Focus on socio-materiality and not on organizational change
McLeod & Doolin, 2012	EJIS	The paper proposes a qualitative process approach to study IS development in practice. In the paper, they further highlight the relevance by reporting such a process study conceptualizing the process as situated socio-technical change.	Focuses on IS development rather than the potential organizational change which might be related to an implementation of the developed IS.
Morris & Venkatesh, 2010	MISQ	The paper finds out "that ERP system implementation moderated the relationship between three job characteristics (skill variety, autonomy, and feedback) and job satisfaction."	Focus on the outcome of IS-related organizational change (changed relationship between job characteristics and job satisfaction) rather than the drivers of the change process.
Nan, 2011	MISQ	Develops a theoretical model of	The focus is not on organizational

		bottom-up IT use processes, focusing in particular on the individual IT use. Draws on complex adaptive systems theory.	change, but rather on IS use. But the paper uses a complexity perspective (complex adaptive systems) and argues for the relevance of studying the individual actions and interactions, and further argues that the traditional IS research does not have the adequate perspectives for this
Njihia & Merali, 2013	MISQ	"demonstrate the value of Archer's morphogenetic approach in understanding and explaining the complexity of the broader context within which" ICT projects in developing countries are implemented	The focus is on developing countries and more specifically on understanding and explaining how the context changes Thus not focus on organizational change
Oborn et al., 2011	ISR	Examine the use of electronic patient records (EPR) by health specialist. In particular how the use differs between different groups of specialist yet are uniform enough to support the use among other groups of specialists	Focus on the use practices related to EPR rather than the potential related organizational changes.
Pinsonneault & Rivard, 1998	MISQ		The focus is not on the change process, but rather on the outcomes of the process.
Ply et al., 2012	MISQ	Tested the prevalent beliefs regarding the relation between IS employees attitudes and perceptions and software process maturity (specifically CMM)	Tests the prevalent beliefs regarding the relation between IS employees attitudes and perceptions and software process maturity (specifically CMM)
Pries-Heje & Baskerville, 2008	MISQ	The paper is concerned with improving the design of problem-solving approaches where a number of competing approaches exist. They thus develops a general method for constructing a design theory nexus and illustrates its usefulness by two field studies, one develops and applies an organizational change nexus	Focuses on how to approach problem solving in contexts where several competing approaches exist. One such context might be organizational change; the focus of the papers is however not on organizational change.

		and the other a user involvement nexus.	
Rivard & Lapointe, 2012	MISQ	A case survey of implementers responses to user resistance – and the effects.	The focus is on implementers' responses to user resistance and the effects it has, not on the organizational changes. The effects in focus are whether the implementer responses leads to more or less resistance, not the consequences in regards to the organizational changes related to the IS being implemented.
Sahay et al., 1994	EJIS	Studies the social interpretations of information technology through a relativist approach	The focus is on the social interpretations of information systems rather than organizational changes related to IT or the social interpretations of IT
Salge et al., 2015	MISQ	Identify four search mechanisms influencing hospital managers' decisions to invest in IS and analyze how these mechanisms present them-selves in practice	Focus on the mechanisms or motivations for IS investment decisions rather than the potential organizational change related to the implementation of IS.
Sankaranarayan an & Sundararajan, 2010	ISR	The paper studies how inter-organizational systems (IOS) which enable broader inter-firm transactions (e.g. electronic markets) affect the extent of outsourcing.	Focus on the relationship between IOS and outsourcing with B2B search (either information intensive or communication intensive) as a mediating factor.
Schryen, 2013	EJIS	Literature review on the relationship between IS investments and business value	It is a literature review and further the focus is not on IT-related organizational change but on the quest for the causal relationship between IS investments and business value.
Silver et al., 1995	MISQ		The focus is not on organizational change
Simon, 2000	EJIS	Reports from an action research project of an organizational change project in the US navy.	Methodological focus.
Street & Ward, 2012	EJIS		Methodological focus It-related organizational change is mentioned but only as an example among other areas in which IS researchers conduct longitudinal case studies. Further, an empirical

			case of *organizational change in a health-care company* is used as an example of the methodological issues related to timelines in longitudinal case studies (but the case process is not described in detail, would however classify it as evolutionary change)
Sykes et al. 2014	MISQ	Post-implementation job outcome, more specifically job performance (as an indicator of implementation success) Draws o social network theory and uses advice networks as grounding for their hypothesis (workflow and software advice networks)	The focus is one the consequences of IT-related organizational change (in the form of an ERP implementation) rather than the process of organizational change in it-self.
Vaast & Walsham, 2013	EJIS	Methodological paper on the use of grounded theorizing in studying electronically mediated social contexts (EMSC)	Metodological focus
Yoo, 2010	MISQ	An essay arguing that the IS community ought to expand the research focus by including the emerging field of experimental computing are form of computing in everyday life.	Not an actual research paper but an Issue and opinion piece arguing for a need field of research relevant for the IS community.

Table A.8: Papers excluded from the initial literature review

Paper	Source	Focus	Reason for excluding
Aanestad et al., 2014	ISR	The paper studies the challenges faces by organizations in resource-constrained contexts which are different to thus faces by organizations in high-income countries	Draws on the Evolution and Teleology motors of change, as the focus is on infrastructures and how these shape changes. Further, the change is intended and the result of decisions made. The technology as well as the context enables and constrains the opportunities for change but it is a choice (by management or +) whether the opportunity is taken or not.
Chang & Powell, 1998	ISJ	"addresses the role of BPR in SMEs and develops a framework to assess its	Draws on the teleology motor of change

		implementation potential"	
Cho et al., 2008	EJIS	The paper study IS implementation in a healthcare context through actor-network theory. Their study reveals how complex contextual dynamics had disruptive effects.	Draws on the Evolution motor of changes, as the focus is on context and on how the contextual factors influence the implementation (change) process.
Choe, 2004	JIT	The paper studies the relationships between advanced manufacturing technology AMT level, amount of management accounting information, learning facilitators, organizational learning, and production performance	Draws on teleology, as changes is assumed to be intended and plan (and thus effectible by organizational learning and more/better information)
Chu & Smithson, 2007	ISJ	The paper studies e-business and claims that due to the difficulties of implementing e-business (particular in large traditional organizations) the implementation should be approach through an organizational change perspective.	Draws on teleology motor of change, as specific change agents are identified (person or group). The agent/s might meet resistance from either groups or structures but the agent/s are still considered the drives of change
Davis et al., 1999	JIT	The papers studies the relationship between the retailer and their customers in electronic commerce environments	The focus is no the consequences of organizational change on the relationship between buyers and sellers in electronic market places – and not on the organizational change and its drives.
Davidson & Chrismar, 2007	MISQ	The paper studies how institutionally triggered and technology triggered change interacted to influence social structures. They draw on Barley's (1990) role- and network-based model for technology and structure alignment.	Draws primarily on the Teleology and evolution motors of change, as change is perceived as planed but often as a response to changes in the institutional environment (evolution) There is however also a limited resemblance with change from a dialectic perspective as the paper also studies how the technology triggers change by focusing on the micro-level of actions. Their main focus is however to highlight the institutional macro-level.
El Sawy et	ISR	The paper proposes a	Draws on the evolution motor of

al., 2010		perspective of theory building and testing (along with appropriate methods) relevant for the IS strategy area. They propose the concept of digital ecodynamics to describe the ecosystem unfolding of environmental turbulence, dynamic capabilities and IT systems, and suggest configurational theories as a lens.	change, as the paper focuses on the turbulent environment as a driving factor. How well organizations respond to the turbulent environment depend on dynamic capabilities and IT systems. These two do however also affect the turbulent environment.
Huber et al., 2013	JMIS	The paper develops a process model of how and why complementarity and substitution form over time between contractual and relational governance in the context of information systems outsourcing	Focuses on IS outsourcing
Hussain & Cornelius, 2009	ISJ	The paper demonstrates how the information technology (IT) Management improved their influence through gaining legitimation from other organizational stakeholders during IS implementations projects. The paper is sensitized by structuration theory.	The focus is not the organizational changes (related to the implementation processes) but rather the process by which the IT management improved their influence
Im et al., 2013	ISR	Examines the causal relationship between firm size and IT use (increased firm size → increased coordination cost → increased IT → decreased coordination costs → decreased firm size)	The focus is on the relationship between IT use end firm size. The papers focuses on which affects which (the direction, and potential mediators), but not on HOW one affects the other. Further IT-related organizational change is not studied as a process
Joshi, 1991	MISQ	Study employees' resistance to change. He proposes that employees evaluate change and resist only the changes they evaluate as unfavorable. The paper introduces a theory-based model (The equity-implementation model) of how employees evaluate changes.	Draws on the Teleology motor of change, as the focus is not on organizational change specifically but on change in a broader sense. Further, the papers does not focus on the change perspective but rather on the resistance during implementation processes.

			However categorizes as teleology since the need for managing the change process is highlighted suggesting that change is planned (the organization is considered one, however the employees are considered a barrier).
Lapointe & Rivard, 2005	MISQ	The paper strives for a better explanation of resistance to IT implementation.	Focus on resistance, not organizational change
Lempinen & Rajala, 2014	JIT	The paper studies stakeholder interplay in IT service processes to find out how the service perspective can support the understanding of how information systems (IS) organizations can be leveraged to co-create business value.	IS development focus
Iivari & Iivari, 2011	ISJ	The paper examines user-centredness in the context of systems development based of an extensive literature review and presents an understanding of the phenomenon as a multidimensional concept composed of four aspects: user focus, work-centredness, user involvement and system personalization	Focuses on systems development and user-centerdness
Loftin & Moosbruker, 1982	MISQ	A study of an organizational change effort (in a data processing firm), focus on the (potential) usefulness of Organizational Development (OD) methods and how they can be relevant for IS managers	Draws on the Teleology motor of change as change is perceived as planed and a phenomenon which the IS manager can plan to alter the current behavior.
Lyytinen et al., 2009	JIT	The paper analyzes institutionalization as a process of transferring and stabilizing material artifacts and routines in the form of enterprise resource planning (ERP) systems. They emphasize the material role of artifacts and routines as carriers of institutional logics and apply	The focuses on how the ERP systems becomes institutionalized – rather than the related organizational changes.

		punctuated socio-technical information system change (PSIC) mode	
Lyytinen et al., 1998	ISR		Focuses on risk management rather than organizational change processes. (They only refer to organizational change as they use Leavitt's (1964) socio-technical model of organizational change as departure in their analysis of the content of risk management approaches)
Madsen et al., 2006	EJIS	The paper explores how an information systems development (ISD) method emerges and what influences and shapes the development of such a local and unique ISD method.	The focus is on the development of an ISD method, and not on how organizational change develops.
McLeod & Doolin, 2012	EJIS	The paper proposes a qualitative process approach to study IS development in practice. In the paper, they further highlight the relevance by reporting such a process study conceptualizing the process as situated socio-technical change.	Focuses on IS development rather than the potential organizational change which might be related to an implementation of the developed IS.
Nan, 2011	MISQ	Develops a theoretical model of bottom-up IT use processes, focusing in particular on the individual IT use. Draws on complex adaptive systems theory.	The focus is not on organizational change, but rather on IS use. But the paper uses a complexity perspective (complex adaptive systems) and argues for the relevance of studying the individual actions and interactions, and further argues that the traditional IS research does not have the adequate perspectives for this
Neville et al., 2005	JIT	The paper studies e-learning and outlines the different characteristics necessary for the successful management of the learning process and the support needed by students. Further, they compare the key critical factors necessary for e-	Draws on an evolution motor of change, as it is highlighted that the competitive landscape forces organizations into continuous organizational change to survive

		learning with those of customer relationship management (CRM)	
Pinsonneault & Rivard, 1998	MISQ		The focus is not on the change process, but rather on the outcomes of the process.
Ply et al., 2012	MISQ	Tested the prevalent beliefs regarding the relation between IS employees attitudes and perceptions and software process maturity (specifically CMM)	Tests the prevalent beliefs regarding the relation between IS employees attitudes and perceptions and software process maturity (specifically CMM)
Sabherwal & Grover, 2010	ISJ	The paper studies political processes in information systems development (ISD). They develops a taxonomy of the three distinct processes they identified during a study of 89 ISD projects.	The focus is on ISD rather than the potential organizational changes related to the information system.
Salge et al., 2015	MISQ	Identify four search mechanisms influencing hospital managers' decisions to invest in IS and analyze how these mechanisms present them-selves in practice	Focus on the mechanisms or motivations for IS investment decisions rather than the potential organizational change related to the implementation of IS.
Sankaranaray anan & Sundararajan, 2010	ISR	The paper studies how inter-organizational systems (IOS) which enable broader inter-firm transactions (e.g. electronic markets) affect the extent of outsourcing.	Focus on the relationship between IOS and outsourcing with B2B search (either information intensive or communication intensive) as a mediating factor.
Selander & Henfridsson, 2012	ISJ	The paper studies user resistance and examines the process by which user cynicism emerges and is constituted. Further they identify three dimensions of user cynicism in IT implementation	Focuses on user resistance
Silver et al., 1995	MISQ		The focus is not on organizational change
Sykes et al. 2014	MISQ	Post-implementation job outcome, more specifically job performance (as an indicator of implementation success) Draws o social network theory and uses advice networks as	The focus is one the consequences of IT-related organizational change (in the form of an ERP implementation) rather than the process of organizational change in it-self.

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		grounding for their hypothesis (workflow and software advice networks)	
Tillquist, 2000	JMIS	The paper studies how management interpret external IS-related organizational change ideas/strategies into locally actionable plans in the context of business process reengineering (BPR).	Draws from teleology motor and the evolution motor, as change is planned and intended by the management (as a unit) but highly influenced by the surroundings (ideas and consultants)
Tillquist et al. 2002	MISQ	Presents a new representation methodology (dependency network diagrams (DNDs)) The intention is to take into account the organizational factors when designing information systems (an attempt to stop "black boxing" the organizational context)	Draws on the teleology and the evolution motors of change. A change process is perceived as planed and intentional (it just needs better information to base the plans on) Part of the pressure for change is assumed to be external (primarily due to competition)
Tingling & Parent, 2004	JSIS	The paper explores the evaluation-and-selection of enterprise technologies by firms. More specifically, they study the decision process related to the choice of email system in a bank. They conclude that also ceremonial aspects plays a curtail role (and not only the rational aspects).	Focus on the IT decision processes not on the potential organizational change that might be related to a later implantation of the system.
Vaast & Walsham, 2013	EJIS	The paper reviews a selected set of papers concerned with grounded IS research on electronically mediated social contexts (EMSCs), with particular focus on data collection, data analysis and theory building.	Methodological focus

Table A.9: Papers excluded from the literature review on the dialectic motor

Appendix B – Review of the Use of the Complex Responsive Processes Perspective in the IS Literature

To evaluate the usefulness of introducing the Complex Responsive processes perspective in the IS literature, a review of the prior use of the perspective was conducted.

Identifying the papers

To identify IS papers using the Complex Responsive Processes perspective, the literature was searched for papers referring to either *Complex Responsive Processes* or Ralph Stacey. The search for papers was completed using the search engine Scopus as this search engine allowed the researcher to search specifically in the references of the papers (see Figure B.1 below).

> Stacey, R OR "complex responsive process"
> [references]
>
> 37,072 *hits*

> **AND**
> (information systems OR information technology)
> [Article title, Abstract, Keywords]
>
> *244 hits*

> Manuel limiting to IS quality outlets
>
> 37 hits
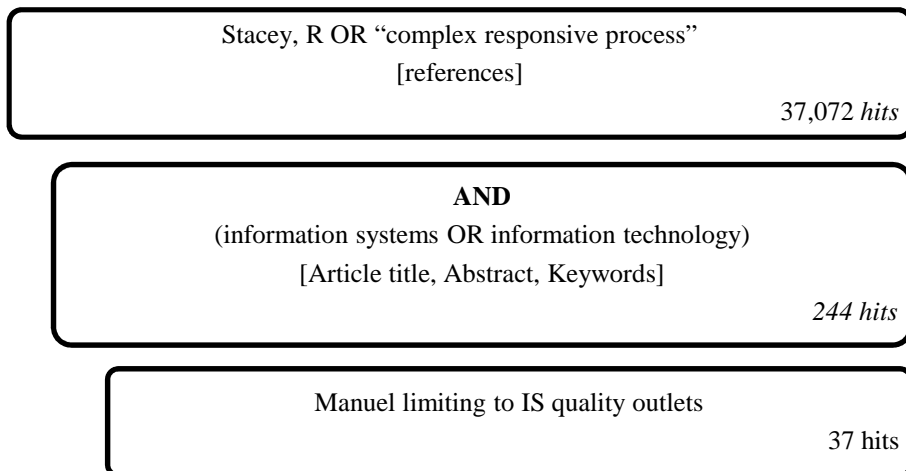
Figure B.1: Searches in Scopus

Through the search, 244 papers citing Stacey and/or Complex Responsive Processes and simultaneous applying the phrase *Information Systems* or *Information Technology* in the title, abstract or keyword were identified. Among the identified 244 papers 37 papers were published in quality IS journals or conferences (see figure B.2 below). A list of these 37 papers are included in table B.1 below.

Quality IS journals:		
• Academy of Management Journal • Academy of Management Review	• IEEE Transactions on Software Engineering • IEEE Transactions on Systems, Man and Cybernetics (in three parts)	• Journal of Information Systems (edu.) • Journal of Information Systems Education

- ACM Computing Surveys
- ACM SIG
- ACM Transactions
- ACM Transactions on Database Systems
- ACM Transactions on IS
- Administrative Science Quarterly
- AI Magazine
- Artificial Intelligence
- Australian Journal of IS
- Behavior and IT
- Business Horizons
- California Management Review
- Communication Research
- Communication of the ACM
- Communication of FAIS
- Computer Decisions
- Computer Journal
- Computer Supported Cooperative Work: CSCW: An International Journal
- Computers and Operations Research
- Computers in Human Behavior
- Data Management
- Database
- Datamation
- Decision Sciences
- Decision Support Systems
- Electronic Commerce Research and App.
- Electronic Markets
- E-Service Journal
- European Journal of Information Systems
- European Journal of Operational Research
- Expert Systems

- INFOR: Information Systems and Operational Research
- Information and Management
- Information and Organization
- Information and Software Technology
- Information Processing and Management
- Information Research
- Information Resources Management Journal
- Information Systems
- Information Systems Frontiers
- Information Systems Journal
- Information Systems Management
- Information Systems Research
- Information Technology and Management
- Informing Science
- Interfaces (INFORMS)
- International Journal of Electronic Commerce
- International Journal of Human- Computer Studies
- International Journal of Information Management
- International Journal of Man - Machine Studies
- International Journal of Technology Management
- Information Technology and People
- Journal of Computer and System Sciences
- Journal of Computer Information Systems
- Journal of Database Admin.
- Journal of Database Management
- Journal of Ed. for Management IS
- Journal of Global Information Management

- Journal of Information Technology Cases and Apps
- Journal of Information Technology Management
- Journal of International Information Management
- Journal of Management Information Systems
- Journal of Management Systems
- Journal of Operations Research
- Journal of Organizational and End User Computing
- Journal of Organizational Computing and Electronic Commerce
- Journal of Strategic Information Systems
- Journal of Systems Management
- Journal of the Association of Information Systems
- Journal of the ACM
- Journal of the American Society for Information Systems
- Informs Journal on Computing
- Journals of Systems and Software
- Knowledge-Based Systems
- Management Science
- MIS Quarterly: Management Information Systems
- MISQ Discovery

Review
- Expert Systems with Applications
- Harvard Business Review
- Human- Computer Interaction
- IBM Systems Journal
- IEEE Computer
- IEEE Software
- IEEE Transactions
- IEEE Transactions on Computers
- IEEE Transactions on Knowledge and Data Engineering

- Journal of Global IT Management
- Journal of Information Management
- Journal of Information Systems
- Journal of Information Systems (account.)
- Journal of Information Systems Management
- Journal of Information Technology
- Journal of Information Technology Theory and Application (JITTA)

- Omega
- Operations Research
- Organization Science
- Organizational Behavior and Human Decision Processes
- Simulation
- Sloan Management Review
- (The) Information Society
- WIRT

(AIS list of MIS Journal Rankings[66])

Quality IS conferences:
- International Conference on Information Systems
- Hawaii International Conference on System Sciences
- International Federation for Information Processing
- International Conference on Decision Support Systems
- Decision Sciences Institute (DSI) - National Conference
- Society of Information Management, Conference

- International Association for Computer Information Systems Conference (Proceedings published in Issues in Information Systems)
- Institute for Operations Research and the Management Sciences Conference
- Information Resources Management Association Conference
- Academy of Management Conference
- Decision Sciences Institute, Regional Conferences

- International Academy of Information Management Conference
- American Conference on Information Systems
- Information Systems Education Conference
- Institute of Electrical and Electronics Engineers, National Conferences
- Informing Science + Information Technology Education, Conference

(Levy & Ellis, 2006 p. 187)

Figure B.2: Quality IS journals and conferences

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[66] AIS's list of MIS journals rankings from 2011: http://aisnet.org/?ISICitations2011

Akgün, A.E., Lynn, G.S., Keskin, H., Dogan, D. (2014)	Team learning in IT implementation projects: Antecedents and consequences	International Journal of Information Management Volume 34, Issue 1, February 2014, Pages 37-47
Esteves, F.M., Anunciação, P.F., Santos, J.R. (2014)	Some information systems requirements in view of organizational sustainability in an information society	Information Resources Management Journal Volume 27, Issue 1, 1 January 2014, Pages 21-35
Schefe, N., Timbrell, G. (2013)	A conceptualization of complexity in is driven organizational transformations	International Conference on Information Systems (ICIS 2013): Reshaping Society Through Information Systems Design Volume 1, 2013, Pages 71-83
Kautz, K. (2012)	Beyond simple classifications: Contemporary information systems development projects as complex adaptive systems	International Conference on Information Systems, ICIS 2012 Volume 2, 2012, Pages 1670-1689
Intezari, A., Pauleen, D. (2012)	When knowledge is insufficient: Wisdom in a complex world: Americas conference on information systems	18th Americas Conference on Information Systems 2012, AMCIS 2012 Volume 5, 2012, Pages 3745-3754
Pillay, J., Hackney, R., Braganza, A. (2012)	Informing strategic IS change: Towards a 'meta-learning' framework	Journal of Strategic Information Systems Volume 21, Issue 1, March 2012, Pages 58-71
Mohamed, S., Coakes, E., Leslie, A. (2010)	Hierarchical structures: Conducive or barrier to knowledge management?	16th Americas Conference on Information Systems 2010, AMCIS 2010 Volume 4, 2010, Pages 2856-2866
Tan, B.C.C., Pan, S.L., Hackney, R. (2010)	The strategic implications of web technologies: A process model of how web technologies enhance organizational performance	IEEE Transactions on Engineering Management Volume 57, Issue 2, May 2010, Article number 5, Pages 181-197
Hanseth, O., Lyytinen, K. (2010)	Design theory for dynamic complexity in information infrastructures: The case of building internet	Journal of Information Technology Volume 25, Issue 1, March 2010, Pages 1-19
Boland, R.J., Goraya, T., Berente, N., Hansen, S. (2009)	It for creativity in problem formulation	ICIS 2009 Proceedings - Thirtieth International Conference on Information Systems 2009
Tan, B., Pan, S.L., Lu, X., Huang, L. (2009)	Leveraging digital business ecosystems for enterprise agility: The tri-logic development strategy of alibaba.com	ICIS 2009 Proceedings - Thirtieth International Conference on Information Systems 2009
Ingawale, M., Dutta, A., Roy, R., Seetharaman, P. (2009)	The small worlds of wikipedia: Implications for growth, quality and sustainability of collaborative knowledge networks	15th Americas Conference on Information Systems 2009, AMCIS 2009 Volume 5, 2009, Pages 3545-3556
Lanham, H.J., McDaniel Jr., R.R. (2008)	An exploration of heterogeneity in electronic medical record use: Information technology use as emergent and driven by values and expertise	ICIS 2008 Proceedings - Twenty Ninth International Conference on Information Systems 2008
Jones, R. (2008)	Breaking down the boundaries: Interdisciplinarity and the future of KM	14th Americas Conference on Information Systems, AMCIS 2008 Volume 3, 2008, Pages 1632-1639

Samoilenko, S. (2008)	Information systems fitness and risk in IS development: Insights and implications from chaos and complex systems theories.	Information Systems Frontiers, 10(3), 281-292.
Flett, P., Curry, A., Peat, A. (2008)	Reengineering systems in general practice-A case study review	International Journal of Information Management Volume 28, Issue 2, April 2008, Pages 83-93
Howard, M., Vidgen, R., Powell, P., Powell, J. (2007)	Exploring the use of QPID: A collaborative study of B2B in the automotive industry.	Omega, 35(4), 451-464.
Braa, J., Hanseth, O., Heywood, A., Mohammed, W., Shaw, V. (2007)	Developing health information systems in developing countries: The flexible standards strategy	MIS Quarterly: Management Information Systems Volume 31, Issue 2, June 2007, Pages 381-402
Merali, Y. (2006)	Complexity and information systems: The emergent domain.	Journal of Information Technology, 21(4), 216-228.
Vidgen, R., Wang, X. (2006)	From business process management to business process ecosystem.	Journal of Information Technology, 21(4), 262-271.
Benbya, H., McKelvey, B. (2006)	Toward a complexity theory of information systems development.	*Information Technology and People, 19*(1), 12-34.
Nobre, A. (2005)	The semiotic learning framework; How to facilitate organisational learning	ICEIS 2005 - Proceedings of the 7th International Conference on Enterprise Information Systems 2005, Pages 459-467
Ferratt, T.W., Agarwal, R., Brown, C.V., Moore, J.E. (2005)	IT human resource management configurations and IT turnover: Theoretical synthesis and empirical analysis	Information Systems Research, 16(3), 237-255.
McBride, N. (2005)	Chaos theory as a model for interpreting information systems in organizations.	Information Systems Journal, 15(3), 233-254.
Dhillon, G., Fabian, F. (2005)	A fractal perspective on competencies necessary for managing information systems	International Journal of Technology Management Volume 31, Issue 1-2, 2005, Pages 129-139
Nelson III, W.H.M., Nelson, A., Reaves, K.N. (2003)	Re-evaluating the business sourcing model in electronic commerce initiatives	Proceedings - Annual Meeting of the Decision Sciences Institute 2003, Pages 261-266
Hendriks, P.H.J. (2003)	When Athena met Tim the Toolman [1]: Connecting organisational learning and information systems	International Journal of Information Technology and Management Volume 2, Issue 1-2, 2003, Pages 122-150
Breu, K., Hemingway, C.J., Strathern, M., Bridger, D. (2002)	Workforce agility: The new employee strategy for the knowledge economy.	Journal of Information Technology, 17(1), 21-31.
Merali, Y. (2002)	The role of boundaries in knowledge processes.	European Journal of Information Systems, 11(1), 47-60.
Falconer, J. (2000)	Knowledge management at a branchpoint: will we ignore the lessons of the AI discipline the way it ignored the lessons of Ludwig Wittgenstein?	International Journal of Technology Management Volume 20, Issue 5-8, 2000, Pages 601-632
Littler, K., Aisthorpe, P.,	New approach to linking strategy formulation and strategy	International Journal of Information Management

Hudson, R., Keasey, K. (2000)	implementation: An example from the UK banking sector	Volume 20, Issue 6, December 2000, Pages 411-428
Sage, A.P., Rouse, W.B. (1999)	Information Systems Frontiers in Knowledge Management	Information Systems Frontiers Volume 1, Issue 3, 1999, Pages 205-219
Hamilton, D. (1999)	Linking strategic information systems concepts to practice: Systems integration at the portfolio level	Journal of Information Technology, 14(1), 69-82.
Handyside, T., Light, J. (1998)	An experiment in organization for innovation	International Journal of Technology Management Volume 15, Issue 1-2, 1998, Pages 160-172
Lea, W., Uttley, P., Vasconcelos, A.C. (1998)	Mistakes, misjudgements and mischances : Using SSM to understand the Hillsborough disaster	International Journal of Information Management Volume 18, Issue 5, October 1998, Pages 345-357
Khoong, C.M. (1997)	Elements of a long term IT R&D agenda and its management	International Journal of Technology Management Volume 13, Issue 7-8, 1997, Pages 865-873
Lee, G.-G.a, Gough, T.ab (1993)	An integrated framework for information systems planning and its initial application	Journal of Information Technology Volume 8, Issue 4, December 1993, Pages 227-240

Table B.1: Lists of identified papers

Analyzing the papers

The 37 identified papers were classified according to their use of the Complex Responsive Processes perspective/Stacey. Three types of use where identified:

- Use of an old Stacey-reference, prior to 2000 where the Complex Responsive Processes perspective was first defined in Stacey et al. (2000)
- Limited use/general reference, where the Complex Responsive Processes perspective/Stacey were referenced in regards to a concept or as an example of something,
- Use of Complex Responsive Processes perspective/Stacey as a central theoretical perspective

The 22 of the 37 papers referred to old Stacey-references, whereby the papers do not relate to the Complex Responsive Processes perspective. Among the remaining 15 papers, 14 had a limited use of or a general reference to the Complex Responsive Processes perspective/Stacey, meaning that only one paper used Stacey and the Complex Responsive Processes perspective as a central theoretical perspective. The 22 papers referring to old Stacey references are listed in Table B.4 later in this appendix. The 14 papers with a limited use/general reference are listed in Table B.2 below. In the following table (Table B.3) the papers are linked to the Stacey/Complex Responsive Processes text they referred to and it is outlined how each of the papers applied the reference. The single paper actually applying the perspective (Jones, 2008) is likewise included in table B.2 and table B.3.

Akgün, A.E., Lynn, G.S., Keskin, H., Dogan, D. (2014)	Team learning in IT implementation projects: Antecedents and consequences	International Journal of Information Management Volume 34, Issue 1, February 2014, Pages 37-47
Boland, R.J., Goraya, T., Berente, N., Hansen, S. (2009)	It for creativity in problem formulation	ICIS 2009 Proceedings - Thirtieth International Conference on Information Systems 2009
Breu, K., Hemingway, C.J., Strathern, M., Bridger, D. (2002)	Workforce agility: The new employee strategy for the knowledge economy.	Journal of Information Technology, 17(1), 21-31.
Ferratt, T.W., Agarwal, R., Brown, C.V., Moore, J.E. (2005)	IT human resource management configurations and IT turnover: Theoretical synthesis and empirical analysis	Information Systems Research, 16(3), 237-255.
Howard, M., Vidgen, R., Powell, P., Powell, J. (2007)	Exploring the use of QPID: A collaborative study of B2B in the automotive industry.	Omega, 35(4), 451-464.
Ingawale, M., Dutta, A., Roy, R., Seetharaman, P. (2009)	The small worlds of wikipedia: Implications for growth, quality and sustainability of collaborative knowledge networks	15th Americas Conference on Information Systems 2009, AMCIS 2009 Volume 5, 2009, Pages 3545-3556
Intezari, A., Pauleen, D. (2012)	When knowledge is insufficient: Wisdom in a complex world: Americas conference on information systems	18th Americas Conference on Information Systems 2012, AMCIS 2012 Volume 5, 2012, Pages 3745-3754
Jones, R. (2008)	Breaking down the boundaries: Interdisciplinarity and the future of KM	14th Americas Conference on Information Systems, AMCIS 2008 Volume 3, 2008, Pages 1632-1639
Kautz, K. (2012)	Beyond simple classifications: Contemporary information systems development projects as complex adaptive systems	International Conference on Information Systems, ICIS 2012 Volume 2, 2012, Pages 1670-1689
Lea, W., Uttley, P., Vasconcelos, A.C. (1998)	Mistakes, misjudgements and mischances : Using SSM to understand the Hillsborough disaster	International Journal of Information Management Volume 18, Issue 5, October 1998, Pages 345-357
McBride, N. (2005)	Chaos theory as a model for interpreting information systems in organizations.	Information Systems Journal, 15(3), 233-254.
Merali, Y. (2002)	The role of boundaries in knowledge processes.	European Journal of Information Systems, 11(1), 47-60.
Merali, Y. (2006)	Complexity and information systems: The emergent domain.	Journal of Information Technology, 21(4), 216-228.
Mohamed, S., Coakes, E., Leslie, A. (2010)	Hierarchical structures: Conducive or barrier to knowledge management?	16th Americas Conference on Information Systems 2010, AMCIS 2010 Volume 4, 2010, Pages 2856-2866
Vidgen, R., Wang,	From business process	Journal of Information Technology,

| X. (2006) | management to business process ecosystem. | 21(4), 262-271. |

Table B.2: List of papers referring to Complex Responsive Processes or newer Stacey

Akgün, A.E., Lynn, G.S., Keskin, H., Dogan, D. (2014)	Stacey, R. (2001) Complex Responsive Processes in Organizations: Learning and Knowledge Creation. Routledge London	Limited use/general reference A reference and exampel of studies highlighting the positive effect of anxsitiy in teams
Boland, R.J., Goraya, T., Berente, N., Hansen, S. (2009)	Stacey, R.D. (2002) Complexity and Creativity In Organizations. Berrett-Koehler Publishers, Inc., San Francisco	Limited use/general reference As an example of the primary focus on structures supporting individual creativity within research on organizational creativity
Breu, K., Hemingway, C.J., Strathern, M., Bridger, D. (2002)	Stacey, R. (2001) Complex Responsive processes in organizations: Learning and knowledge creation, Routledge	Limited use/general reference A reference for the concept of uncertainty
Ferratt, T.W., Agarwal, R., Brown, C.V., Moore, J.E. (2005)	Stacey et al. (2000) Complexity and Management: Fad or radical challenge to systems thinking? Routledge	Limited use/general reference In the implications: Interplay of intentions/choices/actions affecting Human Resource Management
Howard, M., Vidgen, R., Powell, P., Powell, J. (2007)	Stacey, R. (2003) Strategic Management and organizational Dynamics, Pearson	Limited use/general reference In their suggestions for further research: How QPID (qualitative politicized influence diagram) can work with other perspectives e.g. CRP
Ingawale, M., Dutta, A., Roy, R., Seetharaman, P. (2009)	Stacey, R. (2000) Emergence, 2 (4), pp. 23-39.	Limited use/general reference Reference for knowledge as emerging from a 'web of relationships'
Intezari, A., Pauleen, D. (2012)	Griffin, D., Stacey, R. (2005) Complexity and the experience of leading organizations. (Eds.). Routledge, London	Limited use/general reference A reference for complexity as the consequence of studying people which is the focus of social science
Jones, R. (2008)	Stacey, R. (2001) Complex Responsive processes in organizations: Learning and knowledge creation, Routledge Stacey, R. (2003) The Learning Organization, 10 (6), pp. 325-331.	Used related to the purpose of the paper (reflections on the potential for an interdisciplinary future for the field of knowledge management research) As a perspective on communication (incl. the related role of identity and power)
Kautz, K. (2012)	Stacey, R. (2003) Strategic Management and organizational Dynamics, Pearson	Limited use/general reference As a reference for Complex adaptive systems As a reference for situations being

		simultaneously stable and unstable
Lea, W., Uttley, P., Vasconcelos, A.C. (1998)	Stacey, R.D. (1998) Strategic Management and Organisational Dynamics. Pitman, London	Limited use/general reference As an example of "Recent studies in different fields" that "raise doubts over the perception of planning as designing rational, orderly and intentional control structures, bearing in mind determined and foreseen environmental constraints."
McBride, N. (2005)	Stacey, R. (2002) Strategic Management and Organisational Dynamic: the Challenge of Complexity. FT Prentice Hall, London, UK.	Limited use/general reference As an example of authors suggesting the relevance of chaos theory as a basis for understanding business strategy and the generation of it.
Merali, Y. (2002)	Stacey, R. (2001) Complex Responsive processes in organizations: Learning and knowledge creation, Routledge	Limited use/general reference As a reference for the concept of self-organizing
Merali, Y. (2006)	Stacey, R. (2001) Complex Responsive processes in organizations: Learning and knowledge creation, Routledge (Stacey, R.D. (1992) Managing the Unknowable: Strategic Boundaries between Order and Chaos in Organizations, Jossey-Bass)	Limited use/general reference As a reference for: a) Complexity theory and b) link between complexity theory and strategy
Mohamed, S., Coakes, E., Leslie, A. (2010)	Stacey, R. (2003) Strategic Management and organizational Dynamics, Pearson	Limited use/general reference As a reference for defining *the structure of an organization*
Vidgen, R., Wang, X. (2006)	Stacey, R. (2003) Strategic Management and organizational Dynamics, Pearson	Limited use/general reference Stacey critic of Brown and Eisenhardt (1998) understanding of complex systems theory – they convey it into traditional organizational theory

Table B.3: The use of the Complex Responsive Processes perspective or Stacey

The papers excluded

Papers, which only referred to a Stacey-references prior to 2000, where the Complex Responsive Processes perspective was first published (in Stacey et al., (2000)), were excluded. A list of these papers are included in Table B.4 below.

Authors	Title	Outlet	Stacey reference
Benbya, H., McKelvey, B. (2006)	Toward a complexity theory of information systems development.	*Information Technology and People, 19*(1), 12-34.	Stacey, R.D. (1992) Managing the Unknowable. Jossey-Bass San Francisco, CA Stacey, R.D. (1995) Strategic Management Journal, 16 (6), pp. 477-95. Stacey, R.D. (1996) Complexity and Creativity in Organizations. Berrett-Koehler San Francisco, CA
Braa, J., Hanseth, O., Heywood, A., Mohammed, W., Shaw, V. (2007)	Developing health information systems in developing countries: The flexible standards strategy	MIS Quarterly: Management Information Systems Volume 31, Issue 2, June 2007, Pages 381-402	Stacey, R.D. (1996) Complexity and Creativity in Organisations. Berrett-Koehler, San Francisco
Dhillon, G., Fabian, F. (2005)	A fractal perspective on competencies necessary for managing information systems	International Journal of Technology Management Volume 31, Issue 1-2, 2005, Pages 129-139	Stacey, R.D. (1992) Managing the Unknowable: Strategic Boundaries between Order and Chaos in Organizations. Jossey-Bass, San Francisco
Esteves, F.M., Anunciação, P.F., Santos, J.R. (2014)	Some information systems requirements in view of organizational sustainability in an information society	Information Resources Management Journal Volume 27, Issue 1, 1 January 2014, Pages 21-35	Stacey, R. (1993) Organizações em Aprendizagem e Estratégias Emergentes Pensamento Estratégico e Gestão da Mudança, Lisboa: Edições Dom Quixote
Falconer, J. (2000)	Knowledge management at a branchpoint: will we ignore the lessons of the Al discipline the way it ignored the lessons of Ludwig Wittgenstein?	International Journal of Technology Management Volume 20, Issue 5-8, 2000, Pages 601-632	Stacey, R.D. (1992) Managing the Unknowable: Strategic Boundaries between Order and Chaos in Organizations. Jossey-Bass, San Francisco
Flett, P., Curry, A., Peat, A. (2008)	Reengineering systems in general practice-A case study review	International Journal of Information Management Volume 28, Issue 2, April 2008, Pages 83-93	Stacey, R. (1996) Strategic management and organizational dynamics. 2nd ed. Pitman, London
Hamilton, D. (1999)	Linking strategic information systems concepts to practice: Systems integration at the portfolio level	Journal of Information Technology, 14(1), 69-82.	Stacey, R.D. (1996) Strategic Management and Organizational Dynamics (2nd Ed). Cited 743 times. Prentice-Hall, New York
Handyside, T., Light, J. (1998)	An experiment in organization for innovation	International Journal of Technology Management Volume 15, Issue 1-2, 1998, Pages 160-172	Stacey, R. (1996) Management and the science of complexity: If organizational life is nonlinear, can business strategies prevail?

			Research Technology Management, 39 (3), pp. 8-10
Hanseth, O., Lyytinen, K. (2010)	Design theory for dynamic complexity in information infrastructures: The case of building internet	Journal of Information Technology Volume 25, Issue 1, March 2010, Pages 1-19	Stacey, R.D. (1996) Complexity and Creativity in Organisations. San Francisco: Berrett-Koehler
Hendriks, P.H.J. (2003)	When Athena met Tim the Toolman [1]: Connecting organisational learning and information systems	International Journal of Information Technology and Management Volume 2, Issue 1-2, 2003, Pages 122-150	Stacey, R.D. (1996) Complexity and Creativity in Organizations. San Francisco: Berrett-Koehler
Khoong, C.M. (1997)	Elements of a long term IT R&D agenda and its management	International Journal of Technology Management Volume 13, Issue 7-8, 1997, Pages 865-873	Stacey, R. (1996) Complexity and Creativity in Organizations. Berrett-Koehler, San Francisco
Lanham, H.J., McDaniel Jr., R.R. (2008)	An exploration of heterogeneity in electronic medical record use: Information technology use as emergent and driven by values and expertise	ICIS 2008 Proceedings - Twenty Ninth International Conference on Information Systems 2008	Stacey, R.D. (1995) Strategic Management Journal, 16 (6), pp. 477-495.
Lee, G.-G., Gough, T. (1993)	An integrated framework for information systems planning and its initial application	Journal of Information Technology Volume 8, Issue 4, December 1993, Pages 227-240	Stacey, R.D. (1990) Dynamic Strategic Management for the 1990s: Balancing Opportunism and Business Planning. Kogan Page, London
Littler, K., Aisthorpe, P., Hudson, R., Keasey, K. (2000)	New approach to linking strategy formulation and strategy implementation: An example from the UK banking sector	International Journal of Information Management Volume 20, Issue 6, p. 411-428	Stacey, R. (1996) Emerging Strategies for a Chaotic Environment Long Range Planning, 29 (2), pp. 182-189.
Nelson, W.H.M., Nelson, A., Reaves, K.N. (2003)	Re-evaluating the business sourcing model in electronic commerce initiatives	Proceedings - Annual Meeting of the Decision Sciences Institute 2003, Pages 261-266	Stacey, R. (1993) Strategic Management and Organizational Dynamics. Cited 743 times. London: Pitman
Pillay, J., Hackney, R., Braganza, A. (2012)	Informing strategic IS change: Towards a 'meta-learning' framework	Journal of Strategic Information Systems Volume 21, Issue 1, March 2012, Pages 58-71	Stacey, R. (1992) Managing Chaos: Dynamic Business Strategies in An Unpredictable World. Kogan Page London
Sage, A.P., Rouse, W.B. (1999)	Information Systems Frontiers in Knowledge Management	Information Systems Frontiers Volume 1, Issue 3, 1999, Pages 205-219	Stacey, R.D. (1995) Complexity and Creativity in Organizations. San Francisco: Berrett-Koehler Publishers
Samoilenko,	Information systems	Information Systems	Parker, M., Stacey, R.

S. (2008)	fitness and risk in IS development: Insights and implications from chaos and complex systems theories.	Frontiers, 10(3), 281-292.	(1994) Chaos, Management and Economics: The Implications of Non-linear Thinking. Institute of Economic Affairs London
Schefe, N., Timbrell, G. (2013)	A conceptualization of complexity in is driven organizational transformations	International Conference on Information Systems (ICIS 2013): Reshaping Society Through Information Systems Design Volume 1, 2013, Pages 71-83	Stacey, R. (1996) Emerging Strategies for a Chaotic Environment. Long Range Planning, 29 (2), pp. 182-189.
Tan, B., Pan, S.L., Lu, X., Huang, L. Year the (2009)	Leveraging digital business ecosystems for enterprise agility: The tri-logic development strategy of alibaba.com	ICIS 2009 Proceedings - Thirtieth International Conference on Information Systems 2009	Stacey, R.D. (1995) Strategic Management Journal, 16 (6), pp. 477-495
Tan, B.C.C., Pan, S.L., Hackney, R. (2010)	The strategic implications of web technologies: A process model of how web technologies enhance organizational performance	IEEE Transactions on Engineering Management Volume 57, Issue 2, May 2010, Article number 5, Pages 181-197	Stacey, R.D. (1995) Strateg. Manag. J., 16 (6), pp. 477-495

Table B.4: Papers referring to old Stacey references (prior to 2000)

Appendix C - The Vision of a Digital School by 2014

The figure included in this appendix was found in the municipality's strategy politically approved in December 2010 (my translation). The figure includes the vision, the indicators and the objectives for the strategy.

	Competences	Technology and services	Digital teaching aids	Culture	Leadership and management	Communication
Vision			The digital school is a reality in 2014 - and everybody is engaged in it			
	We have the competences to be part of the digital school	Our IT performs, are accessible and have a high stability	All pupils and teachers have access to the digital tool anywhere at anytime	We help each other in the use of IT	Funding and level of ambition are matched	We have a share communication strategy
	We share knowledge locally, in the municipality and nationally	IT-services are motivated be pedagogics	The teaching builds naturally on the digital toolboxes	We take into account the digital social networks that the pupils are a part of	The expectations for the IT-service level is matched together with the schools	We ensure a connection to the development of the digital citizen
Indicators	We have the competences to choose the digital teaching aids which provides the best learning	The physical conditions are adjusted to the digital school	Our digital toolboxes are flexible and connected to other teaching aids	The pupils are involved in the development of the IT use	We have clear guidelines for managing and leading school-IT	communication generally in the municipality
	We share IT-competences across the schools	Everybody may bring their own devices	We adjust the form of teaching to the possibilities provided by the digital toolboxes in striving for the greatest learning	The leaders lead the way		We have a shared platform for digital communication
						Written information and communication take a digital form

The guidelines for sharing IT-competences are clear (2011)	A flexible IT architecture for school-IT is defined (2011)	The first digital toolboxes are defined (2011)	The leaders have the digital knowledge required to lead. The leaders have likewise access to digital knowledge (2011)	The IT-services are described in a catalogue and the expectations are matched (2010)	The communication strategy is developed and implemented (2012)
There exist a plan of competences for School-IT (2012)	The physical arrangements at the schools take place in connection with the "buildings atlas"	The teachers know how they can choose digital teaching aids (2011)	The schools have developed plans for the practical involvement of the pupils in the development of the IT use (2012)	There are clear guidelines for responsibilities, decision-making rights and processes related to school-IT (2010)	We have determined the guidelines for which digital tools we use for which communication (2012)
A research project on knowledge sharing among teachers has been completed (2014)	There is developed a plan for the physical school arrangements (2011), the plan is implemented (2014)	Everybody have the possibility of accessing the digital toolboxes locally and globally (2013)	The schools have adjusted the culture to the digital school (2014)	Goals for the follow-up on the development of school-IT are developed (2010)	We have improved the use of digital communication (2013)
There is a center for knowledge sharing concerned with developing the digital competences. A collaboration between PUC and the teaching counselors (2013)	A security level for the schools specifically is determined (2012)	The digital toolboxes are adjusted to the needs for playing, learning and homework support as well as additional needs in the daycare part (2013)		The budgets for school-IT are adjusted to the school-IT strategy (2011)	A channel strategy is developed, guiding the schools' communication with the surroundings (2011)
	Everybody may bring his or her own devices (2012)			All school-IT projects share the same management and are evaluated systematically from (2012)	
	Everybody has a single user/password combination for all systems (2014)				
	There are share interactive media in all classrooms (2012-2014)				

Appendix D – Interview Guides

This appendix includes examples of the interview guides used during my case study and in the end the guide used for the transcription of the interviews are included.

Examples of interview guides (in Danish)

Below are included two examples of interview guides used during my study. The first is the interview guides used in the interviews of the program manager in January 2012 (Figure D.1), and the second is the interview guide used in the interviews of participants within the selected school projects during the summer 2012 (Figure D.2). As the interviews were conducted in Danish, the interview guides are in Danish as well.

Emner for mødet (fokusområder) - spørgsmål
- <u>Tilbagemeldingerne til skolerne</u>
  - o Hvordan er det gået (processen)
  - o Hvad er der kommet ud af det
  - o Hvad skal der ske nu
- <u>Status på hele programmet (set fra din stol)</u>
  - o Hvordan har du oplevelser forløbet ind til nu
    - ▪ succeser
    - ▪ udfordringer
    - ▪ overraskelser
  - o Dine forventninger til det næste år
    - ▪ fokusområder (ting som bare skal lykkes)
    - ▪ kommende udfordringer
    - ▪ din rolle
- Andre interessante ting

Hvad er det jeg gerne vil have ud af mødet?
- Evaluering af hvordan det gå
- Oplevelser af processen
- Fornemmelse af hvordan planerne har ændret sig hen af vejen

Figure D.1: Interview guide for interview with program manager January 2012

Interview om skoleprojekter (ca. 1 time)

<u>Kort om formålet med interviewet</u>
Interesserer mig for hvordan man arbejder med forandring og digitaliseringsprojekter i en skolekontekst. Har fuldt processen på centralt plan, og fået en fornemmelse for hvordan man har organiseret det og forsøger at påvirke skolerne til at skabe forandringer lokalt.
Men jeg er også meget interesseret i hvad der rent faktisk foregår lokalt – særligt er jeg interesseret i udvikling af ideer og projekter. Jeg er derfor meget interesseret i at hører nærmere om hvordan I er kommet frem til projektet og hvordan I har arbejdet/arbejder med det fremadrettet.
Lidt mere om hvad jeg interesserer mig for: relationer mellem mennesker (altså hvordan kommunikation mm. har betydning for hvad der sker)

Om interviewpersonen
Rolle/job på skolen
Rolle i projektet
Hvorfor er du blevet involveret i projektet
Hvor længe har du været med

Lidt om skolen
Kort om hvad det er for en skole
Hvad der kendetegner den

Samlet om projektet
Startskuddet (hvordan)
Begrundelsen (officielt + andet) – er det evt. noget der har været diskuteret tidligere
Tidligere arbejde med digitalisering
Forskelle/ligheder - hvorfor
Centrale personer (Hvorfor - hvilken rolle spillede de?)
Andre personer (Hvordan var de involveret?)

Om processen – mere i detaljer
Kort om projektet (formål, hvordan, hvorfor)
Beskrivelse af forløbet – evt. tegne…
Emner i processen
Hvorfor har de været centrale (løbende)?
Hvad blev der konkret diskuteret på møder?
Hvordan var stemningen?
Modtagelse/opfattelse af ideer
Hvorfor
Deltagerne
Forskellighed/lighed
Hvordan kunne man mærke det?
Hvilken betydning tror du det har haft?

Tilbage til det overordnede
Ideudvikling (hvor kom ideen fra)
Kendetegn
Målet
Visioner
Formidling til de andre (på skolen)
Generelle visioner, værdier eller traditioner (fra f.eks. jeres skole, folkeskoleområdet generelt, nordjyske mentalitet)

Figure D.2: Interview guide for interviews regarding school projects 2012

Transcription guide – English
As the interviews were transcribed by others than the researcher, the guide for how to transcribe the interviews, which was provided by the researcher is included below I table D.1.

Transcription guide	
Name of file	The interviewee's name and data
Title of the document	The interviewee's name and data
Subtitle of the document	This audio recording is transcribed by (insert your name) – so the researcher can return to you in case of questions
The interviewer	I: …
The interviewee	R: …

I think I know what the interviewee says	marked this section with yellow and write the time of the audio recording
I cannot hear what the interviewee says	Mark this section with red and write the time of the audio recording
The interviewee stops speaking to think	Mark this with …
Write continuously the time of the audio recording (so the researcher can return to the particular passage in the audio recording)	Write the time in bold letters during the transcription
Empty words (such as er, mmm, huh, eh)	Do not write these, unless they are significant

Table D.1; Transcription guide

Appendix E – Overview of Internal Documents

This appendix includes an overview of the internal documents included in my case study. As around 500 documents was included, a full list of the documents are not included, rather the type of documents are listed.

Analysis of competences, culture and knowledge sharing	The analysis (planning, survey, reminders etc.)	15
	Communication of the findings from the analysis	94
	e-mail correspondence	40
Applications for school projects	Applications	32
	Project committee minutes	3
	e-mail correspondence	29
Benchmarking		3
Communication strategy	Minutes	10
	Hearing statement from the schools	27
	Working papers incl. drafts of and the final communication strategy	8
	e-mail correspondence	15
Dissatisfaction with school-IT 2008/2009		13
Focus areas	For each of the schools	13
	Collectively	2
	e-mail correspondence	12
Program steering committee	Agendas	11
	Minutes	6
	Included documents	67
	e-mail correspondence	38
Strategy process	Agendas and minutes	13
	Business cases	13
	Presentation for the political committee of Children & Youth	6
	Working document incl. drafts of and the final strategy	35
	e-mail correspondence	6
Theme day 2012		7

Table E.1: Internal documents

Appendix F – Coding

This appendix focus on the topic coding used as part of the analysis of the empirical material. Firstly, the appendix includes an overview of the codes used during the coding (see Table F.1 below). Further, selected screen-shots from the actual coding process in NVivo is included (see Figure F.1 and Figure F.2).

Time			Events and processes		Code
Prior to 2009			The context prior to 2009 (specifically 2007 and 2008)		Pre 2009
2009	**Spring**		Decision about participating in DEK SIP Benchmarking		09 DEC BENCH
	Fall		Participation in DEK SIP Benchmarking		09 PAR BENCH
			Use of the DEK SIP results to obtain political support and funding		09 POL SUP
2010	**Spring**		Strategy process	Vision workshops	10 STR VIS
				Working group/task group	10 STR WORK
				Project groups	10 STR PRO
	Fall		Central project: improving the quality of technological equipment and infrastructure		10 INFRA
			Political approval and founding of the Strategy		10 POL AP
2011	**Spring**		Presentation of the strategy at all the schools		11 PRES STR
			Pre-analysis of competences, culture and knowledge sharing		11 PRE ANA
	Fall		Decision to let schools apply for project funding		11 PRO FUND
			The pre-analysis is presented at the schools		11 PRES ANA
2012	**Spring**		School focus areas		12 FOC AREA
			Theme day		12 THEME DAY
			School applications		12 SCHO AP
			Evaluation of the strategy		12 EVA STR
	Fall		School applications		12 SCHO AP
			Regarding the project committee		PRO COM
Context			Atmosphere particularly in the program committee		ATMOS
			About the political level		POL
			Various assessments of the process		ASSES
			My ongoing assessments of the process		ASSES RES
			Expressions of concern regarding my presence		RES ROL

Table F.1: Overview of Codes

Figure F.1 Screen-print from NVivo coding no 1

Figure F.2 Screen-print from NVivo coding no 2

Appendix G – Meetings during the Strategizing Process

The table below includes an overview of the official meetings and workshops in the strategizing process during the spring 2010 (my translation).

Meeting	Time	Content	Participants
Kick-off	Marts 8 Kl. 9-12	Determine project process	Steering committee + KMD
Meeting	Marts 8 Kl.12.30-14	Draft of decision matrix	Steering committee + KMD + school-IT consultant
Workshop 1	Marts 17 Kl. 9-13	Determining roles and decision rights (the administration hereafter prepare the material for workshop 2)	Steering committee + KMD + school-IT consultant
Workshop 2	Marts 23 Kl. 11-13	Discussions of the results from workshop 1 – communicating and rooting the decision matrix	Steering committee + KMD + school-IT consultant
Steering committee meeting	Marts 23 Kl. 13-15	Determining organization, e.g. establishment of project group and vision group Planning of next phase in the process	Steering committee + KMD
Workshop 3	April 6 Kl. 9-15	Strategy workshop Developing vision and indicators	Vision group + Project group + Steering committee + KMD
Workshop 4+5	April 12 9-15.30	Strategy workshop e.g. specific objectives for the vision and indicators	Project group + KMD
Steering committee meeting	April 28 8.30-10.30	Approval of digitalization strategy – set direction for indicators	Steering committee + KMD
Workshop 7 Project group meeting	May 4 9.00-15.00	Prioritization of the indicators	Project group + KMD
The project group develop business cases at smaller meetings in May			
Workshop 8 Project group meeting	June 1 9-14.00	The project group develops plan of action and political recommendation	Project group + KMD
Steering committee meeting	June 9 8.30-10.30	Approval of plan of action and recommendation before it is sent to vision group/political approval	Steering committee + KMD
Workshop 6	June 21 9-12.00	Strategy workshop – evaluation	Vision group + Project group + Steering committee + KMD
Evaluation of the project in the project group and steering committee (and KMD) – initiate implementation in August			

Appendix H – Template for Applying for Project Funding

The template included below was used by the schools to apply for funding in episode five. A similar template was filled out in the end of the project to evaluate the outcome of the project (my translation).

The text in bold is the main questions (has to be filled) the other questions are meant to help and inspire the applicants to describe the project in detail, thereby enabling a faster response to the application (as all necessary information are provided).

School:
Title of the digitalization project:
Time frame: In which period will the digitalization project be implemented and when will the final evaluation take place?
The background of the project: Why does the school wish to implement the digitalization project? Which of the school's focus areas will the project build on?
Project purpose and goal: What does the school hope to achieve? Which specific tools does the school wish to purchase/improve the use of? Which questions does the school attempts to answer?
Steps of action: The content of the digitalization project: plan of action and descriptions of the activities Who does what, how and when? Phases, organizing, methods?
Considerations on risks: What might prevent the project from succeeding? What is intended to be done to minimize the risks in the projects?
Evaluation plan: How will the ongoing evaluation take place? Which evaluation forms and methods do you intend to apply? Which specific signs will indicate that the goals will be met? How and when will the final evaluation take place? Who is responsible for the evaluation in practice?
Communication: How do you intend to communicate your experiences to the rest of the school at an ongoing basis? How do you intend to communicate your experiences to the other schools? Who is responsible for the communication at the school website? Who is the contact?

Funding: Which resources does the school apply for?	
Contact with the consultants: Which agreements regarding roles and division of tasks have you made with the consultants from School & Youth / Children & Culture	
Names on the participant in the group behind the project:	
Date and signature of the school leader:	

SUMMARY

The link between information systems (IS) and organizational change has been well established in the IS literature. This dissertation introduces the Complex Responsive Processes perspective as a novel approach to the study of IS-related organizational change. By combining insights from complexity science with insights from social science, attention is directed to differences, and the related conflict and power balance as the basis of change.

An interpretive case study was conducted of a process towards realizing the digital school unfolding within a Danish municipality. Through observations, interviews and access to internal documents, the process was studied using the Complex Responsive Processes perspective as a sensitizing device. Five episodes were identified within the empirical process: Benchmarking, Strategizing, Improving infrastructure, Analyzing and Re-organizing.

By introducing this novel approach to the study of IS-related organizational change, the dissertation identifies the role of conflict as a potential driver of IS-related organizational change as well as the need for ongoing initiatives to ensure the needed local changes. Further, power is emphasized as a relational phenomenon influencing the process along with multiple participants, all together this leads to an understanding of the change process as uncontrollable and unplannable in nature.