

Association for Information Systems AIS Electronic Library (AISeL)

ECIS 2007 Proceedings

European Conference on Information Systems
(ECIS)

2007

Pushing Organizational Change with Information Technology: A Resource/Capability Re-Balancing Act

N Kallberg
nikas.kallberg@hhs.se

Magnus Mähring
Stockholm School of Economics, magnus.mahring@hhs.se

Follow this and additional works at: <http://aisel.aisnet.org/ecis2007>

Recommended Citation

Kallberg, N and Mähring, Magnus, "Pushing Organizational Change with Information Technology: A Resource/Capability Re-Balancing Act" (2007). *ECIS 2007 Proceedings*. 57.
<http://aisel.aisnet.org/ecis2007/57>

This material is brought to you by the European Conference on Information Systems (ECIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ECIS 2007 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

PUSHING ORGANIZATIONAL CHANGE WITH INFORMATION TECHNOLOGY: A RESOURCE/CAPABILITY RE-BALANCING ACT

Källberg, Niklas, Stockholm School of Economics, Box 6501, SE-11383 Stockholm, Sweden, nikas.kallberg@hhs.se

Mähring, Magnus, Stockholm School of Economics, Box 6501, SE-11383 Stockholm, Sweden, magnus.mähring@hhs.se

Abstract

What can an organization do when it has an opportunity to innovate with IT and faces pressure to improve operations – but lacks the capabilities necessary to conduct IT-related organizational change efforts? In this paper, this challenging situation is explored with the help of the resource-based view of the firm.

A case study of digital radiology implementation in a healthcare organization was conducted. In the case, the change process did not follow the canonical view of how IT-related change should be conducted. Instead of a socio-technical, balanced change approach, where technology, processes, organizational structures and people change in concert, this case exhibited successive, focused change efforts targeting one organizational resource or capability at a time. The unorthodox change approach – a resource/capability re-balancing act rather than a case of balanced, socio-technical change – proved successful.

The paper finds that pushing organizational change with technology may be a successful emergent strategy for IT-related change under difficult conditions. It also finds that by focusing one organizational resource or capability in each phase of a change effort, both short-term small wins and longer-term improvement of the organization's dynamic capabilities may be possible.

Keywords: IT implementation, organizational change, resource-based view, dynamic capabilities, healthcare, case study.

1 INTRODUCTION

Organizational change involving information technology is a complex process of mutual influence between an existing organization and a technology being implemented (Lee, 1999; Markus, 1983; Orlikowski & Robey, 1991). After decades of research, much has been learnt about how this process should be conducted: Stakeholders should be involved in the change in a meaningful way to ensure that the outcomes are useful and accepted (Markus & Robey, 1983; Venkatesh et al., 2003). Relevant business processes should be redesigned to really make use of the technology (Brynjolfsson & Hitt, 1998; Davenport, 1993). Change should be managed in a way that reduces the strain on the organization and the people affected by change so that negative consequences do not prevail (Mumford, 1981).

And yet, time and again, we see technology being “pushed” into an organization, as if outcomes would follow in an uncomplicated way. Research on IT-related change generally sees this as bad practice and as a recipe for failure (Markus & Benjamin, 1997; Robey & Boudreau, 1999). But is this really the case? And if so, why does practice not change? Could it be that the organization’s conditions and capabilities for change play a role in the formation of change approaches?

In this paper, we use the resource-based view (RBV) of the firm (Barney, 1991; Teece et al., 1997) to explore a change effort in a radiology unit within a European for-profit healthcare organization, in which information technology was used to “push” organizational change. With the help of RBV, we explore shifts in focus of the change process over time, as well as the existence and evolution of the organization’s capabilities for effecting change (Eisenhardt & Martin, 2000; Winter, 2003). The purpose of the paper is to explore how an organization can employ IT to pursue organizational change when the capabilities required for the ideal (or canonical) approach to IT-related change are lacking.

In the following, we first discuss IT-related change and the resource-based view of change, with focus on dynamic capabilities. Thereafter, we describe the case study research approach, which is followed by the case description. We then discuss the case and offer conclusions from the study.

2 IT-RELATED CHANGE AND DYNAMIC CAPABILITIES

IT-related organizational change has been studied extensively in the IS field. While the topic continues to intrigue and challenge researchers and practitioners alike, there is today a rather extensive body of knowledge on how IT-related change should be conducted, which includes critical success factors and central considerations to be made in the process (Lucas, 1981; Markus & Keil, 1994). Central themes in this literature include that the implementation process and its results should be organizationally and politically feasible, that stakeholders should be properly involved and managed, and that the participation, involvement and “buy-in” of users are crucial (Myers, 1994; Venkatesh et al., 2003). Furthermore, organization and technology need to be aligned, meshed together to harness the potential of IT. Therefore, redesign of business processes is key to achieving benefits from IT (Brynjolfsson & Hitt, 1998; Davenport, 1993).

These and additional well-established guidelines for IT-related change, firmly grounded in empirical research, can be seen as providing a canonical view: a view to which there is little opposition in IS research. Following Baskerville (1999), we use the term canonical to denote a dominant or standard view, not a single, unitary view. Furthermore, we do not claim that our short characterization of the canonical view of IT implementation covers all the nuances or provides a comprehensive overview of the literature. However, we do claim that there is such a thing as a dominant view. Indeed, when popular practice deviates from this view, academics are prone to criticize, such as in the case of techno-centric approaches to change (Biazzo, 1998; Davenport, 1995; Robey & Boudreau, 1999). Even when the case of technology-driven organizational change is acknowledged (Markus, 2004), or when the change process is seen as more flexible, improvisational and open-ended (Orlikowski &

Hofman, 1997), the view is still that changes in organizational structures and incentives, knowledge and skills, and attitudes should be concurrent with and integral to the technology implementation effort.

The canonical view is well rooted in the organizational behavior and change literature, for example in its emphasis on conflict resolution, participation, and understanding technology adoption in its social context (Lewin, 1948; Lewin, 1958; Mumford & Banks, 1967; Trist, 1981). These findings have stood the test of time, although recent work sometimes acknowledges variations in implementation approaches (Nutt, 1998). The canonical view, however, demands that an organization is capable of managing change in the proper way. But what happens if an organization does not possess the capabilities necessary for IT-related change? Can anything be done if an organization has repeatedly failed to change, perhaps even learned to fail (Lyytinen & Robey, 1999), with change efforts?

Dynamic capability	Description	Relation to IS/IT implementation
Process innovation	Design and implementation of changes in operative processes that lead to improvements in cycle time, quality of outputs, etc. (Eisenhardt & Martin, 2000)	Business process redesign (Davenport, 1993; Markus, 2004) and its importance for achieving benefits from IT (Brynjolfsson & Hitt, 1998).
Organizational restructuring	Design and implementation of changes in organizational structures, control procedures, etc. that change how the firm operates internally and in relation to its environment (Zollo & Winter, 2002).	Importance of IT solutions that are organizationally valid and acceptable (Markus, 1983; Markus & Robey, 1983).
Integration of IT knowledge and business knowledge	Selection, development and implementation of technological opportunities that integrate with organizational strategies and processes (Peppard & Ward, 2004).	Amalgamation of organization and technology (Lee, 1999). Integration of IT and business issues (Feeny et al., 1992).
Emotional Capability	The organization's acknowledgement of and attentiveness towards emotions of organizational members in relation to organizational change efforts (Huy, 1999).	Attention to stakeholder needs in implementation processes (Lucas, 1981; Mumford, 1981).
Change management	Direction and implementation of planned change (Eisenhardt & Martin, 2000; Zollo & Winter, 2002).	User involvement and acceptance, alignment of interests, usage incentives (Markus & Keil, 1994; Venkatesh et al., 2003)
Project management and project work	Organization, staffing, management, control and execution of projects (Zollo & Winter, 2002).	Control, management and escalation avoidance for IT projects (Keil et al., 2000; Kirsch, 1997)

Table 1. Dynamic capabilities related to evolution of organizational processes and structures, compared to key aspects of IS/IT implementation

To explore these questions we employ the resource-based view of the firm (RBV), which sees firm performance as resulting from the management and use of resources and capabilities over time (Eisenhardt & Martin, 2000). While earlier theoretical contributions within RBV did not clearly distinguish between resources and capabilities, recent advances distinguish between the two concepts: Resources are tangible (e.g. raw material in the firm's possession) that can normally be owned in a legal sense. Capabilities are firm attributes that emerge through repeated execution of routines/processes (Eisenhardt & Martin, 2000). They are nested within bundles of routines (e.g., product development) that employ resources to perform behaviors important for firm performance and/or competitiveness (Winter, 2003). Lately, increased attention has been devoted to the concept of *dynamic* capabilities, second-order capabilities that concern adaptation and renewal (Eisenhardt & Martin, 2000; Zollo &

Winter, 2002). Dynamic capabilities can be defined as stable patterns of collective action through which the organization generates and modifies operating routines in pursuit of improvements (Zollo & Winter, 2002). Some dynamic capabilities are specifically related to changes in organizational processes and structures. Table 1 presents such dynamic capabilities identified in the literature and relates them to the IS/IT implementation literature. Central to the resource-based view is that capabilities are organization-level attributes, not individual or group traits (Winter, 2003).

3 RESEARCH APPROACH

A case study based on extensive field research within a radiology unit provided the empirical basis for this paper (Pettigrew, 1990; Yin, 2003). The first author participated in a change process over a period of three years, averaging two days per week in the organization. Throughout the period, the field researcher was immersed in streams of organizational events at the research site (Evered & Louis, 1981), but also devoted time to field note writing and to reflection away from the field. Following Yin (2003), interviews were conducted with medical professionals, managers and administrative staff and corporate documents were collected and corporate records surveyed. Access was granted to all historical and concurrent documents. Media coverage was also surveyed throughout the period. For events prior to the field researcher's entry into the organization, particular care was taken to triangulate between data sources in order to arrive at a rich understanding of historical events (Golden, 1997; Mason et al., 1997). Table 2 provides an overview of data collection.

Type of Data Collection	Oct. '02 – Jul. '03	Aug. '03 – Jul. '04	Aug. '04 – May '06
Days in the field	Approx. 5	Approx. 100	Approx. 250
Management meetings	1	Every/other week	Every second week
Department meetings	1	Once a month	Once a month
Impromptu discussions with actors	5	>200	>200
Discussions with unit manager	Approx. 10	Daily	Every second day
Process team meetings	None	Approx. 20	Approx. 50
E-mail correspondence	Approx. 20	2-3 per day	3 per day
Recorded interviews	9	8	2
Documents	> 500 pages	> 1000 pages	> 1000 pages
Corporate records	Continuous Access	Continuous Access	Continuous Access
Media coverage	Approx. 20 articles	Approx. 20 articles	Approx. 40 articles

Table 2. *Overview of Field Research and Related Data Collection over Time.*

To counter potential biases in data collection and representation, the second author, who did not participate in the field, was assigned the role of challenging the field researcher's view of events. A dialectical process was employed in which the field researcher offered descriptions and explanations of events and the non-field researcher questioned the observations and offered alternative analyses of events based on the literature (Eisenhardt, 1989). In analyzing the case data, we used a process-centered approach (Langley, 1999), looking for phases and shifts in the change process. Mapping the process according to key concept from RBV, we detected that the change process could be understood as a sequence of phases, each characterized by the focus of the change effort. The case narrative was thus structured chronologically and in accordance with the identified phases. Finally, we analyzed existence and evolution of dynamic capabilities for each phase (cf. Table 1).

4 A CASE OF DIGITAL RADIOLOGY IMPLEMENTATION

In this section we describe organizational change at a radiology business unit within PHCO Radiology (a pseudonym), a major division within a Northern European for-profit healthcare organization. The case spans the years 2002 to 2005, but we also provide an exposé of the historical background of the

unit as a department within a major city hospital. In 2002, the unit had approximately 100 employees, most of which belonging to four groups: physicians, nurses, assistant nurses and medical secretaries.

4.1 Prologue: A History of Stability and Troubled Change

For decades, the radiology unit had operated under highly stable conditions in terms of clinical procedures, equipment, staff turnover, organization and environment. The heads of the unit had traditionally been highly renowned physicians who stayed in the position between ten and 25 years. Until the late 1990s, the unit was a department within a large, public city hospital and delivered services almost exclusively to other hospital departments. During the 1990s, the department faced recurrent demands to reduce costs. At this time, other radiology departments made the shift to digital radiology technology for imaging and administrative procedures. The new technology was frequently depicted as challenging existing work procedures and expertise. It was also described as a means for achieving major improvements in productivity, although reports from early adopters indicated that cost savings (and related personnel reductions) often did not materialize.

In the late 90's the hospital was privatized. The new owner, here called Private Health Care Organization (PHCO), transformed the radiology department into a business unit within division PHCO Radiology. Within a few years, five successive business unit managers struggled to cope with accelerating demands for productivity increases. Digitization efforts were initiated and abandoned on several occasions and several other productivity-development initiatives fell well short of demands and goals.

The unsuccessful change initiatives, which included personnel reductions, led to resentment among personnel. This resentment was not only directed towards the business unit managers, but also in many cases towards the healthcare company that had taken over the hospital and the radiology unit:

Finally I come to a radiology unit where everything works, where people are able to go home when they should and where everybody is content. And then along comes PHCO and after that everything just collapses.... If it was because of PHCO or if it was just a coincident I don't know, but there have been reorganizations ever since. (Judy, resident physician)

4.2 Phase 1: Re-initiating Change

In 2002, the radiology unit was running a substantial operating deficit, which had increased several quarters in a row. PHCO operates as an independent healthcare provider within the public healthcare system and therefore the county sets price levels and service requirements. At this time, upon renewal of contract, the county forced a clause that stipulated a significant price reduction effective until the unit was able to produce and deliver digital radiology images and reports.

The president of PHCO Radiology, frustrated with the unsuccessful change initiatives, personally took over management of the unit on an interim basis. He also initiated the acquisition of digital radiology equipment (called RIS/PACS, Radiology Information System/Picture Archiving Communication System) with the help of the PHCO IT department. A new business unit manager was hired in November, with a clear mission to digitize radiology operations within six months and implement personnel reductions. The new manager was not a physician; she had experience from different types of organizations, including healthcare. Upon assuming the position, she found the impending digitization effort technology-focused:

The task was to carry out digitization of radiology operations.... [They] had no thoughts about changing work procedures.... It was a pure technology acquisition.... (Anna, business unit manager)

4.3 Phase 2: Broadening the Scope of the Change Effort

The new manager spent a lot of time during her first months talking to the physicians, building trust. Soon after starting the job, she started to view the digitization project as problematic. Deadlines were

tight, the project charter was not well defined and project management did not function well. Furthermore, user representatives and domain experts were missing in the project.

...it didn't have anything to do with the actual clinical work.... There were really no healthcare professionals, no medical staff, in that project. (Anna, business unit manager)

Before Anna came, the project was run as a tech project. Some people were to go. Logically, people knew that, but did not really want to grasp it. (Liza, personnel manager)

The business unit manager hired an external consultant as project manager who formed a new project team with all occupational groups represented. The scope was widened to include process redesign.

This was a very positive period. They saw that we listened to operations. (Adam, digitization-project manager)

The project group identified a preferred RIS/PACS solution, with user requirements a major determinant in the choice. The contract with the supplier was signed in February 2003. In parallel, the plan for personnel reductions was prepared by the business unit manager, who was also in contact with the unions and key staff concerning the reductions.

4.4 Phase 3: Refocusing Technology Implementation

During March and April of 2003, the subprojects ran into difficulties. Participants complained about not being able to devote time to project work, but in addition, there was a severe shortage of project skills in the project. Many of the medical staff did not have experience of working in a project. Motivation and commitment was slumping.

Two physicians... were supposed to represent the physicians in the team... but [it didn't work], so there was a lot of frustration among the physicians during the spring.... [It] manifested itself in criticism against the project. They got upset when someone expressed a different viewpoint. They couldn't work in [a project environment]. It was apparent that none of the occupational groups could cope [with project work]. (Anna, business unit manager)

It turned out that there is not much maturity in this organization in terms of working in accordance with a project model.They didn't have the skills to conduct a workshop, collect and organize information, even at a basic level, those skills just aren't there. (Adam, digitization-project manager)

As project work was perceived increasingly difficult and unproductive, anxiety spread amongst staff. The business unit manager gradually realized that the aggressive timetable and the lack of necessary skills for process-design work were incompatible. At the next unit-wide information meeting, the business unit manager informed that while there were major needs for process redesign, the current digitization process would only focus implementation of the purchased RIS/PACS system. Further changes would follow at a later stage. Subsequently, in April, a formal decision about notice of dismissal to about ten percent of the staff, effective at year end, was taken and communicated.

At this time, however, the business unit manager found that the scheduled personnel reduction would be insufficient to meet board expectations on productivity improvements. She informed the management team about her assessment and started to work on an action plan that focused new work processes and organizational structures as direct consequences of the digitization effort. In June, a staff meeting was held where a plan for the upcoming implementation was presented. The business unit manager then also informed about the restructuring project planned for the fall, and stressed the financial pressure and budget restrictions facing many of the unit's clients, particularly the large hospitals.

At the end of June 2003, the RIS/PACS system went live. After a few initial problems, the system was up and running. The physicians were quite satisfied with the system, while the nurses and assistant nurses experienced some initial, temporary problems. The anxiety that had been building amongst the staff throughout the spring turned into relief. But there was more to come.

4.5 Phase 4: Effectuating Personnel Reductions

In line with the April decision by the business unit manager, the digital radiology system had been implemented with a minimum of changes in work processes. Only changes absolutely necessary to operate the new system and produce digital radiology images had been implemented and many of these changes were made ad hoc during the first hours and days of operation.

Work here... has sort of deteriorated to the point where nothing is documented anymore. You solve imminent problems, and you get all happy about the fact that you made it through another day. Interest in building structures that are more effective than the current ones hasn't really existed here. (Adam, digitization project manager)

In August 2003, the restructuring effort outlined during the spring was initiated. A “staffing team” was formed to analyze the increased potential for personnel reductions following from the digitization project. Over the next months, the team produced competence requirements for the future organization and job descriptions, finding that a major additional personnel reduction was possible. The staff, however, was largely of the opinion that further change was unlikely.

It was like with the digitization decision. Everyone, including the assistant nurses and the secretaries, knew that there were going to be changes, but the majority probably thought that nothing was going to change anyway. (John, president of PHCO Radiology)

Based on the staffing team’s work, the business unit manager crafted a document (“The Final Effort”) and presented it at a PHCO board meeting, proposing a go-ahead for the personnel reduction effort.

PHCO Radiology is in need of a fundamental restructuring and a long-term change effort to meet corporate profitability goals as well as present and future demands from personnel, referring clients and patients. (Quote from the document “The Final Effort”, by the business unit manager)

The PHCO board approved the plan and one week later the personnel was informed about the plans. External pressures and the potential of the digital technology were again cited as the main reasons behind the impending changes. The plans were met with frustration and skepticism, although the dynamic of the change process had also to some extent subdued opposition to change.

The willingness to change is very low. The digitization is a very big thing, it affects the daily work so much, there is no time to think of anything else. At the same time, conflicts disappear from sight when you focus on the digitization, [there is] no time to argue with each other.... Change is possible, not because there is a strong willingness to change, but because resistance is weak right now. (Mary, specialist physician)

In October, a process change group was formed and assigned with identifying improvement potential in work processes. Throughout the fall, however, process redesign work was overshadowed by the notifications of layoffs, effectuated from October to mid-December. While the personnel reduction process had been taxing, the state of the unit was not all negative:

It looks positive with the digitization.... Some [physicians] have resigned, the physicians get stressed out – ‘what are we gonna do?’ – and want to write a formal letter to management. That’s their problem. They do that instead of talking to management. It’s a cultural thing, (Catherine, specialist physician)

Throwing in the technology was the right thing to do... shocking the system, forcing change to happen.... (Anna, business unit manager, at management team meeting in December 2003)

4.6 Phase 5: Work Process Redesign

In January 2004, lingering stress from the taxing events during the fall contributed to irritation and dissent in the management team and amongst staff.

Well, Anna and the management team. First of all, the management team is completely anonymous for us.... Our only representative there has been fired from the team, and now there are people there we don't know and that we... well, don't have any connection to.... (Judy, resident physician)

There is a lot of anxiety ...about what they might come up with, without caring about what we say, and what the consequences might be. (Jenny, specialist physician)

In April, process work was reinvigorated by a new design approach. PHCO General Hospital, the largest client, joined the effort and work was focused on redesigning work processes to fit with client processes. In five weeks, the group delivered process descriptions and a set of prioritized and detailed process improvements. Small improvements were implemented as opportunities arose and further developments were scheduled to be implemented in the upcoming months.

During the spring, the business unit manager also decided to initiate a leadership-development program to start in the fall. This was partly in response to staff discontent, but also because she had identified a need for leadership and business development skills among physicians and other key personnel. In June, however, the continued discontent resulted in a letter to the CEO of PHCO demanding dismissal of the business unit manager. The business unit manager responded to the initiative first through an e-mail to all staff, pointing to the pace of the change effort and flaws in ensuring participation in the effort as causes of discontent. In a second step, the business unit manager and the president of PHCO Radiology called an information meeting in which the president stressed that people involved should work to resolve their differences and find common ground.

4.7 Phase 6: Personnel Development

After the summer of 2004, the crisis seemed to have dissipated. Previously planned trips for all personnel were carried out as part of an incentive program. During trips, team-building seminars were held. In the seminar material, the business unit manager described the change process thus far, empathized with staff feelings of exclusion and change resistance and stressed that the worst part was over.

When the leadership development program commenced, participating physicians initially questioned its purpose and vented feelings of being forced to participate. Several group development sessions and a study trip later, participants increasingly saw the program as valuable for their work. At this time, a set of process improvements (mapped out during the spring) were successfully implemented. Further process improvements were pursued by a newly formed process-development team and the importance of their work was increasingly acknowledged by staff.

In early 2005, the business unit manager was promoted and the former head of staff planning and scheduling took over as business unit manager. The physician group complained of lack of influence and work overload. Two additional physicians were recruited, one becoming new chief physician. During the year, some physicians increasingly engaged in discussions with management on individual basis, expressing views and making arguments based in strategic and/or financial reasoning.

4.8 Epilogue

In late 2005, the digital radiology system is fully operative and appreciated by staff. The staff of the unit is now at a stable 75 people, down from 100 in 2002, with an increase in the number of radiology exams performed. The financial performance of the unit meets corporate/owner demands, and response time for radiology exams meets client expectations. In late 2006, these conditions still hold.

5 CHANGING WHEN YOU CAN'T: A RESOURCE/CAPABILITY RE-BALANCING ACT

In this section, we discuss how the change effort in the studied radiology unit shifted in focus over time, identifying what organizational resources and operative capabilities were focused during each phase. We also connect this to the presence or absence of dynamic capabilities (please refer to Table 1 as needed) and discuss how these dynamic capabilities evolved during the change process.

In *phase one*, the change effort focused only one resource: technology. This focus probably helped gain momentum and broke with earlier change efforts. It can also be understood as a consequence of outside pressure and lack of dynamic capabilities to drive and manage change: the unit did not possess capabilities in process innovation, organizational restructuring, change management or project work. Arguably, the organizational capability to address emotional needs of employees was also limited.

In the *second phase*, the resource/capability scope of the project was broadened to include not only technology but also organizational structures and routines, including process design. This can be understood as a consequence of the business unit manager's identification of lack of user participation. Events during this period also testify to the lack of capability to conduct project work on a wider scale.

As a consequence, in *phase three* efforts were concentrated on implementing the digital radiology technology. The lack of relevant dynamic capabilities (in process innovation, restructuring, change management, project work) and the outside pressure partly account for this change. In addition, this change in scope and focus addressed the organization's history and sentiment of failing to change: with problems plaguing the project, there was a clear risk that the change effort would ebb out into disillusionment, inactivity and resistance. The choice to push change with the new technology was therefore not only a response to outside demands, but also a way to demonstrate that change was possible. The new technology also paved way for a shift in the configuration of organizational resources and capabilities: suddenly, new procedures were possible.

In the *fourth phase*, when the RIS/PACS system was up and running, focus shifted to the personnel resource. While process redesign would have benefited the use of the new system, efforts in this area did not gain momentum until later, when personnel reductions had been effectuated. The organization did not have the capacity to address process redesign and personnel reductions simultaneously. Furthermore, "quick wins" were important both due to the financial situation and to reinforce the change effort through continued disconfirmation of the status quo. The personnel reductions effectuated during the fall provided additional evidence that the world had changed: this was not the stable environment of the previous decades, neither was it the change-incapable environment of recent time. It was established that the organization was capable of change; change management capability increased. The layoffs also further increased the pressure to rethink work practices.

With the fundamental changes in resources – the new technology and the new personnel structure – the radiology unit had the structural, but not yet the processual, prerequisites for improved operative and financial performance. In the *fifth phase*, the focus of the change effort switched to work processes. Process redesign work finally gained momentum, and process improvements were achieved on the basis of continued use of a well-functioning, stable digital radiology system. At this time, a re-balancing is taking place within the unit: the new technology, the size and competence of the staff and the work processes increasingly match each other. The effects of the combined change efforts are manifested in improved operative performance, successful response to client demands and financial performance.

The unit also exhibited dynamic capabilities in organizational restructuring, process innovation and change management, while emotional capability had not developed significantly. After the unsuccessful broad involvement of stakeholders in the second phase, change efforts were driven through targeted efforts driven by small teams. The emotional strain from the accelerated, often non-participative

change processes erupted in dissent. While resources and capabilities were being re-balanced into a coherent and well-functioning operation, the change process was not entirely in balance.

In *phase six*, the resource primarily focused is again personnel, but this time with focus on competence development and staff–management interaction. The leadership program partly countered dissent amongst physicians. We can also see that the organization by now had acquired some capacity to conduct change with a broader focus: process innovations continue and help build capabilities related to service delivery. The organization had by now broken the earlier change deadlock.

However, as a consequence of accelerated, largely non-participative change, development of emotional capability was still limited at best. It is possible that development of this capability was subordinated to making change possible; perhaps attending to emotional needs was seen as posing a risk of fallback to earlier, ineffective change efforts. On the one hand, the fact that the unit had made it through an exceptionally turbulent period and arrived at a more stable situation, without imminent threats to the unit’s survival, might have built capacity for uncertainty and ambiguity amongst employees. On the other hand, the stress and pressure of living through change had also caused emotional strain. Change had become part of everyday organizational life, but it had not become the norm or the preferred state. While resources and operative capabilities were re-balanced, emotional re-balancing partly remained.

6 CONCLUSIONS

The findings from this case suggest that pushing organizational change with technology may not always be an inferior strategy for IT-related change. Especially when an organization lacks the dynamic capabilities necessary to effectuate change “by the book”, the focus on one resource or capability at a time might lead to small wins in the short term while over time contributing to a more change-able, organization. In such circumstances, technology might sometimes be the first resource focused. Consequently, pushing change with technology might be a workable, emergent strategy for coping with difficult preconditions for change.

It should be noted that our findings do not constitute a readily repeatable implementation method. Rather, what we have found is that when an organization is unable to pursue IT-related change in accordance with the canonical view, an approach that contrasts quite starkly with the canonical view might be viable. However, it was also found that the successive, focused change efforts and the accelerated pace of change contributed to dissent and resistance in the organization: thus, a critical aspect of employing the observed approach is to detect and act upon the need for re-balancing not only of resources and capabilities, but also emotional rebalancing.

Furthermore, the observed strategy might work only under certain conditions, which may include characteristics of the technology deployed, the range and complexity of operative processes affected, user group characteristics and the ways in which power relations are impacted. Also, the case also shows that this strategy has consequences for the development of organizational capabilities. It may lead to temporary skill deficiencies and sustainment of ineffective work processes. It may also fuel conflict and distrust in management. These risks need to be balanced against progress achieved through successive, targeted efforts.

On the other hand, an upside of the change strategy is that it makes it possible to work separately, and at different time periods, with challenges such as learning a new technological tool, coping with personnel reductions, and changing work processes. In contrast to an optimal, balanced approach to change, the approach described in this paper can thus be understood as sequential, emergent and partly opportunistic. The successive shifts in focus also shape a process of repeated disruption and re-balancing. In this type of process, the challenge is not to avoid disruption, but to allow for and facilitate re-balancing of resources, skills and capabilities after a disruptive change has occurred. The challenge is to manage this re-balancing act so that opposition to change does not halt the process. It comes with

the territory that such re-balancing is likely to be temporary, serving as the ground for another wave of disruptive change.

The findings from this study are particularly important in a time when organizations are increasingly required to change rapidly and where technological advances continuously change the rules for what can and cannot be done. Consequently, more research is needed into varieties of approaches to IT-related change. One way to conduct this research is to pursue opportunities to study cases where unorthodox approaches to change have been successful. We believe that this should be done not with an immediate aim to produce normative advice on successful change methods, but rather to first better understand and uncover the anatomy of IT-related change in a variety of circumstances – perhaps particularly such circumstances that make traditional approaches unviable. While this study has focused lack of dynamic capabilities as a reason to divert from the canonical approach, hyper-competition and start-ups are examples of other conditions or circumstances where non-traditional IT implementation approaches may be useful or necessary. Such conditions should not be treated as anomalies within IS research, but as part of an expanding variety of contexts to which IT implementation approaches must adapt.

For future practice, the perhaps most central implication of the study can be formulated quite concretely: When you cannot do IT-related organizational change the way you should, do it the way you can, one step at a time.

References

- Barney, J. (1991) Firm resources and sustained competitive advantage. *Journal of Management* 17 (1), 99-120.
- Baskerville, R. L. (1999) Investigating information systems with action research. *Communications of the AIS* 2 (19), 1-32.
- Biazzo, S. (1998) A critical examination of the business process re-engineering phenomenon. *International Journal of Operations & Production Management* 18 (9/10), 1000-1016.
- Brynjolfsson, E. and Hitt, L. M. (1998) Beyond the productivity paradox. *Communications of the ACM* 41 (8), 49-55.
- Davenport, T. H. (1993) *Process innovation: Reengineering work through information technology*. Harvard Business School Press, Boston, MA.
- Davenport, T. H. (1995) The fad that forgot people. *Fast Company*, p 70.
- Eisenhardt, K. (1989) Building theories from case study research. *Academy of Management Review* 14 (4), 532-550.
- Eisenhardt, K. M. and Martin, J. A. (2000) Dynamic capabilities: What are they? *Strategic Management Journal* 21 (10/11), 1105-1121.
- Evered, R. and Louis, M. R. (1981) Alternative perspectives in the organizational sciences: 'inquiry from the inside' and 'inquiry from the outside'. *Academy of Management Review* 6 (3), 385-395.
- Feeny, D. F., Edwards, B. R. and Simpson, K. M. (1992) Understanding the CEO/CIO relationship. *MIS Quarterly* 16 (4), 435-448.
- Golden, B. R. (1997) Further remarks on retrospective accounts in organizational and strategic management research. *Academy of Management Journal* 40 (5), 1243-1252.
- Huy, Q. N. (1999) Emotional capability, emotional intelligence, and radical change. *Academy of Management Review* 24 (2), 325-345.
- Keil, M., Mann, J. and Rai, A. (2000) Why software projects escalate: An empirical analysis and test of four theoretical models. *MIS Quarterly* 24 (4), 631-664.
- Kirsch, L. J. (1997) Portfolios of control modes and IS project management. *Information Systems Research* 8 (3), 215-239.
- Langley, A. (1999) Strategies for theorizing from process data. *Academy of Management Review* 24 (4), 691-710.

- Lee, A. S. (1999) Researching MIS. In *Rethinking management information systems* (Galliers, B. and Currie, W. L., Eds), pp 7-27, Oxford University Press, Oxford.
- Lewin, K. (1948) *Resolving social conflicts*. Harper and Row, New York, N.Y.
- Lewin, K. (1958) Group decision and social change. In *Readings in social psychology* (Maccoby, E. E. and Newcomb, T. M. and Hartley, E. L., Eds), pp 197-211, Henry Holt and Company, New York.
- Lucas, H. C. J. (1981) *Implementation: The key to successful information systems*. Columbia University Press, New York, NY.
- Lyytinen, K. and Robey, D. (1999) Learning failure in information system development. *Information Systems Journal* 9 (2), 85-101.
- Markus, M. L. (1983) Power, politics, and MIS implementation. *Communications of the ACM* 26 (6), 430-444.
- Markus, M. L. (2004) Technochange management: Using IT to drive organizational change. *Journal of Information Technology (Palgrave Macmillan)* 19 (1), 4-20.
- Markus, M. L. and Benjamin, R. J. (1997) The magic bullet theory in IT-enabled transformation. *Sloan Management Review* 38 (2), 55-68.
- Markus, M. L. and Keil, M. (1994) If we build it, they will come: Designing information systems that users want to use. *Sloan Management Review* 35 (4), 11-25.
- Markus, M. L. and Robey, D. (1983) The organizational validity of management information systems. *Human Relations* 36 (3), 203-226.
- Mason, R. O., McKenney, J. L. and Copeland, D. G. (1997) An historical method for MIS research: Steps and assumptions. *MIS Quarterly* 21 (3), 307-320.
- Mumford, E. (1981) Participative systems design: Structure and methods. *Systems Objectives Solutions* 1 (1), 5-19.
- Mumford, E. and Banks, O. (1967) *The computer and the clerk*. Routledge & Kegan Paul, London.
- Myers, M. D. (1994) A disaster for everyone to see: An interpretive analysis of a failed IS project. *Accounting, Management and Information Technologies* 4 (4), 185-201.
- Nutt, P. C. (1998) Leverage, resistance and the success of implementation approaches. *Journal of Management Studies* 35 (2), 213-240.
- Orlikowski, W. and Robey, D. (1991) Information technology and the structuring of organizations. *Information Systems Research* 2 (2), 143-169.
- Orlikowski, W. J. and Hofman, J. D. (1997) An improvisational model for change management: The case of groupware technologies. *Sloan Management Review* 38 (2), 11-20.
- Peppard, J. and Ward, J. (2004) Beyond strategic information systems: Towards an IS capability. *Journal of Strategic Information Systems* 13, 167-194.
- Pettigrew, A. M. (1990) Longitudinal field research on change: Theory and practice. *Organization Science* 1 (3), 267-292.
- Robey, D. and Boudreau, M.-C. (1999) Accounting for the contradictory organizational consequences of information technology: Theoretical directions and methodological implications. *Information Systems Research* 10 (2), 167-185.
- Teece, D. J., Pisano, G. and Shuen, A. (1997) Dynamic capabilities and strategic management. *Strategic Management Journal* 18 (7), 509-533.
- Trist, E. (1981) The sociotechnical perspective. In *Perspectives on organizational design and behavior* (Van De Ven, A. H. and Joyce, W. F., Eds), pp 19-75, John Wiley & Sons, New York.
- Venkatesh, V., Morris, M. G., Davis, G. B. and Davis, F. D. (2003) User acceptance of information technology: Toward a unified view. *MIS Quarterly* 27 (3), 425-478.
- Winter, S. G. (2003) Understanding dynamic capabilities. *Strategic Management Journal* 24 (10), 991-995.
- Yin, R. K. (2003) *Case study research: Design and methods*. Sage Publications, Thousand Oaks, CA.
- Zollo, M. and Winter, S. G. (2002) Deliberate learning and the evolution of dynamic capabilities. *Organization Science* 13 (3), 339-351.