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INFORMATION TECHNOLOGY (IT) MANAGERS´ CONTRIBUTION TO IT AGILITY IN ORGANIZATIONS — VIEWS FROM THE FIELD

Tommi Tapanainen

Turun kauppakorkeakoulu
Turku School of Economics

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1 INTRODUCTION

The ability of organizations to withstand turbulent, rapidly changing conditions has always been important for the long-term sustainability of operations. In the business domain, the maintenance of competitive advantage over long periods is a crucial yet extremely difficult task of which only select enterprises are capable. Our increasingly changing and discontinuous world makes it ever more important to develop the capability to foresee changes and react accordingly, and if possible, to act before the change actually takes place.

In the itLEPO research project relating to IT services, conducted at the Turku School of Economics between 2007-2009 with seven public and private Finnish organizations, it was found that some organizations had significantly mature IT services in place, whereas others did not. Particularly advanced IT services are being monitored and controlled to account for changes in the needs of the service consumers, as well as environmental influences. Thus, such advanced services are *agile, i.e., capable of change according to environmental needs*. For instance, IT can help organizations cope with change by offering information processing capabilities that facilitate process reengineering efforts. On the other hand, IT can also act as a barrier to change by restricting the strategic options of the organization, e.g. by constraining the choice of process. As the significance of information systems in business increases, the need for agile IT management will grow in importance.

The role of the IT manager seems to be one crucial element of the capability to change, but hitherto in IT management literature, there has been far too little attention paid to IT managers' contribution to the agility of the IT function. For instance, IT managers are considered agents of change management, there to help the organization revolutionize its culture and work practices that have become redundant. According to an extensive survey by CapGemini (2007), 83% of Chief Executive Officers (CEOs) considered IT function agility essential for the agility of the entire organization. However, 38% of CEOs did not consider their own IT organization able to function in an agile way. Consequently, there is a great need to develop IT agility for businesses. There are naturally many factors that impact on the change-readiness of IT services, but the role of the IT manager is important and intriguing enough to warrant further investigation.

Adjusting and responding to change has been examined in the past via concepts such as agility, flexibility, and dynamicity. Sherehiy et al. (2007) claim that agility is the latest stage of development of these concepts and is used to refer to the ability to adjust and respond to changes and uncertainty in the environment. Overby et al. (2006) also add that agility contains the ability to proactively embrace change and take advantage of change. There is no general agreement in the literature as to what the exact domain of each concept is – agility, flexibility, dynamicity and others

– and accordingly, this research utilizes the latest term, agility, to refer to the capability to proactively and reactively deal with environmental change.

Agility has previously been examined extensively with regard to strategic agility, agile manufacturing systems, agile software development, agile development teams, and agile project management (Sherehiy et al. 2007). Research on the role of IT in organizational agility (henceforth termed IT agility) is relatively recent. On the other hand, literature relating to the capabilities of IT managers has concentrated on prescriptions for IT managers to improve their ability to provide good service for the business functions, such as the abilities required of the ideal chief information officer (Benjamin et al. 1985, Feeny et al. 1992, Grover et al. 1993, Stephens et al. 1992, Weiss & Anderson 2004). However, there is a dearth of research on what is the individual dimension of IT agility and what IT agility entails for the capabilities of the IT manager.

1.1 Research question and objectives

Our research question is:

(RQ1) How does the IT manager contribute to IT agility?

In other words, we wish to find out on one hand (1) what IT agility means, and on the other hand explore (2) how the IT manager contributes to IT agility. This research aims to contribute to agility research in the IT field to help position the IT manager in the creation and maintenance of agility in the IT function. Organizations and in particular their human resources management may benefit from the research findings, as they point to leadership skills that should be developed for IT managers.

As will be seen later, IT agility consists of the agility of the IT function itself as well as the agility of the IT function to partner with the business. Both of these dimensions have a bearing on the agility of the entire organization. As the activity of the IT manager takes place within these two aspects of IT agility, to properly answer RQ1, we shall need two research sub-questions to examine the contribution of the IT manager in each.

(RQ1.1.) How does the IT manager contribute to IT function agility?
(RQ1.2.) How does the IT manager contribute to IT-business partnership agility?

1.2 Definitions

Agility
This research uses several agility terms, including *IT agility*, *IT function agility*, and *IT business partnership agility*. Agility connotes the ability of an entity to adjust and respond to changes and uncertainty in the environment. This includes the capacity to sense changes in the environment and to react appropriately by adjusting internal systems of the entity. This response might also be directed toward the external environment, meaning that the entity would attempt to change its surroundings rather than its internal state. In the case of the organizational level of analysis, such as for *IT function agility*, the concept would denote the ability of that organization to adjust and respond with regard to changes in the organizational environment and the extra-organizational environment. Similar agilities can be derived and indeed have been derived in the literature for *individual agility* and *group agility*. However, based on previous work, the definitions for these two lower-level agilities in this research are constrained to reacting to external change by modifying internal functioning of the entities. Thus, the proactive dimension of agility is bypassed with regard to these two entities. For that reason, the definition of *IT function agility* is also restricted to the internal response to compatibility. In addition, an umbrella concept, *IT agility*, is adopted, which is defined as being composed of both *IT function agility* and *IT-business partnership agility*, the latter of which provides the external response dimension to *IT function agility*.

CIO (Chief Information Officer)
The CIO is one type of executive position in an organization that is defined here as a subcategory of the IT manager. The responsibility of CIOs is to ensure that organizational IT is operating effectively and producing the necessary support to business functions. In essence, the CIO is the highest executive position responsible for organizational IT. CIOs tend to be officially nominated in larger organizations, whereas in smaller ones the equivalent responsibilities are often delegated to financial executives or even the Chief Executive Officer. This research assumes that the position exists separately from these business executives.

Group agility
Group agility is defined by Kozlowski et al. (1999) and Han (2003) as the capability of the group to meet performance demands in rapidly shifting contingencies. They identify three qualities as the components of group agility: network selection, network invention, and coordination maintenance. It is to be noted that, although certain other group agility definitions include the external response dimension as a characteristic of group agility, the definition of Kozlowski et al. does not. Their definition is used in this research.

Individual agility
Individual agility is defined by Lui and Piccoli (2007) as how well individuals are able to perform in various types of duties in the face of change. The definition assumes that if the training level of an individual is high and he/she has engaged in job rotation, the individual has good capacities to accommodate change. As with group agility, some other definitions also take into account the external response dimension, but the definition that is used in this research assumes internal change only occurs at the individual as a result of sensing external changes.

IT (Information Technology)
Two meanings are used in this research to refer to this term. On one hand, "IT" alone as an abbreviation or as an attributive noun "IT {something}" denotes the processes and resources related to the collection, transformation, transmission, and management of information in an organization. "IT", therefore, is taken to encompass things such as organizational structures and processes in the IT function and IT workforce, in addition to the actual technological artifacts in the organization. The content of {something} tells the reader which aspect of this wide class of entities is referred at any given time. On the other hand, if the intended meaning is merely the technological artifact that is used in organizations for information processing purposes, that is specified either by using the full term "information technology" or an additional explanation.

IT agility
IT agility refers to the ability of the IT function to sense external changes and respond internally and externally to requirements so arising. It is an umbrella concept containing IT function agility (internal response dimension) and IT-business partnership agility (external response dimension).

IT function
The organizational structure that manages IT is termed the IT function. That is the organizational unit responsible for all procedures related to the processing of information. It is not necessarily the owner of such systems, but is tasked as the "caretaker" of these systems. The objective of the IT function is to support the functioning of the business functions or other functions of the organization. To do so, the IT function must remain internally and externally effective.

IT function agility
An agile IT function is one that can sense changes in the organizational environment (and beyond), and is capable of adjusting and responding internally to those changes. The stress here is on the internal nature of adjustment. IT function agility is contained in IT agility.

IT manager
IT manager refers to an employee in the IT function of the organization who has managerial duties, being responsible for one or more subordinate employees either through permanent (line organization) or temporary (project organization) arrangements. The CIO is one type of IT manager.

IT-business partnership agility
The main duty of the IT function is to provide services to the business functions in order to support the objectives of the organization. Because information technology is a pervasive technology, it is not merely enough for the business to purchase such services from the IT function. Instead, the two parties need to be aligned in a partnership. Should such a partnership be agile, IT alignment can continue to develop according to environmental requirements. This concept refers to the external dimension of IT agility, providing the external response component in IT agility.

1.3 Structure of this dissertation

This dissertation is a compilation work, i.e. it consists of four peer-reviewed articles that have been published in academic journals and presented at conferences. Here, the results from individual articles are combined using further information from a literature review. Thus, the articles only represent parts of the main research question of this dissertation. Therefore, the chapters that follow attempt to describe the overall data collection and analysis that occurred, and explain how the research question may be answered using the empirical results obtained in combination with the literature. This dissertation is organized so that the actual articles are attached to the work as appendices, whereas the beginning, chapters one through six, explain how the articles answer the research question. The remainder of the dissertation, then, contains the following:

- *First*, we examine the literature regarding the research question to identify what the previous literature states on the topic.
- *Second*, we present the overall methodology for the dissertation, including supplementary methodological choices, and how the research was carried out within the parameters of these methodologies.
- *Third*, we move to presenting the summary of results from our empirical intervention regarding the research question. This part also includes a description of the pre-understanding we held before embarking on the research. We also follow up with an interpretation of the empirical results in light of the literature, and propose a rearrangement of the literature that describes the position of the IT manager in IT agility. This rearrangement also leads us to our two research sub-questions. Finally, we present the summary of results from our

examination of the two research sub-questions, and our (so far) best understanding of the research topic.
- *Fourth*, we draw the conclusions and contributions of this research for theory and practice.
- *Fifth*, we summarize the main ideas and content of the dissertation.
- *Sixth*, and finally, we précis the articles this compilation is founded on as well as list the reference literature we used during the course of the research.

The articles in the appendices to the dissertation form the contribution of this dissertation. The purpose of the main body of the dissertation is to collect these contributions and explain their contribution to the research question. Therefore, this main body itself is not designed to contribute anything new. The following is a list of the articles contained in the appendices:

- Tapanainen, T., Hallanoro, M., Päivärinta, J. and Salmela, H. (2008). Towards an Agile IT Organisation: A Review of Prior Literature. Proceedings of the 2nd European Conference on Information Management and Evaluation (ECIME '08), Royal Holloway, University of London, UK, 11-12 September 2008, pp: 425-432.

- Tapanainen, T. (2008). The Agile IT Manager. Proceedings of the HRM Global 2008 – Sustainable HRM in the Global Economy; 27-29 August 2008; Turku, Finland, pp: 318-326.

- Ryömä, A. and Tapanainen, T. (2010). The Applicability of Transformational Leadership to Short-term Projects. Proceedings of the 6th European Conference on Management Leadership and Governance (ECMLG`10), Wroclaw, Poland, 28-29 October 2010, pp:332-338.

- Tapanainen. T., Ylitalo, J. and Partanen, S. (2011). Towards a Partnership in CIO-business Relationship – The Role of Expectations. Kokusai CIO Gakkai Jaanaru (International CIO Conference Journal) Volume 5, pp: 53-61.

2 PRIOR RESEARCH

This chapter is divided in three parts (Figure 1). The first subchapter (I) summarizes the results of a comprehensive literature review on IT function agility that were published as a research paper (Tapanainen et al. 2008) and are included as an appendix to this dissertation. The other subchapters detail a supplementary literature review on the role of IT managers in IT function agility. This supplementary review includes two parts: a review of the IT manager (II), including IT and business alignment, and a review of the chief information officer (CIO). Moreover, the review of the IT manager's contribution to IT agility (III) includes change and knowledge management, agile groups and individuals, and transformational leadership. As this dissertation is focused on the information systems management field, most of the literature discussed hereafter concentrates on that field, but relevant topics in other fields are also included.

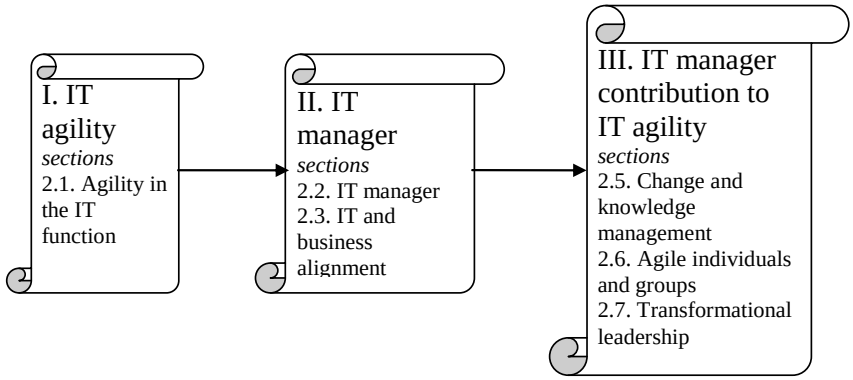

Figure 1: Structure of the literature review

The topic of this dissertation is an examination of how the IT manager contributes to IT agility. IT agility is a relatively new concept that combines the concept of agility – previously researched in strategic, organizational, software development, and manufacturing contexts, for instance – to the IT function in the organization. IT agility may also be seen as an extension of the organizational agility concept to the subparts of the organization, which includes the IT function as well. In this research, we reach the conclusion that IT agility should be interpreted as the agility of the IT function itself on the one hand, and as IT-business partnership agility on the other.

We have expanded the research question of the dissertation to reflect this decision. Henceforth, we will start from the concept of agility of the IT function in particular, then shift the focus onto the IT manager, and next move on to review the literature on possible ways the IT manager can contribute to agility.

2.1 Agility in the IT function

The capability of organizations to withstand turbulent, rapidly changing conditions has been examined in the past via concepts such as agility, flexibility, and dynamicity. For example, Evans (1991) quotes numerous articles from the 1930s to the 1970s addressing diverse aspects of strategic flexibility, e.g. oscillations in the business cycle, organizational flexibility in rapidly changing or uncertain environments, and flexible manufacturing systems. Sherehiy et al. (2007) claim that agility is the latest stage of development of these concepts and is used to refer to the ability to adjust and respond to changes and uncertainty in the environment. Agility has previously been examined extensively with regard to strategic agility, agile manufacturing systems, agile software development, agile development teams, and agile project management (Sherehiy et al. 2007). They argue that all definitions of agility emphasize speed, flexibility and effective response to change and uncertainty. In addition, the literature on strategic agility, e.g. Overby et al. (2006), argues that a proactive sensing aspect is pertinent in agility.

IT can be considered both an enabler and a disabler of agility for organizations. On the one hand, IT provides new possibilities for the organization to do business. On the other hand, IT binds the organization into certain configurations and processes that are facilitated by the technology. In many cases, the latter disabling aspect can predominate because although IT offers these new possibilities, they are long-term solutions and do not necessarily answer the daily challenges and changes that emerge from the environment. Thus, IT can be viewed as a barrier to the changing capacity of the organization. As the significance of information systems in business increases, the need for agile IT management will grow in significance. It is of utmost importance to examine the ways IT functions can be made agile.

Our literature review finds that, among the articles examined, the first article linking agility to the IT function was published in 1991. The 24 articles that were found to link agility with the IT function were grouped into five categories:

- Agility in IT organization structures (e.g. centers of excellence and the skillful management of outsourcing),
- Agility in the IT workforce (e.g. the capability of an individual to be sensitive to changes in the environment and act accordingly),
- Agility in IS development processes (e.g. an iterative, rather than comprehensive, approach in the development of information systems),

- Agility in IT management and leadership (close working relationship between IT and business management), and
- Agility in IT infrastructure (e.g. the usage of standardized modules to foster interoperability, and the capability of technology to link people together).

These categories largely agree with the previous literature that uses several categories to describe IT function agility (Duncan 1995, De Michelis et al. 1998). However, this literature review arrived at its classification via a comprehensive methodology. Moreover, the IS development processes dimension of IT function agility is an addition that was not addressed by previous models. Figure 2 below compares the prior categorizations with the one proposed in our literature review.

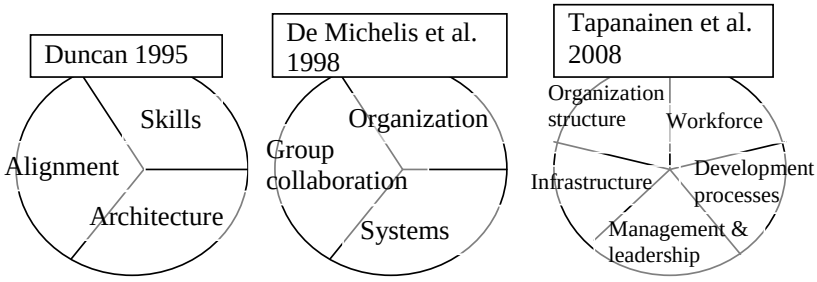

Figure 2: IT function agility components

As is apparent from the review, IT function agility seems to be related to several subject areas within the IT function. Although strictly speaking the categories represent themes that have been discussed by researchers in connection with agility in IT functions, they also suggest that these researchers have interpreted some part of the locus of agility to these issues. Therefore, it is reasonable to assume that overall, in the opinion of research included in this review, agility in IT functions is composed of the agilities in these categories. Almost all areas of organizational existence in IT functions seem to be included. The categorization reinforces the idea that IT function agility is a comprehensive concept that is present in all aspects of the organization. Let us now think about the definition of agility anew and make conclusions on that basis.

Most researchers agree that agility is about an effective response to change and uncertainty (Goldman et al. 1995, Kidd 1994, Sharifi & Zhang 2001) and that speed and flexibility are at the core of agility (Gunasekaran 1999, Sharifi & Zhang 1999, Yusuf et al. 1999). Numerous researchers differentiate between agility and flexibility, defining for instance that whereas flexibility is a predetermined response to a predictable change, agility is an innovative response to an unpredictable change (Wadhwa & Rao 2003), or that flexibility signifies the capability to detect changes, and agility signifies the capability to not only detect, but also to respond to changes

(Lui & Piccoli 2007). In most cases where this separation between flexibility and agility exists, agility is seen as a higher level capability. Here, we do not differentiate between the concepts.

Definitions of agility differ in many ways as well. Dove (2001), and Sharifi and Zhang (1999) maintain that agility implies the capacity to proactively take advantage of changes. According to Conboy and Fitzgerald (2007), an agile entity learns from change. Some researchers posit that agility is a state that balances change and stability. For instance, Overby et al. (2006) propose dynamic capabilities to be a source of agility, and Custodio et al. (2007) suggest that agility consists of dependable practices that produce repeatable results. Mooney and Ganley (2007) propose "loose coupling" of IT infrastructure/systems and business and organization processes to allow for changes. Yet other researchers consider agility as an array of possibilities for the organization that can be realized when needed. Mårtensson (2007) describes agility as consisting of three abilities – versatility, reconfiguration and reconstruction – that make it possible to respond to changes, while McGrath and Boisot (2003) suggest adapting the real options view as an analytic structure to examine flexibility. There is also literature that attempts to define various agilities for organizational issues, such as Sambamurthy et al . (2003) with their customer agility, partnering agility and operational agility, and the research of Lui and Piccoli (2007) specifying technology agility, process agility, people agility, and structure agility based on the work of Bostrom and Heinen (1977). These latter attempts are similar to the results from the literature review presented above.

While some prior literature proposes that fairly generic best practices be adopted to promote agility, other literature suggests an insight into how to approach the objectives stated above. The consensus among this latter literature seems to be that organizations should make investments that are not necessarily profitable in the short term, but can bring benefits in the long term. Thus, to survive the challenges of the future, the organization should have a long-term vision, attempt to forecast coming changes, and actually make monetary commitments to prepare for future eventualities. Although this insight is not exactly a major innovation, it certainly serves as a point of emphasis for organizations that face increasingly high pressures to "act in the moment". The definition of agility may intuitively be seen in this trade-off between preparation for the future and tackling current problems.

Even though they posit different viewpoints on agility, the basic objective of agility in each of these definitions seems to be similar – the capability to respond to changes. However, these definitions fail to address important details, such as how to measure agility, and what, if any, is the link to performance of the organization. For instance, almost any organization is able to sense and respond to changes in its environment. What is *agile* sensing and responding, and what kind of improvement does it bring to the organization? Moreover, is agility something unique, like an inimitable competitive advantage, or is it possible for several organizations to be similarly agile? Is agility relative to other organizations or alternative states of the same organization, or is there a universal measure? Is it possible to quantify agility objectively, or are all measures necessarily subjective? Most of these questions are

poorly, if at all, addressed in the existing literature. Indeed, if the IT manager contributes an improvement to the IT function (signified by "a" in Figure 3, step A), how can we determine that it exists as part of the IT function (step B)?

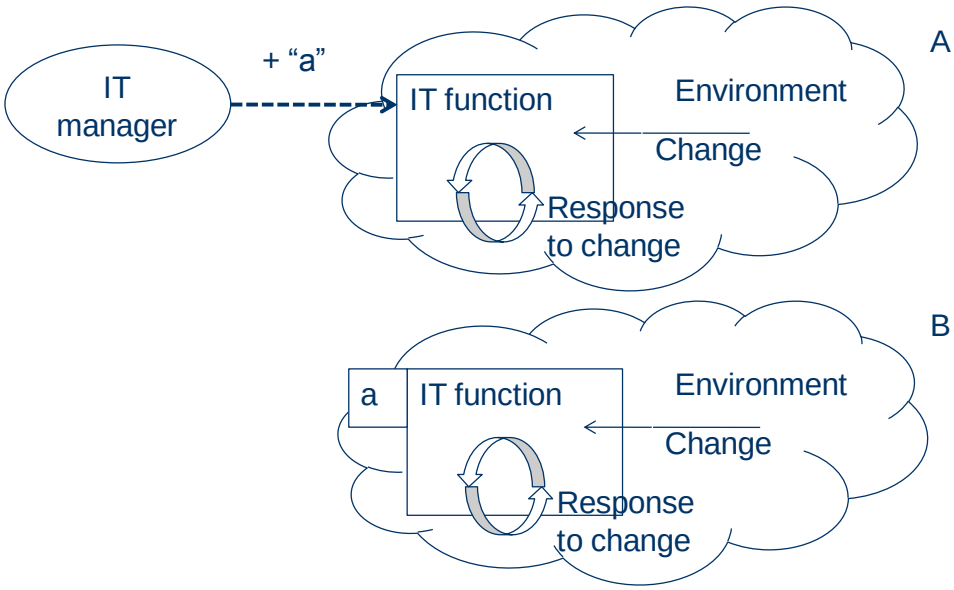

Figure 3: IT manager's effect on the agility of the IT function

Some research has attempted to answer the previous questions. Zhang (2007) proposes that IT support for strategic agility should contribute to firm performance, and similarly, Mårtensson (2007) links agility to effective seizure of business opportunities. Van Oosterhout et al. (2007) contend that agility is relative to the industry sector characteristics and organization-specific agility need. Similarly, Gherardi and Silli (2007) argue that the viewpoint ascribed to agility is, much the same as for the concept of "success", politically constructed, and thus dependent on the group that "owns" the concept. Conboy and Fitzgerald (2007) give a measure for agility, stating that agility should maximize customer-driven efficiency and effectiveness. Several researchers claim agility should lead to high quality and highly-customized products (Gunasekaran 1999, Kidd, 1994, McCarty 1993, Tsourveloudis & Valavanis 2002). However, it seems that these definitions offer little more than guidelines for generalized "good governance" of organizations. To elucidate, the critical issue seems to be whether attempts to create agility are actually the same as common sense entrepreneurial actions.

One answer to the issue of how to determine the "value" of agility to the IT function may lie in the IT function – business collaboration that justifies the existence of the IT function in the organization. Most prior research seems to treat

agility as an intrinsic characteristic of the unit being analyzed. However, some of the literature above does indeed attempt to understand agility as an externally verifiable property. As is already included in the model of Duncan (1995), alignment between IT and business can provide for this dimension of IT agility. Because this division occurs in the literature, in this research we opted to use the concept of "IT agility" to account for both the intrinsic IT function agility and the extrinsic component of agility with regard to the IT function, here termed IT business partnership agility.

To answer the research question: "What is the contribution of the IT manager to IT agility?", we should next address the levels of analysis issue. As mentioned above, the locus attributed to agility in previous research has most often been the organization/enterprise, or the team. The former approach is prevalent in strategic and enterprise agility, whereas the latter is prevalent in software development agile methods. In this research, we have already addressed the organizational level. To gauge the contribution of the IT manager in IT agility, we are specifically interested in addressing the group/team level of analysis, with particular focus being on IT function teams in which the IT manager is taking part in, and the individual level of analysis, which has not received a great amount of interest in the past. As the actor of interest is the IT manager, however, before dwelling on how agility is exhibited in groups and individuals, it is necessary to understand the role of the IT manager in the organization. The next subchapter describes the IT manager.

2.2 The IT manager

The IT manager is a generic concept that has not been strictly defined in the literature but is commonly understood as a manager in charge of IT issues. Here, IT managers are defined as IT staff with management responsibilities and who are employed in the IT function. It should be noted that some employees with IT-related responsibilities are employed in other departments, but they are not IT managers by this definition. Figure 4 shows the role of IT managers. They primarily exercise leadership over IT workers. The work in which IT managers lead IT workers can consist of both regular line work and project work. Frequently in IT organizations, the daily operation of systems takes precedence to maintain the support of business in transactions but special project work is also necessary, for instance to carry out maintenance tasks. The leadership relation above subsumes both line work and project work.

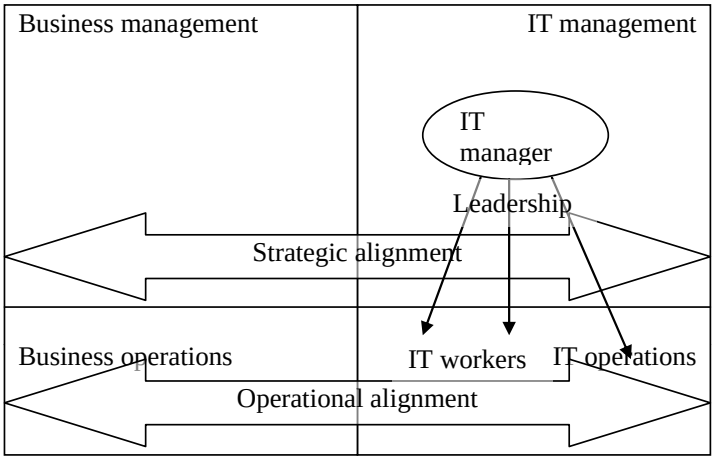

Figure 4: The IT manager's role

One way to describe the duties of IT managers is to look at the IT function in terms of the outputs that are expected from it, in other words, the contribution of IT to the organization and its objectives. IT can act as the provider of competitive advantage to the business that can help the organization to perform in a superior way or better than its rivals. According to the capabilities theory adopted by Peppard and Ward (2004), organizations' competitive advantage emerges from the competencies, i.e. the ways that resources are utilized. They identified 26 IT competencies in six domains, and argue that these competencies are formed by various combinations and networks of the roles of organizational actors (Figure 5), in the organization's structures and processes. IT managers comprise one such possible role. As most of the competency groups identified by Peppard and Ward are managerial competencies such as strategy formulation, IT contribution and capability formulation, exploitation and support, it is natural that IT managers have an important stake in the creation and maintenance of each of these competencies. They do this by drawing upon skills, knowledge and experience in both business and IT, possessing the appropriate attitudes, and behaving appropriately in the job as indicated in Figure 5. While a single individual may not necessarily have all the necessary faculties, a group of people can work together to provide the required skills, knowledge, and experience for a given competence.

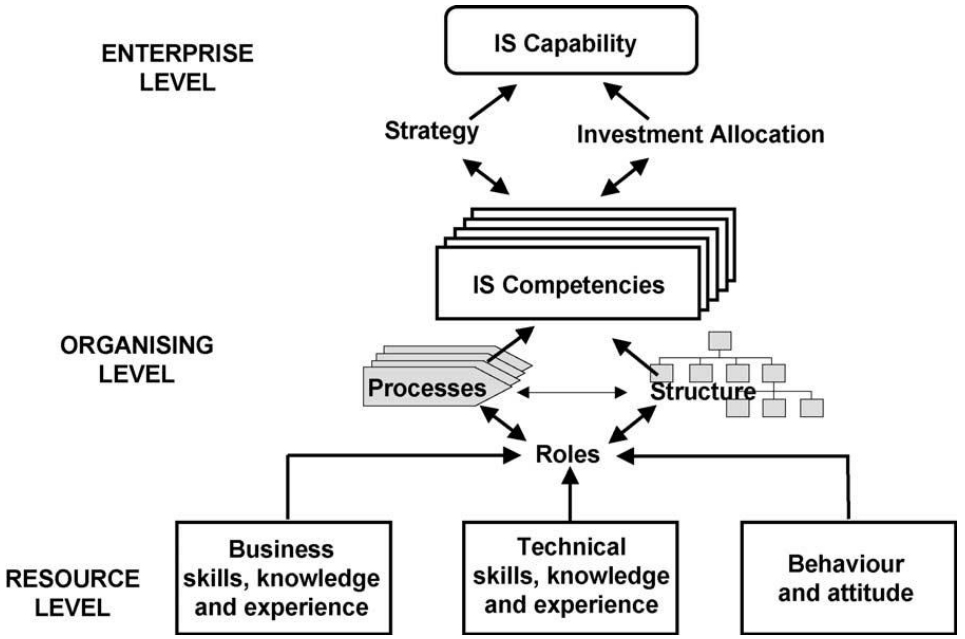

Figure 5: A model of the IT capability (Peppard & Ward 2004)

Wu et al. (2004) found that the perceived importance of managerial skills for IT managers differed across levels of management but did not significantly differ across industries. According to their study, leveraging internal and external resources, standard operation procedure design, and others were included among the skills considered important for the supervisory level that is the lowest managerial level. The middle manager level emphasized recruiting and crisis management in addition to those of the supervisory level. For the top level, organization design was included in addition to the ones important for the middle level.

As is evident from the study of Wu et al., one of the most important skills for IT managers is communication and coordination with both internal IT function employees and employees and managers from other functions. In many cases, IT is a supply function to the organization, and its task is to provide technologies and services to the business functions in order for the organization to have the capacity to serve its customers. However, one of the perennial challenges for IT managers is this communication and coordination with extra-function employees and managers. The inability of IT staff, including IT managers, to relate to business staff or users (Boddy et al. 2008) has been widely recognized. A culture gap exists between IT and business staff that causes the following problems (adapted from Boddy et al. 2008):

- Business staff
  - fail to communicate the business plan to IT
  - fail to contribute to the strategic planning of IT
  - fail to communicate requirements to IT staff
  - fail to appreciate IT complexities
  - emphasize the cost of IT

- IT staff
  - fail to understand the business environment
  - fail to match IT to business needs
  - fail to market the benefits of IT
  - are preoccupied with IT technicalities

Thus, IT staff do not understand what business staff do and need, and vice versa (Boddy et al. 2008). This culture gap is a very important problem for contemporary organizations. Willcoxson and Chatham (2006) found that IT managers exhibit task-oriented behavioral styles and consequently appear to tend toward positioning IT in a service rather than a strategic role. They may thus have problems building relationships that are needed in a true partnering relationship with business executives. However, there have been numerous attempts to bridge this gap. According to Khandelwal (2001), it is critical for IT managers to gain a business-oriented perspective, but it is equally important for the chief executive officers (CEOs) and senior business executives to develop a management-level understanding of IT. Sauer and Willcocks (2002) suggest the training of "organizational architects", workers from either a business or IT origin that have knowledge of both fields. Weiss and Anderson (2004) claim that IT managers and senior IT staff must increasingly assume change and risk management roles and orchestrate the cultural and political interests of multiple stakeholders. They must assist business problem-solving in addition to addressing problems in their own field.

It should be recognized that IT issues in organizations are not defined exclusively by the cultural gap between IT and business professionals. Huang et al. (2003) report "subcultural divides" within both IT and business groups, that are evident in the opinions of front and back office staff, regardless of IT or business orientation. In the study, front office staff were more inclined to accept innovative solutions, whereas back office staff were opposed to them. This division was one reason why the project in question failed to reach its targets. While the provision of some solution to such subcultural differences as well as IT-business differences alike are part of the IT manager's job, the approaches to these two problems have been somewhat different. We shall therefore discuss the latter, that is IT business alignment, first, and return to the topic of facilitating change in the IT function in section 2.5.

It seems that this IT-business alignment is one of the greatest challenges that IT managers face. As the literature on IT agility indicates, the value of agility in the IT function may be gauged by how well the IT-business link is realized in an

organization. Several of the definitions of agility that mentioned the objective for agility used concepts that can only be measured from the business side. Thus, it is crucial for IT agility to examine how IT-business alignment is working in the organization. In the next section, we move on to address IT-business alignment.

2.3 IT and business alignment

In most organizations, the IT department is responsible for technological support to external customer-oriented services that are provided by the business functions of the organization. Therefore, the role of the IT function is a support role for business, and it becomes necessary for the function to provide a service that (1) matches the need of the business functions and (2) changes according to the changing needs of the business and ultimately the final target customers of the organization. This alignment of the IT function to the business is a crucial issue for the IT function, and makes it feasible to produce benefit to the business from IT resources (Boddy et al. 2008). Indeed, some of the most important responsibilities for IT managers are to create and maintain this alignment. The alignment concept is multilevel. On the executive level, a formal IT strategy that is aligned to the business strategies is one way to support alignment. Today, it is often required that this strategic alignment is two-way, i.e., not merely aligning IT goals to business goals, but also considering the contribution of IT to the business (Rockart et al. 1996). Another executive-level issue is the formulation and maintenance of IT decision-making rights and responsibilities so that all relevant parties will be considered. This latter issue is called IT governance. Alignment should also exist at the operational level so that the IT services provided address the need of business functions, but ultimately, these lower-level issues are subservient to alignment decisions made at the higher, executive level.

Henderson and Venkatraman (1999) present a model of strategic alignment between IT and business, positing that two types of alignment are necessary. These are strategic integration between business and IT strategies, and operational integration between business and IT infrastructure and processes (Figure 6). In addition, they claim there are several facets within the framework of IT strategy that need to be addressed within strategic IT decision-making, such as competencies, technology, and IT governance. Henderson and Venkatraman describe alignment as always being two-way. Their model is one of the most cited IT alignment frameworks.

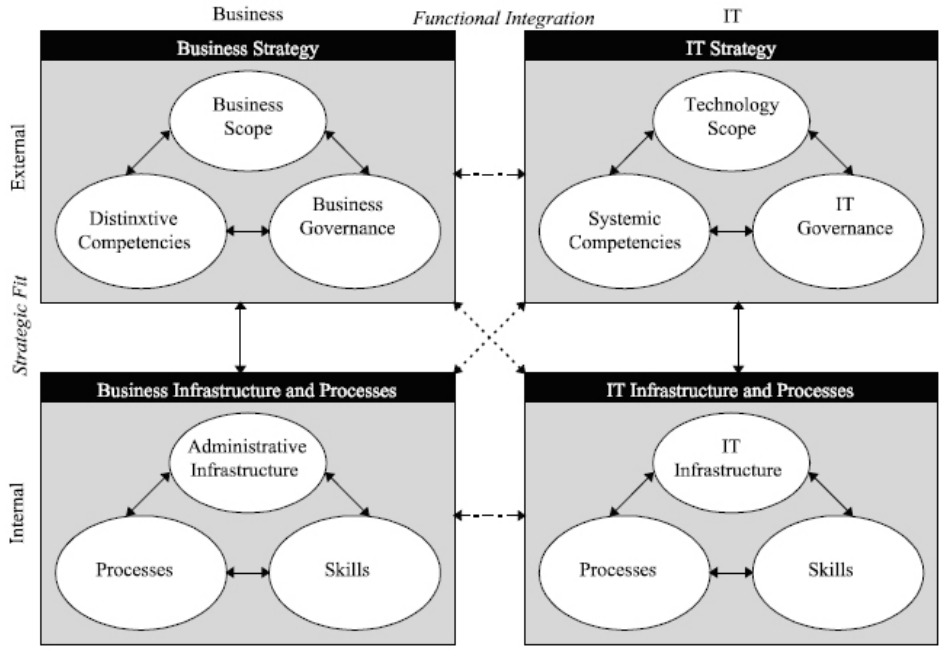

Figure 6: Strategic IT/Business alignment (Henderson & Venkatraman 1999)

In practice, there seems to be a gap between IT and business managers in building alignment (Booth & Philip 2005). One dimension of this gap is the perception that IT managers concentrate on technological issues, whereas they should have an organization-wide perspective on the business (Khandelwal 2001, Pervan 1998). However, CEOs were also perceived to be relatively weak in understanding IT issues (Khandelwal 2001, Pervan 1998), creating obstacles to achieve understanding and consensus in IT decision-making. Indeed, alignment has been a perpetual problem in organizations and a widely researched topic in the IS field. Along the practical "how to achieve" problem of IT alignment, another problem of alignment has been the "how to maintain" one. With frequent changes in the environment, even if optimal IT-business alignment were to be achieved at one point in time, it is not clear if that advantage could be maintained for a long period. A successful IT alignment process would have to be sensitive to changes both in the environment the organization is placed in as well as the internal changes occurring, for instance a change in business strategy. A perfect alignment process would be dynamic.

Galliers (2009a) posits that information systems strategizing has to assess four aspects (Figure 7):

- a demand-oriented information infrastructure strategy that assesses what is offered to solve clients and partners' needs
- "an exploitation strategy that addresses the use of already existing IT resources and knowledge (March 1991, Raisch et al. 2009)

- an exploration strategy that addresses new IT resources and knowledge that are sought (March 1991, Raisch et al. 2009)
- a change management strategy that strives to account for future needs of strategizing.

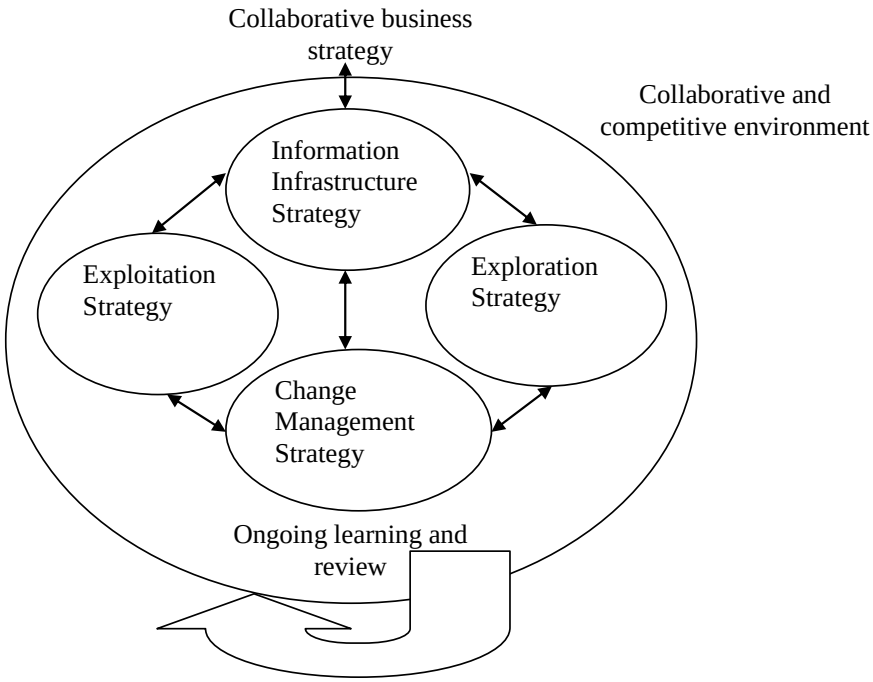

Figure 7: Framework for information systems strategizing (Galliers 2009a)

This model proposed by Galliers seems to capture agility in the context of IT strategic alignment: "the kind of socio-technical environment being proposed here…would facilitate both exploration (knowing) and exploitation (knowledge sharing) (March 1991, Raisch et al. 2009), and the kind of agility necessary to enable appropriate responses to changing business imperatives" (Galliers 2007, p.10). He proposes an exploration strategy that seeks to project changes in the environment, experiment, and find new ways of doing things to contribute to the existing practice and improve upon it, claiming that "agility is more likely to emerge from a creative process of exploration, and not from mechanistic, prescriptive and commoditized techniques and technologies" (p.11). He also includes a change management strategy to fit new knowledge and learning into that which already exists. Here, Galliers emphasizes the role of emergence, "tinkering" and "bricolage". He associates agility with the exploration strategy in his framework in particular,

which produces new ways of doing things in the organization. This exploration strategy seems to be close to the innovation concept, but with a wider focus, including not simply formal product-centered activities but also all grassroots-level "mindfulness" to improve current work practices. What results is a dynamic system of maintaining a strategic alignment not unlike agility.

The need for dynamicity in IT strategic alignment has been recognized for some time in academic literature. This dynamicity has often been seen as a requirement to periodically or constantly assess the strategies and the state of alignment, and thus has resulted in the addition of a process task – that of review – to strategizing. The lesson learned from Galliers and certain other scholars (e.g. Salmela 1996, Salmela & Spil 2002) is that alignment is a dynamic concept that has to be reviewed constantly according to changes in the environment, both internal and external to the organization. The result of this process is the mutual ability to adjust and respond to changes in IT and business so that strategic plans and operational structures can be aligned in a suitable way.

Another aspect of IT-business alignment is IT governance, whose literature underlines that IT management should work with business management to effectively govern IT resources and competencies (Nolan & McFarlan 2005). In this task, the responsibility of business management has been particularly emphasized. Weill and Ross (2004, p.8) define IT governance as "specifying the decision rights and accountability framework to encourage desirable behavior in the use of IT". They see IT governance as a part of corporate governance that is the responsibility of the executive team, and see its development as a process of harmonization of six elements (Figure 8, arrows indicate harmonization). Thus, IT governance requires alignment much the same way as IT strategies and processes. IT governance arrangements/mechanisms harmonization indicates internal consistency, whereas the link to enterprise strategy/organization and to business performance goals indicate external consistency in IT governance.

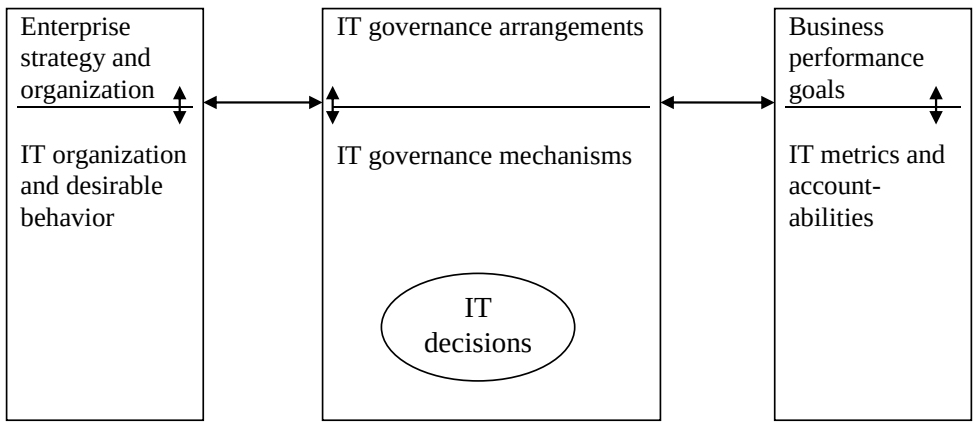

Figure 8: IT governance design framework (Weill & Ross 2004)

Criticisms toward IT alignment have been posed regarding the possibility of achieving dynamic alignment, but also regarding basic questions such as exactly what and who is being aligned (Galliers 2009b). Galliers points out that alignment should incorporate not only strategic considerations, but also the demand and supply of IT as suggested by Earl's (1989) alignment model. Current alignment models tend to concentrate on the strategic dimension. Earl poses the question whether, given the concept of alignment, suppliers, customers, and communities of practice (Brown & Duguid 1991) of organizations should be included, and points out that alignment is an inherently problematic concept, because overdoing alignment might have the unhelpful result whereby "serendipity" is diminished in the organization, leading to reduced capability to innovate. While recognizing these challenges, many researchers nevertheless consider the pursuit of IT alignment as a worthy objective (Chan & Reich 2011).

The implementation of IT alignment in organizations presents a mixed picture. On the one hand, Booth and Philip (2005) report that large organizations recognized the importance of the relationship between IT and business, and a service ethos prevailed in the IT function. IT managers appeared to be shedding the image of pure technologists. Likewise, the importance of information was recognized on the business side as well. The more fast-moving the environment, the more committed the business management was to the management of IT. The authors conclude that IT should continue to strive to change the attitude of management and prove its value to business in order to deploy IT in more innovative ways than before. On the other hand, business managers questioned the value of IT planning in a fast-changing environment. According to the research of Sabherwal et al. (2001), dynamic IT alignment is not easy to achieve. The companies examined tended to stick to a pattern of IT alignment and to make only incremental changes unless extensive changes became absolutely necessary, often with strong pressure from outside the organization. Unfortunately, such extensive changes did not always result in improved IT alignment – further corrective changes took place to adjust the IT alignment. It seems that IT alignment is at best challenging to achieve, but that there have been successes as well.

In summary, IT-business alignment is a major responsibility of the IT manager. Contemporary understanding of these issues underlines the need for IT and business to work together in a reciprocal relationship to provide benefits for the business from IT resources. Although the planning aspect is traditionally strong within IT strategy research, current approaches suggest that collaboration among IT and business executives, frequent iterations, and dynamism within the strategic alignment process are crucial. Similarly, IT governance takes collaboration as the starting point, emphasizes the practice of management, and a sound process to manage the decision rights and responsibilities for IT decisions.

Boddy et al. (2008) review the literature and conclude that the placement of a chief information officer (CIO) at the top of the IT function helps address IT issues at the uppermost decision-making level of the organization. Another suggestion has been that an IT steering group be commissioned, which has the responsibility to

bring relevant decision-makers together to address these issues. In practice, both these methods are often utilized. The next section introduces the CIO role and explains the specific tasks that are entrusted to it in comparison with other IT managers.

2.4 The Chief Information Officer (CIO)

One special category of the IT manager – as mentioned above – is the chief information officer. The CIO position was first referred to by Synnott and Gruber (1981) when information technology increased in importance in corporate functions. The CIO is the leader of the IT function, but his/her main task is to represent IT to business functions and to work toward a continuous alignment between the IT and business functions, in order to support the competitive advantage of the firm (Benjamin et al. 1985, Grover et al. 1993, Stephens et al. 1992). Before the title of CIO existed, the wider IT/IS manager or MIS manager terms were used to refer to the leader of the IT function, but actually the tasks set for CIOs are somewhat different than for other IT managers, even though there is considerable overlap. The responsibilities of the CIO are wider than for most business managers as well, including knowledge of technology, business and people management (Weiss & Anderson 2004). The CIO also provides leadership in IT governance (Rau 2004). Most large organizations have a CIO, they often report to the CEO, and they work in the executive team (Benjamin et al. 1985, Grover et al. 1993, Stephens et al. 1992).

Below (Figure 9), the role of the CIO is shown. It describes an organization, its IT and business functions showing both management level and operational level, and the IT governance/strategic decision-making team. Here, the teams are treated as one group, but in practice, it should be recognized that organizations do have various structures for IT decision-making. The model shows business executives and the CIO participating in the team. In practice, the format of the IT governance/strategic decision-making team varies across organizations, but here, it is assumed that the CIO and business executives do participate in the team. As there is a CIO position, it is assumed that the organization is of sufficient size to permit an IT function with both the CIO and other IT managers in addition to other IT workers. Small organizations might combine the CIO role with the chief executive officer(CEO) role, or with other executive roles. In the picture, lines to/from the CIO toward the IT function indicate leadership relationships toward the other IT managers. However, for CIO – business leaders within the IT governance/strategic decision-making team, a partnership relationship exists. The CIO has no official superior-subordinate relationship with these other leaders. In this case, partnership signifies an influence relationship that is vital for the team to function appropriately.

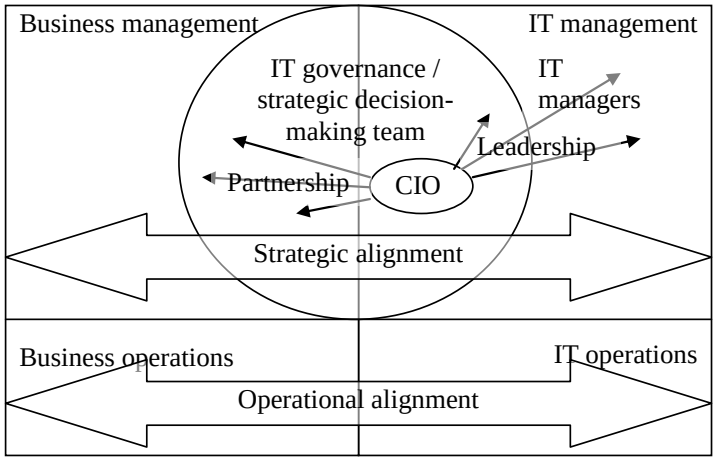

Figure 9: The CIO's role

Depending on the governance mechanism adopted, the structure of IT decision-making differs across organizations. The most important division between these approaches seems to be whether the business or IT has the upper hand in decision-making, but typically, senior business executives (CxOs), business unit leaders, and/or IT executives participate (Weill and Ross 2004). Nolan and McFarlan (2005) suggest that an IT governance committee responsible for strategic IT decision-making should be set up and staffed by senior business directors from around the organization. Although the CIO should participate and assume a leading role within the committee, he/she should not chair the committee, but rather act as a technology expert and an opinion leader with regard to IT (Figure 10). Nevertheless, the CIO should have an important leader role within the committee.

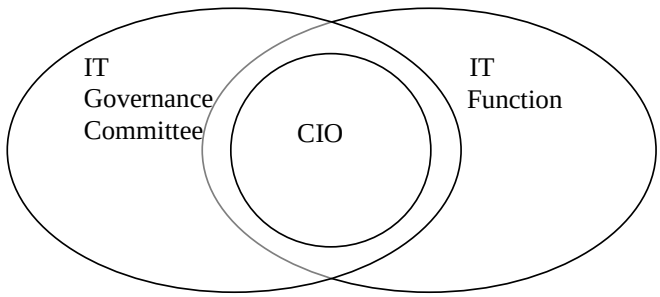

Figure 10: The CIO's position according to Nolan & McFarlan (2005)

The difference between the CIO and the IT manager is that non-CIO IT managers do not typically participate in the IT strategic decision-making team of the organization, and do not decide on issues of IT governance. Of course, this depends on the organization, but in this typical case, an organization having a CIO is assumed and for that reason, the CIO is assumed to be the primary external representative of the IT function. Non-CIO IT managers may partner with business representatives, but in this case the partnering role is defined to be the CIO. A skilled CIO would be able to support the strategic decision-making team in the strategic alignment task to make the group arrive at an appropriate understanding of the role of IT in the organization, and therefore make alignment of strategic plans and governance arrangements feasible. The CIO, while providing expertise and cooperating in the strategic decision-making team, also has to possess the faculties to observe the environment and encourage consideration of changes according to, or in anticipation of, those influences. The same holds true for IT governance. However, the CIO does not function as the official leader of the IT governance/strategic decision-making team.

In practice, it is quite difficult to evaluate who is the CIO, or indeed whether there is a CIO in the first place in the organization. This is because those managers who are in charge of organizational IT do not necessarily carry the official title of CIO. This may happen for instance in cases where the organization is very small, in which case there is no need to appoint a CIO. The CEO or the finance executive can be charged with the CIO's responsibilities. On the other hand, executives with the CIO title may not necessarily be CIOs as per the definition. This case can surface in situations where organizational arrangements or the culture set requirements that conflict with the traditional CIO role. The background of the CIO also varies. Some organizations prefer to have CIOs who come from the business department and who are trained in IT, while others prefer to have CIOs with a technical background, trained in generic business management. Sometimes a technical background can be seen to work to the CIO's disadvantage by distancing him/her from the other executives. A study found that IT managers tend to be more task-oriented than relationship-oriented, hampering their people leadership skills. Their focus on control may also inhibit the consideration of IT in a strategic role (Willcoxson & Chatham 2006). Enns et al. (2003), however, found that the technical background of the CIO does not impact his/her use of influence behaviors, i.e., it does not have a negative impact on his/her ability to influence his/her peers. There seems as yet to be no agreement whether a business background or an IT background is more advantageous for CIOs.

Chun and Mooney (2009) conducted a survey of CIOs in the United States, and found evidence of three capabilities that CIOs most need in their job. These are relationship building, business systems thinking, and leadership. CIOs indicated in their research that the five most significant attributes required of today's CIOs were: (1) the ability to contribute to corporate strategy; (2) competence in business process innovation and design and the ability to anticipate business needs; (3) expertise in managing and demonstrating IT costs and their impact; (4) effectiveness in publicizing and raising IT's profile and position within the company; and (5) strong

communication, negotiation, and facilitation skills. Chun and Mooney also found that the CIOs in their study fell into one of four roles along the dual axes of IS strategic orientation (risk-oriented or risk aversive) and IS infrastructure (centralized or distributed).

Descriptive surveys of CIOs around the world suggest that there are national differences in competencies required of CIOs, CIO tenure, and reporting relationships (Gottschalk 1999, Iwasaki 2008, Kamioka 2008, Matsushima & Isobe 2006). For instance, Iwasaki and Obi (2007) report that CIOs in the United States emphasize IT strategic planning and organizational planning, whereas their Japanese counterparts emphasize leadership and management, as well as process and change management. Bensaou and Earl (1998) claim there is a qualitative difference between how IT is managed in the West and the East. They refer in particular to the case of Japan, whose IT management they state to be less IT-centric than that of the West. Indeed, Japanese CIOs often hail from the business management (Iwasaki 2008) and undergo lengthy career development in various departments of the organization before finally ending up in the position of CIO. Government CIOs in Japan are also significantly different from their private sector counterparts, having little technological expertise and relying on their aides (assistant CIOs) for IT knowledge (Matsushima & Isobe 2006).

As the representative of the IT function in business functions, the CIO's role is also important with respect to the agility of the IT function. In this "gateway keeper" position, the CIO has the responsibility to create good relationships with business executives. If he/she fails in this task, the best efforts of the IT function to provide good service might be in vain. Business functions could extend their suspicions and misgivings toward the CIO as an individual to the entire IT function. However, a well-managed relationship may bolster the CIO personally. In particular, CIO relationship skills have been investigated with reference to the chief executive officer (CEO). The CIO-CEO relationship is regarded as vital (Feeny et al. 1992, Earl & Feeny 1995) and has an influence on IT involvement on top-level decisions (Jones et al. 1995). The CEO-CIO relationship also impacts on the similarity of IT perceptions between these persons, along with culture and industry variables (Tai & Phelps 2000). Channel richness and communication frequency predict convergence in various dimensions between the CEO and CIO (Johnson & Lederer 2005). Richer communication channels seem to predict greater shared vision regarding the future role of IT (Johnson & Lederer 2007).

The nurturing and training of "hybrid managers" (Earl & Skyrme 1992, Skyrme 1996) was introduced in the 1990s to emphasize the need for a new type of manager. These managers are capable of understanding both IT and business issues. Indeed, the concept stems originally from the IT alignment literature, where the culture gap between IT and business professionals has often resulted in difficulties for employees to communicate successfully, align their agendas, and help IT contribute to business goals. These hybrid managers, on the other hand, should be able to have (1) a deep knowledge of the organization where he/she is working, (2) general management skills, and (3) social/outgoing personal characteristics, in

addition to (4) knowledge of business and (5) knowledge of IT to advance IT-business communication and IT alignment in their organizations (O'Connor & Smallman 1995, Skyrme 1996). Hybrid managers can have any background – but IT employees often lack the people skills necessary for the hybrid manager without adequate training, and therefore many hybrid managers come from business departments. However, the concept has clear lessons for CIOs.

In this and previous sections, we have examined the roles and responsibilities of the IT manager. We have seen in particular that IT-business alignment is one important facet of the IT manager's job that focuses on the role of the CIO. One property of this alignment is the CEO-CIO relationship, and it is clear that when addressing the IT manager's contribution to IT agility, these human relationships and interactions do become crucial. However, in addition to this external dimension, IT managers also have internal responsibilities in the IT function. Internal management, such as taking care of staff performance, having formal planning mechanisms, building competencies, etc. are important for the sustainable operation of the IT function. In the context of agility, change and knowledge management approaches are particularly important. Change is necessary for agility and it often requires that the impetus for change, that is new knowledge and understanding, exists within the organization. The next section will move from discussing the responsibilities of the IT manager to reviewing what options IT managers have in terms of enacting change and knowledge management in the organization, and from there, what contributions they can give to IT agility.

2.5. Change and knowledge management

This section will concentrate on the capabilities of the IT manager to effect change. The idea of change management is much the same as for agility: internal change is necessary in response to external needs. The focus on continuous change is also similar, as exemplified by Galliers (2011), who points out that the change management strategy that was embedded in the strategizing model presented (ibid.) suggests an "incremental exploration of possibilities". Lewin (1947) specified that his freeze-unfreeze-freeze change model could be repeated and change after change could be carried out in sequence. It is also stated in the principles of Total Quality Management that the change must be "continuous" (Feigenbaum 1991); Bostrom and Heinen (1977) likewise argue that the sociotechnical design they advocate requires "continual examination of the new or redesigned system". Furthermore, Lyytinen and Newman (2008) propose understanding IS change as multilevel sociotechnical change that includes iterative change and sudden "punctuated" changes.

However, the change has perhaps more often been seen as originating at the will of human actors – that is, the management of the organization; whereas in agility, the locus of control is more amorphous and contested. Some of the first well-

known examples of change management were the automatization of factories in the United States by Taylor and Ford in the late 19th and early 20th centuries. These efforts greatly increased productivity in the factories by introducing scientific measurement of the work process and also brought technological advancements to the process, such as the assembly line. However, the changes resulted in monotonous, stressful work and worker-supervisor conflicts. The rationale for change was mainly decreasing waste and thus increasing output and profit from these business activities.

Subsequent decades brought further incremental improvements in optimizing manufacturing and business processes. For instance, Toyota made a series of improvements in manufacturing, called Just-In-Time or lean manufacturing methods. These methods created further incentives and pressures for companies to revolutionize their way of doing business – in this case, specifically to limit the amount of stock they produce and streamline supplier relationships. Another approach was the focus on quality. Total Quality Management and Six Sigma (originally pioneered by Motorola) suggested methods to minimize product faults by increasing the degree of standardization, measurability and transparency in production. The foundation of each of these methods was that they attempted to achieve a given result: a more effective and less wasteful production system whose output was higher quality products. Each of them made the organization better at responding to change, in particular the variability in demand or the sensitivity to customer preferences.

Concurrently, similar developments occurred in the IT domain. Design of work in organizations had not kept up with the development of IT, and Hammer (1990) proposed that antiquated processes should be reengineered in order to reap the benefits in efficiency for which IT allows. Eventually, the concomitant introduction of new business process changes became standard procedure whenever new IT systems were adopted. Another approach to improving work came from the sociotechnical school of thought (Bostrom & Heinen 1977). This faction maintained that the organization of work oriented toward maximum efficiency, e.g. via Taylorist methods, created inefficient organizational “silos” that diminished both performance and the well-being of workers. They proposed the formation of autonomous teams to improve motivation and counter deskilling in work that Taylorism accompanied. These movements demonstrated that, as with other technologies, IT held implications on how organizations would work. However, due to IT being a much more pervasive technology than its predecessors, the effects on working arrangements would be much greater. What the assembly line did to manufacturing, IT did to office work – and because many jobs had moved from automated factories to the office, the number of people that would be affected was that much greater.

Current organizations often have constant reengineering projects underway, and such projects are often based on the management trends of the moment. The change management movements of the past have given way to continuous change that in many ways seems to be the reason for the demand for agility in contemporary society. At the same time, the focus of change has moved from process and

technology issues to people issues. One of the classic ways change is captured is Lewin's (1947) "unfreeze-transition-freeze" cycle, in which he posits that change occurs in the transition phase, and argues an adjustment period to be necessary before and after the actual change. Change is no longer achieved at the proverbial flick of the wrist, people need time to change. Other approaches to address change include developments in the organizational learning field, which suggest that learning and innovation take place in communities of practice – small groups of professionals in the organization that educate new members by socializing them into the group and teaching them the tacit knowledge that is needed to perform their job (Brown & Duguid 1991). If managed properly, this learning and innovation can lead to the "learning organization" which has many of the traits that agile organizations are claimed to have. The competitive advantage research stream has likewise arrived at a similar concept, termed dynamic capabilities (Teece et al. 1997), that aim to describe the characteristics organizations should possess in order to create and maintain their competitive advantage over long periods. These dynamic capabilities have significant similarities to agility, and stress that learning and the renewal of intangible assets are crucial to organizational competitive advantage.

IT managers are continuously tackling the management of change. Often, however, this change is addressed to the business functions where new systems are being implemented. Therefore, many change projects are not focused within the IT function, but are rather one part of the service role of the IT function to its customers on the business side. For example, Hammer's reengineering theories are focused on the organization's business functions, where value creation takes place. The sociotechnical school in IT contends that systems should be developed to accommodate the social environment where they are being used. This environment refers to the user community in the business functions. While these activities no doubt increase the value of the IT function in the organization, they do not address the IT function's need to change according to environmental challenges.

Approaches that are well suited to change and knowledge management *within* the IT function may include the facilitation of the activities of communities of practice and the creation of dynamic capabilities. In the case of communities of practice, this would involve the construction of an environment that encourages small, informal groups of professionals to get together and share their knowledge, forming teams of highly skilled experts that are able to train new members, learn, innovate, and apply their knowledge in the work context. The role of the IT manager would be a facilitator role, with no direct steering of these groups. It is assumed that the informal groups are self-organizing and capable of managing these tasks without outside intervention, with the exception of facilitating environmental constraints so that these groups can function more effectively. The IT manager could also concentrate on building competencies to generate new strategic assets and coordinate/transform existing ones within the IT function. According to the dynamic capabilities theory, communication and partnerships increase the possibilities that learning will occur, leading to new strategic assets or combinations of already held assets. In addition to promoting communication and collaboration among internal

groups, the IT manager should scan the environment and enact rapid transformation that can present further opportunities for the creation and modification of strategic assets. Indeed, the dynamic capabilities theory greatly resembles the agility concept in terms of the requirement to "sense and respond" to external changes.

The conclusion, then, is that IT managers are facilitating change and knowledge creation both within and without the IT function. The external dimension has traditionally been seen as the more important among these two, as it is part of the service and support role of the IT function, and is connected to the IT-business alignment concept that was strongly emphasized in the IT manager's role. Nevertheless, in order to promote the viability and sustainability of the IT function in face of environmental change, internal reorganization also becomes necessary. Here, we presented two options from the previous literature for internal development of the IT function, of which dynamic capabilities interestingly resemble agility itself. However, as a relatively abstract concept, dynamic capabilities do not explain as to how the IT manager contributes to IT agility any more than agility does. In the next section where we discuss how the IT manager might contribute to IT agility, we apply something more akin to the second option, that is communities of practice.

2.6 Agile individuals and groups

At the beginning of this literature review, we introduced the concept of agility in organizations. The level of analysis issue in agility was addressed only with respect to the entire organization. Here, the concept is expanded to the group and individual levels of analysis. In order to investigate the contribution of the IT manager to IT agility, it is necessary to make this transition from the organizational level.

Sherehiy et al. (2007) reviews the literature on "workforce" agility and finds three groups of qualities that must be present in an agile workforce: (1) proactivity, (2) adaptivity, and (3) resilience. Proactivity refers to the situation when a person initiates activities that have a positive effect on a changed environment, e.g. anticipation and solution of problems related to change, and personal initiative. The adaptivity dimension is based on changing or modifying oneself or one's behavior to better fit a new environment. Examples of this activity are interpersonal and cultural adaptivity, spontaneous collaboration, learning new tasks and responsibilities, and professional flexibility. Finally, resilience describes the ability to function efficiently under stress and despite a changing environment, or when applied strategies have not succeeded. Positive attitudes to changes, to new ideas and technology, tolerance to uncertain and unexpected situations, and coping with stress are some ways how resilience can manifest itself. See also Dyer and Shafer (2003) for similar results.

Lui and Piccoli (2007) consider varied skills central to "people" agility. They argue that two variables, training level and job rotation, dictate how agile individuals are in terms of accommodating change. Those with high training levels and experience of jobs other than their main job are able to perform well in various types

of duties in the face of change. Taking another approach, Hodgson and White (2003) have investigated the mindset required for agility at the individual level, and found five skill sets. They identified risk-taking, motivation, simple and clear communication, prioritizing, and relying on instinct with hard facts to determine the right course in ambivalent situations. Considering these approaches together, the previous literature seems to underline the very same sensing and responding, and proactive and reactive stances in agility that were also found in organizational agility. The major difference in the emphasis of these researchers seems to be whether they consider agility to be related to experience or not. While Lui and Piccoli strongly advocate the role of skills and experience in agility, Sherehiy et al. and Hodgson and White are more oriented toward a "mindset" approach that can include abilities that are not readily learned.

The implication of these individual agility concepts are that IT managers may be seen to contribute to IT agility by the abilities and tendencies that are listed above. On one hand, the IT manager who possesses these abilities is capable of changing his/her own behavior according to environmental needs – perhaps better than the average human being. On the other hand, he/she can also cause a change in the IT function and in the organization at large, which results in better adaptation to environmental changes. Next, the occurrence of agility as a group-level concept in the existing literature is examined.

One of the largest concentrations of literature on agility with regard to IT refers to agility in information systems development occurring in teams (Dybå & Dingsoyr 2008). The Agile Manifesto (Beck et al. 2001) states twelve principles for agile software that relate to the process of developing software. The objectives of this agile software development process are to create competitive advantage for the customer and make the customer satisfied through speed and quality of the working software. Agility is seen to emerge from self-organizing teams of motivated individuals working together in close proximity with the customer, maintaining openness to changing requirements and continuously reflecting on how to improve their efficiency. At the group level, however, the group tasks have an important role in terms of the interpretation of agility. This view of group agility is specific to information system development teams, and may not be directly applicable to management teams, for instance.

Kozlowski et al. (1999) present a different concept of group adaptivity. They see the agile team as an extension of normal team development. Here, adaptivity and adaptability denote a capability of meeting performance demands in rapidly shifting contingencies, and are thus similar to agility (Sherehiy et al. 2007). Their model assumes that teams are composed of networks that comprise nodes (equivalent to roles held by people in teamwork) connected by links. The model prescribes three qualities for team adaptability: network selection, network invention, and coordination maintenance. Network selection refers to the ability of team members to rapidly select an appropriate network (pattern of workflow interdependence and coordinated interactions among roles) from their repertoire. This ability is facilitated by a shared understanding and mental models of the contingencies that connect

different networks to team tasks, and which team network is appropriate for what task situation. Adaptive teams have a repertoire of networks for different situations and are aware of indicators that signify when a change in configuration is necessary. Sometimes the appropriate network does not exist in the repertoire, and in that case, network invention is necessary. This is the ability of team members to create new networks rapidly. New roles and links must be established. Teams that have explored transaction alternatives are well placed to engage in rapid network modification. Finally, coordination maintenance refers to the ability to maintain coordination and pacing to meet the ebb and flow of novel task demands, and to avoid bottlenecks and overloads. Coordination is facilitated by understanding how pacing varies within a given configuration, and when to choose alternative configurations. Teams that have explored the fit of different pacing and coordination sequences to novel task situations will have a wider repertoire of configurations from which to choose.

This model is appropriate for all kinds of groups, including IT project groups, for instance. Han (2003) has further extended the model of Kozlowski et al. and investigated the linkages of individual and team-level adaptive performance, assuming that team-level adaptive performance emerges from individual-level adaptive performance, and is affected by team efficacy. Each team member therefore has individual abilities which they bring to the team, but it is the leadership of the IT project manager that amalgamates the individuals into one agile team. While Kozlowski's model emphasizes internal change and does not address the response or result dimension of agility that we saw was present in organizational and individual agility, those connotations may be strongly perceived in software development agility concepts, meaning that the proactive dimension of agility is not absent in the group level of analysis either.

In summary, this literature suggests that the IT manager could contribute to IT agility in two overlapping ways. One, he/she would exercise individual abilities as a leader in the IT function to affect the IT function and IT-business collaboration, in order to keep the organization competent and changeable. At the same time, he/she would need to keep his/her own knowledge and skills up to date and maintain personal agility if changing situations warrant new personal capacities. Second, the IT manager would lead IT function groups and IT-business collaborative groups and be responsible for the agility of these groups in the ever-changing environment. However, so far, there is no explanatory framework for combining these levels of analysis. Some connections are posited between the levels of analysis by individual researchers, but a comprehensive model is lacking. It appears that empirical work is needed to confirm the contribution of the IT manager to IT agility.

The literature review does suggest avenues for empirical research. Two things seem to be of particular importance. First, leadership practiced by the IT manager seems to be relevant for both approaches of the IT manager to contribute to IT agility – the personal and the group-induced approach. Accordingly, the next section reviews one promising leadership method that has relevance for agility. Second, the issue of partnership with the business functions should be examined. As

was shown above, this dimension is one focal route to evaluating the impact of IT function agility, and as the provision of service to business is also the most important objective for the IT function, the IT manager's contribution to IT-business partnership agility cannot be ignored.

2.7 Transformational leadership

Leadership is one of the oldest research fields and spans centuries of literature and numerous schools of thought. The oldest leadership theories concentrated on describing the behavioral characteristics of "great leaders" who were typically male military and political leaders such as Sun Tzu, Napoleon or Eisenhower. These theories contend that leaders are born and not trained. Later approaches concentrated on formulating elaborate theories on contingencies and situational factors that affect leadership, as well as the styles needed to deal with various contingencies. For example, it was claimed people could be led by rewarding desirable behaviors and punishing undesirable ones, or that people of certain level of skill and ability working in tasks of a certain level of difficulty would be best led using a given method. Although some approaches have waned in their popularity, the leadership field as a whole has continued to embrace those theories and they have not been proved wrong. It is clear that as a human behavior discipline, numerous approaches will continue to abound in leadership. Here, only one such approach is discussed.

When examining leadership, one crucial factor to be defined is the viewpoint of leadership. The traditional view of leadership is the leader-oriented view, in which leadership is seen to be beneficial for the subordinates, and whose prescriptions address the outcomes of the group of subordinates. In this kind of research, the outcome of leadership is emphasized and ways of improving the outcome are debated. Another view centers to the subordinate, and in this research, the interests of the recipient of the leadership are prominent. Frequently, this latter research considers the negative impacts of leadership (misuse of power, politics) on the subordinate and criticizes the authority of the leader. The third type of research takes the leadership relation as the research object and attempts to examine how the relationship is created and develops when leadership is expressed. Research on leadership traditionally follows the first approach, and the approach adopted here does so as well.

Despite the wealth of research on CIO-CEOs, there seems to be as yet little research on the characteristics of the leadership relationship of the CIO with his/her subordinates, that is other IT managers and IT staff. To be able to steer the IT function successfully, it is recognized that the CIO must have the ability to lead people. In particular, leadership is important in changing times in which the organization and processes are in a flux, because it is at precisely those times that the staff are most troubled and stressed in their jobs. Thus, not only conducting change management, CIOs should also be competent in leading their staff and

supporting them toward the transition to something better in their organization. Indeed, transformational leadership (変革型リーダーシップ) was considered a crucial skill for CIOs by 90.4% of Japanese CIOs interviewed (Nikkei Joho Strategy 2004). Furthermore, Gupta et al. (2009) found that effective CIOs exhibit behaviors consistent with transformational leadership. The empirical material from this research also indirectly suggests that transformational leadership is important for agility, prompting the researcher to investigate the approach further. When this research was carried out in Finland, a specific term was frequently used by the interviewees when they were asked about the skills important for agility. This term is *muutosjohtaminen*. In Finnish, both change management and transformational leadership are referred to as *muutosjohtaminen*. Due to the frequent references, the concept started to pique the interest of the author. The researcher realized that the interpretation of change management – which he was already familiar with – was not the only possible one. So far, the application of the concept of transformational leadership in IT has been limited, because most IT professionals and academics are relatively unfamiliar with leadership approaches.

Transformational leadership (Burns 1978) is one of the newer leadership paradigms. Transformational leadership emphasizes that certain characteristics of leadership can produce favorable team conditions and improve team performance (Bass 1985a). Transformational leadership theory provides an understanding of how leaders may influence followers to make efforts, commit to organizational goals, and perform in a way that is beyond expectations (Yukl 1999). According to Bass (1985(1)), a transformational leader is a person who:

- raises associates' level of awareness of the importance of achieving valued outcomes and the strategies for reaching them,
- encourages associates to transcend their self-interest for the sake of the team or organization, and
- develops associates' needs to a higher level in such areas as achievement, autonomy, and affiliation.

Thus, a transformational leader is someone who can create a transformational leadership relation between him/herself and the associates (subordinates). The paradigm is often contrasted with transactional leadership, which is defined as a leadership approach wherein the leader rewards correct behavior and/or punishes incorrect behavior. Later, the full-range leadership model was added, which considers transformational and transactional leadership as points on a single axis.

The dimensions of transformational leadership are (Bass 1985a):

- individualized consideration
- intellectual stimulation
- inspirational motivation
- idealized influence

Individualized consideration denotes the ability of the leader to take into account the individual needs of each subordinate, and respect the individual contribution of each. Intellectual stimulation refers to the ability of the leader to challenge the assumptions held by each subordinate and place intellectually demanding tasks on them. This dimension refers to the extent the leader can create a learning environment around the subordinates. Inspirational motivation is the leader's skill to articulate an appealing vision of a future state and to promote that vision so that the subordinates become motivated to act on the basis of that vision. It is very close to the concept of charisma that has also spawned a leadership approach of its own, i.e. the charismatic leadership approach. Finally, idealized influence is defined as the capability of the leader to become a role model and gain the trust of the subordinates through his/her ethical actions.

Lowe et al. (1996) found in their study that critical dimensions of transformational leadership correlate positively with subordinate satisfaction, motivation and performance. It mediates the link between emotional intelligence and team outcomes (Hur et al. 2011). Transformational leadership has been studied in many different contexts. Studies have shown that transformational leadership has a positive effect on performance in profit and non-profit (Egri & Herman 2000), educational (Harvey et al. 2003; Kirby et al. 1992), governmental (Wofford et al. 2001), military (Bass et al. 2003), religious (Druskat 1994) and sports (Charbonneau et al. 2001; Ristow et al. 1999) organizations. Thus, it appears to be an effective leadership approach for many types of organizations. Transformational leadership may be measured by the widely accepted MLQ (Multifactor Leadership Questionnaire) instrument (Bass 1985a).

Transformational leadership influences team performance via intermediate outcomes and teamwork process variables, but it has been found to also directly affect team performance (Figure 11). Here, teamwork processes refer to the quality of interpersonal relationships, which Dionne et al. (2004) define as communication, conflict management, and cohesion. Intermediate outcomes include shared vision, commitment, empowered environment, and functional conflict (Dionne et al. 2004). Thus, the team is a suitable level of analysis for examining transformational leadership.

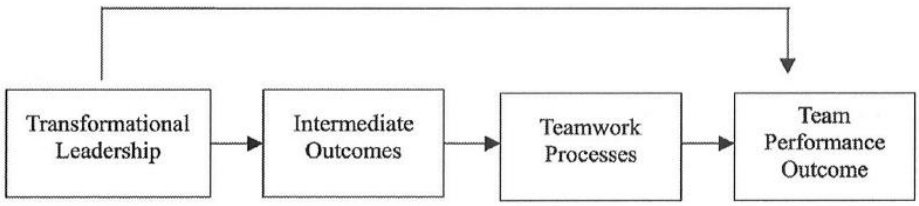

Figure 11: Transformational leadership and team performance (Dionne et al. 2004)

In this section, we have reviewed transformational leadership, and have seen that the approach can contribute to organizational change on the individual level by changing the values of the subordinates to match organizational objectives and to develop individual capacities to improve the dynamicity to the workforce in changing situations. On the other hand, the approach is useful in most types of organizations and particularly relevant for group leadership. These aspects make transformational leadership a candidate tool for the IT manager to promote agility in the organization and the group level as outlined in previous sections. The final subchapter shall summarize the literature reviewed thus far.

2.8 Summary of the literature

Some scholars have argued that technological changes are making the managerial cadre of contemporary organizations redundant (King 2011). They see the general management education that underlies the "chief executive" position as being a parochial phenomenon that has its roots in the industrial revolution and the resultant carefully planned and automated management methods that followed. Could it be, for instance, that today's self-made IT entrepreneurs that grew their businesses from humble garages to worldwide empires are the harbinger for a new kind of business leader who is no longer bound to the rigid cast of the traditional business executive? While there is always a leadership position for innovative, visionary individuals, the increasing complexity of technology and social and organizational structures suggests that people will be needed to understand and manage these aspects also in the future. King is undoubtedly right in that management education must keep up with these changes, but lacking the position of executive IT chief altogether, for instance, would not make it easier for companies to coordinate their IT services. Several researchers (Chun & Mooney 2009, Weiss & Anderson 2004) found that CIO roles and responsibilities have evolved to reflect contemporary challenges and unique organizational needs. The work of these scholars suggests that an integrative role between IT and business that increasingly includes strategic and change management tasks is needed in organizations. Thus, there continues to be interest in the capabilities of IT managers and CIOs.

Prior literature has painted a picture of the desirable characteristics of "ideal" or capable IT managers and CIOs. Researchers note that the enduring objectives within IT management – such as the IT-based competitive advantage and IT-business alignment – demand the existence of IT managers but also set very specific requirements on the abilities of these IT managers. These requirements naturally extend to future IT managers but increasingly to traditional IT managers who seem not to always measure up to the high standards set of them. For example, scholars point out that, in addition to technical skills, IT managers should have business and general management skills. These skills are particularly emphasized in the hybrid manager concept. The literature on CIOs argues similarly that business and people

management skills are crucial, because one of the main duties of the CIO is to help the business functions understand IT's contribution. To some extent, different capabilities are expected of the CIO than from other IT managers. The position of the CIO as the top IT executive means that the necessary skills are more strategic in nature. Moreover, the relationship between the CIO and the chief executive officer are emphasized in numerous previous articles.

Thus, the profile of the capable IT manager or CIO is well known in general terms. The purpose of this research is to examine the concept of IT agility in terms of these professionals. In other words, we are interested in whether the requirements and emphases from the agility approach toward the IT manager/CIO remain the same as what prior literature has already prescribed, or whether some other skills or new emphases can be found. As we have seen, IT managers and CIOs have an important role in organizations for the time being, and because fulfilling all the myriad expectations is by no means easy for them, there is a need for a more fine-grained view of their capabilities that can help researchers and practitioners to understand their work better. Next, the methodology of the research is described and discussed.

3 METHODOLOGY

In this chapter, the research methodologies used in this research are thoroughly described. The rationale for selecting these methods and how they fit the research questions are explained. The literature on the methods selected is reviewed and the constraints, weaknesses and strengths of the methods are discussed.

A wealth of literature seems to exist on issues related to the research questions. A significant number of articles on many disconnected research streams have addressed the role of IT in organizational agility and, on the other hand, the IT manager's job. Prior research on the role of IT in agility has been mainly conceptual, and therefore it is not clear how practitioners view the responsibility of the IT manager in creating agility. Moreover, there seems to be very little overlapping literature in these streams addressing the research question directly. Therefore, it seems that a fruitful approach could be to approach the question using a two-pronged method: first, to examine the role of the IT manager in the agility of the IT function empirically without any literature review, in order to capture the meanings that actors in the workplace assign to the role of the IT manager, and secondly, to conduct a comprehensive literature review on the agility of the IT function to interpret the results of the empirical inquiry again. Such an approach would allow both endogenous conceptualizations to appear as well as validating these within the framework of prior classifications.

We have chosen two mutually compatible research methods to answer our research question. The role of the IT manager in either IT function agility or IT-business partnership agility have both been little examined in prior works, making it important for empirical data to be obtained. As this is the case, the analysis process would also benefit from an analysis approach based on these field observations, because related literature abounds on the prescriptions for successful IT managers, for example. If we were to depend on the literature too heavily, that might lead to a confusing of the concept of agility with other related concepts and therefore unconsciously tempting the subjects of the empirical study to answer in a certain way. We opted for an inductive approach to firmly anchor ourselves to the field data, and to the understanding of the empirical subjects. As the issue being investigated is complex in both cases, the empirical method would need to accommodate a "thick" description. The qualitative research method is capable of this rich description. Both research sub-questions contribute to the overall research question 1, meaning that the data should be the same for these questions. If it were different, then contextual factors may confuse the results. However, after the literature review we gained an understanding that the IT manager's role in the IT-business partnership agility was

insufficiently examined, which prompted us to look at our empirical data again using another methodology. This is why we use two methodologies in this research, with one of them in a leading role and the other in a supportive role.

We utilized the grounded theory methodology (Strauss & Corbin 1990) as the main methodology, and case study methodology (Yin 1984) as secondary in this research. The empirical data was analyzed first using the grounded theory method to obtain an overall understanding of both RQ1.1. and RQ1.2. and then followed by the case method to fill in ground that was not covered in RQ1.2. This latter part was predominantly the IT manager's role in the IT-business partnership. Then finally, we combined these results with the literature review and interpreted the results to arrive at conclusions for RQ1. Figure 12 illustrates the methodologies and their relationships in this research.

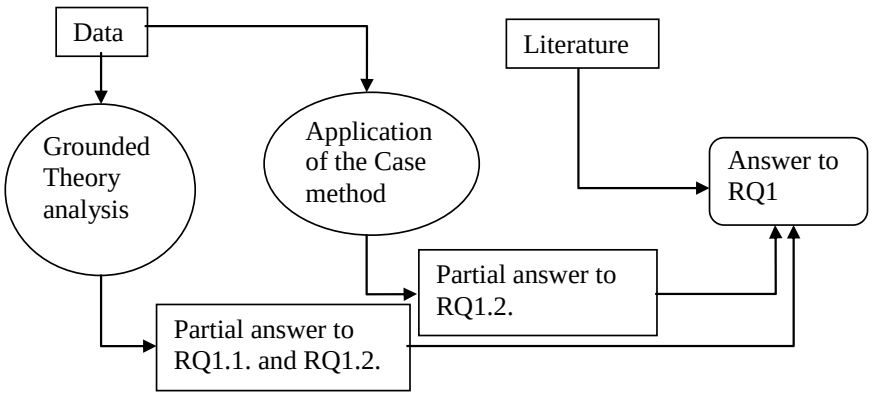

Figure 12: Research methods and their application to research questions

The justification for these methodologies is as follows. Grounded theory allows for the possibility of understanding the meanings ascribed by managers to the role of the IT manager in creating IT agility, and therefore it can provide an answer to the question that is well connected to the actual contexts and discourses in organizations. The methodology is especially appropriate for inductive examinations. The case methodology was subsequently used on the same data because the focus of research changed. Whereas the focus on the grounded theory analysis had been on abilities required of the IT manager, it was deemed insufficient to consider the IT manager alone in RQ1.2. The research question also moved from ideal abilities to the actual situation in the organizations. The case method was seen to be natural to this type of research problem and allowed the consideration of the IT-business relationship as it presented itself in the interviews. Table 1 summarizes the methodologies used with respect to each research question.

Table 1: Methodologies used with respect to research questions

Research question	Methodology
RQ1: How does the IT manager contribute to IT agility?	Comprehensive literature review according to Webster & Watson 2002. In addition, the results of RQ1.1. and RQ1.2. were interpreted to answer this question.
RQ1.1.: How does the IT manager contribute to IT function agility?	Grounded theory methodology used to analyze data as per Strauss & Corbin 1990. Literature and conceptual analysis used after the grounded theory phase.
RQ1.2.: How does the IT manager contribute to IT-business partnership agility?	Grounded theory methodology used to analyze data as per Strauss & Corbin 1990. Literature analysis and case study methodology used to analyze data as per Yin 1984.

The methodological approach of the dissertation may be further described with the use of Figure 13 below, in which Burrell and Morgan (1979) describe four paradigms of research into information systems. Functionalism denotes positivistic research that relies on natural science principles and the ontological stance that an objective reality exists apart from the subjective experiences of individuals. This paradigm attempts to create generalized theory and verify theories with mainly quantitative, but also qualitative methods. The social relativism paradigm generally rejects the notion that an objective reality exists, but rather attempts to gain insight into the world by examining individual perceptions of phenomena, with limited attempts to generalize between instances. Radical structuralism and neohumanism both subscribe to the belief that society is disorderly, and that conflict is necessary to promote change. These paradigms correspond to critical research approaches in the social sciences.

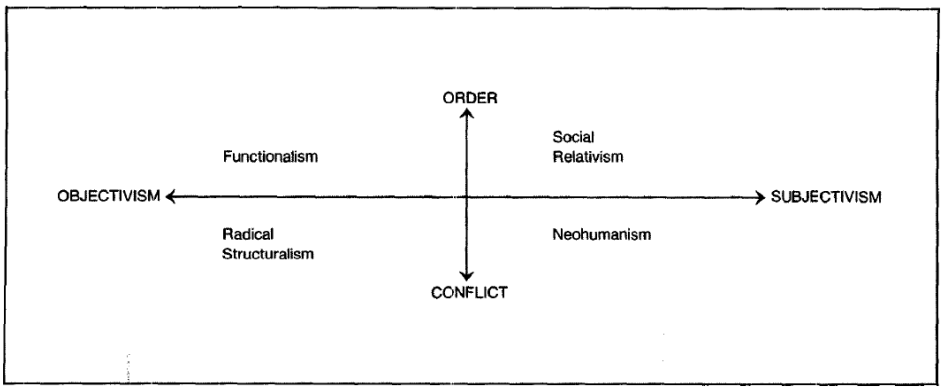

Figure 13: Information Systems Development Paradigms (Hirschheim & Klein 1989, Burrell & Morgan 1979)

To further clarify the methodological standpoint of this dissertation, it is possible to specify the position of each of the scientific articles in this dissertation in Figure 13. First, article 2 (in Appendix 2), utilizes the grounded theory method. Grounded theory assumes that theory emerges from data and does not employ typically positivist constructs such as hypotheses (Corbin & Strauss 2008). Corbin and Strauss specify that some of the assumptions in the grounded theory method are that the external world is a "symbolic representation" and is "created through interaction" (ibid., p.6), implying that the epistemological foundations of the method lie in interpretivism rather than positivism. However, there are also signs that grounded theory is positivist. The assumption that generalized theory is created from data is similar to the epistemological notions in functionalist theories. Thus, it seems grounded theory is not strictly functionalist or social relativist, and may be used as part of positivist or interpretivist research. Therefore, it is up to each individual researcher to decide how to utilize the method. In article 2 (Appendix 2) that used grounded theory, the results of the analysis were used rather in a positivist fashion, with the assumption being that they point toward a reality separate from the minds of individuals. This would give justification to classify article 2 as mildly functionalist.

All the other articles 1, 3 and 4 could also be categorized as functionalist to some degree. The literature review paper (Article 1 in Appendix 1) is functionalist due to the generalizing approach that was used to classify the papers analyzed in the review. The assumption was that each paper reviewed reflects a truth about the objective world, and thus the approach is nearest to functionalist types. The conceptual paper (Article 3 in Appendix 3), had a similar background with the assumption that examination of the literature can give a common view to understanding the environment, including project scenarios. Finally, Article 4 (Appendix 4) is a case study paper using Yin's (1984) methodology. Case studies are not inherently positivistic or interpretivist in character, they can be used as part

of both types of research approach. For example, Klein and Myers (1999) describe the tenets that interpretive case studies should follow. The premise in case studies is that they are essentially in-depth research into a single or multiple cases, where certain generalizations to larger populations can be made. Yin, however, states for example that case studies should be judged as being good if they can be favorably evaluated with certain criteria, including construct validity, internal validity, external validity, and reliability. These criteria are reminiscent of positivist research approaches, and are intended to verify that the research is "correctly" analyzing reality. It then seems that Yin's case method leans toward the functionalist approach. The article adopted an inductive analysis approach, which conversely weakens this functionalist tendency, but nevertheless attempts to generalize and would be classified as weakly functionalist.

Accordingly, it may be argued that each of the papers in this dissertation are functionalist, and further that all papers can be said to be located within the orderly or development-driven, rather than conflict-driven, field in Figure 13. Therefore, the methodological stance of the entire dissertation would be located somewhere in the upper left corner of Figure 13. However, the style of the dissertation is influenced by the data collection methodology, and thus, we would not classify it as strongly positivist in its epistemological standpoint. Other researchers, e.g. Eisenhardt (1989) and Kirsch (2004), have conducted research with a similar methodological and epistemological stance, combining grounded theory and case study. Similar to this dissertation, these studies utilized both theoretical constructs developed prior to data collection, and allowed for inductive reasoning from data.

In the next four subchapters, the research methodologies of grounded theory, case study, and the method used for the comprehensive literature review are presented. In addition, the research design is described in detail.

3.1 Grounded theory methodology

Grounded theory was used in this research to answer research questions (1.1.) and (1.2.). The approach as described by Strauss & Corbin (1990) is a methodology to create theory based strongly and exclusively on the data collected in a research effort. The approach thus has an inductive character. The data analysis procedures of grounded theory analysis are very formally defined, and the output of these procedures is a piece of theory, not merely a description of the research setting (Eriksson & Kovalainen 2008). These procedures follow similar data collection and analysis phases to the hermeneutic circle. However, the authors of the theory contend that theory in this case does not refer to a strict universal theory that is applicable without condition in any circumstance. Rather, they interpret theory to be an understanding of the problem setting that is the product of a procedural search for meaning based on empirical data.

The analysis process starts with open coding, a process that requires the researcher to read through the textual account of empirical observations and attach labels to key words and phrases line-by-line. These codes should be found in the account and describe generalities and uniformities in the data. They are thus one way of abstracting concepts important to the field of inquiry from the raw data. After this process, the relationships between these codes are investigated by comparing the datasets with one another. This phase is called axial coding. Thus, axial coding produces larger concepts called categories by linking elementary concepts together. Here, the researcher considers both the meaning of the codes as given by the informant who provided the account, and his/her own interpretation of the words at the same time to create connections based on causal connections or contexts. The final step in the coding process is selective coding, in which the researcher selects one category from those created in axial coding that forms the basis for the new "grounded" theory. In the process of coding, elementary concepts that are directly extracted from the data are gradually integrated into larger elements and become increasingly abstract. These steps were followed carefully in this research.

As the labeling/coding process is critical in grounded theory research, several instructions are given to researchers as how to create concepts, their interrelationships, and categories from the raw data. The researcher is urged to "ask the data questions" that are related to the original research idea, and to try to give a proper name for a category of a given incident in the data. The researcher should analyze the data at word level when needed, but at other times perform "theoretical memo writing", referring to considering the set of codes obtained thus far as a whole. This process is similar to the alternate examination of individual parts and the whole that takes place in hermeneutics. Validation of the interpretations of the researcher happens by comparing the generated hypotheses from the categorizations and relationships and testing these hypotheses against field data. At this stage the construction is said to become a "theory".

Grounded theory is appropriate if the researcher wishes to approach the problem setting relatively open to novel interpretations and conduct inductive research, while still being sufficiently familiar with the research subject to be able to make meaningful observations and conclusions from the data. This was the case with our research questions. Strauss and Corbin prescribe that the researcher should enter the research field soon after the research field has been defined, and should maintain a balance between objectivity and sensitivity in the process. The latter, sensitivity, means the researcher has to be able to give meaning to the events in the field, for example through personal experience in a similar setting, but that at the same time, he or she should be prepared to encounter unexpected events which can provide an important insight into the research problem at hand. The former, objectivity, means that the researcher should be convinced that the results are meaningful and impartial. However, Strauss and Corbin emphasize sensitivity more than objectivity because grounded theory is by its very nature closer to instantiated, contextualized research rather than objective, generalized research.

Charmaz (2006) gives the criteria of credibility, originality, resonance, and usefulness that can be used to judge the merits of grounded theory research post hoc. The number of interviews done was extensive and each was analyzed using a consistent, structured method prescribed for grounded theory. The results of the analysis were used as the basis of further deliberations in this dissertation. Thus, the credibility of the research appears to be rather strong. Considering the originality dimension, previous research has not examined this particular topic in the past, and therefore this research fills a theoretical niche. This research is original in that it uses data collected without *a priori* theoretical fetters. However, the results categories – that is the capabilities of the IT manager that are contributing to IT agility – show that capabilities that are useful to the IT managers in many regards are also useful with regard to promoting the agility of the IT function. Thus, despite the fresh stance on collecting data, the results of the research confirm what has been said in the related literature, and this is particularly reassuring regarding the research question of this research.

The results of the grounded research do take account of every instance in the data where the interviewees talked about the IT manager's role in promotion of agility, and related topics. Thus, we included passages that were not direct causal argumentations as to the contribution of the IT manager. In this way, the widest possible range of interpretations has been captured. It was noticed in the later stages of the project where data was collected that the interviewees and company representatives did indeed feel familiarity and agreement with the results of our analysis. Thus, the criteria of resonance may be said to have been reached. The results do also have practical value. The categories identified show areas that should be considered when improving the agility of the IT function. More research, however, would be needed to confirm exactly what kind of capabilities are required and how they should be utilized. Even though this research is restricted to reporting these categories as interpretations of the interviewees (affected by the researcher's involvement), many people were involved in the study, and as such, it is quite probable that these categories do represent widespread views.

3.2 Case study methodology

In this research, the case study method is applied to one part of the research question (1.2.). The aim of case research is to examine the selected case or cases in light of its context (Yin 1984). One of the principles of case study is the inclusion of many and varied information regarding the focus of investigation. The method is especially applicable to situations where the object of examination is highly complex in nature, so that multiple information sources are needed to be analyzed and also presented to the audience of the research exposition. Defining the boundaries of the case is key in case research. However, the case is investigated holistically, not merely delimiting the research to certain variables or aspects of the case. Case studies may further be

categorized into intensive and extensive approaches (Eriksson & Kovalainen 2008). The former approach concentrates on finding out as much as possible from a few cases, whereas the latter concentrates on generalizing the findings from a group of cases. The approach used here is the extensive case study.

Eisenhardt (1989) provides an overview of the steps required in case research. First, the researchers should formulate a research question, specify the unit of analysis and methods of data collection and analysis, and possibly specify constructs that can form the basis of the field investigation. Next, the cases are selected based on a pre-understanding of the target population and theoretical sampling to fill out conceptual categories that are expected to be relevant. The actual intervention should utilize multiple data collection methods on both qualitative and quantitative data if possible, and be conducted by multiple investigators to avoid researcher bias. It is advisable that analysis is conducted in parallel with data collection, and the methods in use should be constantly re-examined for relevance and emergent themes. The analysis is first done within the individual case, and then progressing on the cross-case topics with multiple different perspectives in order to capture various interpretations. This takes place by tabulating data according to constructs for each case and iteratively verifying these hypotheses using field data. The hypotheses should not be correlational but rather looser propositions regarding the existence or non-existence of a phenomenon (Johnston et al. 2000). Yin (1984) presents five different techniques for analyzing cases: pattern finding, searching causal explanations, time-series analysis, and cross-case analysis. Each method can be used in extensive case studies to produce meaning to the results. The researchers should also utilize the extensive data available and ask why certain hypotheses are confirmed while others are not. In the cross-case phase, the theory is also brought to use to understand the findings. Literature that supports the hypotheses but also literature that is in conflict with them should be used.

As with the grounded theory methodology, case studies also make use of coding of the data. There are two possibilities for conducting this operation. One is to use a preplanned coding system, which makes use of the concepts in the researcher's existing theoretical framework. The second is inductive coding, in which the case and its context are taken as the basis for creating codes. This latter approach is particularly similar to the grounded theory coding method. Even in this case, however, the use of concepts from prior research is not prohibited. They are often used as a sensitizing device to help describe the phenomenon at hand. The guideline when formulating the codes using the latter method is that the researcher should be "asking" issue questions from the data, i.e. attempting to find out the meaning of the piece of information rather than concentrating on an externally verifiable aspect of the data.

The above empirical and analytical work is repeated until a sufficient understanding of the research question is reached. Here, the principle that should be followed in selecting cases is called replication logic (Yin 1984). According to replication logic, additional cases may be selected to replicate the conditions in the first case to provide more evidence of the results in that case, or they can be selected

purposefully to show a counterexample of the conditions in the first case. They can also be selected to conform to conditions categorized in the theory of the research. There is no minimum number of cases prescribed, only that each case should add something important for the study. However, the crucial thing is that similar data is collected from each case to enable comparability between them. Extensive case studies do not describe the cases in as much detail as the intensive ones, because the researcher has a specific focus already in mind regarding what kind of information is relevant for each case. The results of case studies may be generalized to theory by means of analytic generalization (Yin 1984), in which the researcher replicates the findings in other cases where the conditions for the results of the first case are found to apply. In extensive cases studies, this evidence may already exist as part of the research design.

Case research is compatible with grounded theory (Eisenhardt 1989) and this made it easier to apply case research, as the data being analyzed is the same. As required in case studies, we selected the cases used as prescribed by taking the contribution that each case would bring to the research into account, even though those cases were restricted to the original set of data gathered. Each case was analyzed holistically using coding methods and considering the organizational background that was stated in the empirical material. Eisenhardt (1989) notes that a successful application of the case method results in parsimonious, logically coherent and testable theory that is supported by the data. The theory should be backed up with evidence on the sample, data collection procedures and analysis, ruling out rival explanations and giving a new insight. It is argued that the results of the case method in this research have succeeded in conveying such theory to some degree. While the results do not claim that the explanation given would be the only one, it presents one reasonable possibility as an explanation for a complex phenomenon that has the further interest that it has often been ignored in prior literature.

3.3 Method used in the comprehensive literature review

The comprehensive literature review ("Towards an Agile IT Organisation: A Review of Prior Literature") described in the appendix (Tapanainen et al. 2008) was completed as per Webster and Watson (2002). As described in the article, this process took place in five phases. In the first phase, the information sources to obtain the articles for review were selected from among the more respected and influential journals of the information systems and management sciences. Next, appropriate keywords were chosen to find relevant articles that would be likely to fulfill the detailed constraints of the research. In this case, not only the most obvious keywords related to agility were used; the literature was consulted selectively *ex ante*, and this resulted in the addition of several keywords to the set that had previously been found to have a meaning similar to the sought concept. By feeding the keywords to search engines, the resulting list of 1,140 articles was the output

from phase one. This article set represented articles in IS and management journals that had the potential to refer to agility.

Phase two concentrated on screening the found articles by involving three researchers who took turns to examine the articles first by title alone, next by abstract, and lastly by reading the entire body text of the article. This happened by means of iterative exclusion of articles from the set in such as way that every time a researcher made an iteration by giving a pass/fail grade to the article, another researcher would take his/her place and examine that particular set of articles in the next iteration. For example, if an article was assigned "pass" in title examination by researcher A, the abstract would next be examined by researcher B. This guaranteed that no researcher was responsible for the same portion of articles from the beginning to the end of the screening, and thus minimized the effect of researcher bias in the screening. The author was one of the screening agents involved. The researchers had an agreement as to what kind of articles would be allowed to pass, and discussed unclear cases in a group. This agreement was based on the definition of agility as the proactive and reactive mechanism for sensing and responding to change.

The third and fourth phases of the research worked on the list of articles that had been produced by phase two. In the third phase, the references of the articles resulting from the previous phase were analyzed using the same screening method as in phase two. The fourth phase utilized the Web of Science citation index by searching the articles that cited the articles identified in phase two, and likewise followed the screening method of phase two. Thus, phases three and four provided extra articles for the review by extending the search to articles that were good candidates regarding the research theme but were not identified in phase one. The fifth and final phase consisted of focus screening in which the articles inappropriate for the research question – that of agility regarding the IT organization – were excluded. In other words, articles dealing only with business and enterprise agility and not with IT agility were excluded. The result of these iterations of literature search was 24 articles that were analyzed and categorized according to the viewpoint each emphasized in IT function agility. We summarize the results and expand upon the literature review in the prior research section.

3.4 Study design

This section describes the data acquisition methods and the data analysis methods actually used in the research, within the constraints outlined in the previous section. Differences between the ideal data collection and analysis methods and actual practice are critically examined and discussed in the limitations section.

The research comprises the following data acquisition methods as shown in Table 2. Interviews were used to obtain data. Interviews have the property that a large amount of data on a highly specific topic can be collected and subjected to

fine-grained analysis. The requirement for both research questions was that a complex situation could be interpreted, meaning that a method allowing the collection of rich data was needed, and this is the reason interviews were implemented for these problems. Other data, e.g., company internal documentation was collected to a minor degree in this research, but this was not explicitly analyzed in this research, and thus, the main effect of that data was to give background knowledge to the researchers that helped to understand certain interview statements, and react appropriately in the interviews.

Table 2: Data collection methods with respect to research questions

Research question	Data collection method
RQ1: How does the IT manager contribute to IT agility?	Literature review. In addition, the results of RQ1.1 and RQ1.2 were interpreted to answer this question.
RQ1.1: How does the IT manager contribute to IT function agility?	Conducted 40 interviews to IT and business managers in five Finnish organizations. This is a portion of a seven-organization field research in which 94 managers were interviewed.
RQ1.2: How does the IT manager contribute to IT-business partnership agility?	As above for RQ1.1, and in addition used 27 interviews of the same data set again concentrating on the relationship of IT and business managers in three Finnish organizations.

The collection of empirical material was possible as part of a research project (itLEPO, an abbreviation of "information technology leadership potential") that took place between 2007-2009 and in which the objective was to investigate the "agile management of IT services". The seven organizations (Table 3) participating in the research project were the research subjects. Each organization paid to participate, and it may be surmised that these organizations participated due to having a recognized need to develop their own IT services. Thus, it seems likely these organizations were oriented toward the less agile or less capable IT function type rather than to the exemplary IT function type. The mix of organizations in the project was rich – both public and private, international and national, large and medium-sized organizations were participating. Each organization had an IT function and decision-making processes regarding which mutually comparable information could be collected. Although the selection of organizations was based on the principle of possible access, the resulting set was determined to be suitable for this dissertation research because it was thought to be beneficial to examine diverse organizations, and therefore to collect varying interpretations of the role of the IT manager.

The interviews were conducted early, most during the autumn of 2007, before the literature review described above could be completed, and thus without an in-depth understanding of the problem setting. Therefore, the understanding of the researchers had not yet developed to a level at which the research problem could be seen holistically. However, such a situation is compatible and actually required by the grounded theory research method. The guideline used by the researchers entering the field was their own preconceptions of the locus of agility in the IT function and the issues involved. There was some interaction with the interviewees before the data collection, in particular with the contact persons of the organizations. Of the people who were interviewed, 30 attended a seminar on the topic prior to the interviews. The seminar can be said to have "primed" the attendants on what agility means and probably affected communications regarding the project within each organization. On the other hand, the researchers obtained a tentative understanding of what practitioners think about agility and the connected issues. The author was not present at this seminar, but was responsible afterward for the communication with the cooperating organizations and participated in the preparation of interview templates. The author was wholly responsible for design and inclusion of questions regarding the role of the IT manager in IT function agility.

The empirical effort resulted in a total of 94 interviews of 81 minutes length each on average (Table 3). The interviewees were, with four exceptions, all manager-level employees of their respective organizations. As can be seen in the table, the interviews were well balanced between business and IT employees when looking at the entire set of interviews, but at the organization level, they were skewed either toward the business or the IT side. In particular, the profile of the Infotech company is different from the others, as it is an IT service provider, and all interviewees were classified as IT employees. Some interviewees met twice with different researchers, and thus the number of interviews is somewhat greater than the number of interviewees. Of the 94 interviews, 34 were conducted by one researcher – the rest were conducted by a pair of researchers. The author himself participated in 54 interviews, of which six were carried out alone. The research project also involved analysis of certain documents, e.g. related to IT strategy of the organizations, but the documents were not included in the materials of this dissertation research at all.

Table 3: Organizations participating in the research, interviews and interviewees by business/IT-orientation of the interviewee

Organization	Business	Staff	Inter-views	Interviewees Business/IT	Interviewee status
Govt1	Government	10,000	11	Business: 3 IT: 8	Managers: 10 Experts: 1
Govt2	Government	15,000	19	Business: 15 IT: 3	Managers: 18 Experts: 0
Govt3	Government	5.000	15	Business: 2 IT: 10	Managers: 12 Experts: 0
Infotech	IT services	15,000	14	Business: 0 IT: 11	Managers: 10 Experts: 1
Insure	Insurance	1,000	16	Business: 9 IT: 3	Managers: 12 Experts: 0
Manu1	Manufacturing	15,000	13	Business: 9 IT: 2	Managers: 11 Experts: 0
Manu2	Manufacturing	1,000	6	Business: 3 IT: 1	Managers: 4 Experts: 0
TOTAL			94	Business: 41 IT: 38	Managers: 77 Experts: 2

The data collection method was the semi-structured interview (Lindlof & Taylor 2002). This interview type allows the researchers to formulate questions in advance, but leaves room for the interviewee to take up new conversation subjects, and also allows for unplanned topics to be asked by the interviewer. This method was thought to be particularly appropriate for the kind of data-centered investigation approach that was aimed for in the empirical intervention. It is also compatible with the grounded theory and case study methodologies. The preplanned interview questions reflected the understanding of the researchers regarding the issues and factors that would affect the research topic to be examined, but the scope of the questions was wide enough so that there was considerable freedom for the interviewee to answer, and enough time was reserved for the interviewee to bring his or her unique point of view into the conversation as well. Research questions 1.1. and 1.2. regarding which data was collected were represented in every interview.

The interview template used by the researchers included two parts: first, the obligatory part that was carried out from beginning to end with each interviewee, and second, the supplementary part that was used as help for the interviewers if they felt something more should be asked regarding a given subtopic. As mentioned, the focus of the research was on the "agile management of IT services", and the subtopics in part two included areas which the researchers saw as related to this topic, e.g. staff, communication, IT managers, anticipating change, information systems, IT project portfolio, and supplier relationships.

The main, obligatory part of the template included these questions:

- What changes do you see affecting the organization in the short term?
- What does the role of IT mean to you on the one hand, and to the organization on the other?
- How is IT fulfilling its role?
- What do you see is the meaning of agility?
- Why should IT services be agile?
- List three things that enable and prevent agility.
- What important changes have taken place in your organization, and how has the organization tackled them?
- Are the IT services agile enough? In what area are they agile and not agile?
- Who are the most influential people in promoting agility?
- Describe the agile IT manager/CIO. How does he/she promote agility?
- List three best practices that promote agility. Why are IT services agile or are not agile with regard to these best practices?
- How would you describe the co-operation between yourself and the CIO? (or in the case of the CIO being interviewed, "how would you describe the co-operation between yourself and the top management team?")
- How has organizational structure affected agility?
- How has the staff skill level affected agility?
- Describe the relationship with the IT suppliers.
- Would you say the agreement with the IT outsourcing partner or the internal IT department is sufficient?
- Describe how a couple of recent development projects were started.
- How have information systems affected agility?
- Is agility present in organizational values? How?
- How would you estimate the success of the IT service management?
- Does it seem that IT service management is actively following business changes?
- Has IT service management been able to implement difficult changes?
- What do you remember best regarding agility in this interview?
- What would you want us to emphasize in terms of agility?
- What should we do to promote agility within the boundaries of this project?

In addition, the interviewee was briefed on the research project and its objectives at the beginning of the interview. This briefing included an explanation of how the

researchers viewed agility. The concept was referred to consistently as the "capability to sense and respond to environmental changes".

After the interview data was collected, the grounded theory method was used to analyze the data. This process was as depicted in the description of the grounded theory method above. This was followed by the literature review and the application of case techniques (both also described above in the methodology).

4 RESULTS

This chapter describes the results gained from the empirical research connected to this dissertation. Because one of the important points in the research methodology was that the empirical work would be conducted without an in-depth understanding of the research field, the first chapter explains the pre-understanding of the researchers before going into the field to collect data. Next, an analysis of the viewpoints of the business and IT managers that were interviewed is presented. The impact of these results on the research questions is then considered. Finally, the answers to the research questions are given in the final subchapter.

4.1 Pre-understanding of the research topic

This section gives an overview of the understanding of the author with regard to the research topic prior to the commencement of the empirical research and the literature review.

We understood agility as being the capability to sense and respond to environmental changes. Traditionally, agility and other similar concepts such as flexibility and adaptability had been examined with regard to company strategy, manufacturing systems, etc., but they had not been seen in context of the IT function until recently. While the pace of technological change forces the IT department to reinvent itself rapidly, the function also faces environmental pressures to reform from the business side. As the owners of IT resources are often the business functions, and these resources are in any case supported by common organizational funds, the IT function must prioritize services that provide a real benefit to business. If intra-function arrangements do not allow flexible change, the function becomes a dead weight for the organization and lowers the business potential of the organization. IT function agility is thus crucial for the organization to remain viable. However, agility has remained thus far a rather abstract organizational-level concept whose dynamics have not been investigated. It is not well understood how agility can be created, maintained, or adjusted, and in particular, the role of the IT manager is unclear. We thought this research could contribute to our knowledge of what the role of IT managers in the agility of the IT function is.

The IT manager refers to an employee in the IT function of an organization who is entrusted with leadership duties. It is a generic category that includes such diverse occupations as project managers, line managers, executive officers, team heads, directors who hold regional and/or sectional responsibility, etc. The thing that

binds these various people together is that they are all leaders in the IT department. Previous literature emphasizes the responsibility of all IT function employees but specifically IT managers in creating and maintaining IT alignment with the business. Because IT is typically the support function for other organizational functions that bring in cash flow and/or provide a valuable service for the customers of the organization, it is essential that the IT function justifies its usefulness to the business by facilitating adaptation to environmental needs or at least not slowing down the process of adaptation. IT managers are critical in coordinating with the business to achieve a two-way IT-business alignment that in turn contributes to the awareness of environmental changes and the capability for the IT managers to make internal changes using their leadership in the IT department.

One important way in which the performance of IT managers can be evaluated in their job is IT alignment. As organizations face ever-growing needs to acquire and develop their IT capabilities, the historically clear distinction of the IT function as a specialist technical unit has diminished and the boundary between other functions blurred. Today's IT functions can exist in many forms: there are departments that have outsourced everything and exist solely as acquisition and management functions, there are traditional departments that still do all the work from software development to rollout, provision and maintenance of services; and then there are complex federal arrangements in which part of the services are entrusted to units under the direct control of business departments, but in almost every case, the co-operation between IT and business has become close in recent years. This has meant that a greater share of corporate profits depends on the successful utilization of IT. Almost all organizational members use IT tools to at least some extent. Indeed, the rapid concomitant change of information technology and business needs has created a scenario in which IT must dynamically adapt to the current situation on the business side – there exists no permanently optimal IT-business alignment. Thus, IT alignment gives justification for the need for agility, and it also describes much of the IT manager's job.

One of the most visible features of modern IT-business alignment is the nomination of a chief information officer (CIO), an executive leader in charge of all organizational IT. This position has become synonymous with the entire IT operation in organizations, so much so that personal abilities and disabilities can directly affect the reputation of IT in the organization. Conversely, success in organizing the IT function may bring great personal fame to the CIO. Nevertheless, the CIO represents the IT function across the rest of the organization and therefore is in a crucial position to develop IT-business alignment as well as to participate actively in IT governance, i.e., the setting and continued review of appropriate rights and responsibilities regarding IT decisions within the organization. Many prescriptions have been given to CIOs regarding how the relationship with the business and more specifically, with the chief executive officer (CEO) is managed. The CIO is one specific type of IT manager who may have a key role in agility as well.

The next section will present the findings of our empirical investigation with regard to the role of IT managers in IT agility.

4.2 Managers' perspectives on the research question

The results of the empirical inquiry were analyzed as reported in the research paper "The Agile IT Manager" appended to this dissertation. This data answers the main research question "How does the IT manager contribute to IT agility?" Grounded theory analysis of the interviews with managers of seven Finnish organizations regarding the contribution of the IT manager to the agility of the IT function yielded categories of skill areas where the "agile" IT manager is capable of affecting agility. These skill areas consisted of concepts that are typically attributed to leadership, strategic planning, knowledge of IT, knowledge of business, and co-operation (Figure 14). The interviewees seem to consider the contribution of IT managers to IT agility to be expressed in various ways, which are not germane to traditional conceptions of IT manager excellence. For instance, the capabilities and attributes required of today's CIOs according to Chun & Mooney (2009) are much the same as these skill areas. IT managers would be contributing to the agility of the IT function by doing what they generally are told to do well – there doesn't seem to be a specific "silver bullet" to improve performance in agility alone.

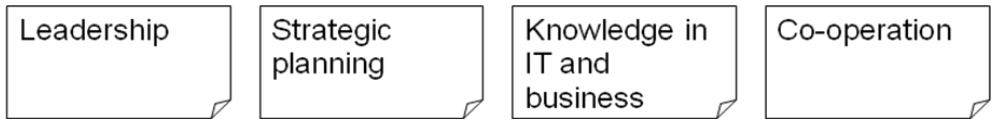

Figure 14: Main skill areas attributed to the IT manager who can promote IT agility

The results point to a wide interpretation of agility by the interviewees. Among the questions in the interview, the one that was most fruitful with regard to research question 1 was "Describe the agile IT manager/CIO. How does he/she promote agility?" Although other interview questions provided material for analysis, and some material was contributed by the interviewee without specifically asking a question, the majority of the material was seen as a response to this one question. As can be seen, agility was not defined in the question, nor was the specific mechanism by which the "agile" IT manager would be promoting agility. Rather, these details were left to the individual interviewee to think about. Next, we outline how the interviewees described the skill areas of the IT manager who was able to promote IT agility in their own words.

The interviewees described the leadership ability required to promote IT agility in the following way:

- "What is most important in our group is to be a kind of people leader, that is inspiring… and make the people follow. That is really helpful."
- "… inspiring and motivating, and… has created the group spirit…"
- "…a good people leader plus, at the same time, a demanding leader. That is, with equal treatment and, by trusting the people, you can earn the trust. If he can make the atmosphere such that we feel like we are doing real work, then we work, really crazy."

As may be seen from the statements, the opinions of managers tended to emphasize "people leadership". They connect an IT manager able to influence people as the kind of person who is able to promote IT agility. Although some interviewees also valued different kinds of leadership, such as command-oriented leadership, the majority seemed to advocate a softer, interactive leadership approach.

The IT manager should also be able to act as a strategist. These statements by the interviewees reflected this capability expected of the IT managers:

- "…a visionary… can concentrate on the company's long-term, life and death questions. He can see, like alternative strategies for the company. He should present alternative strategies for the company. In particular, he should see these threat factors and the company's weaknesses as an area that needs addressing. The visionary's problem is that he is rarely respected…"
- "…he should be able to see the role of the information management function and position the entire information management team correctly, in order to build the foundations for it… in particular with respect to the business and with respect to the system suppliers."
- "…he has to be a good visionary, a good strategist."

Statements on the strategist capability pointed out that the IT manager should move beyond the immediate concerns of the job and take a high-level vantage point over the organization, looking at what benefits the organization as a whole. From this vantage point, he/she should then generate strategies for the IT function based on the movements and scenarios that can be observed.

Knowledge of IT and business was also viewed as crucial. It surfaced in the interviews, e.g. in the following statements:

- "...knows what IT affairs are like the contents of his own pockets and then is familiar with the needs of users, and can combine these two"
- "Is familiar with the [IT] field… is able to describe the matter and its effects to these business experts… is capable of business thinking so that he is able to disentangle from this technology and support users in finding workable and economic solutions"

- "…should have a truly wide vision of the business field… in addition should have a grasp of IT to some extent, at least be familiar with the terminology".

The IT manager was said to had better know not only his own professional field but also the business that he/she is providing a service to. In addition to having knowledge in both, he/she should also be able to act as a bridge between these two worlds, to translate from IT language to business language and vice versa.

Finally, regarding co-operation, manager statements included the following:

- "…at least not a strong introvert, it is better I think, that he is capable of interacting with people and discussing things, and so forth."
- "...overwhelmingly crucial ability is co-operation ability, that is, I believe today and probably also tomorrow that business should decide how issues are handled, and we are the customers of IT in that regard."
- "...relationships with the business that are functioning very well."

The interviews pointed out that the IT manager who can promote IT agility must have the personal characteristics and traits to be able to co-operate as well as work to maintain relationships with the business departments.

In the next section, the research question is re-examined in light of the results of the empirical study.

4.3 Re-examining the research question

The empirical results pointed to the IT manager's role in IT agility being evident through leadership, strategic planning, knowledge in IT and business, and co-operation. The literature review then revealed that certain aspects found it important for IT managers to promote IT agility are fairly common requirements from effectively performing IT managers, and in particular, CIOs.

For example, the hybrid manager literature argued that managers should have (1) a deep knowledge of the organization that they work in, (2) general management skills, (3) social/outgoing personal characteristics, (4) knowledge of business, and (5) knowledge of IT to advance IT-business communication and IT alignment in their organizations. The results obtained from empirical data in this research pointed toward similar abilities for IT managers in the case of IT agility. In detail, we found that (A) leadership, (B) strategic planning, (C) knowledge in IT and business, and (D) co-operation are crucial for IT managers to support IT agility. These results do seem to corroborate that certain skills prescribed to hybrid managers also apply to IT managers that positively influence IT agility. In particular, knowledge of business and IT are listed in both requirements. It is not only the hybrid manager literature that talks about business and IT skills being important for IT managers – much of IT management literature has concluded thus. However, it is interesting to note that the

hybrid manager literature prescribes IT skills as important for all business managers aspiring to hybrid manager standards. Business, on the other hand, may mean a variety of things depending on the organization in question. While this means that the IT manager has to know his/her job and his organization, it also means that significant requirements are placed on other managers. It seems as if they have to know some of the IT manager's job as well.

Looking at the differences between the results herein and the hybrid manager literature, the results of this research showed an emphasis on collaborating and leading people that is less evident in the hybrid manager literature. It may be that instilling IT agility in the organization is a duty that requires soft people management skills in particular. On the other hand, hybrid managers are said to need organization-specific knowledge to operate successfully in their duties, and these were not present in our results for IT agility. Thinking about the objectives of each approach, reasons may be suggested for these differences. It seems that the goal of achieving IT alignment that is present in the hybrid manager literature is about achieving organizational harmony, but in contrast, the goal of building and maintaining agility in IT is more about achieving resilience and internal change-capability. The former might need someone with deep knowledge of the unique organizational context and very good social skills to be able to negotiate solutions acceptable throughout the organization. The latter would rather need an active leader figure, but one who is not too forceful in his/her leadership approach.

In general, these results suggest that agility is a property that is inseparable from day-to-day organizational affairs at the level of the IT manager contribution to IT agility. It is consistent with the literature review on IT function agility, which suggests that the agility of the IT function is broad-based and inseparable from the generic management of the IT function. Thus, the IT manager does seem to have a significant impact on IT agility. Therefore, our attention turned toward the ways that IT managers can promote IT agility according to the literature.

The literature review on agility underlined some interesting points. First, agility has been examined with regard to organizational, individual and group levels in previous works, and the latter two levels have also been linked together. There is, however, no comprehensive theory to link all these concepts. Second, the review found that the IT manager can be seen to contribute to IT agility via two means, on the one hand his/her personal management and leadership of the IT function and IT-business partnership, and on the other hand, his/her management and leadership of groups within the IT function. The former may be seen as a direct effect on agility and the latter an indirect effect. Figure 15 illustrates the four different types of effects. Third, we found reasons why transformational leadership should be examined as a means for the IT managers to promote IT agility in each of these four effect types. In the following, we draw conclusions from these issues and rearrange the literature by which the results of the research papers attached to this dissertation may be interpreted.

	IT function agility	IT-business agility
Indirect effect	IT manager indirect effect on IT function agility	IT manager indirect effect on IT-business agility
Direct effect	IT manager direct effect on IT function agility	IT manager direct effect on IT-business agility

Figure 15: IT manager effects on IT agility

The figure presented below (Figure 16) shows a tentative model for studying the IT manager's contribution to IT agility. Group agility is defined by Kozlowski et al. (1999) and Han (2003), and is based on the individual agility concept. Individual agility, in turn, is defined by e.g. Dyer and Shafer (2003) and Lui and Piccoli (2007). There are many definitions for agility at the organizational level of analysis, which here is defined as IT agility. The existence of interrelationships between agility concepts as outlined in the figure are founded on literature. The interrelationship between IT agility and individual agility is based on e.g. Breu et al. (2001), Butler and Gray (2006), Markus and Benjamin (1996), and Prager (1996). Breu et al. (2001) also argue that IT agility and group agility are connected. Finally, the link between individual agility and group agility is defended by Han (2003).

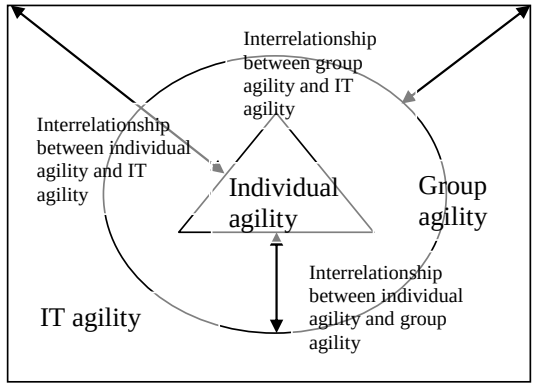

Figure 16: Assumed interrelationships between the agility concepts

Figure 17 rearranges the role of the IT manager in promoting IT agility. There are two channels through which he or she is able to do this. One is the direct channel, which affects the IT agility through his/her individual agile capabilities AND other capabilities that contribute directly to IT agility. This channel determines the capabilities, whether connected to individual agility or otherwise, that promote the IT manager's contribution to IT agility. The second is the indirect channel, which affects group agility by his/her individual faculties and then IT agility via the group level. In other words, this channel determines the individual capabilities (including those subsumed in individual agility and those that are not) that promote the IT manager's contribution to group agility, and in turn, help the group to contribute to IT agility. These channels are shown in Figure 17 below. Here, only one-sided relationship from the IT manager to IT agility is considered.

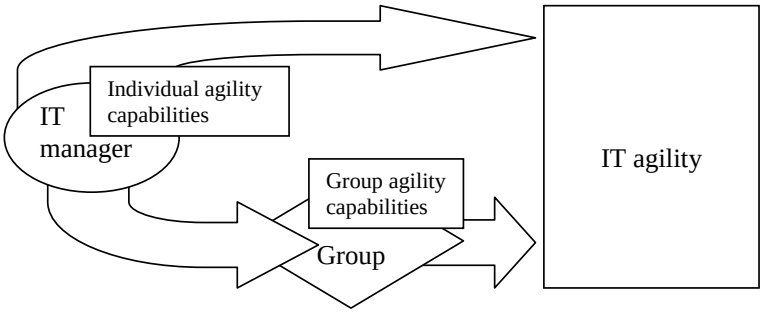

Figure 17: IT manager contribution channels to IT agility

This categorization makes it possible to consider the locus of IT manager agile capabilities identified in Tapanainen et al. (2008) among the levels of analysis (Figure 18). Four capabilities, namely strategic planning, knowledge of IT and business, leadership, and co-operation were found. The premise of individual agility was that the individual is capable of bringing about changes within him or herself in response to environmental changes. The interviewees commonly referred to strategic planning as leading to organizational change that is triggered by the IT manager's careful and deliberate forecasting and planning. Indeed, definitions of organizational agility posit that proactive and reactive response to change is required, and strategic planning seems to be the activity practiced by managers that answers to this need. Strategic planning can thus be said to be an agility factor for the IT function but not for the IT manager as an individual. According to the definition of group agility by Kozlowski et al. (1999), the group should be able to form and manage networks of dependencies among its members in order to change the working style of the group in response to environmental fluctuations. Strategic planning would fit the group agility definition as well if it is used to refer to group-level planning and changes.

Second, knowledge of IT and business is a capability of the IT manager that can help in a variety of situations in the IT manager's job. The context that interviewees seemed to ascribe to this concept was the collaboration of the IT manager with the business executives of the organization, in other words, by understanding business in addition to IT, the IT manager could function as an intermediary between the business and IT experts of the organization. Again, the objective of possessing the capability is not personal transformation, but rather aiding organizational transformation. Duncan (1995) corroborates that skills, and in particular, IT and business knowledge are important in organizational agility, suggesting that this applies to IT function agility as well. Thus, the capability of IT and business knowledge is not individual, but rather an agility capability in the IT-business partnership. The capability does not appear to provide a benefit for transformation at the group level, since it does not promote the formation or management of network dependencies within the group as per Kozlowski's theory.

The latter two capabilities, leadership and co-operation, are quite obviously not individual-level agility capabilities either, since these skills may not even be exercised at the individual-level. Both can, however, contribute to work in groups and organizations, and indeed, "management and leadership of IT" was identified as one field in IT function agility research (Tapanainen et al. 2008) – suggesting that leadership is one facet at this level of agility. The work of De Michelis et al. (1998) also identified group collaboration as a facet of organizational agility, suggesting that co-operation is one aspect of IT agility. The difference between these two capabilities is that leadership is more applicable within the IT function when the IT manager leads his/her workforce, whereas co-operation is more relevant for the IT-business partnership in which the IT manager has to work together with the business functions to produce benefit. Insofar as these two capabilities also support the formation and management of network dependencies in groups, they also promote agility at the group level.

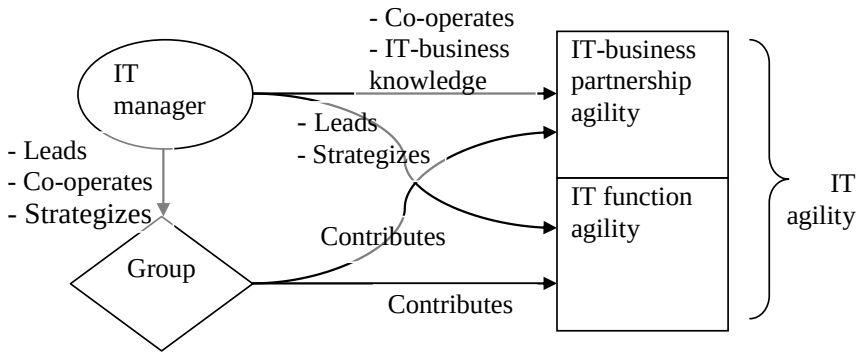

Figure 18: IT manager contribution types to IT agility

It appears that interviewees did not consider the personal change of the IT manager to be important for IT function agility, although the above definitions and mutual linkages of agility concepts clearly show that individual agility is an important part of IT function agility as well. Instead, the interviewees saw that the IT manager can provide agile capabilities to the IT function. They ascribed a seemingly "permanent skill set" to the IT manager that would continue to provide agility at the organizational level. While the capabilities agree with prior literature, it is not clear whether these capabilities continue to be relevant in the future. More importantly, the content of these capabilities might not remain the same ten years from now, for instance. In that case, a further "IT manager self-development" capability might be needed that would upgrade the skills of the IT manager to match the requirements of the future environment.

No matter how strong a strategic acumen the IT manager may have, or how skillful he/she is in IT and business, the most significant impacts to the IT function will come about as a result of interacting with other employees in the organization. Therefore, social skills are invaluable in managing the sense and response of organizational agility. Accordingly, the indirect influence mechanism of the IT manager to the IT function agility via the group level is important. However, there are many types of group that the IT manager has an influence on. The work arrangement can be a superior-subordinate type of arrangement within the IT function, where the IT manager leads a group of IT workers to perform a task. Such a task can further be categorized as a temporary group arrangement, or it can be a more permanent arrangement taking place in the line organization. The previous literature review details yet another arrangement, namely the IT strategic decision-making/governance group which is a joint IT function – business function organ. In this case, the participants are more equal, and in particular, the IT manager is frequently not the group leader. In fact, the specific IT manager profile taking part in this group is typically the CIO. Figure 19 below illustrates the types of groups and the role of the IT manager in each.

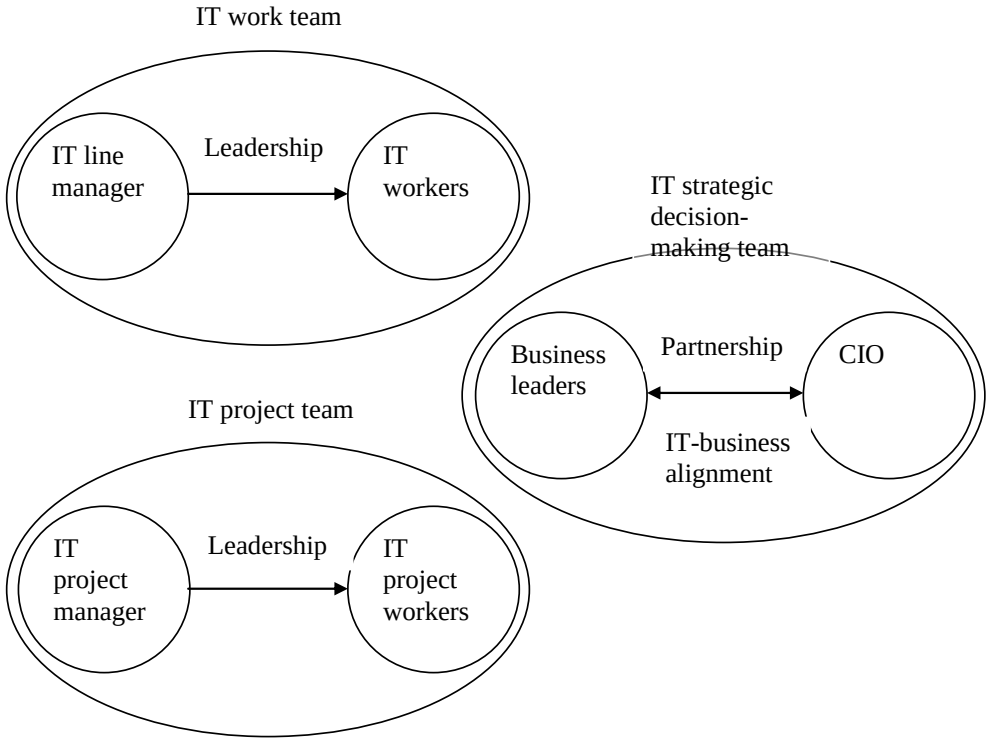

Figure 19: Types of teams in the IT function and the role of the IT manager in each

In these groups, the IT manager exercises leadership and co-operation skills to achieve results and to help the group perform in an agile way. These actions also contribute to IT agility in making the IT function and IT-business partnership more agile. The IT work team illustrates regular line work in the organization, in this case taking place in a team. The other two illustrate other types of work arrangements: IT manager (CIO) collaboration with the business executives, and IT manager leadership of an IT project team. In this research, we have concentrated on these latter two groups to clarify the contribution of the IT manager to IT agility with regard to the research sub-questions, namely:

(RQ1.1.) How does the IT manager contribute to IT function agility?
(RQ1.2.) How does the IT manager contribute to IT-business partnership agility?

Above, we saw that leadership, co-operation and strategizing were some of the main ways for the IT manager to promote IT agility at the group level. As an IT project team leader, the IT manager's actions can portray the case for leadership as a factor promoting IT function agility. This effect takes place via team leadership. In

particular, the transformational leadership method is generally considered to be a superior approach in improving team performance, and team efficacy is one of the antecedents of team agility. Kozlowski et al. (1999) defines group agility as the capability of the team to meet performance demands in rapidly shifting contingencies. This suggests that the environment the group is placed in should be rapidly changing. Thus, short-term projects in which change is often fast and frequent can provide a setting in which to evaluate the agility of transformational leadership in improving team agility. On the other hand, the IT manager's actions in the IT-business decision-making team can portray co-operation as a factor promoting agility in the IT-business partnership. In this team, the CIO is in a partnership relationship with the business executives. The co-operation of the parties determines the result of the team, and must therefore be examined as the CIO's tool to produce agility in the team. Moreover, shared understanding and mental models of the contingencies are requirements for the team to be agile (Kozlowski et al. 1999), meaning that expectations between the parties should be realistic in order to coordinate well. One crucial factor in evaluating the agility of a strategic decision-making team is thus the mutual expectations of the parties in the partnership. Both of these two methods – leadership and co-operation – for the IT manager to contribute to IT agility are examined in two articles attached as appendices. In this research, the case for strategizing is not examined in more detail.

To summarize, we focus on the contribution of the IT managers in IT agility. Based on our literature review, we conclude that prior research does not address the question of the role of the IT manager in IT agility satisfactorily. The empirical investigation concluded that interviewees viewed strategic planning, knowledge of IT and business, leadership and co-operation as important capabilities of the IT manager that contribute to IT agility. We categorize these capabilities based on the literature review, and suggest that leadership and strategic planning contribute to the IT function agility component of IT agility, whereas knowledge of IT and business and co-operation are contributing to IT-business partnership agility component. We also note that the IT manager appears to be influencing IT agility in two ways: one, the direct channel through his/her personal abilities, and two, the indirect channel through the groups within the IT function. We conclude that examining two of the group-mediated roles the IT manager uses to affect IT agility has major implications to IT agility. These two roles of the IT manager are (1) by partnering with business managers in the IT managerial team, and (2) by leading IT staff. While this examination is not enough for a comprehensive study on the indirect way the IT manager can affect agility, it can give a foundation to further research on the subject.

4.4 Summary of results from all three research questions

This research set forth from research question 1 (RQ1) and a pre-understanding based on the background knowledge of the researcher regarding this topic. He made

an excursion into the field equipped with this knowledge and extracted data on the embedded and ascribed meanings of the actors there (business and IT managers) with respect to the contribution of the IT manager to the IT function agility. The interpretation of these meanings by the author have been published as Tapanainen (2008), which is appended to this paper. When examined through the lens of previous research, however, these results could be interpreted in a different way. We found that, although literature generally agrees about the objective of agility, it does not agree about the way to achieve it. The measurement of agility remains obscure, and (excluding the agile software development field) there are as yet few attempts to define agility for other levels of analysis than the organization. However, it is possible to attempt to interpret the results of the interviews in terms of prior literature. We rearranged the literature to arrive at a dualistic view of IT agility as being composed of IT function agility and IT-business partnership agility. We could then categorize the IT manager capabilities according to these two dimensions. On the other hand, previous literature also suggested that there are two ways, the direct and indirect, that IT managers may affect IT agility.

In Tapanainen (2008), it is stated that leadership and strategic planning are the main findings as the capabilities of the IT manager in supporting IT function agility. The research also found that knowledge of IT, business and co-operation were reported by the interviewees as capabilities that would be possessed by IT managers who promote agility. These latter two capabilities were less emphasized due to them already having been mentioned in prior literature, as well as the fact that they had a lesser presence in the field data. In this introduction, however, we have taken another look at those two capabilities and, based on the literature that has been analyzed later, we have noted that they, also, may explain facets of the research question. Hence, we portray all four capabilities as part of the solution to the research question.

It is to be noted that the interviews did not point to agile capabilities that would function at the individual level of analysis, that is, be classified as individual agility factors. Apparently, the interviewees did not imagine that the IT manager would influence IT function agility via his or her personal development. However, the literature identifies this individual level of analysis for agility and links it to the group level (and from there to the IT function level), suggesting that it is also important for IT managers to develop this level. The interviews reveal, however, a point that is of relevance when considering the content of one capability prescribed for the IT manager. That point is related to leadership capability. The interviewees repeatedly referred to *muutosjohtaminen*, an ambiguous Finnish term that may refer to change management or transformational leadership. In most cases in the interviews, it was not clear which concept it referred to. While the interviewees also referred to other aspects of leadership, the prevalence of this Finnish term caught the author's attention. It was one catalyst for the inclusion of transformational leadership in the inquiry of leadership methods to promote IT agility.

The reflection of the research question in light of the empirical data and the literature review suggested that there are two channels by which the IT manager can

affect and contribute to the IT function agility. The direct channel determines the IT manager's direct effect on IT function agility, whereas the indirect channel determines the IT manager's effect on IT function agility via the group level of analysis. This line of thought led to the consideration of the types of groups where the IT manager makes a contribution to IT function agility. The contribution of this channel gives additional perspective to RQ1, so it was decided that two group cases should be adopted to examine IT function agility and IT-business partnership agility. These cases would then supplement the answer to research sub-questions RQ1.1 and RQ1.2. Consequently, two research papers included in the appendices introduce the following examinations that supplement research thus far on the IT manager contribution to IT agility via the group level.

- *Is transformational leadership applicable in short-term projects?*
  - Supplementing RQ1.1.
- *What is the role of expectations in IT manager – business manager partnerships?*
  - Supplementing RQ1.2.

The main research question of the dissertation is "How does the IT manager contribute to IT agility?" This and two sub-questions investigating details regarding the main research question have the following answers (Table 5) as explained in the articles in the appendices:

Table 4: Answering the research questions

Research question	Answer
RQ1. How does the IT manager contribute to IT agility?	IT managers' skills that make them agile are, among others, leadership, strategic planning, knowledge in IT and business, and co-operation. IT managers contribute to IT agility directly by their own abilities and indirectly via the group level. This contributes to both IT function agility and IT-business partnership agility.
RQ1.1. How does the IT manager contribute to IT function agility?	IT managers contribute to IT function agility primarily by leadership and strategic planning. This can happen directly through their personal influence or indirectly via IT line groups and project groups, for instance. Transformational leadership can be a potential enabler for IT manager leadership to influence IT agility. In IT project groups where the project duration is short, the use of transformational leadership is, however, predicted to be challenging, unless the relationship duration of the IT manager to his/her subordinates is long.
RQ1.2. How does the IT manager contribute to IT-business partnership agility?	IT managers contribute to IT-business partnership agility primarily through co-operation and knowledge of IT and business. This can happen directly through their personal influence or indirectly via the IT strategic decision-making group, for instance. This is particularly relevant for CIOs. The role of expectations in CIO-business partnerships is important. If CIOs and business leaders' expectations of each other's role in the partnership do not meet, the partnership can deteriorate.

The next chapter explains the theoretical and practical contributions, as well as the limitations of the research in more detail. Moreover, future research directions are presented.

5 THEORETICAL AND PRACTICAL CONTRIBUTIONS, LIMITATIONS, AND FURTHER RESEARCH

This research details an empirical investigation into the topic of the IT manager's contribution in IT function agility, and the qualitative analysis of the results, in addition to extensive literature review. The empirical fieldwork was conducted before the literature review, and the investigation continued to reassess the field data using the understanding obtained in the literature review. The results of the empirical work have been previously published in three scientific reports, which are attached as appendices. One of the appended publications is an extensive literature review. As the nature of this work is a compilation dissertation, the contributions are to be found separately in each of these appendices, but they are collected here for reference. In addition, the supplementary literature review in this introduction section has produced a means to present these contributions with one single, easily understandable apparatus.

Thus, this research has produced an analysis of the ascribed meanings of the interviewees regarding the contribution of the IT manager to IT function agility. The interviewees were IT and business managers in several Finnish companies. The process of this analysis attempted to take the unique context of each organization into account and carefully consider the statements of each interviewee. We believe the grounded theory approach was one of the best methodologies to allow for this. The approach has enabled us to consider the field data as a basis for a new, more informed analysis using the results of the literature review, and in that way produce new understanding from the empirical work.

Prior research has examined the role of the IT manager in IT function agility to only a slight degree. The closest work done in this area has been that of Kozlowski et al. (1999) and Han (2003), who describe the agility concept as being related to the individual and group dimensions. Sherehiy et al . (2007), Lui and Piccoli (2007), Dyer and Shafer (2003), and Hodgson and White (2003) have also published research on the individual and group dimensions of agility. This work was not related to the IT manager, however. Most prior investigations have examined the agility of organizational staff as one generic concept, or have concentrated on the IT development team, as the literature of agile software development does. Research has, of course, been conducted elsewhere under the rubric of organizational change through IT, or for instance on the dynamic alignment of business and IT, but this literature does not really consider the sensing dimension of agility. These fields concentrate exclusively on the response dimension, trusting that managers can

somehow decide when the time is right for change. Agility is a qualitatively different concept that seems to capture what is needed for organizational long-term survival and evolution more effectively.

We contribute to IT management research by presenting the four abilities (leadership, co-operation, strategic planning and IT and business knowledge) of the IT manager that were seen by interviewees to contribute to IT agility. While it is not surprising that each of these abilities would be important to the IT manager, our research also links this group of abilities to IT agility. We decompose IT agility into IT function agility and IT-business partnership agility, on the one hand, and theorize that it is dependent on lower-level individual and group agilities. We also position these capabilities in the proposed model constructed from literature (Figure 18) with regard to individual (IT manager) agility, group agility, and IT agility. The model we draw from the literature, however, is not a contribution to this research. It is merely a device meant to present the empirical data and contributions that have already been made in the publications included in the appendices. Finally, we let this tentative model extend our research question and propose two further research sub-questions that demonstrate the limits of two of the IT manager capabilities that promote IT function agility, namely leadership and co-operation. The answer to and contributions of these two research questions are presented in Ryoma & Tapanainen 2010 and Tapanainen et al. 2011 in the appendices.

Our results also have practical implications. It is well known that IT managers should practice leadership, co-operation, and strategic planning, and have knowledge of IT and business, but the nature of leadership to achieve organizational transformation has not been clear to many IT managers and CIOs. Indeed, these managers often grapple with the day-to-day management of their functions, lacking the time and resources to acquire the capacity to truly lead their staff. This research suggests one method for these professionals to improve their own leadership ability. The transformational leadership approach is a leadership approach that has been found to be applicable in many contexts and circumstances, and most importantly, seems to be compatible with organizational transformation such as that required in agile IT functions. Many IT managers have been trained in IT functions, being primarily technologists and having acquired their business acumen as their careers have progressed. However, as technological occupations do not emphasize human contact, the leadership skills of IT managers may not include what is required of leaders of their caliber. Transformational leadership can be seen as one concrete approach to adopt as one's learning objective when working toward adopting the ever-increasing curriculum of the IT executive.

Leadership is one of the oldest sciences, and it has experienced many revolutions in the past, but in modern literature, it is generally agreed that transformational leadership – leadership that aims at the gradual adoption of the leader's values among subordinates – is one of the best and most enduring approaches. Transformational leadership is attractive, not only because it has been claimed to be universally applicable and effective, but also because the basic tenet of the approach, transforming the values of the subordinates, is particularly suited to

changing environments. Compared with more static leadership models, transformational leadership contends that the leader is able to bring forth a new state of being in the workplace through his/her leadership. Ideally, this new state may be better aligned with the environment than the prior one. Transformational leadership thus seems to be one leadership approach IT managers may use to generate agility in the IT function.

5.1 Limitations

This section elaborates on the limitations of the research, methodology, and study design. The main methodological approach utilized was the grounded theory approach, and a multiple case study approach was used as the secondary methodology. In addition, a methodology for comprehensive literature review was utilized as well. The limitations of each will be reviewed in turn.

It seemed that the definition used for agility at the outset may have been overly generic and did not sufficiently differentiate agility from good performance. Our literature review indicated that many prior conceptualizations of agility have lacked important details, e.g., on its measurability, and thus almost any organizational issue can be related to agility. The results of the empirical inquiry as they came out may then be seen to reflect not the researchers' confusion regarding the concept of IT function agility, but rather the confusion regarding the concept of agility in the academic world. We selected the most prevalent definition of agility, but on hindsight, it may have been better to adopt very specific definitions of how agility is assumed to be built or how it is measured. In this way, it might have been possible to obtain more accurate comments from the interviewees and narrow down the essence of agility. However, that would also have led to the narrowing down of the entire concept, and may have led to results that have less to do with agility as it is generally understood than with some other micro-level concept.

The organizations available for access in the empirical research were limited. The selection of organizations was based on the principle of possible access. The selection of organizations was fairly heterogeneous, but although some of them were multinational, all of these organizations were headquartered in Finland. The research design as part of a project influenced the selection so that the participating organizations were probably less adept at their IT management and IT-business alignment than some others. Moreover, it should be borne in mind that only business and IT managers in these organizations were interviewed. The project may have also affected the interviewees by subjecting many of them to certain conceptions of agility beforehand. The analysis method might have been even more interesting had it differentiated between business managers and IT managers' interpretation of the contribution of the IT manager in IT function agility, for example. Finally, it would have been interesting to collect material for use in this research using methods other than interviewing, such as through observation of IT manager activities.

Although the requirements for the grounded theory methodology were met, some issues during the analysis process warrant attention. There was some interaction with the interviewees before the data collection, in particular with the contact persons in the organizations. The foundations of the interview construct were laid when the itLEPO project was planned, and the assumptions regarding the concept of agility were probably fairly entrenched among the participants when a launch seminar was held before the start of the empirical data collection. This author joined the project immediately after the seminar, and there is no doubt he "inherited" the corpus of these assumptions. Because there was no comprehensive literature review before the empirical work, these assumptions dominated the interview topics as well. However, this is not to say that the empirical effort is a failure because it was based on assumptions. Were it based on a rigorous literature review, the researchers might have lost the drive to find something new in the field. The temptation to defend a favored theoretical device might have proved too strong. That would also have been contrary to the requirements of grounded theory.

However, even though the researchers' assumptions can be said to have a great effect on what was found, the interviews were open-ended and left room for the interviewers to express their own opinions on the topic. It is possible that some interviewees took this opportunity to utilize the researchers as their tool to point out issues in the hope that the research report that was eventually forthcoming would then affect decision-makers to redirect resources in favor of the interviewees. The researchers were sensitive to these kind of "manipulation attempts" during the course of data collection and analysis, but as the interviewees are the primary sources of information for the research, there is often little that can be done to see behind the "veil" that is cast over the eyes of the researcher. It helps of course to have several interviewees combine the statements into a more holistic story, but in the end, each interviewee has a unique point of view that cannot be fully integrated into the story of another individual. Thus, we were to some degree susceptible to the "plots" of the interviewees.

The analysis phase of grounded theory assumed that all interviewees had their idiosyncratic conceptions of the meaning of agility, the IT manager's role in IT function agility, and so forth. When analyzing the data, this issue was internalized as part of the requirements of taking the context into account. However, when assigning labels to the data, this idea must be set aside to some extent. If that were not the case, how could any generic conclusions be drawn from the data? Actually, the decision of whether to generalize or not was one of the toughest choices for the researcher in the course of the analysis. A generalization would nullify the unique connotations of a certain label but possibly facilitate a richer generalized understanding. The individual choices of the researcher in this area was certainly one issue that influenced the emergent results. On the other hand, the interviewees might also have stated content that was at odds with itself. However, the tendency of human beings is to construct an image of themselves and their opinions that makes the observer believe that their view is plausible and generally non-contradictory. Rather, the presence of outright contradictions in the interviewees' speech could

engender the view that the person in question is disturbed or lacks mental faculties. Such strong tendencies were not found in the data.

Some limitations can also be found in the reporting of the interview data. More could have been done. For instance, the evidence presented to readers regarding the analysis process (in Tapanainen 2008) could have been greater. The research might have collected more data (other than mere interviews) and analyzed it to further improve credibility. The result dimensions are quite abstract due to the process of analysis reducing them to only four categories. In this way it is difficult for the reader to obtain a detailed view of the variety of opinions in the field. However, at this level, it does seem that they conform well to previous research on the requirements for IT managers. In light of the decision that empirical data be collected ahead of the literature review, it is particularly reassuring that the results seem to support the conclusions of the literature review.

Later, the case research methodology was used to analyze the data again with respect to the role of expectations in the IT-business partnership. Here too, the requirements of case research were followed but certain limitations apply. As case research was used as a secondary research methodology, it had to be applied after the main methodology, grounded theory research. This meant that the organizations had already been chosen and case selection would have to take place among these organizations. The use of replication logic to add new cases depending on the results from already included cases was then restricted only to the set of data that was already available. This was the case with the research question as well. We chose the research question for the study only after data had been collected. The research focus can be said to have emerged from the data. We were also restricted to the data collection methods that had already been used when collecting the data. Here, the only data utilized was interview data. Finally, the recommendation that rival explanations be investigated was largely ignored in this case research. We limited the research to explaining one particular aspect of the research focus that was also stated in the research article. In that way, we provide only a limited view to the problem setting.

The methodology for the comprehensive literature review can also be seen to have had limitations. Due to the wide variety of articles that were examined, it was difficult to form an unequivocal definition of the pass/fail decision regarding the inclusion or rejection of each article. Thus, each individual researcher was left to make the decision based on an (arguably) equivocal standard. While the method used is consistent with Webster and Watson (2002), an improvement on the method would have made a “trial examination” of the articles and formulated an unequivocal definition in text to guide the selection process.

Despite these limitations, we hope that readers gain an improved understanding of their own research problems through this work and are able to use it as part of their materials in conducting research on IT agility and the role of IT managers.

5.2. Further research

The results of this research can inspire research in both the IT-business relationship and the internal functioning of the IT department. The link between IT management and business has been widely examined in the literature, for example in the IT-business alignment and CIO-CEO relationship research strands. In contrast, the IT manager's "hidden" day-to-day routines and work within the IT function has been less studied. Future research could have manifold focus areas in this sense. It could concentrate on examining the indirect channel of the IT manager's contribution to IT function agility by investigating the group effect on IT function agility. In particular, such research could utilize the agile team concept and continue the line of inquiry by Kozlowski et al. (1999) and Han (2003), but focus on the leader's role in creating and nurturing adaptive teams rather than prescribing improvements to human resource management systems. For example, prior research refers to the need for IT managers to adopt responsibility for change management in the organization, and argues at length as to the dynamic capabilities in organizations, but what skills and actions would be required from IT managers to instill an agile capability in the teams they work with? The agile software development research can help answer this question to some extent, but only with regard to software development. The more helpful solutions may have been discovered in the field of knowledge management, where researchers conclude that the active support of communities of practice and autonomous teams is the best way to encourage dynamism and innovation in the organization. However, the autonomous aspect of these communities of practice suggests – contrary to most of IT management literature – that the role of management is not very crucial in agility. Thus, knowledge management does not offer a clear solution as to how these IT managers should encourage the formation and functioning of communities of practice. We may have to turn to other fields and disciplines, such as psychology and leadership, to acquire some ideas as to how the problem may be approached.

In addition, it might be acknowledged that the methodological choices adopted so far in examining IT managers have been somewhat limited. A large part of the literature relies on interviews and self-reported questionnaires to the IT managers, which may not be the most reliable way to accumulate information. Perhaps it is time to use more accurate – and at the same time more invasive methodological tools, such as ethnography and observation. It may also be very useful to test what insights may be gained from interviewing the IT managers' subordinates, for example, rather than the traditional CIO-CEO pairs, to acquire the view of the "other" in IT function relationships. Therein lies the difficulty, of course. It is clear that as high-level executives, CIOs are not very eager to let outsiders examine their private space so intimately. However, in contrast with the large number of relatively superficial studies conducted e.g. by large multinational consulting companies, it would truly be a contribution if for once we could see how IT managers and CIOs work in their day-to-day activities at a micro-level.

On a more basic level, we saw that agility concepts are qualitatively different in content, although the objective of each tends to be similar. This would prompt an examination of the organizational effects caused by adopting and executing a given IT agility strategy. It is probably the case that there are multiple ways of attaining IT agility and that many of the agility theories presented in this work are merely different interpretations of the same idea, and it would be enlightening to compare the outcomes when the IT manager adopts a certain behavior pattern based on a particular IT agility concept. At the moment, it is confusing not only to the practitioner but also to the researcher that there are so many varied terms for concepts similar to agility. This type of comparative approach may help to establish some mutual order and connections in the current conceptual jungle. The exact contribution of the IT manager may be difficult to measure in practice if these basic conceptual questions are not addressed at the outset, and for that reason, one direction for future research would be to clarify the main theoretical directions in agility concepts, operationalize them, and conduct an intervention to measure the outcomes.

The IT manager's contribution to IT function agility could also be examined in other cultures to verify the results herein, or to find new skills and capabilities that are culture-dependent. As noted in the literature review, the responsibilities and status of CIOs, for example, are very different in Japan when compared to the USA and Europe. The literature suggests that Japanese CIOs, at least those in large organizations, may be more capable and better prepared to collaborate with the business functions than their counterparts in the West. While the human resource management systems in Japanese organizations are well known, it is less well known what results they can produce in IT manager contributions to agility. Thus, it would be useful to compare the skill differences and working and leadership style differences between IT managers in various countries. In doing so, however, there is a tendency to assume that IT management is fairly uniform around the world, and that "best practices" from one culture may be instantly and uncritically applied to problems in another. Such learning can have great benefit, but it also has its risks. Therefore, when suspecting that IT managers may have an advantage in some country with respect to certain problems in collaboration and decision-making, it is advisable to look beyond the differing organizational characteristics and remember that these differences may only matter in a given context, when other pieces of the puzzle lock into place.

In practical terms, this research suggests that strategic planning, knowledge of IT and business, leadership and partnerships are the key abilities to emphasize in IT manager training, when agility of the IT function is an issue. However, while leadership in crucial, it should be recognized that it has its limits. If the environment is highly unstable, as is frequently the case in current organizations with work arrangements often being short projects, it is better to advise the IT manager to develop close relationships with his/her subordinates to allow leadership to also achieve more success. In addition, while partnerships with business managers in particular are vital, they should be backed up with a solid understanding of what the

other party can and will do, i.e., the expectations of the parties must be both mutually understood and accepted.

6 SUMMARY

The theme for this Ph.D. research is “Information Technology (IT) manager’s contribution to IT agility in Organizations – Views from the Field". We explore how the IT manager can promote the ability to sense, adjust and respond accordingly to rapid changes in the environment for the organization’s IT. Essential to this topic is the role of IT manager as the leader of the IT function, the leadership capabilities of the IT manager, and the relationship between the chief information officer (CIO), who is the top executive of the IT function, and the business leaders who are his/her counterparts in other organizational functions.

Our investigation utilized grounded theory and multiple case study approaches. We were aware of agility being a controversial and complex concept, whose meaning has not been agreed in the academia. Thus, we began the investigation with minimal theoretical preparation and entered the field early on in the research. This allowed us to understand the way the practitioners view agility and the role of the IT manager in providing agility at the IT function level. Our empirical inquiry consists of 94 interviews spread out over seven organizations in Finland. This data was analyzed using the grounded theory approach. However, after the empirical data collection, we also carried out a major literature review on IT function agility, independent of the field research. Then, we conducted the multiple case investigation, selecting our cases from among the data collected at the outset. These efforts allow us a glimpse of IT function agility and the IT manager’s role in it though the theoretical lens and the practical lens.

The grounded theory analysis of our empirical results paint a picture of IT manager as contributing to the agility of the IT organization in a variety of ways. The interviewees saw leadership, strategic sense, IT and business knowledge, and co-operation, among others, as vital skills to the IT manager in this respect. These resulting skill groups do not seem surprising. They agree with the capabilities prescribed to the IT manager in a number of other publications. The interviewees interpreted the IT manager as being involved in the creation of IT function agility in ways that resemble how the IT manager is expected to succeed in his/her job in general. Thus, the analysis suggests to us that IT agility may not be separable from day-to-day organizational functioning. It also suggests that the role of the IT manager is very comprehensive in IT agility.

We view the empirical observations above as one step in increasing our understanding of IT function agility. Our literature review adds another layer to this understanding and examines how IT function agility has been previously discussed in the IT field literature. This discussion may be divided into that concerning the internal IT function agility and that concerning IT-business partnership agility.

Recognizing that leadership is one central facet of the IT manager's involvement in the IT function, we contribute the view that leadership, and particularly transformational leadership, can be a conduit for the IT manager to play a role in the agility of the IT function. We rearrange the literature to show one interpretation of IT agility as being a concept affected by the individual agility of the IT manager and the group agility of the line and project groups he/she leads in the IT function. We assign the IT manager capabilities identified in the empirical work to contributing either to IT function agility or to IT-business partnership agility.

The upshot from our results is that if the IT manager is to contribute to IT agility, his/her leadership in the IT line and project groups should be effective. Moreover, the IT manager's partnership with the business executives in the IT strategic decision-making group should be good. To demonstrate the role of the IT manager in these groups, we examine two issues in our appendix publications – short-term projects and expectations – that have an effect on how these groups perform. According to our arrangement of the agility literature, these issues also have an effect on how agility is built in at the IT function level. Despite the best efforts of the IT manager to exercise transformational leadership in IT projects, the short project context can limit his or her opportunities to affect the project team, and thus detract from project performance. On the other hand, if the mutual expectations in the IT decision-making team are not met among the CIO and the business executives, this can also impact on the partnership of these managers and cause problems in co-operation.

The contributions of this research add to the agility research field in IT by interpreting the opinions of managers regarding the role of the IT manager in IT agility, and rearranging the literature to position the IT manager in relation to IT agility. This understanding of the IT manager's role can be used by IT managers themselves to understand the beliefs other managers hold with regard to their role, and to adjust their own behavior to address the crucial issues in IT function agility. In addition, they can be used by educational institutes to improve their teaching programs for future managers. Secondly, the research contributes by analyzing two important issues in the functioning of groups in which the IT manager is involved. The results point out that transformational leadership, a well-known leadership approach, has limitations in short-term projects, and that the unfulfilled expectations of parties can hinder CIO-business partnerships. These contributions can make the IT managers aware of constraints in their job that can affect group functioning and thus detract from the IT agility of the firm.

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ATTACHED PUBLICATIONS

ARTICLE 1: Tapanainen et al. (2008). Towards an Agile IT Organisation: A Review of Prior Literature.

ARTICLE 2: Tapanainen (2008). The Agile IT Manager.

ARTICLE 3: Ryömä and Tapanainen (2010). The Applicability of Transformational Leadership to Short-term Projects.

ARTICLE 4: Tapanainen et al. (2011). Towards a Partnership in CIO-business Relationship – The Role of Expectations.

Article 1

Towards an Agile IT Organisation: A Review of Prior Literature.

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Towards an Agile IT Organisation: A Review of Prior Literature

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Abstract: An abundance of research exists on strategic agility, agile manufacturing systems, and agile software development. However, since the beginning of the 1990s, agility has also been considered as a significant objective for IT organisations. As the penetration of information systems in business operations increases, the ability to sense changes and respond accordingly to changing business requirements is becoming both more difficult and more important. Moreover, IT organisations increasingly need to understand changes affecting the business in order to justify IT investments and current structures. Building agility to IT organisations is not, however, easy.

This article reports results from a systematic literature review that collected and classified agility oriented research published in highly ranked IS journals. The review was performed by a four-person team in accordance with the method suggested by Webster and Watson, and focused on the incidence of agility and similar terms in article titles, abstracts, and full text, as well as the articles' relevance with respect to a commonly used definition of agility. This resulted in a set of 24 articles addressing agility in the context of IT organisations.

A characteristic feature in prior studies is that most studies focus on one specific area of the IT organisation. Frameworks that comprise a broader view of prerequisites for agility are almost non-existent. The review suggests a five-point classification of the fields addressed by the reviewed literature, that is, IT organisation structures, IT workforce, IS development processes, IT management and leadership, and IT infrastructure. More importantly, it provides an overall view of variables that have been used in explaining agility in the IT organisation context. Hence, for researchers, the paper provides a first attempt to build a broader theoretical foundation for explaining IT organisation agility. Information systems managers can use the results to identify measures that they can take in order to improve the agility of their own organisations.

Keywords: Agility, information systems development, IT infrastructure, IS organisation

1. Introduction

As organisations become more and more dependent on IT to provide core services and capabilities (Butler and Gray 2006, van Oosterhout et al. 2006), many researchers (e.g. de Michelis et al. 1998, Rockart et al. 1996) emphasize that IT organisation agility is a major factor in the entire organisation's agility. Staying abreast of changes in today's hypercompetitive environment requires capabilities to adjust and respond to change. When organisations are increasingly dependent on IT, the IT organisation should possess capabilities to facilitate IT changes.

In this paper we concentrate on collecting and classifying literature which can be used to discover the major factors affecting IT organisation agility. We researched issues with immediate relevance to IT organisation agility through a systematic literature review of high-quality and peer-reviewed scientific journals and publications. The literature review provided a set of articles giving an overall picture of prior research regarding this topic, thus helping to direct the focus of future studies.

2. What is IT organisation agility

Evans (1991) quotes numerous articles from the 30's to the 70's addressing diverse aspects of strategic flexibility, e.g. oscillations in the business cycle, organisational flexibility in rapidly changing or uncertain environments and flexible manufacturing systems. Sherehiy et al. (2007), describe agility as the latest stage of development for the idea of being able to adjust and respond to change. They argue that all definitions of agility emphasize speed, flexibility and effective response to change and uncertainty. In addition, literature on strategic agility, e.g. Overby et al. (2006), argue that a proactive sensing aspect is pertinent in agility. We take both of these views as the basis of our literature review.

Information systems may provide the business a possibility to adjust and respond to change. For example, an IT system can allow major changes to the business (e.g. Moitra and Ganesh 2005,

Volberda and Rutges 1999). In this view, the IT organisation does not necessarily have an explicit role. On the other hand, the IT organisation's ability to respond to changes in business needs may facilitate business agility (e.g. de Michelis et al. 1998, Rockart et al.1996). In this view, agility in business can be achieved only if the IT organisation is able to adjust and respond to business change by reinventing itself, making changes in its functions, and providing a possibility to create new solutions underpinning business agility.

The requirement for agility in an IT organisation has been addressed by many researchers. For instance, researchers have called for agile workforce (e.g. Sherehiy et al. 2007, Clark et al. 1997), agile IT infrastructure (e.g. Byrd and Turner 2000) and continuous IT-business strategic alignment (e.g. Kearns and Lederer 2000, Keen 1993). A characteristic feature in these studies is that they focus on a fairly narrow sector of an IT organisation. The overall view of how an IT organisation can contribute to business agility is fragmented.

Duncan (1995) used surveys, interviews and the Delphi method to capture IS executives' opinions on the flexibility of IT infrastructure. The study addresses a wide variety of technical agility factors such as connectivity of systems, interface standardisation, and compatibility rules for networks, data, and applications. However, it also identifies a wide array of management factors such as technological architecture, alignment of planning, and human resource skills. Meanwhile, de Michelis et al. (1998) suggest a conceptual model of change in the IS environment (see Figure 1). The model divides change-related issues for IS to three areas of concern: the systems facet, the group collaboration facet, and the organisational facet. These three facets reflect three complementary points of view for understanding the change management problem of IS. In addition, they suggest that work within an organisation could be viewed as executions of operations on a system (the operational perspective), events in the history of group practice (the practical perspective) and as performances intended to fulfill organisational objectives in accordance with organisational rules (the managerial perspective).

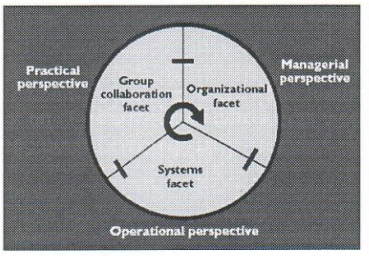

Figure 1: The three facets of information systems (de Michelis et al. 1998)

Nevertheless, it can be concluded that conceptual cohesion among the efforts to manage agility for the entire IT organisation is still largely missing, and "one needs to adopt a comprehensive approach that recognizes the many types of system evolution and their interdependencies" (de Michelis et al. 1998, p. 64). Beneath, we propose a holistic view of the literature that can work as the building block for a comprehensive model. First, we describe our research method in chapter 2 and then move on to present the search findings in chapter 3. Chapter 4 summarizes the major contributions of our work for researchers and practitioners. The final chapter discusses limitations and future research opportunities.

3. Research method

This review was made systematically in accordance with the structured approach recommended by Webster and Watson (2002) to ensure the completeness of the source material in a literature review. Their approach consists of three phases. In the first phase, relevant articles are searched from the leading journals where the major contributions are likely to be found. The second phase continues with a review of the citations for the articles identified in the first step. The third phase completes the search by utilizing the Web of Science citation index to find articles citing the key articles identified in the first two phases. The purpose of this literature search was to find articles addressing agility in the IT context, and then extract the articles relevant for IT organisation agility in particular. The search was started from the leading journals in the field of information systems and management (Table 1), and during the process only one article was added from a journal not on this list. Because there are many synonyms for agility in the literature (Sherehiy et al. 2007), several keywords and search fields

were used to ensure as complete a result as possible. The keywords used were: agility, agile, flexibility, flexible, adaptability, adaptive, and organic, which were found by Sherehiy et al. (2007) to be commonly used to describe agility. However, in the case of business journals (the last three journals in Table 1) the keyword "information system" was used to delimit the search to the information systems field. Articles were searched by title, abstract and full text fields, and the results were limited to articles published after the year 1990.

Table 1: Journals included in phase one of the literature review and articles found

Journals searched in phase one	Articles in the final result set
MIS Quarterly	5
Journal of Management Information Systems	3
Information Systems Research	0
Communications of the ACM	3
Information and Management	0
European Journal of Information Systems	3
Database for Advances in Information Systems	0
Decision Sciences	0
Decision Support Systems	0
Journal of Information Technology	1
Journal of Strategic Information Systems	1
International Journal of Information Management	1
Information Systems Management	4
Harvard Business Review	1
Sloan Management Review	1
Management Science	0

The review process is described in Table 2. The number of articles resulting from this search was 1140 in the first phase. Thus, in order to find the most relevant articles, all of the search results had to be screened. The screening was done in three steps, and was based on grading the articles according to search criteria. All the steps were performed in turns by different persons to triangulate results.

Table 2: The review and selection process

Phase	Process description
1, keyword search	The keyword search resulted in 1140 articles.
2, screening	The search results from the first phase were screened in three steps; first by title, then by abstract, and finally by full text. The screening was based on both the keywords given above as well as our definition of agility (see chapter 1). In unclear cases the article was discussed by everyone involved in the screening process before any decision to accept or reject. After the screening we were left 45 articles. The following two phases of source material search were based on this list.
3, backward search	The third phase was carried out by processing the references from articles selected in the second phase. There were 614 articles referred in the list from phase one. These references were screened in the same way as the journal search results in phase two, with the exception that we moved to full text analysis immediately after title-based analysis. After the screening, we were able to add 4 new articles to the list.
4, forward search	In the fourth phase Web of Science was used to identify articles that cited the selected articles identified in phases one and two. All of the selected articles were entered to the Web of Sciences citation search, and the new search results, altogether 479 articles, were screened in the same way as in the previous phase. We found 5 new articles to the result set from this phase.
5, focusing	In the fifth phase we concentrated specifically to IT organisation agility by excluding the articles that dealt only with business or enterprise agility from the set of 54 articles collected in phases 2, 3, and 4. Finally, we were left with 24 articles listed by journal in Table 1.

In phases three and four it was possible to see that the list of key articles started to be fairly complete: the search result started to repeat itself the further we were in the process. The majority of the search

results in phases 3 and 4 had already appeared in the first phases' search result, and thus these phases yielded few new results. The next chapter elaborates on the content of our 24 identified articles.

Even though we included agile information systems development in our review, agile software development was left out from the scope of this paper as it is a large research area (see e.g. Nerur and Balijepally 2007, Börjesson et al. 2006, Nerur et al. 2005, Nelson and Ghods 1998, Jones and King 1998). Due to the large number of articles, agile software development would deserve a literature review of its own (Dybå and Dingsøyr 2008). We recognise, however, the close relationship between these two areas.

4. Search findings

Tables 3 thru 7 give an overview of the findings. We arrived at 24 articles and having seen that these articles represented fragmented approaches to IT organisation agility, we decided to produce a classification of five demarcations. These classes comprise viewpoints on how agility in the IT organisation context has been understood by scholars, and gives a representative scheme for researchers wishing to delve further into the subject.

In addition to articles addressing the agility of the IT organisation itself, we found agility to have been investigated in connection with IT workforce, IS development processes, IT management, and IT infrastructure. In the following, a short overview of the emphases of each of the relevant research strands will be given.

The issue most frequently arising with regard to the literature on IT organisation structure agility (Table 3) is the center of excellence (Boar 1998, Clark et al. 1997, Gerth and Rothman 2007). Other issues receiving significant attention in this thread are the centralization – decentralization dilemma (Allen and Boynton 1991) and the more recent suggestions of the federal scheme and the front-back organisation (Gerth and Rothman 2007). On the one hand, the development of internal markets was seen as important (Boar 1998), and on the other, selective outsourcing and its skilful management was claimed to enhance organisational agility (Gerth and Rothman 2007, Lacity et al. 1995, Rockart et al. 1996). In addition to the general effective management of the IT function (Rockart et al. 1996), turbulent times require a strategic partnership with the business (Scott 2007) and a two-way strategic alignment (Rockart et al. 1996) which supports the increasing role of IT as a strategic function within the organisation.

Table 3: Articles addressing the agility of IT organisation structures

Agility in IT Organisation Structures				
Authors	Year	Type of analysis	Data	Focus
Allen, Boynton	1991	Conceptual	--	IS architecture
Boar	1998	Conceptual	--	IT organisation
Clark et al.	1997	Case	Longitudinal	IS organisation
Gerth, Rothman	2007	Conceptual	--	IS organisation
Lacity et al.	1995	Conceptual	--	IT outsourcing decision
Rockart et al.	1996	Conceptual	--	IT organisation
Scott	2007	Conceptual	--	IS organisation

Second, workforce was found to be one important aspect in the literature addressing IT-driven organisational agility (Table 4). This literature emphasized the evolving role of the IT professional as a change agent and the impediment of the profession's traditional role and structural factors to this development (Markus and Benjamin 1996). To build one's competency in this area, it is a requirement to seek continuous input from the business and predict future changes (Prager 1996). Mindful, aware activity (Butler and Gray 2006) and behavioural flexibility (Markus and Benjamin 1996) are pertinent to manage the changing environment and produce reliable outcomes in the long term. It is also claimed that new collaborative work arrangements enabled by flexible IT and the competencies to utilise it are most critical to workforce agility (Breu et al. 2001). Agility or lack of it is implicit also in the organisation's culture (Breu et al. 2001, Prager 1996).

Table 4: Articles addressing the agility of the IT workforce

Agility in the IT Workforce				
Authors	Year	Type of analysis	Data	Focus
Breu et al.	2001	Survey	Cross-sectional	Workforce
Butler, Gray	2006	Conceptual	--	Reliability and IS
Markus, Benjamin	1996	Case	Single instance	Change agentry
Prager	1996	Conceptual	--	Aligned IT organisation and IT professionals

The third area impacting IT agility in the context of the organisation are the processes of IS development (Table 5). On the strategic level, IS development goals should be congruent with business goals and the relationship of IT strategy and project management should be carefully monitored (Lee et al. 2006) The understanding that the process will be incremental and development will be constant, is essential (Truex et al. 1999). For the process to be agile, project management must decree clear roles and responsibilities (Lee et al. 2006), arrange sufficient back channel communications for the professionals and have a proper rewards system in place (Truex et al. 1999). On the technical level, good version control, IT infrastructure modularity and global integration of architectures are all desirable (Lee et al. 2006). Stakeholder partnerships should be flexible (Lee et al. 2006). In general, the faster the process, the more agile; but scholars have found alternative conceptions of the locus of speed (Lyytinen and Rose 2006) in ISD projects. Further, a tradeoff has been found between the extensiveness and efficiency of ISD responsiveness (Lee and Xia 2005). As most changes affecting the ISD process originate in the business, sensitivity to social and organisational aspects is pertinent in addition to familiarity regarding new technologies (Lee and Xia 2005).

Table 5: Articles addressing the agility of IS development processes

Agility in IS Development Processes				
Authors	Year	Type of analysis	Data	Focus
Lee et al.	2006	Case	Longitudinal	Globally distributed system development
Lee, Xia	2005	Survey	Cross-sectional	IS project team
Lyytinen, Rose	2006	Case, multi-site	Longitudinal	IS development
Truex et al.	1999	Conceptual	--	IT organisation and IS development

Agility is also present in management practices (Table 6). Traditional strategic information system planning (SISP) approaches favour the comprehensive development idea. Scholars claim that incremental elements should be introduced to SISP in order to make it more flexible (Salmela and Spil 2002). Scenario development and restricting the size of projects (Holmqvist and Pessi 2006), retention of staff with critical skills, customisation of education around skill shortages, and adoption of compatible IT (Benamati and Lederer 2001) are also seen important for agility. A decision path tool has also been suggested to evaluate the need for flexibility in an IT investment (Kim et al. 2000) and guide the process.

Table 6: Articles addressing the agility of IT management and leadership

Agility in IT Management and Leadership				
Authors	Year	Type of analysis	Data	Focus
Benamati, Lederer	2001	Survey	Cross-sectional	IT change
Holmqvist, Pessi	2006	Case	Longitudinal	Management of IS development
Kim et al.	2000	Case	Longitudinal	IT investment
Salmela, Spil	2002	Conceptual	--	IS strategy

Finally, the agility of IT infrastructure is widely acknowledged to have an impact to organisational agility (Table 7). IT infrastructure from one viewpoint can be seen to break down into technical and human infrastructure, whose primary agility factors have been found to be integration and modularity, and IT personnel flexibility, respectively (Byrd and Turner 2000). Another article by Duncan (1995) divides infrastructure into technology and management factors, and arrives at the conclusion that the most critical agility factors regarding technology are business management support in long-term planning, connectivity of systems, interface standardization, and compatibility rules for networks, data,

and applications. As for management, technological architecture, alignment of planning, and human resource skills are critical. Agility may also be viewed as an adaptation process guided by information efficiencies and synergies and facilitating the beneficial organisational outcomes of linking and enabling employees, codifying the knowledge base, increasing boundary spanning, and enhancing organisational efficiency and innovation (Dewett and Jones 2001). Similarly, cross-functional and cross-business IT infrastructure has been found to facilitate business process reengineering (Broadbent et al. 1999).

Table 7: Articles addressing the agility of IT infrastructure

Agility in IT Infrastructure				
Authors	Year	Type of analysis	Data	Focus
Bhatt, Grover	2005	Survey	Cross-sectional	IT capabilities
Broadbent et al.	1999	Survey	Cross-sectional	Implications of IT infrastructure for business process redesign
Byrd, Turner	2000	Survey	Cross-sectional	IT infrastructure
Dewett, Jones	2001	Conceptual	--	Role of IT
Duncan	1995	Survey	Cross-sectional	IT infrastructure

5. Contributions

The contribution of this research is the identification of five broad dimensions related to an IT organisation's ability to adjust and respond to changes in business. These five dimensions were extracted from a comprehensive literature analysis that first identified articles related to IT organisation agility and then classified them on the basis of factors that each emphasised in relation to this theme. These five dimensions are:

- Agility in IT Organisation Structures (e.g. embraced centres of excellence and the skilful management of outsourcing)
- Agility in the IT Workforce (e.g. the capability of an individual to be sensitive to changes in the environment and act accordingly)
- Agility in IS Development Processes (e.g. embracing an iterative, rather than comprehensive, approach in the development of information systems).
- Agility in IT Management and Leadership (e.g. close working relationship between IT and business management)
- Agility in IT Infrastructure (e.g. the usage of standardised modules to foster interoperability, and the capability of technology to link people)

The five dimensions have similarity to the models proposed by Duncan (1995) and de Michelis et al. (1998). Similar to Duncan, the results of our literature review emphasise the attributes of technical infrastructure (Dimension #5), the skills of IS workforce (#2) and the quality of managerial processes (#4) as significant antecedents for an agile IT organisation. They support also the three facet model proposed by de Michelis et al., as the organisational/managerial facet (Dimensions #1 and #4), the group collaboration facet (#2) and the operational systems facet (#5) have been previously addressed.

However, neither Duncan nor de Michelis have arrived at these models via a comprehensive literature analysis on the agile IT organisation. Hence, our research is the first to offer a list of relevant articles pertaining to each dimension. Our paper provides a good basis for further studies in any of the five identified sectors. It also contributes to any future attempt to build a more comprehensive view of the interplay between these five dimensions. Moreover, both Duncan and de Michelis omit the IS development process dimension (#3) emerging from our work.

Researchers who plan to conduct survey research on this topic can use the article when they search for existing instruments on IT organisation agility. Surveys have been conducted in all five dimensions except in IT organisation structures. In particular, the majority of studies related to IT infrastructure are cross-sectional surveys. Case researchers can use the review results to identify experiences from prior qualitative research. Case studies have also been carried out in all five dimensions except IT infrastructure.

6. Limitations and future research

The literature search window was extended only to year 1990, meaning that possible earlier articles may have been excluded from the study. Moreover, we restricted this review to IS journals and IS articles in certain non-IS journals; the logistics field in particular might hold promise with respect to future studies. Agility has also been widely discussed in relation with software development and this literature was screened out of the review.

In general, there seems to be demand for more empirical research regarding the agility of IT organisations. The results do also suggest a need for further conceptual work that would better integrate the five different dimensions. Such conceptual work can draw from all articles identified by this study and listed in tables 3-7.

The dependent variable in agility research should be examined in detail. For example, many scholars seem to associate agility with long-term organisational success. On the other hand, we should more carefully define the relationships between enterprise/strategic agility and IT agility. This review has found that IT organisation agility is influenced by factors that also seem to be relevant for enterprise agility.

Agility is an attribute that is rarely associated with large and complex information architectures. This literature review has shown, however, that agility is dependent on several controllable variables. More research is nevertheless needed in order to provide a more comprehensive view of the antecedents of IT agility.

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Article 2

The Agile IT Manager.

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THE AGILE IT MANAGER

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Abstract

Agility is an organizational concept applied in many fields, e.g. corporate strategy, manufacturing, and software development. Today, agility is increasingly important also to IT organizations in responding to changing business demands. However, agility is still not well understood in this context and this paper seeks to elaborate the role of the IT manager in the agility of the IT organization.

We focus on the capabilities required of IT managers to create and support agility in IT organizations. In addition to a literature review on agile IT management, we present results from a qualitative research in 5 Finnish organizations. Both interviews and the literature suggest that agile IT managers are capable leaders who are strategists and skilled in both IT and business. In particular, the strategist capability was supported by the evidence as important for agile IT managers.

Keywords: agility, IT management, IT manager

1. Introduction

Today, the dual challenges that organizations face – changing technology and changing organizational environment – emphasize the role of the corporate IT function in sensing and responding to change (de Michelis et al. 1998; Rockart et al.1996; Truex et al. 1999; van Oosterhout et al. 2006). However, rather than being purely a technological challenge, mitigating these changes seems primarily to be a management and people challenge. We present research on the "agile" IT manager who is able to promote agility in the IT organization. Our results are based on a case research project in Finland, the purpose of which is to build a foundation for a testable framework of the agile IT manager.

Agility has been defined as the capability to adjust and respond to change with speed and flexibility (Sherehiy et al. 2007; Overby et al.

2006). The concept and similar others such as adaptability and flexibility (Sherehiy et al. 2007) have in previous literature been much discussed with regard to strategic-decision making and manufacturing. In IT, agile software development has in particular stood out as an important field (Dybå & Dingsøyr 2008), but with respect to IT organizations, we found agility to have been addressed from the 1990s (Evans 1991).

Building agility to the IT organization is the responsibility of the IT management, which should then have capabilities to realize this. However, agility has traditionally been utilized as an organizational concept, and a comprehensive literature review indicates that we do not yet have a satisfactory understanding on the relationships of agility to capabilities required of individual managers. This paper reports results from a qualitative research performed as a series of interviews in three public sector and two private sector organizations in Finland.

Chapter 2 illustrates what is written on agile IT management. Chapter 3 describes our research method and chapter 4 gives the results. Finally, chapter 5 outlines the contributions and 6 the limitations and further research opportunities.

2. IT Management Skills and Agility

In this chapter, we briefly outline the skills known to be required of IT managers. Next, we present what has been written on agile IT management that has relevance for IT managers.

Lee and Lee (2006) have carried out a longitudinal investigation of Fortune 500 companies' job advertisements for IT management positions and noted that management (98,6 %) and social skills (92,4 %) were required in most advertisements. Regarding the former, the desirable skill profile tended toward a resource control aspect, and people-oriented leadership ability was required in only 65 % of cases. System development skills (98,4 %) and business skills (89,4 %) were also frequently quoted in advertisements, but the latter were skewed toward general business knowledge, with industry- and organization-specific knowledge being less important (23,4–60,0 %). Only 48,3 % quoted adaptive/flexible problem solving skills, whereas strategic decision-making capability was not present in the survey as an independent category.

Here, we note the relatively low incidence of leadership ability requirements in job advertisements and call attention to the fact that the IT professionals themselves consider people-oriented skills as the most important (Gallivan et al. 2004). According to Todd et al. (1995), IT manager job requirements had hardly changed at all in newspaper job advertisements between the 70's and 90's. Below, we consider the implications of agile IT management literature for IT managers.

Agile IT people should possess a broad range of skills not limited to technological management, but also encompassing business expertise, interpersonal skills, and management skills (Bhatt et al. 2005; Byrd et al. 2000). Duncan (1995) elaborates that the IT and business skills should be in balance and the IT skills must include knowledge of both new and old technologies. He goes on to claim that business experience gained in multiple business units of the firm is preferable, and stresses that these capabilities should be complemented with knowledge of complex resource management techniques.

Further, agile IT people would be familiar with and active in promoting organizational change. In order to contribute to the organization's success with IT, they should be skilled in all the three change agent roles identified by Markus et al. (1996) and able to rapidly shift between these roles depending on the circumstances. Beyond the ability to change themselves, these individuals are able to anticipate and predict the nature of change to the organization by perceiving and interpreting the world (Prager 1996) and observing the business (Butler et al. 2006). This demands a "mindful" approach to interpretation of new

events and possibilities, including openness to novelty and alertness to distinction, and the capacity to deal with multiple values. The approach must be grounded in the present and current circumstances (Butler et al. 2006), allowing down-to-earth, scenario-based planning (Holmqvist et al. 2006).

Agile IT professionals work closely with strategic planners, market researchers and R&D professionals (Prager 1996) and share IT responsibilities and roles with line management (Bhatt et al. 2005). In developing new IT solutions, they should temporarily step away from their expertise and professional interests so as not to be blind to technically inferior but working solutions (Markus et al. 1996). This work to build infrastructures must focus on implementing systems that support evolving organizations and adapting them to changing external drivers (Prager 1996). Implementation projects should be kept to a comprehendible size (Holmqvist et al. 2006).

In summary, agile IT management requires IT and business skills, management skills, and social skills. In addition, IT managers should perceive and interpret the environment and thus be aware of and capable of promoting organizational change. To achieve this, they must cooperate with businesspeople and have an open mind. In chapter three, we present our empirical research method by which we set about to investigate how people perceive the agile IT manager.

3. Research Method

Owing to the small number of publications addressing the topic of agile IT managers, an investigation was carried out in five Finnish organizations (Table 1) in September-December 2007 to conceptualize the agile IT manager. The organizations were characterized by their desire to develop IT organization agility, and were selected into the sample based on this criterion. We may assume this to indicate that the organizations are having problems in their IT agility and thus the interviewees might have insight as to the role of IT managers in the creation of agility.

Organization	*Business*	*Turnover 2006 (EUR)*	*Staff*
CGO1	Government bureau	576,700,000	10,952
CGO2	Government bureau	349,237,000	6,133
IC	Insurance	328,000,000	~1,000
CO	City	1,049,607,000	14,072
MC	Manufacturing	137,500,000	1,069

Table 1. Organizations participating in the research with type of business, turnover in 2006 and number of staff

Data was collected in semi-structured interviews having an average duration of approximately 90 minutes, and based on a thematic question graph with the themes outlined below:

- Which roles are the most important in agility
- Describe an agile IT manager
- How does the agile IT manager create agility
- How do the business managers see their cooperation with the IT managers and vice versa
- How active are the IT managers in sensing changes in the business
- How capable are the IT managers in carrying out changes

There were 40 interviews in total, people both in the IT and business functions were interviewed, and every participant was interviewed only once. All of the interviewed

IT people were manager- and director-level employees, and with exception for one person (in CGO1) the interviewed businesspeople were senior executives in their organizations.

We saw the paucity of theory being sufficient motivation to utilize the grounded theory approach (Strauss et al. 1990) in the analysis. Table 2 presents an outline of the research setting, giving the number of interviews.

The analysis progressed in three phases in accordance with Strauss et al. (1990) and as described in Table 3, below. In chapter four, the results of this analysis are presented.

Organization	*Interviews*		
	Total	*IT people*	*Business people*
CGO1	7	6	1
CGO2	7	7	0
IC	9	3	6
CO	13	2	11
MC	4	1	3
Total	40	19	21

Table 2. Research setting in the case study

Phase	*Description*
1. Open coding	All interviews were transcribed from tape and read, labeling each instance in which the theme of discussion was related to the capabilities of the agile IT manager. This process generated in total 356 labels describing agile IT managers. The second step was the pruning of very similar labels resulting in the label space being deducted to 201. Finally, we categorized the remaining labels, giving 26 categories.
2. Axial coding	Here, we created mutual linkages between the categories and sampled the data for possible contradictions to the tentative scheme. The categories suggested a preliminary arrangement which was adjusted to broadly comply with the actual interview statements.
3. Selective coding	We added a category for the agile IT manager, around which we assembled the category structure. This required a further validation of the established relationships, modifying the result. The grounded theory method further assumes that the researcher examines the resulting design and fills in any missing categories not present in the data to finalize the fledgling model, but we skip this step for the time being as we wish to continue iteration further.

Table 3. Analysis process according to Strauss et al. (1990)

4. Results

Here, we first describe the output of the grounded theory method. Next, we compare these results to the literature reviewed in chapter 2 and the transcribed interviews.

An interesting set of capabilities emerging from the interviews and suggesting substance to the individual dimension of agility for IT managers is hereafter referred as the "strategist" capability set.

According to the inteviewees, "the strategist" role of an agile IT manager may only be achieved by firstly moving away from the mundane world of work to a higher executive position:

- "…traditionally, we think of [corporate] silo models and the like, in that you are stuck in a pipe like this, so you should have a kind of rotor in your backside, in a way allowing you to lift yourself over these and then see the large arc." (CIO, MC)
- "…I should now somewhat distance myself with the immediate manager function in order to take larger plans forward. And now I have spent too much time, I feel, with small things, I have had to arrange and agree administrative and other nuances. And I want to dispense with those…" (IT manager, CGO2)
- "He must trust the next rung so that he will never involve himself in this kind of everyday activity, rather looking at it from above." (Business manager, CGO1)

Secondly, the IT manager can achieve a holistic understanding of the organization and its requirements from this "lofty vantage point". However, at the same time, he must not

distance himself from the realities of the business:

- "...feet on the ground, head in the clouds. You need to have a quite wide perspective on the field..." (IT manager, CGO1)
- "...pretty holistic, that is... able [to see] in a way from the helicopter perspective and position different things and their roles in this whole...a certain vision, yet feet on the ground..." (Business manager, LGO)
- "...a CIO... must have insight, he must have a kind of strategic ability and holistic perspective..." (Business manager, LGO)

Thirdly, the agile IT manager should have the ability to make use of this understanding by creating visions and generating alternative strategies, positioning the IT function in accordance with the selected scenario:

- "...a visionary... can concentrate on the company's long-term, life and death questions. He can see, like alternative strategies for the company. He should present alternative strategies for the company. He should in particular see these threat factors and the company's weaknesses as an area that needs addressing. The visionary's problem is that he is rarely respected..." (IT manager, CGO1)
- "...he should be able to see the role of the information management function and position the entire information management team right, in order to build the foundation for it... in particular with respect to the business and with respect to the system suppliers." (Business manager, IC)
- "...he has to be a good visionary, a good strategist." (Business manager, CGO1)

A holistic vision combined with realistic understanding of the grassroots activities and a forward-looking, visioning and strategic planning –oriented approach can be seen to be compatible with the definition of agility, namely adjusting and responding to change with speed and flexibility. Indeed, the strategist capability receives support from articles reviewed in chapter 2, in particular from scholars addressing change management (Markus et al. 1996; Prager 1996) and mindfulness (Butler et al. 2006). However, strategic skills were conspicuously absent in IT manager job advertisements (Lee & Lee 2006).

By using the grounded theory method, we also were able to ascertain to what extent the strategist capability was referred to in the interviews and what other capabilities were linked to the agile IT manager. Our qualitative approach yielded a conceptual web consisting of the capabilities viewed by the interviewees as desirable to agile IT managers. Code categories with direct antecedent status to the Agile IT Manager are represented in Figure 1, below. In effect, the data did not justify demoting these categories as subcategories to other categories.

With the exception of the "Bilingual Professional", the categories are fairly self-explanatory. "Bilingual Professional" is an intriguing term emerging from the interviews that refers to the capability of agile IT managers to understand not only IT, but also the business the organization is involved with, thereby functioning as intermediaries between these functions.

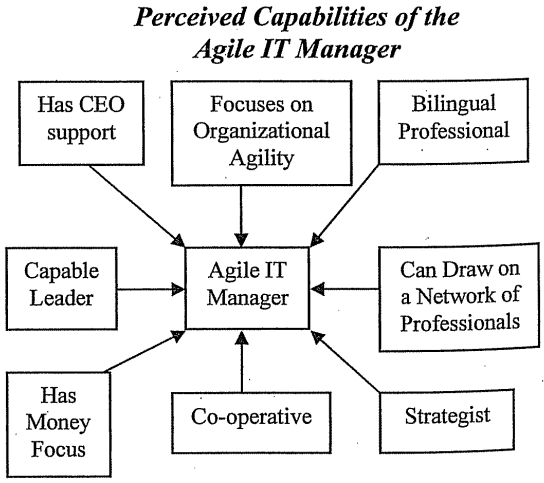

Figure 1. Perceived capabilities of the agile IT manager

Table 4 gives further insight to the results, showing the number of code instances located in the interview material that were assigned to the given category. Also shown are the

subcategories of each parent category and the total number of code labels in all subcategories plus those directly in the parent category, indicating the relative weight of the parent. The code numbers in Table 4 do not sum up to 201 as some subcategories are assigned as antecedents to more than one category.

It was found that the "Capable leader" and "Strategist" categories were in particular strongly represented in the interviews, as evidenced by the weight of each. Moreover, the code total also reveals that the "Bilingual Professional" category is important although having no antecedent categories.

Category	*Codes*	*Subcategories*	*Weight*
Bilingual Professional	63	none	63
Capable Leader	47	Capable Communicator, Determined, Driven, Inspiring, Persuasive Ability, Supportive of Employees, Systematical	152
Can Draw on a Network of Professionals	3	Eager to Learn	9
Co-operative	6	Customer-oriented	14
Focuses on Organizational Agility	2	none	2
Has CEO Support	5	none	5
Has Money Focus	3	none	3
Strategist	31	Able to Prioritize, Capable of Change, Eager to Learn, Future-oriented, Open-minded, Perceptive	81

Table 4. Code and category distribution in the results

Code frequencies and distribution among the categories (Table 4) suggests that the perception of interviewees on the agile IT manager is, first and foremost, a capable leader who has a strong strategist streak. This individual is not merely a leader, however, but one who also possesses both IT and business expertise. To a lesser extent, agile IT managers are co-operative and able to draw on a network of professionals when their personal skills or resources do not suffice.

The capable leader was described as follows in the interviews:

- "What is most important in our group is to be a kind of people leader, that is inspiring... and make the people follow. That is really helpful." (Business manager, IC)
- "... inspiring and motivating, and... has created the group spirit..." (Business manager, CO)
- "...a good people leader plus, at the same time, a demanding leader. That is, with equal treatment and, by trusting the people, you can earn the trust. If he can make the atmosphere such that we feel like we are doing real work, then we work, really crazy." (IT manager, CGO1)

Contrasting these results with the literature in chapter 2, it is evident the most referred capability of agile IT managers – that of capable leadership – has only a thin presence in the agile IT management literature; only Byrd et al. (2000) and Duncan (1995) refer to these generic management skills. Although management skills are strongly present in job advertisements, however, they tend to

underline the more technical management skills.

The subcategories of the capable leader seem to point toward a concept of leadership close to the transformational leadership proposed by Burns (1978) and Bass et al. (2006). According to Burns, a leader should "tap" the motives of followers in order to reach common goals and help them to reach their fullest potential, thus demanding both persuasiveness and supportiveness from the leader. In this way, leadership is inseparable from the followers' needs. Moreover, Bass adds in his model of transformational leadership that successful leaders are capable of inspiring their followers.

The capability having the strongest support in the literature is the bilingual professional. Bhatt et al. (2005), Byrd et al. (2000) and Duncan (1995) all consider both IT and business skills important for agility, and this is also confirmed in the study by Lee and Lee (2006). Moreover, there is some additional support for the importance of co-operation (Bhatt et al. 2005; Prager 1996) and the utility of focusing on organizational agility (Prager 1996), but in summary, the perceptions on agile IT managers seem to focus on capable leadership whereas, in the main, research emphasizes dual IT-business expertise. Both agree on the importance of factors here attributed to the strategist category. Together with the meaning associated by the interviewees to the strategist, which we see as congruent with agility as defined by Sherehiy et al. (2007) and Overby et al. (2006), we take this as a strong implication that the capability is particularly important to agile IT managers.

5. Contributions

Our analysis suggests that the interviewees seem to place most value in leadership traits when judging how successful an IT manager is at creating agility in the IT organization. In particular, people-oriented skills are recognized by IT professionals as the most important skills in their job. According to our results, a large part of what makes an agile IT manager is this people leader ability. Agile IT managers must be able to inspire their fellows and thus make the organization move.

We also found strong evidence to the effect that strategic ability is highly valued in agile IT managers. The interviewees considered an IT manager who is seen as a strategist would distance himself from the immediate manager function and corporate units to operate at a higher organizational level, allowing him to perceive the organization in a holistic way. At the same time, he would be able to create visions and strategies for the IT function. This should, however, not mean that the IT manager loses his touch on the realities of the business. The strategist aspect is interesting as prior research has shown that IT managers tend toward task-orientation rather than people-orientation and are less able to deal with strategic decision-making than general managers (Willcoxson & Chatham 2006).

Finally, knowledge of both IT and business was identified as a third important aspect for the agile IT manager. However, it came as no surprise as there is already much support in the literature to this effect. Literature on agile IT management emphasizes these three capabilities in the reverse order, which implies that the strategist capability has the strongest compound evidence from both interview data and the literature.

We intend to continue iteration with the grounded theory method in order to create a framework that may be tested with a quantitative method. However, these findings should increase our understanding of the individual capability aspect of agility.

6. Limitations and Further Research

It would be interesting to further analyze these results, for instance, by focusing on the perceptions of IT people and business people separately. Another group that would need attention is the CIO group, who have above been treated as part of the IT manager group.

We also find it important to study agile IT managers in organizations already known to be agile. Moreover, in the future, we intend to eliminate the cultural bias so far existing in the data.

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DIGGIN' DEEP TOWARDS A THEORY OF SUSTAINABLE EMPLOYEE COMMITMENT

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Keywords: employee commitment, employee perspective, qualitative approach

Over the past three decades, commitment research developed into one of the most important topics on both the agenda's of Human Resource Management (HRM) scholars and practitioners. Tremendous effort has been put into clarifying the commitment concept itself, and in studying its statistical relationships with antecedents and outcomes. This is not surprising, as commitment seems to predict critical employee behaviour, such as performance (e.g. Meyer, Paunonen, Gellatly, Goffin & Jackson 1989) and organisational citizenship behaviour (e.g. Moorman, Neihoff & Organ 1993). Concerning antecedents, employees' commitment can be seen as a reward for decent and fair HRM policies and practices offered by the employer. Most research has been done on 'organisational commitment': the commitment an employee has towards the company as a whole. However, and contrary to what many scholars and practitioners seem to assume (e.g. Beer, Spector, Lawrence, Quinn Mills & Walton 1984; Pfeffer 1994; Rousseau 1995), commitment to an abstract entity such as the organisation seems less realistic and beneficiary for employer as well as employee than commitment towards more proximate work-related foci such as work, colleagues, and supervisor (e.g. Becker, Billings, Eveleth & Gilbert 1996; Millward & Hopkins 1998). Furthermore, taking recent developments into account such as mass downsizing, reorganisations and declining job security, why should employees develop overall commitment to firms? Allen and Meyer (1990) developed a three-component model of commitment and distinguished affective, continuance, and normative commitment. Most scholars believe that especially affective commitment predicts desired employee behaviour (e.g. Meyer, Stanley, Herscovitch & Topolnytsky 2002; Vandenberghe, Bentein & Stinglhamber 2004). Therefore most research still focuses on this commitment nature, and, as a consequence, "the most obvious gap in research pertaining to the Three-Component Model concerns the development of continuance and normative commitment" (e.g. Meyer et al. 2002, 42). Moreover, when studying the existing gaps in employee commitment as referred to by experts in the field, they seem to be exclusively concerned about psychometric properties, discriminant validity and 'correlates'. In other words: The debate is reduced to a positivistic one reflecting modern psychology's dominant paradigm, leaving or pushing aside arguments that reflect an alternative symbolic universe (Tashakkori & Teddlie 1998). This can explain why still very few researchers take Reichers (1985, 469) critique seriously and therefore his remarks remain topical: ...a second problem that emerges from the commitment literature as a whole is the lack of emphasis on the individual's own experience of being committed. That is, definitions and operationalizations of commitment seem always to evolve from reviews of the literature and hybridizations of previous definitions. Researchers have not asked subjects directly (or even indirectly) for their perceptions and

Article 3

The Applicability of Transformational Leadership to Short-term Projects.

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The Applicability of Transformational Leadership to Short-Term Projects

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Abstract: In the business domain, the increasing demand for transparency in corporate operations, greater scrutiny by shareholders and government agencies, and the need for quick response to customer needs have contributed to the need to make achievements rapidly, increasing the frequency of short-term work arrangements. Therefore transformational leadership, the dominating paradigm in leadership research, should also be examined from the short-term perspective. This conceptual study assesses the applicability of transformational leadership in short-term projects with a duration of one year or less. Earlier research shows that there are significant impediments for transformational leadership in this kind of short-term projects. Project leaders have lesser influence on team members than traditional line managers. Short-term projects are ambiguous and stressful work settings in which follower confidence and values are not easily built. Trust formation in the team, subordinate identification to the leader, commitment and motivation are time-consuming processes that are critical to the success of transformational leadership, yet are difficult to achieve in short time frames. Empirical research has so far been ambiguous as to the success of transformational leadership in project settings. This may be due to the insufficient granularity of research designs, as much empirical research is conducted without specifying project duration. Our research indicates, however, that one crucial issue for the applicability of transformational leadership in short projects seems to be relationship formation between the leader and subordinates. Work environments in which relationships extend beyond such short projects could be more promising for transformational leadership than environments in which relationships are formed during the project. We propose future research should examine transformational leadership in projects within the context of the leader-follower relationship. In addition, researchers should in the future attempt to specify which relationship characteristics in particular are essential for transformational leadership to function, as well as the conditions for these characteristics to develop, highlighting the importance of systematic future research on this topic.

Keywords: transformational leadership, short-term, project management, conceptual study

1. Introduction

Transformational leadership has received support as a leadership approach that is applicable in most situations (Bass & Riggio 2006). The applicability of transformational leadership with regard to organizational and team performance has been tested primarily against approaches such as laissez-faire leadership, management by exception, and transactional leadership. This research has typically concluded that the transformational leadership paradigm is superior to the other approaches (Lowe et al. 1996; Rubin et al. 2005), or that it is applicable, but should be complemented with aspects from these other approaches (Bass & Bass 2008). In any case, the paradigm continues to dominate leadership research.

However, recently the context in which leadership is enacted has been emphasized (Badrinarayan 2003). There is a growing recognition that leadership can not be separated from its context, and current research is grappling with ways to address specific circumstances and contingencies in leadership (Porter & McLaughlin 2006; Osborn & Marion 2009). So far, little research has been done in the domain of short-term projects. The domain is exceptionally important as projects are a prominent area in business. Organizations are utilizing project-based work arrangements due to the flexibility they offer in establishing a temporary work setting. Today's organizations are often built around project work (e.g. matrix organization, see Lawson 1986). Frequently, employees are working in multiple projects at once and may meet their project managers more often than their direct supervisors in the line organization. This change in the way work is organized has been facilitated by the demand for flexibility and speed in business operations (Nicholas & Steyn 2008). Customers, shareholders, regulators, and other interest groups are eager to receive outputs from the organization faster than before. Project arrangements allow for rapid deployment of resources, and their rapid redistribution to other tasks. Short-term projects in particular are attractive for organizations that wish to maintain control over resource allocation and avoid committing resources for long periods of time.

Indeed, leadership in projects is different from more permanent leadership arrangements. Project managers generally have less power over project team members than do traditional line managers (Keegan & Den Hartog 2004). Due to their temporary nature, project settings are less conducive to

employee identification and motivation than is regular work (Cha & Edmonston 2006, Krishnan 2005). Short-term projects of under one year are particularly susceptible to these problems, and because time is required for the processes of transformational leadership to function, it is unclear how this approach could be utilized in short-term project work settings. It may be that transformational leadership is not at all applicable in this type of context and that other leadership approaches should be considered.

In this study we examine the literature regarding how applicable transformational leadership is in short-term projects that have a duration of under one year. We use project success (that is, the collective performance of the project group toward agreed targets, such as time and budget) in settings where transformational leadership occurs as the condition for applicability, and assume that (1) transformational leadership and (2) individual performance contribute to this variable. Transformational leadership can affect both individual performance and collective performance, and we found references to both in the literature. In our study leadership is understood in accordance with Northouse (2001, 3): "*Leadership is a process whereby individual influences a group of individuals to achieve a common goal.*" Thus, both leaders and followers are involved in the leadership process.

In the following chapters, we first examine transformational leadership (chapter 2) and then move to consider its application to project settings (chapter 3). Finally, we present our findings and discuss the results (chapter 4).

2. Transformational leadership

Transformational leadership theory provides an understanding how leaders may influence followers to make efforts, commit to organizational goals, and perform in a way that is beyond expectations (Yukl 1999). According to Bass (1985), a transformational leader is a person who raises associates' level of awareness of the importance of achieving valued outcomes and the strategies for reaching them, encourages associates to transcend their self-interest for the sake of the team or organization, and develops associates' needs to a higher level in such areas as achievement, autonomy, and affiliation. Transformational leadership is composed of four dimensions that make this possible: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration.

Among the full-range leadership scales (transformational, transactional, laissez-faire) transformational leadership is typically seen as the most effective leadership style. Lowe et al. (1996) found in their study that the dimensions of transformational leadership correlate positively with subordinate satisfaction, motivation and performance. Transformational leadership has been studied in many different contexts. Studies have shown that transformational leadership has a positive effect on performance in profit and non-profit (Egri & Herman 2000), educational (Harvey et al. 2003; Kirby et al. 1992), governmental (Wofford et al. 2001), military (Bass et al. 2003), religious (Druskat 1994) and sports (Charbonneau et al. 2001; Ristow et al. 1999) organizations. Transformational leaders have been observed in different organizational levels, and although the literature is divided on this issue (Bruch and Walter 2007, Neuhauser 2007) scholars claim that they exist among non-supervisory project directors at the lowest level of management as well as among high ranking managers at the top levels of the organization (Bass & Bass 2008). Thus, it seems transformational leadership would be desirable for projects as well, and it looks possible that project managers could function as transformational leaders.

However, transformational leadership has not been widely examined in project settings, and there are very few studies on short projects in particular. Turner and Müller (2005) have noted that earlier studies have to a great extent ignored the leadership style and competence of project managers in project success factors. In contrast, the general management literature considers leadership to be an essential success factor. Thus, there is need to examine further the applicability of transformational leadership in project settings.

3. Transformational leadership in projects

A project can be considered as a temporary organization created to accomplish a task (Turner & Müller 2003). Lundin and Söderholm (1995) argue that there are four basic concepts – task, team, transition and time – that are the foundation for temporary organizations. In chapter 3.1, we examine the applicability of transformational leadership in projects regarding the first three dimensions, and address time in chapter 3.2.

3.1 Task, team and transition in project environments

Temporary organizations should achieve success – a transition – in some way before being terminated (Lundin & Söderholm 1995). There are several criteria for measuring project success (Freeman and Beale 1992), but one of the main reasons to organize work based on projects is to obtain results effectively and quickly, and leadership is a major factor in this process (Zimmerer & Yasin 1998). Leban and Zulauf (2004) found in their study that transformational leadership behavior enhanced actual project performance. Thite (1999) argues that managers of more successful projects exhibit transformational leadership behaviors to a greater extent than their counterparts in less successful projects. According to Prabhakar (2005), in terms of transformational leadership approach, individual consideration, idealized influence and a strong relationship orientation were linked to project success. Moreover, Barber and Warn (2005) argue that transformational leadership is more applicable in projects than leadership by exception. Thus, transformational leadership seems to have support as a leadership method pertaining to project leadership as well.

On the other hand, prior research also suggests that transformational leadership might have to be complemented with other approaches in projects. Bass and Bass (2008) have come to admit that transformational leadership should in many contexts be combined with transactional leadership and exhibited by the same leader in varying degrees over time. Thite (1999, 2000) has obtained similar results in technical projects, indicating that transformational leadership augmented with technical leadership gives the best results. Indeed, project managers seem to use a mixture of leadership behaviours in practice, and that transactional behaviours are not uncommon. Mäkilouko (2004) identified that project managers tend to be more task-oriented than relationship-oriented. Neuhauser (2007) found in her study that behaviours perceived by project managers themselves as the least important for a project manager were all in the transformational behaviours group. It appears that a mixture of leadership styles can lead to better results than transformational leadership alone.

Why would a project setting limit the applicability of transformational leadership? Project leadership commonly implies that the project manager does not have full responsibility over his followers as would a more traditional leader, but rather functions as a task leader for the project staff. Katz (1982) and Weick & Roberts (1993) note that tasks are much more important in temporary organizations than in organizations with more permanence. The duties of project managers are typically limited to task aspects related to the project. Contact with employees may be intensive during project tasks, but issues related to employee satisfaction and career development typically continue to be the line manager's responsibility (Keegan & Den Hartog 2004; Turner et al. 2009). This in particular limits the possibilities of the leader to consider the unique situation of every follower over and beyond the task at hand and thus seems to inhibit individualized consideration toward the followers. Moreover, project success is dependent on the will and commitment of employees. Lundin and Söderholm (1995) underline the importance of motivating and building commitment within the team. Transformational leadership has been found to promote the development of trust and commitment (Arnold et al. 2001, Bass & Riggio 2006); however, Keegan and Den Hartog (2004) found that in-work learning process, long-term career development and social integration are all adversely impacted in project work, and that commitment was not linked to transformational leadership in project teams. Consequently, it becomes more difficult than usual to motivate the followers by communicating a vision of a desirable future state. This seems to impede inspirational motivation.

In summary, prior research indicates that project settings inhibit transformational leadership by restricting the leader's scope of influence with regard to the subordinates, and provide fewer opportunities to build trust and commitment within the project team in comparison with more traditional work arrangements. While some literature regards transformational leadership as a relevant leadership approach in projects, other literature finds that transformational leadership should be exhibited in combination with other leadership approaches for best outcomes.

3.2 Time in projects

Time is a fundamental concept to the temporary organization (Lundin & Söderholm 1995), where the very existence of the organization is bounded by a temporal limit. Burns (1978) emphasizes that time is critical for transformational leadership to work. Avolio and Bass (1995) note that the component of individualized consideration in transformational leadership diffuses from the individual level to the group level, and then to the organizational level with time. This process is part of the "transforming" behavior focal to transformational leadership, affecting the team's values and culture. However, Avolio

and Bass do not indicate the time period required for this diffusion, referring merely to an example where the transformation took 50 years. It is unclear whether this process can occur in short projects of under one year.

The impact of time to leadership has been extensively addressed with regard to leader-follower relationships. Factors such as follower self-worth (Dansereau et al. 1995), friendship between the leader and follower (Boyd & Taylor 1998), identification and congruence (Cha & Edmonston 2006, Krishnan 2005) and justice perceptions (Scandura 1999) can develop progressively to greater depth with the passage of time. Follower identification to the leader requires that a relationship based on trust is established (Bass & Bass 2008, Butler et al. 1999, Gillespie & Mann 2004, Podsakoff et al. 1996), and this will be difficult when the job needs to be finished quickly (Nicholas and Steyn 2008). Similarly, it is difficult to imagine that the leader could impart a vision to the followers unless such a trusting relationship already exists. Short projects may simply be too short to enable relationships that need to develop for these processes of transformational leadership.

Relationship duration between the leader and follower is indeed a crucial factor for transformational leadership. Krishnan (2006) confirms that relationship duration moderates the effect of transformational leadership on outcomes in the case of congruence and identification. However, there is very little research on this topic so far. The length and quality of the leader-follower relationship that is required for transformational leadership has not been examined. One important reason for the fact that short projects are challenging for transformational leadership seems to be that they provide a challenging context for relationship development. Even so, it is possible that the leader and follower already have a relationship from previous projects, making it easier for the follower to identify with the leader in a short time span, and therefore increasing the likelihood that transformational leadership can be applicable in the project. The first step to improve understanding about transformational leadership in short projects would be to concentrate on the time dimension not only regarding project duration, but in particular, the leader-follower relationship duration.

Even though many researchers indicate that the duration of projects influence the preferred leadership behaviour in project environments, very few report any details revealing the duration of projects studied. The references found indicate a fairly long average project duration, for example, in Thite's (1999) study the average duration of the projects was 15 months, and in Prabhakar's (2005) study the average number of weeks the projects lasted was 57. Neither author reveals the range of project duration studied. This is particularly problematic as it can lead to confusing results regarding transformational leadership in projects. In chapter 3.1., we referred to literature stating that transformational leadership is linked to project success on the one hand, but is severely hampered and not sufficient by itself without the use of other leadership approaches on the other hand. This contradiction may exist because project duration has not been considered. For instance, Bass et al. (2003) examined the correlation between the leadership ratings given to U.S. military leaders (platoon leaders and sergeants) and the performance of the military teams they led, and concluded that both transformational and transactional leadership were positively correlated with performance. Whereas the link with transformational leadership and performance was expected, they attribute the unexpected link between transactional leadership and performance to the rapid turnover and short tenure of personnel in the U.S. army, as well as the short duration of tasks reported in the study (see also Geyer & Steyrer 1998, Mannheim & Halamish 2008). The cause of confusion in previous research regarding the applicability of transformational leadership in projects can be due to ignorance of project duration in the research design. The research of Morgeson and DeRue (2006) supports this by showing that the greater the urgency of an issue, the more directive and task-focused interventions leaders exhibit, suggesting that leaders tend toward transactional leadership behaviours in short-term task situations.

To summarize, prior research notes that several crucial aspects of transformational leadership are constrained by time. However, most literature does not reveal the duration of projects, making it difficult to judge the applicability of transformational leadership to short-term projects based solely on previous empirical research. Nevertheless literature suggests that transformational leadership is often found to be more effective with transactional approaches in short-term task situations. Unless a relationship already exists between the leader and followers, it may be difficult to build such relationships during short projects. However, so far research has to a great extent ignored the leader-follower relationship in transformational leadership.

4. Findings, discussion and future research

Short projects are an increasingly important area of organizational work that has received little attention in transformational leadership research. This paper has sought to examine the literature to answer the question whether transformational leadership can be applicable in short-term projects (duration less than one year). We conclude that:

- Prior research claims that transformational leadership is applicable to projects, but on the other hand, notes that there are significant barriers to transformational leadership in projects, and that transformational leadership should be combined with other approaches in projects.
- Project managers' responsibility toward the followers is limited to task aspects in the project, limiting the applicability of transformational leadership.
- Short projects are particularly difficult settings for transformational leadership, due to several dimensions of transformational leadership being time-dependent. These dimensions are built in the interaction between the leader and follower, and consequently the duration of leader-follower relationships is emphasized. Short projects may be too short to allow for the development of these relationships, affecting the applicability of transformational leadership negatively.
- Prior research on transformational leadership in projects fails to address the project duration. This may be why the literature has been inconclusive regarding the applicability of transformational leadership in projects. Projects of both long and short duration are included in research designs, confusing the results.
- Future research should examine transformational leadership in the context of the leader-follower relationship duration. The mere consideration of project duration is not sufficient, as relationships can extend over projects.

Adding to the work of Keegan and Den Hartog (2007), Krishnan (2006) and others, our contribution in this paper is that leader-follower relationship duration is critical to the applicability of transformational leadership in short projects. The project duration in short projects may be too short for the establishment of a relationship between the leader and followers, making transformational leadership inapplicable. However, the relationship may exist before the commencement of the project, facilitating transformational leadership. Thus, the applicability of transformational leadership in short projects is contingent on the leader-follower relationship duration.

Researchers should, in the future, strive to express the duration of projects they examine in order to facilitate the comparison of study results with regard to the time dimension. Short-term projects should be considered as a separate research area and receive more attention in transformational leadership research. Future research should also strive to identify the relationship duration between the leader and followers. We believe our paper can help researchers to focus on the specific context of short-term projects in transformational leadership research. It can also help organizations to identify problems in project leadership and facilitate the development of leadership to accommodate them.

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Article 4

Towards a Partnership in CIO-business Relationship – The Role of Expectations.

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TOWARDS A PARTNERSHIP IN CIO-BUSINESS RELATIONSHIP – THE ROLE OF EXPECTATIONS

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Abstract

A well-functioning relationship between the Chief Information Officer (CIO) and business leaders has in the past been examined mainly from the viewpoint of the relationship between the CIO and the Chief Executive Officer (CEO). Within this relationship, expectations are placed on the CIO. However, IT-business alignment requires a partnership where the CIO and business leaders participate equally in decision-making processes. This research investigated the perceptions of CIOs and business leaders in three Finnish companies regarding the degree of attainment of the CIO-business partnership and expectations set for the other party, and interpreted them using Brinkerhoff's (2002) partnership model. The cases suggest one model of a dysfunctional CIO-business partnership in which the inability of the parties to fulfill expectations is a major factor. We propose the model for future verification.

Keywords: IT alignment, CIO, partnership, expectations

1. INTRODUCTION

The IT (Information technology) unit is a relative newcomer as a corporate unit, and its proper management has gradually come to be regarded as one of the most problematic issues facing contemporary organizations. This has been due to the growing role of IT. If not a strategic business enabler, IT is typically at least a critical resource for most organizations. There is now a widespread recognition that IT-business alignment [1] and strategic planning of IT [2] are necessary in many organizations to ensure the smooth functioning of day-to-day business operations. Successful IT-business alignment requires that structures, policies and practices in IT management exist and are aligned with business equivalents to facilitate decision-making [1].

Along with the growing importance of IT in business operations, the role of the Chief Information Officer (CIO) in strategic management has considerably increased [3, 4, 5]. In particular, the personal relationship between the CIO and the CEO (Chief Executive Officer) has been recognized as crucial (e.g. 6, 7). For instance, Li & Ye [8] found that close CIO-CEO ties can have a positive impact on the financial performance of IT investments especially in companies operating in a dynamic business environment, and that are strategically proactive. According to Feeny et al. [9], a good CIO-CEO relationship contributes to success in strategic IT planning, IT-business collaboration, and CEO involvement in IT management. However, the creation of mutual trust, understanding, and close collaboration between the CIO and managers in other organizational functions tends to be challenging due to differing professional mindsets, language, and past personal experiences [5, 10, 11, 12, 13, 14).

In this paper, we concentrate on the CIO's relationship with business leaders involved in top IT decision-making, and define this as the CIO-business relationship. A partnership is one type of relationship that implies especially close cooperation and collaboration between the parties. In the following chapters we argue that expectations are important in CIO-business partnerships and describe a research where business executive expectations toward CIOs and vice versa were investigated in the context of CIO-business relationships. The results suggest new avenues for future research.

2. IT – BUSINESS RELATIONSHIPS

IT–business relationships have been much debated. It is necessary for successful and appropriate business-oriented IT management that both parties, IT and business, work genuinely together. The need for reciprocity in CIO-business collaboration is apparent from the IT alignment research field, which emphasizes the role of business in providing direction to IT, and the role of IT in providing solutions to the business [1]. This kind of two-way alignment is desirable. One suggestion to create such alignment has come from the dynamic capabilities research field, which suggests that mutually shared capabilities between IT and business are vital [15]. Some of these shared capabilities are related to collaborative and communicative practices between the parties in the IT-business relationship, for instance the CIO and business leaders. Yet building these capabilities remains a difficult task for many organizations, and there have been calls that

the CIO position fails to deliver the claimed benefits [11, 16]. The literature has interpreted the problem to be linked to the CIO's behaviour, but in this paper, we are examining a more systemic explanation.

Prior research on the CIO's relationships with business executives has focused exclusively to the CIO-CEO relationship. Within that research stream, most prescriptions to improve such relationships have focused on the CIO (e.g. 9). In other words, in order for CIO-business relationships to improve, the CIO should improve his/her abilities and competencies. There is far less emphasis on the requirements for the CEO for ideal IT-business collaboration. The relationship with other business executives has also received little attention. However, the CEO divides his time to all organizational functions, and while his/her assistance is vital in launching large-scale projects, the CEO is not able to participate in day-to-day decision-making in IT matters. Moreover, much of the CIOs work takes place outside the strategic board, in bodies responsible for IT prioritization and investments. Thus, an approach to build closer collaboration within the top management team as a whole – between all its members – is desirable. Doz & Kosonen [17] have pointed out that the top management teams in companies that have succeeded in highly turbulent business environments are tightly connected, and the team members are mutually dependent on each other. They argue that one precondition for business agility is management unity. It refers to complimentary personalities, skills and views within the top management team, shared mindsets and values of collaboration, mutual appreciation and respect. A partnership relationship between the CIO and business executives may best describe the kind of relationship that is required to build joint collaborative capabilities between IT and business.

Peppard & Ward [18] posit a problem-centric approach to analyze IT-business relationships, presenting a framework for analyzing the gap existing in the relationship between IT and business functions (figure 1). As seen in the model, values and beliefs are important constituents of IT-business relationships. Values and beliefs refer to the values and beliefs held by individual employees. In this paper we focus on expectations of employees with regard to CIO-business relationships. Expectations are one type of belief about a given state of affairs. Next, we move to defining partnership and identifying the link between expectations and partnerships.

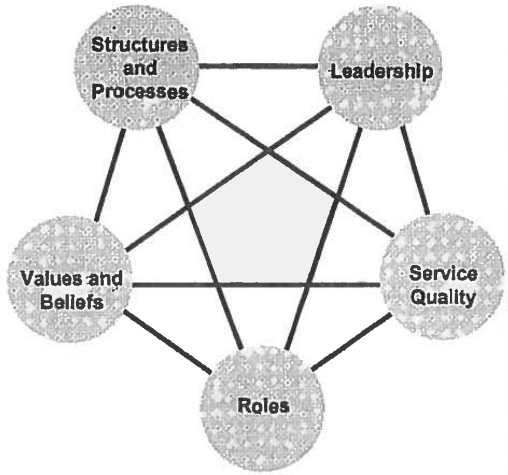

Figure 1: A framework for managing the relationship between the IT organization and the rest of the business

Source: 18

3. PARTNERSHIP RELATIONSHIP

A partnership is a special case of a relationship. Partnerships have been examined extensively as relationships between organizations in the strategic alliances/partnerships literature. The conclusions of that research indicate that partnerships allow the acquisition of capabilities that are not previously possessed by the organization, and as such, they improve the performance of the organization [19, 20]. Partnerships are also key predictors of outsourcing success [21, 22]. However, with exception to outsourcing, the fruits of this partnership research appear thus far not to be rigorously applied to IT-business relationships in general.

As stated in the previous chapter, an essential element of success in IT-business relationships is how well IT and business can build a relationship in which both parties contribute in an equal and balanced way. The business side must know and be able to describe the needs for IT in an understandable way, and the IT side must be able to interpret these needs and tell what is required to fulfill them [23]. Solli-Saether & Gottschalk [24] present a three-stage model for development of IT outsourcing relationships into partnerships. According to the model, these relationships develop from the "cost stage" where the parties essentially have a buyer-supplier relationship into "resource stage" that signifies a shift from economic benefits to strategic resources and core competencies of the parties. The third, final stage in this model is the "partnership stage", in which economic interests are accompanied with integration of the parties' aims and interests. Partnerships seem to be highly developed relationships with special characteristics.

Brinkerhoff's [25] partnership model has been widely used in both empirical and conceptual studies [26, 27, 28, 29]. She defines a partnership as follows:

"Partnership is a dynamic relationship among diverse actors, based on mutually agreed objectives, pursued through a shared understanding of the most rational division of labor based on the respective comparative advantages of each partner. Partnership encompasses mutual influence, with a careful balance between synergy and respective autonomy, which incorporates mutual respect, equal participation in decision-making, mutual accountability, and transparency"

A partnership suggests that the parties have equal opportunity to participate in the decision-making process. However, in many organizations partnerships between the CIO and business executives might be difficult for the business executives to accept. After all, IT is often seen as the service provider, and business is seen as the consumer of IT services, setting customer-buyer positions for the parties in the relationship from the very start. Such a relationship tends to favour the customer side in decision-making. In organizations where IT has a strategic role in the business, business leaders should recognize that they also have to learn the basics of how IT can be successfully utilized, and how IT investments are managed. If business leaders do not make the effort to understand IT concepts with regard to their application in business, they themselves cannot participate in the decision-making as full members.

Brinkerhoff argues that the degree of a partnership relationship ("partnership practice" in figure 2) can be measured on a relative scale by (a) mutuality and (b) organization identity. In other words, highly reciprocal relationships in which there is a large impact on organization identities signify high degree partnerships (upper right corner in figure 3). Prerequisites, success factors, and partner performance each have an impact on the degree of the partnership (figure 2).

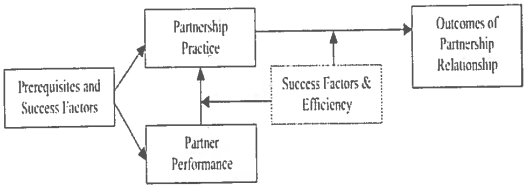

Figure 2: Relationship factors and causalities

Source: 25

Mutuality high Identity lost	Mutuality high Identity maintained
Mutuality lost Identity lost	Mutuality lost Identity maintained

Figure 3: Partnership degree

Source: author

The role of expectations is great in partnerships. The ability to meet expectations is a success factor for the partnership. In Brinkerhoff's model, partner performance is evaluated according to how that partner complies with expected and agreed roles, and whether that party exceeds expectations. Where those expectations and roles are not discussed and defined explicitly among the parties, the role expectations of both parties regarding the other party remain hidden from that party. In that case it is difficult to address the performance gaps in relation to expectations or to identify unrealistic expectations. This can lead to serious problems in CIO-business relationships. We believe that the call for CIOs to become "super-CIOs" to resolve problems in IT-business alignment is misplaced and more attention should be focused on the expectations that are being placed on the role [30]. The explanation why CIOs sometimes "fail to deliver" is embedded in part in the interactions of these managers with business managers in the organization.

It is particularly important to examine partnership in CIO-business partnerships, because the CIO is the newest of the CXO positions and as such, what can be realistically expected from the position may not have sufficiently stabilized in the mind of business leaders. Thus, the expectations held by business leaders toward the CIO, as opposed to other CXOs, are more likely to be disconnected from what the CIO can in reality provide. Moreover, IT has in recent years made great inroads into the daily operations of companies, which has made it imperative for business leaders to acquire an understanding of IT issues in order to be able to make decisions regarding IT. This rapidly increasing attention toward IT matters makes the CIO-business partnership exceptionally interesting and unique.

In this research our aim was to explore the perceptions of CIOs and business leaders regarding the CIO-business partnership by interviewing CIOs and business leaders in three Finnish organizations. In the following chapters we will describe our research process (chapter 4), results (chapter 5) and conclusions (chapter 6) more closely.

4. MATERIALS AND METHODS

Our three case [31] organizations were hand-picked among the cases in a research project (between September 2007 and May 2008) in which IT-business dynamics and agility of IT management were analyzed. The selected cases were all medium-sized and large private businesses in Finland. Table 1 shows an overview of the organizations that participated in the research.

Table 1: Organizations participating in the research

Organization	Business	Turnover 2006 ('000 EUR)	Staff
Insure	Insurance	250,000-500,000	Ca. 1,000
Manu1	Manufacturing	100,000-250,000	Ca. 1,000
Manu2	Manufacturing	500,000-1,500,000	Ca. 20,000

In each organization both IT and business management representatives were interviewed (table 2). The business representatives were senior business directors and, with exception for one organization, also included the CEO. The IT representatives comprised IT managers and directors and always included the CIO. Out of the total number of 27 interviews, 7 were targeted to IT people and 20 to business people. The interview themes were IT-business collaboration, the success of IT in supporting business transformation, and the relationships between key IT and business directors and managers responsible for achieving these goals.

Table 2: Interview details

Organization	Interviewees	IT leaders	Business leaders
Insure	12	4	8
Manu1	4	1	3
Manu2	11	2	9
Full total	27	7	20

All interviews were recorded and transcribed by a professional. The analysis process was inductive in nature [32]. We did not have pre-defined hypotheses for analysis, but explored what would emerge from the data concerning CIO-business relationships. We analyzed the interview transcriptions by organization and by business/IT side, concentrating on statements that describe the relationships, communication, and collaboration of the CIO with the business leaders in that organization.

5. RESULTS

The CIO-business relationships in the case organizations of this research were all mature relationships, in which the CIO had stayed in the organization for several years and where joint working methods between the CIO and business leaders had stabilized. While each of the three cases had a unique situation, all of them exhibited similar characteristics in their CIO-business relationships. In each case, both business executives and CIOs felt dissatisfied with the relationship. The exact underlying problem varied in each case:

- In Insure it was perceived to be disagreement regarding the decision rights for IT resources between the central group company and the branch companies
- In Manu1 it was perceived to be the lack of communication in the relationship
- In Manu2 it was perceived to be the lack of strategic consideration of IT in the company.

Nevertheless, the expectations of the parties toward each other seemed to be similar in each case. The business executives expected the CIO to possess business knowledge to be able to explain IT initiatives. On the other hand, the CIOs expected the business executives to understand IT issues to a certain degree to be able to make IT decisions. However, these expectations were not fulfilled. The cases suggested a "cool" CIO-business relationship in which the parties held fast to their own responsibilities in the relationship, thus maintaining their identities in regard to the relationship. The mutuality between the parties was perceived as low (table 3), as the determinants of mutuality (equality in decision-making, transparency, mutual respect, etc; [25]) pointed to cost and contract focused, buyer-supplier relationships in which the CIO was the supplier of IT services to the business [24].

Table 3: Partnership degree in case companies

	Mutuality	Identity
Insure	Low	Maintained
Manu1	Low	Maintained
Manu2	Low	Maintained

In chapters 5.1 and 5.2, we present the perceived expectations of the parties toward each other. The cases we examined seemed to have a common pattern that we interpret in this paper using Brinkerhoff's partnership model. Hence, we combine the statements by CIOs and business leaders regarding each organization into the following two chapters. We also identify some cause-effect relationships among the factors that are suggested by Brinkerhoff. While many issues we heard in the interviews are individually already well-documented in the literature, their interconnections and consequences for IT-business partnerships are less understood.

5.1 Business leader perceptions on the CIO-business relationship

Table 4 summarizes the expectations to CIOs and partnership practice as viewed and reported by business leaders.

Table 4: Business leader perceptions

Organization	Expectations to CIOs	Partnership practice
Insure	CIO should be more diplomatic, and less direct and opinionated early in discussions.	There is a struggle on the decision-making right and ownership of IT resources between the local company branches and the company group. Branches claim the centralized IT function lacks service disposition and budget transparency.
Manu1	CIO should not act independently in IT decisions. He should make his intentions understood and obtain permission from the business side before acting.	The relationship between the CIO and business executives is strained due to lack of communication on part of the CIO. He has acted without keeping the board properly informed.
Manu2	The CIO should make more effort to understand the business direction and how IT can serve business needs.	IT has been managed smoothly and rigorously as a support function without interference to the business, but IT could offer more in terms of strategic contribution.

Business leaders emphasized the importance of a commonly understood language and terminology in a partnership. If the CIO uses technical jargon that is not understood on the business side, the result can be confusion and irritation. To avoid that, business leaders want the CIO to interpret IT terminology to business language. The problem can thus be classified under partner performance in the partnership model. In other words, according to business leaders, CIOs are not functioning according to their performance expectations of the business. One of the most commonly mentioned requirements to collaboration between the CIO and business management was stated to be the CIO's business knowledge and ability to communicate IT issues on business terms:

"The case is quite often that the business leaders are not familiar with the ICT systems. That requires an active role from the IT management to provide the business leaders with the right kind of knowledge of IT's possibilities to support the business" (business leader, Logi)

When business leaders fail to understand IT issues, they may get an uncomfortable feeling because they recognize that they should know more about the way IT is deployed and what possibilities it can bring to their business. This impacts the success factors for the partnership, including business leader confidence and their ability to meet CIO expectations:

"I still don't quite understand and then I get the feeling that, wait a moment, should I familiarize myself with this even better so I could understand what that guy [CIO] is saying" (business leader, Insure)

In this case, business leaders may hope for an omnipotent CIO to come into being, who could take care of the communication without the need of business leaders learning how IT investments affect the business and how they are managed. Thus, the expectations the business leaders set for the CIO rise further, making it more and more difficult for the CIO to comply with his expected role:

"the responsible director [CIO] in the board could make his case so plain and simple that without any background at all, without education or experience, you would understand the connection to business development without fail" (business leader, Manu1)

If the business leaders do not have that understanding whether by training or the CIO being capable of communicating the needed information in a way that is understandable for them, this can lead to insufficient consideration of IT to achieve the organization's strategic goals. In such cases, partnerships can be reduced to buyer-supplier-relationships and IT seen merely as a cost factor:

" on the business side it requires a kind of understanding and acceptance that you can invest in IT... so that you don't always need to cut IT costs" (business leader, Manu2)

"it is often seen nowadays that IT management costs are expenditures and not necessarily investments" (business leader, Insure)

"it [IT] is in a way seen as a necessarily evil and a big expenditure in the worst case" (business leader, Manu1)

In summary, the statements of business executives in these companies proposed that a host of connected problems existed in the CIO-business partnership. Brinkerhoff's model helps categorize these problems and leads us to hypothesize that they are connected as a vicious circle that starts from incapability of the CIO to comply with his expected role, leads to degradation of partnership success factors, further dissonance between the expected and realized CIO performance, and finally can lead to the degradation of the partnership.

5.2 CIO perceptions on the CIO-business relationship

In table 5, the perceptions of CIOs regarding the expectations to business executives and views on partnership practice are summarized.

Table 5: CIO perceptions

Organization	Expectations to business executives	Partnership practice
Insure	Business executives, especially branch CEOs, should understand IT issues better than they currently do.	Local company branches act independently in IT matters and do not follow group decisions. Business prioritization of IT projects is weak.
Manu1	Business executives should have more interest in and understanding of IT issues.	Acknowledge that relations with business executives are strained. There are communication problems because the board does not understand IT investments to a sufficient degree.
Manu2	Business executives should understand the benefits and costs of IT solutions. They should communicate new initiatives early enough to let the IT function prepare for changes.	The IT steering group has not been active in communicating IT requirements. IT is seen as a support function; there is little strategic consideration of IT potential in the executive leadership.

Where business leaders commented on CIO's lack of business knowledge, CIO interviews said that neither was the IT knowledge of business leaders sufficient. Business functions are the users and owners of systems, and thus must be able to make decisions regarding investments to such systems. This decision-making ability entails not only familiarity with certain IT concepts, but most importantly, the ability to understand the contribution of IT to business processes and outcomes. Thus, when the CIO's indicate that business leader IT understanding is insufficient, the partnership model interpretation that can be derived mirrors that of the business leaders, i.e. the business leaders are not performing according to CIO expectations:

"one of the greatest problems when talking with business is to make this IT-talk understandable to business" (CIO, Manu2)

"we have been unfortunately blessed with leaders who have had little of this understanding" (CIO, Insure)

"their understanding of things is basically PC [Personal Computer]-level" (CIO, Manu1)

If business leaders feel they have insufficient understanding of IT decisions, they may lack the knowledge to contribute in meetings regarding IT investments or strategic IT issues. Thus, partnership success factors such as CIO trust toward business leadership in IT decisions and business leader ability to meet CIO expectations are negatively affected:

"…there are rarely any initiatives from that group, at least in those meetings. Initiatives may come via other channels in advance or from the side, but those people mostly stick to what I have come up with on the agenda" (CIO, Manu2)

"the discussion is rather weak right from strategy issues" (CIO, Manu2)

In such cases co-operation and dialogue related to IT can be assigned as a responsibility to the CIO. This measure would actually improve the preconditions of the relationship by increasing the clarity of the relationship in terms of mutual responsibilities and expectations, but would be disastrous by eliminating mutuality, one of the two indispensable requirements for high-degree partnerships. In other words, when co-operation is the responsibility of just one party, high degree partnerships can be difficult to achieve, because the business leaders do not feel they have to contribute. Such situations were found in the case organizations:

"My task is to ensure that there is a proper dialogue between IT and business" (CIO, Manu2)

"the main field [of responsibility] is, in a way, fitting business and information management together" (CIO, Insure)

"the task has been fairly clear – when the field is defined, and as long as you stay within those bounds, you can just keep going. And that has, in a way, led to this thing, that I have done this job pretty independently and stubbornly" (CIO, Manu1)

In summary, the statements of the CIO's seemed to mirror the observations that we made on the business side. Business leaders are not performing according to the CIO's expectations that impacts partnership success factors, and can lead to a destructive "renegotiation" of the responsibilities of the partnership.

6. CONTRIBUTIONS

In this study we carried out interviews targeted to the CIO and business leaders in three Finnish companies involved in high-level IT decision-making to find their perceptions regarding the expectations for the other party in the partnership between the CIO and business leaders, and their views on the partnership practice. The case relationships were all interpreted as being less than ideal partnerships, and the results suggested a dysfunctional partnership model in which expectations are an important factor.

Prior research on CIO relationships with business has concentrated on the CIO-CEO-relationship and the abilities of the "ideal CIO". In contrast, this research emphasizes that CIO – business leader relationships should not be built on the efforts of only one party. We examined the opinions of both CIOs and a wide range of business leaders, and interpreted them using Brinkerhoff's [25] partnership model. The research contributes to further explanation of the dimension of values and beliefs in IT-business relationship gap and provides one elaboration of

the "disconnected" and "unloved" IT organizations proposed by Peppard & Ward [18]. To our knowledge it is the first research to utilize Brinkerhoff's partnership model in interpreting CIO – business leader relationships, and among a few number of studies that addresses expectations in CIO-business relationships.

Our cases describe a situation where:

- The business leaders expect that the CIO should have business knowledge
- Vice versa, the CIO expects that the business leaders should have IT knowledge
- Both parties fall short of these expectations
- The business leaders have little confidence or ability to fulfil their role as IT decision-makers
- The CIO has little trust in the business leaders' role in IT decision-making
- The business leaders place more expectations on the CIO in IT decision-making and alignment
- If the CIO can not fulfil these expectations, the partnership can deteriorate into a cost-centric buyer-supplier relationship in which responsibility for IT-business co-operation is placed entirely on the CIO

Our hypothesized "dysfunctional partnership model" (figure 4) describes the way partnerships can fail to reach high degrees. If the business leaders lack sufficient IT knowledge and have difficulties with assessing the business impacts of IT, they have an aversion for IT decisions and tend to push their responsibility for IT decision-making over to the CIO. If the CIO accepts this, the need for collaboration diminishes but the implicit expectations placed on the CIO expand to unrealistic proportions.

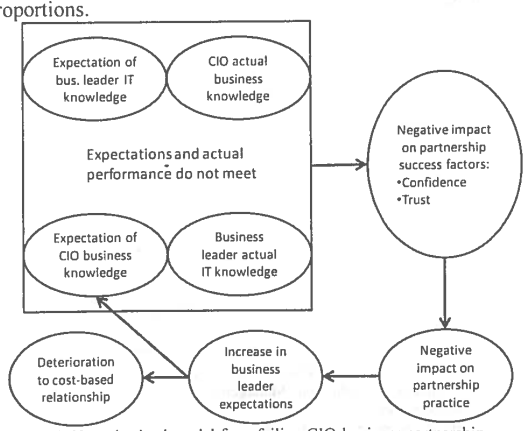

Figure 4: Hypothesized model for a failing CIO-business partnership
Source: author

The model should be confirmed by future studies. Future research should in addition concentrate on the CIO-business link rather than mere CIO-CEO relationship, confirm how prevalent the previous issues are in organizations, analyze their interdependencies, and suggest ways how partnerships can be promoted in organizations.

7. DISCUSSION

The cases in this research implied that the expectations of business leaders toward the CIO tend to increase if the expectations are frustrated. Other possibilities would be that the expectations would decrease or their characteristics would change in response to such expectation-performance gaps. This suggests other forms of development for CIO – business leader relationships that should be examined in more detail by future studies.

The cases also suggest that the expectations for CIO performance on the business leaders' part and the business leader performance on the CIO's part have not been realistic from the start. Instead of assigning responsibility for the co-operation on the CIO, the role of each member in the partnership should be carefully articulated [33]. This requires that suitable collaborative practices be built. For instance, business leaders tended to value the active involvement and initiative of the CIO, but the timing for initiatives should be correct, emphasizing the need for the parties to have several levels of communication available. For instance, crisis management requires special collaboration modes [33, 34]. The roles of the CIO and business executives were also reported to vary in different situations – i.e. managing large development projects vs. running daily IT operations. There should be a capability to switch from one role to another more flexibly, and the roles should be mutually recognized and understood. Finally, it seems that there is no one single good model for a working relationship between CIO and business, but it must always be developed and understood in its context:

"It is a misconception to think that there would be a one right way to work and act as a CIO. You must build the right way by yourself, proactively."(CIO, Logi)

We emphasize that partnerships between the CIO and business leaders should address the following issues:

- Discuss methods of collaboration and communication between the CIO and business leaders
- Agree the roles of the CIO and each business leader in IT decision-making
- Build partnerships to fit the contextual needs of their own organization

The interviews also highlighted the reluctance of both CIOs and business leaders to acknowledge their own deficiencies in the relationship, as well as the cost-centred mindset to IT management by business leaders that tends to draw attention away from real collaboration and direct it toward a simple exchange (buyer-seller) relationship between the CIO and business leaders. The interviewed CIOs stated that the business representatives are not always interested to invest their time to relationship

development. On the other hand, many business leaders suggested that it is the CIO's role to adapt and serve the business needs cost-efficiently and their role is to tell those needs.

This research reiterates that functioning CIO-business relationships require action from both parties over an extended period of time in order to build trust. CIOs recognized that mutual trust and respect are important to a partnership. Trust is especially necessary in crisis or other special situations in which collaboration is more intensive. CIOs linked trust to the ease and readiness to approach the business leaders in order to have advance information on changes:

"I think that the most essential in the relationship between CIO and a business representative is interpersonal trust between these two persons, it simply works or not...and if it does not work then it will be a misery as a job. It has nothing to do with ICT as such."(CIO, Logi)

"You have to have a good trust-based relationship with your boss or with the CEO to get early enough information of the big moves in business. That enables you to prepare for the changes a bit earlier. Of course I understand that some issues cannot be told in advance even to the CIO." (CIO, Manu3)

Relationship development should not be seen as a temporary project but sustained practice that is embedded into the collaborative process itself. None of our empirical cases reported very systemized and conscious ways to develop the CIO-business relationship. Improvements were mostly taking place implicitly and/or on an ad hoc basis. It was considered that more conscious, systemized and long-term approach would make the development more effective. However, the interviewees described that meetings tend to be very busy and time for communication limited. Dedicated time for the relationship development should be considered as an investment for the future. The time should be used to agree about roles, working methods, communication, and success criteria for the partnership.

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