Exploring the relationship between IT Governance and Strategic Alignment

Kari Hiekkanen
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A doctoral dissertation completed for the degree of Doctor of Science (Technology) to be defended, with the permission of the Aalto University School of Science, at a public examination held at the lecture hall F239A of the school on 8 June 2016 at 12.

Aalto University
School of Science
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The relationship between business and information technology (IT) has been a persistent topic of discussion both in academia and among practitioners in the past decades. The alignment of business and IT, or strategic alignment, is viewed as an important factor and driver of business value of IT. While the importance of alignment is acknowledged, organizations continue to struggle in achieving it. IT governance has been identified as one of the key factors in achieving strategic alignment. In order to effectively apply IT governance practices, it is important to understand the relationship and impact of IT governance on strategic alignment.

This dissertation explores the extent to which strategic alignment is impacted by IT governance practices. The dissertation is composed of an introduction and five individual studies addressing the different aspects of the problem. The studies apply a mixed research approach, using conceptual, qualitative and quantitative research methods. The empirical part of the dissertation consists of an in-depth case study conducted in a large multi-national service and manufacturing company and a quantitative study based on two surveys conducted among both private and public sector participants.

First two papers explore the evolution of strategic alignment and its nature from various perspectives based on extensive literature reviews. The third paper elaborates business value of IT and its link with IT governance practices in the extant literature. The fourth paper describes an in-depth case study on IT governance best practices and their impact on strategic alignment. And finally, a quantitative study explores the relationship between IT governance and strategic alignment, discusses the underlying factors affecting the alignment, and offers a set of key IT governance practices for further scrutiny.

The key contribution of this dissertation is on providing empirical evidence on the complex relationship between IT governance and strategic alignment. The research findings suggest that IT governance practices have a significant contribution to strategic alignment on operational and tactical levels. On strategic level, however, the findings suggest that the implementation of IT governance practices is dependent on how strategic IT is seen in the organization. Finally, the dissertation puts forth a new construct, a set of eight key IT governance practices found to have a positive impact on strategic alignment, refining previous research on the topic.

Keywords IT Governance, Strategic Alignment, Business Value of IT
Avainsanat  Tietohallinnon johtaminen, strateginen yhteenveto

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Writing this dissertation has been a journey. What started a decade ago as a part-time hobby, has led me to a new career in academia doing research and teaching – and also finally finishing this dissertation. Working in various IT leadership roles in the industry was what originally sparked my interest in this topic, but overall the shift from industry to academic research has been quite a learning experience. Between now and then, I have had the opportunity to meet and work with many bright minds who, in one way or the other, have influenced my work.

First, I would like to thank my supervisor, Professor Martti Mäntylä for guiding this work in its final stages and clearing the hurdles on the way. I would like to thank my original supervisor, Professor (pro tem) Matti Hämäläinen for his guidance and support. I would also like to thank Adjunct Professor Jari Collin for his advice and guidance in writing the final papers and putting this dissertation together.

Second, I would like to thank the pre-examiners of my dissertation, Professor Jukka Heikkilä and Professor Eng K. Chew for their insightful comments and suggestions for improvements in ensuring the quality of this work.

Third, I wish to thank the people who co-authored the papers for this dissertation and my colleagues from SOLEA, ACIO and ISSEG research groups for many interesting and constructive discussions and debates over the years: Mika Helenius, Janne J. Korhonen, Mikko Heiskala, Timo Itälä, Marco Halén, Elisabete Patricio, Kimmo Karhu, Ilkka Melleri and all the others I have had the privilege to work with.

Last but not least, I thank my wife for her unwavering support and encouragement during this long journey.
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List of publications

This work is based to large extent on the following publications, which are referred to in the text by their roman numerals:


The author’s contribution to the publications

I. The author of this thesis was the primary author of the paper, responsible for formulating the research problem, participated in the literature review and analysis, and produced the final wording in the paper. Mr. Helenius, Mr. Korhonen and Ms. Patricio participated in systematic literature review and scrutinized the publication in general.

II. The author of this thesis was the primary author of the paper responsible for constructing the classification framework, participated in the literature review, and producing the final wording in the paper. Mr. Helenius, Mr. Korhonen and Ms. Patricio participated in systematic literature review and scrutinized the publication in general.

III. The author of this thesis was the primary author of the paper responsible for the classification, analysis, and argumentation, and produced the final wording in the paper together with Mr. Korhonen. Ms. Patricio participated in the systematic literature review. Mr Helenius and Adj. Prof. Collin scrutinized the publication in general.

IV. The author of this thesis was the primary author of the paper producing the final wording in the paper. He and Ms. Pekkala worked together in the development of the research design and analyzing the findings. Ms. Pekkala conducted the data collection and interviews. Adj. Prof. Collin scrutinized the publication in general.

V. The author of this thesis was the sole author of the paper.
## Abbreviations

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<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tr>
<td>BVIT</td>
<td>Business Value of IT</td>
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<tr>
<td>CEO</td>
<td>Chief Executive Officer</td>
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<td>CFO</td>
<td>Chief Financial Officer</td>
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<tr>
<td>CIO</td>
<td>Chief Information Officer</td>
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<tr>
<td>COO</td>
<td>Chief Operations Officer</td>
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<tr>
<td>IS</td>
<td>Information Systems (used interchangeably with IT in this thesis)</td>
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<td>IT</td>
<td>Information Technology (used interchangeably with IS in this thesis)</td>
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<td>ITG</td>
<td>IT Governance</td>
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<td>ITG-BP</td>
<td>IT Governance Best Practices (De Haes and Van Grembergen, 2008)</td>
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<tr>
<td>SAM</td>
<td>Strategic Alignment Model (Henderson and Venkatraman, 1993)</td>
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<tr>
<td>SAMM</td>
<td>Strategic Alignment Maturity Model (Luftman, 2000)</td>
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1 Introduction

1.1 Background

Gone are the days of business-as-usual tranquility. Contemporary business environment requires organizations to be to be faster and more innovative in the face of uncertainty, complexity and change. The focus of competition is shifting from the management of internal resources to identifying and nurturing business models and capabilities that rely on assembling and orchestrating difficult-to-replicate co-specialized assets in building competitive advantage (Teece et al., 1997).

Regardless of the industry, intensive use of information systems (IS) and information technology (IT) has become an integral element of organizational activity. IT plays a part of enabler or facilitator in most business processes, products, and services. As a result, organizational processes and knowledge have become codified into the structures of the information systems, which have come to constitute an important source of automated and routinized organizational behavior (Dewett and Jones, 2001; Galliers, 2008).

IT is no longer a mere enabler for business, but considered seen as a valuable asset and resource, and IT capabilities increasingly drive business strategy or even comprise the foundation of the business model (Bharadvaj, 2000; Cherbakov et al., 2005). As El Sawy (2003) notes, IT has evolved from “a tool used by people to help them in their work” to being “fused with the business environment such that (IT and business) are indistinguishable to our perception and form a unified fabric”.

As IT has become crucial in supporting, sustaining and enabling business models, top management needs to have an understanding of individual business and IT capabilities for current and future business needs. There is a need for better governance of related assets, competencies and capabilities in order to succeed in planning, organizing, controlling, and directing the IT. Organizations are also progressively exploring networked business ecosystems and seeking new products, services and business models, which are reliant on extensive use of IT, increasing the management challenges related to IT even further.
1.2 The Business Value of IT and Strategic Alignment

The benefits – both tangible and intangible – of IT have on organization’s performance or the business value of IT has been recognized (Brynjolfsson and Hitt, 1996; Kohli and Devaraj, 2003; Poon and Davis, 2004, Kohli and Grover, 2008). Over the years, researchers have adopted various kinds of conceptual, theoretical and analytic approaches, and empirical methodologies at multiple levels of analysis (Melville et al. 2004). On practitioner side, organizations continue to seek ways to create greater value from IT investments.

Business value of IT research has placed much emphasis on how IT resources and IT capabilities affect an organization’s performance. IT capability can be defined as the organization’s ability to acquire, deploy and leverage IT-related resources in combination with other resources and capabilities supporting the conduction of business in value-adding ways.

The notions of IT resources and IT capabilities as a source of competitive advantage are based on the resource-based view of the organization. In resource-based view, the organization is viewed as a collection of resources and capabilities, which form the basis for sustainable competitive advantage (Wernerfelt, 1984; Barney, 1991). To sustain competitive advantage, these elements need to be valuable, rare, inimitable and non-substitutable (Barney, 1991). Resources refer to a stock of available factors that are owned or controlled by the organization, and capabilities refer to an organization’s capacity to deploy resources. Capability is organization-specific, since it is embedded in the organization and its processes and, secondly, its purpose is to enhance the productivity of other resources (Amit and Schoemaker, 1993). Resource-based view and its extensions have become a widely utilized theoretical foundation of IT business value research (Wade and Hulland, 2004).

As the importance of IT increases, understanding the strategic value of information systems has been among the top concerns for many IS practitioners and scholars. Chen et al. (2010) list three enduring research streams of research relating to strategic value of IT: (1) strategic information systems planning (SISP); (2) the competitive use of IS or using IS for competitive advantage, and (3) alignment between IS strategy and business strategy. In the same vein, Tanriverdi et al. (2010), name business-IT alignment or strategic alignment one of “central quests” in IS strategy research.
The relationship between strategic alignment and business performance or business value of IT has been studied for several decades. Empirical evidence suggests, that organizations with “high” degree of alignment are able to leverage new information technologies more innovatively, optimize their IT spending, and achieve competitive advantage (e.g. Powell, 1992; Henderson and Venkatraman, 1993; Sabherwal and Kirs, 1994; Bergeron and Reymond, 1995; Teo and King, 1996; Chan et al., 1997; Cragg et al., 2002; Bergeron et al. 2004; Kefi and Kalika, 2005; Luftman and Kempaiah, 2007; Oh and Pinsonneault, 2007; Johnson and Lederer, 2010; Luftman et al., 2010; Taskin and Verville, 2010).

Overall, the findings support the hypothesis that organizations successfully aligning their business and IT strategy will outperform those that do not (Chan et al., 2006). Alignment is a prerequisite to more focused and strategic use of IT, which, in turn, leads to increased performance (ibid.). In other words, strategic alignment is seen as a mediating factor in IT value creations (Kohli and Grover, 2008). The elements most affected by strategic alignment are operational excellence, financial returns and customer focus.

The academic interest on strategic alignment is evidenced by the literature review by Chan and Reich (2007a) and more recently by Kaidalova and Seigerroth (2012) and Aversano et al. (2012). As Chen et al. (2010) note, “IS/business strategic alignment continues to be a major concern of CIOs and other organizational executives”. The practical relevance of strategic alignment is further supported by annual surveys targeted to CIOs and other IT executives (Luftman and Ben-Zvi, 2010; Luftman and Zadeh, 2011; Luftman et al., 2012; Luftman et al. 2013b; Kappelman et al., 2013; Derksen and Luftman, 2014; Kappelman et al., 2014). The strategic alignment has been an issue for IT management for over 30 years, ranking consistently among the top ten concerns worldwide (Luftman et al., 2013b, Kappelman et al., 2014).

Luftman et al. (2013a) list several reasons why alignment still remains an issue: (1) a need to recognize how business and IT are aligned with each other; (2) a tendency to look for a one silver bullet; (3) an absence of effective tool to assist in addressing alignment; (4) concentrating too much on IT infrastructure considerations; (5) concentrating on semantic disagreements rather than enhancing alignment; and (6) the premature announcement that alignment is dead. As Kappelman et al. (2013) note, “alignment is a persistent issue because organizations, markets, economies, and technologies are constantly changing and thus achieving and maintaining alignment is a continuous process.”
Previous research discusses a number of factors affecting strategic alignment, such as strategic orientation and the role of IT (e.g. Chan et al., 1997; Sabherwal and Chan, 2001), industry type and size (e.g. Raymond et al., 1995; Cragg et al., 2002; Chan et al., 2006), the role and position of CIO (e.g. Feeny et al., 1992; Luftman and Brier, 1999; Chan 2002; Preston and Karahanna, 2009; Johnson and Lederer, 2010; Banker et al., 2011), and enterprise architecture (e.g. Ross et al., 2006; Plazaola et al., 2007; Gregor et al., 2007; Kappelman et al., 2008; Plazaola et al., 2008; Wang et al., 2008; Saat et al., 2010; Saat et al. 2011).

IT governance has been identified as one of the key factors in achieving strategic alignment (e.g. Peterson, 2004; Dahlberg and Kivijärvi, 2006; Bowen et al., 2007; Chan and Reich, 2007b; De Haes and Van Grembergen, 2009; Balocco et al., 2013). The role of IT governance is to ensure alignment with organization’s strategy and goals and support the creation of business value (Weill and Ross, 2004; Van Grembergen and De Haes, 2009). IT governance transcends the traditional issue of structure – centralization vs. decentralization (Brown and Magill, 1994) – to more existential questions such as ownership and funding (Coltman et al., 2015).

IT governance affects strategic alignment as it can help to develop a system of accountability surpassing a simple focus on IT planning (Weill and Ross, 2004; Wu et al., 2015). As Huang et al. (2010) note, “well-designed and orchestrated IT governance mechanisms are expected to produce IT-related decisions, actions and assets that are more tightly aligned with an organization’s strategic and tactical intentions”. Such governance mechanisms comprise of a variety of IT-related issues such as IT decision-making and related accountabilities, roles, and policies.

Well-designed IT governance is expected to produce IT-related decisions, actions and assets that are more tightly aligned with an organization’s strategic and tactical intentions. Such governance mechanisms are directed toward a variety of IT-related issues, including but not limited to IT decision processes, policies, and the assignment of roles and accountabilities regarding these decision processes (Sambamurthy & Zmud, 1999; Weill & Ross, 2004).

To help practitioners in implementing IT governance, a number of guidelines and frameworks have been presented both by practitioners and academics. One of the most widely known practice-based frameworks is COBIT (www.isaca.org).
On the academic side, De Haes and Van Grembergen (2008, 2009), propose a set of 33 IT governance best practices intended to assist practitioners in implementing effective governance. The proposed set of IT governance best practices are based on an exploratory research and consists of structures, processes and relational elements rated by their effectiveness and ease of implementation by the panel of experts. De Haes and Van Grembergen (2009) conclude that organizations with a mature mix of IT governance structures, processes and relational mechanisms very likely achieve a higher degree of strategic alignment maturity.

Despite a considerable body of work on IT governance, strategic alignment and business value of IT, empirical studies on the impact of IT governance practices on strategic alignment are still scarce (e.g. Coltman et al., 2015; Wu et al., 2015). Although the literature mostly agrees on the positive relationship between IT governance and strategic alignment, the empirical research exploring the impact of actual IT governance practices is limited and the proposed causal relationship needs more empirical corroboration. In other words, our understanding of how and through which mechanisms does IT governance influence strategic alignment and consequently business value of IT is nascent.

Highlighting the lack of empirical evidence on the relationship between IT governance, Wu et al. (2015) recently note, that “strategic alignment remains a top priority for business and IT executives, but theory-based empirical research on the relative importance of the factors affecting strategic alignment is still lagging.” This gap is also of considerable practical importance, since it addresses the issue whether actual IT governance practices impact and sustain strategic alignment. As strategic alignment remains a top priority for both academia and practitioners, theory-based empirical research on the factors affecting strategic alignment is called for.

Drawing upon the work of De Haes and Van Grembergen (2008, 2009), this study explores the impact of previously identified IT governance practices on strategic alignment and consequently on business value of IT. As De Haes and Van Grembergen (2009) note, the set of IT governance best practices is based on exploratory research and requires further statistical testing, and especially call for further validation of the accuracy of the defined key minimum baseline for IT governance.
1.3 Research objectives and research questions

Previous research on business value of IT, strategic alignment and IT governance has highlighted the importance of alignment in value creation, how different IT governance arrangements contribute to the business value of IT, and how IT governance is linked with strategic alignment.

However, based on the discussion above, it is evident that more research is needed on how actual IT governance practices contribute to strategic alignment in an organizational setting. In this thesis, the positive impact of strategic alignment on the business value of IT is accepted based on previous literature and the thesis focuses on the contribution of IT governance practices to achieving strategic alignment. By providing empirical support for the importance of IT governance structures, processes and relational elements on strategic alignment, this study contributes towards the body of knowledge on IT governance and strategic alignment.

Therefore the research question is as follows:

RQ: What is the impact of IT governance practices on strategic alignment

The research question is broken down into three parts:

1. How strategic alignment is operationalized and measured?
2. What is the theoretical relation between IT governance, strategic alignment and business value of IT?
3. What is the impact IT governance practices on strategic alignment?

The core elements of the research framework are summarized in Figure 1.
This thesis is composed of five individual studies addressing the different aspects of the problem using multiple levels of analysis and different theoretical perspectives. First two papers explore the evolution and the nature of strategic alignment in literature from various perspectives. The third paper explores the extant literature on business value of IT and IT governance practices in order to understand what constitutes business value of IT and how IT governance practices link with business value of IT. The fourth paper describes an in-depth case study on how IT governance best practices contribute to strategic alignment maturity in an actual organizational setting. And finally, a quantitative study explores the relationship between extant instruments measuring the maturity of strategic alignment and IT governance practices.

Table 1 summarizes contribution of individual papers.

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*Table 1 Research questions and publications*

The main academic contribution of this study is on providing statistically supportable evidence regarding the impact of IT governance practices on strategic alignment. To practitioners, this study puts forth a tentative set of eight actionable IT governance practices supporting strategic alignment. Thus, this study possesses the potential to support IT management in selecting and implementing effective IT governance in organizational settings.
1.4 Philosophical foundations and methodology

All research is based on some underlying philosophical assumptions about reality to be observed and scrutinized, what constitutes 'valid' research and which research methods are suitable and appropriate for in a given study.

IS research is an interdisciplinary field that addresses a wide range of multifaceted problems regarding the development, use and implications of information technologies in organizational settings. Although IS research is concerned with technology, it is often about organizational action and social change. Due to the interdisciplinary nature of IS, researchers have adopted a multitude of theoretical and empirical approaches.

Traditionally, IS research has been dominated by positivist, and interpretive paradigms (e.g. Orlikowski and Baroudi, 2001; Chen and Hirschheim, 2004). Ontologically, positivist paradigm asserts that reality exists objectively and independently from human experiences while interpretivist paradigm emphasizes the subjective meaning of the reality that is constructed and reconstructed through a social interactions (Burrell and Morgan, 1979). Epistemologically, positivist paradigm concerns with the hypothetic-deductive testability of theories whereas interpretivist paradigm assumes that knowledge should be obtained through the understanding of human and social interactions and the subjective meaning of the reality (Chen and Hirschheim, 2004). Although ontology, epistemology, and research methodology do not depend on each other in principle, they tend to be interrelated in practice (Iivari et al., 1998)

Instead of traditional positivist or interpretivist paradigm, this study adopts the perspective of critical realism (Bhaskar, 1978, 1998). In general, the critical realism argues that reality exists independent of our representations of it; the reality and the “representation of reality” operating in different domains – the transitive epistemological dimension and an intransitive ontological dimension (Bhaskar, 1998). For Bhaskar, reality is both intransitive (existing independently of humans) and stratified into a three-layered ontological model: (1) the empirical domain, consisting of experiences; (2) the actual domain, consisting of events; and (3) the real domain, consisting of causal mechanisms (Bhaskar, 1978). Critical realism seeks to understand any social event (at the level of the actual domain) by exploring the underlying causal structures and mechanisms (at the level of the real domain). Critical realism transcends some of the classic dualisms in the social sciences such as positivism vs. interpretivism, and structure vs. agency and adopts a view of reality as an open system that is beyond our direct control (Bhaskar, 1998, 2002).
Epistemologically, the aim of critical realism is in explaining the relationship between empirical experiences, events and mechanisms. The emphasis is on understanding “how and why” of the phenomenon of interest. In order to analyze the various domains of reality and identify the relationships between experiences, events and mechanisms, critical realism endorses the use of different modes of inference: inductive, deductive, abductive, and retroductive (Danermark et al., 2002).

Mingers (2004) posit that critical realism can add to IS research by opening up a particular methodological space that lies between empiricism and interpretivism. Similarly Wynn and Williams (2012) argue that, as IS research is confronted with a complex socio-technical environment consisting of several interacting structures, mechanisms and events, a social structure consisting of individuals, groups, and organizations, with a number of rules and practices, technological artifacts and discursive entities, critical realism can be a viable paradigm for conducting research that is well suited for developing causal explanations of complex phenomena.

Critical realism does not commit to single type of research, but rather endorses the variety of different methods, both quantitative and qualitative, which are chosen according to the nature of the study (Zachariadis et al., 2013).

Accordingly, this study follows a mixed methods approach (Bryman, 2006; Tashakkori and Teddlie, 2010). The mixed methods research began to evolve as a synthesizing approach in the 1970’s in reaction to the polarization between the qualitative and quantitative approaches and is becoming the third approach to research, along with the quantitative and qualitative (Fidel, 2008). Mixed methods research is increasingly utilized in IS research (Mingers, 2001; Fidel, 2008; Venkatesh et al. 2013; Ågerfalk, 2013).

On a general level, mixed methods research adopts a pluralist methodology in research design, that it uses multiple methods and worldviews – i.e. quantitative or qualitative approaches in a single research inquiry, and argues that “consideration should be given to the different dimensions of a real situation, material, social, and personal; to the tasks involved in the different stages of a research study; and to the research context” (Mingers, 2001).

The proponents of the mixed methods research argue for the combined value of both quantitative and qualitative worldviews in developing a deep understanding of a phenomenon of interest (Venkatesh et al., 2013). A mixed methods approach may help in uncovering different (i.e. contradictory and complementary) conclusions from the quantitative and qualitative strands and lead to enriching our understanding of a phenomenon and help us appraise the boundary conditions of a phenomenon or relationships among its components (ibid.).
Greene et al. (1989) present five major reasons for mixed methods research: (1) triangulation (i.e. merge qualitative and quantitative data to in seeking convergence and corroboration); (2) complementarity (i.e. seeking elaboration, enhancement, illustration and clarification of the results of one method with the results from the other method); (3) initiation (i.e. discovering paradoxes and contradictions that lead to recasting research questions); (4) development (i.e. using finding from one method to inform the other method); and (5) expansion (i.e. seeking to expand the breath and range of the study by different methods).

In this study, motivation for mixed methods approach stems from triangulation and complementarity purposes. Triangulation reflects the importance of including multiple approaches to support causal analysis based on a variety of data types and sources, analytical methods, and theoretical perspectives (Denzin, 1978). Also, as this study uses both qualitative and quantitative approaches and different empirical contexts, it employs both methodological and data triangulation (ibid.).

Although critical realism advocates retroduction and abduction as the logic of analysis, it does not exclude either inductive or deductive reasoning. Overall, this study adopts deductive reasoning. As the aim is to explore causal relationships between the phenomena under interest, the theory-driven, deductive approach is a natural choice for the purposes of this research.

Following deductive approach as described by Robson (2002), this study (1) builds research problem and questions about the relationship between IT governance and strategic alignment based on the previous research and literature; (2) expresses this hypothesis in operational, measurable terms; (3) tests the hypothesis in empirical settings; (4) examines the results; and finally (5) proposes refinements to the theory based on the findings.

In other words, the existing theories are used to guide the study before the data collection. After confirming initial hypothesis, the data is used to inductively extend existing theories.
1.5 Structure of the thesis

Overall, the study is structured as follows. I will start by outlining key concepts and theoretical background on the business value of IT, IT governance and strategic alignment. Next, I will discuss the five papers that comprise the dissertation in detail; their methodologies, key results and contributions. Then I will present the findings and discuss the limitations and avenues of future work and finally summarize the study.

The individual studies are attached as Appendices 1-5.

The chapters are organized as follows:

- Chapter 1 presents the background, objectives and scope of the research, and discusses the philosophical foundations of this study.
- Chapter 2 presents the context of the research and related works in the areas of business value of IT, strategic alignment and IT governance.
- Chapter 3 discusses the methodologies, key results and contributions of the five papers that comprise this dissertation.
- Chapter 4 summarizes the findings and discusses the limitations and presents topics for future research.
- Chapter 5 concludes the study
2 Context of the Research and Related Works

This chapter discusses the context of the research and related works on the core concepts of the research disseminated in this thesis: business value of IT (*the end*), IT governance (*the means*) and strategic alignment (*as a measure of IT effectiveness*).

2.1 Business Value of IT

The organizational impact of IT has been a persistent topic of discussion both in academia and among practitioners in the past decades. The impact, value and the nature of IT in organizations have been intensively studied from various perspectives, such as organizational competitiveness, productivity, operational efficiency and organizational capability. Masli et al. (2011) define the business value of IT research as one that “examines direct or indirect impacts of one or more IT constructs on outcomes that can be measured in an economically meaningful way”. In broad terms, this research falls under a theme “information systems and competitive advantage”. Over the years, researchers have adopted various kinds of conceptual, theoretical and analytic approaches as well as empirical methodologies at multiple levels of analysis (Melville et al. 2004).

The impact of IT on organizational performance can include e.g. productivity enhancement, profitability improvement, cost reduction, competitive advantage, and inventory reduction. The business value of IT can be defined as “the organizational performance impacts of information technology at both the intermediate process level and the organization-wide level, and comprising both efficiency impacts and competitive impacts” (Melville et al., 2004). Peppard and Ward (2004) note that the business value from IT only emerges through business changes and innovations, and organizations must be able to assimilate this change if value is to be ultimately realized. However, the benefits of IT are not automatic. To be realized, IT requires complementary investments in human capital and much organizational and social learning (Brynjolfsson and Saunders, 2010).

IT contributes also indirectly to business value through a number of factors. Lower communication and replication costs will help businesses innovate through new products (Brynjolfsson and Saunders, 2010). As information infrastructures become fully digitalized and embedded, new dynamics emerge, affecting the social and technical infrastructures. This leads to regular leaps in performance, exceptional growth, and radically decreasing costs not offered by physical infrastructures (ibid.).
Overall, previous research presents contradictory evidence on whether the benefits of IT have materialized. The argument is (e.g. Hitt and Brynjolfsson, 1996; Lee, 2001) that the reasons for seemingly contradictory results are mostly related to methodological and conceptual issues. Brynjolfsson and Saunders (2010) argue, that there is a significant lag (approximately 3 or 4 years) before the benefits of IT investments are realized. Also, to create business value, IT needs to be embedded in organisational processes in combination with other resources, these desirable characteristics become easier to achieve (Brynjolfsson and Saunders 2010). After reviewing recent literature, Wiengarten et al. (2013) conclude that, despite conceptual and methodological progress, the field still lacks a more coherent way to conceptualize and measure business value of IT.

Two predominant theoretical perspectives have been used as the conceptual bases in research of the organizational impact of IT: the resource-centered view and the contingency-based view.

Studies based on the resource-centered view tend to consider IT itself to be a strategic resource that can directly affect a business’s performance if properly combined with other strategic resources. Studies representing the contingency-based view, on the other hand, suggest that the strategic value of IT should be understood in conjunction with a company’s strategy and highlight the importance of finding a good “fit” or “alignment” between business and IT strategies. According to the contingency-based view, IT resources alone may add little value. (Oh and Pinsonneault, 2007).

There are two main streams of literature that draw on the resource-centered view as their theoretical basis: the production function view and the resource-based view (Oh and Pinsonneault, 2007). Both views assume that IT is a strategic resource that brings important benefits to companies (ibid). According to the production function view, IT capital and labor are independent production inputs that can affect many financial measures (ibid). Several authors (e.g. Soh and Markus, 1995) argue that linking the size of IT investment directly to company performance is problematic and misleading.

The resource-based view of the firm (Wernerfelt, 1984; Barney, 1991) stipulates that resource asymmetries of businesses in the same industry form the source of competitive advantage. To sustain this competitive advantage, the resources need to be valuable, rare, inimitable and non-substitutable (Barney, 1991). While these characteristics address how a business can protect its resources, they do not account for how the resources are changed over time.
The resource-based view has been extended by dynamic capabilities, which focuses on determining the “degree to which specific resource-level processes improve a firm’s competitive position by operationalizing the independent variable as the interaction of a specific resource and a specific dynamic capability and testing its relationship with performance” (Wiengarten et al., 2013).

The dynamic capability approach (e.g., Teece et al., 1997; Eisenhardt and Martin, 2000; Benner and Tushman, 2003; Teece, 2007) explores how organizational and strategic management competencies can enable organization to sense, seize and capture market opportunities in order to achieve and sustain competitive advantage in an open, rapidly changing environment (Teece, 2007).

There is a key distinction between resources and capabilities. Amit and Schoemaker (1993) define resources as stocks of available factors that are owned or controlled by the organization and convertible to final products or services. Capabilities, in contrast, refer to the organization’s capacity to deploy resources towards desired ends (ibid.). They are tangible or intangible organization-specific information-based processes that provide enhanced productivity of resources.

Research that investigates organizational impact of IT using the resource-based view, assumes that in order to create and sustain competitive advantage, a company must acquire unique IT resource bundles that are not simultaneously implemented by competitors (Mata et al., 1995; Santhanam and Hartono, 2003). Less emphasis is put on the size of IT capital than the importance of the scope of resources (Oh and Pinsonneault, 2007).

Prior research has linked IT resources and IT capabilities with their effects on organizational performance, competitive advantage and business value of IT (Mata et al., 1995; Ross et al., 1996; Bharadwaj, 2000; Bhatt and Grover, 2005; Feeny and Willcocks, 1998; Liang et al. 2010). IT-related capabilities of organizations contribute to various measures of IT-related business value (Powell and Dent-Micallef, 1997; Santhanam and Hartono, 2003; Ray et al., 2005).

On a high level, IT capability can be defined as an ability to acquire, deploy and leverage IT-related resources in combination with other resources and capabilities supporting business in value-adding ways (Ross et al., 1996; Bharadwaj, 2000). Conceptually, the bulk of research on IT capabilities focuses on identifying IT capabilities contributing to perceived performance, however the measures used to operationalize performance vary (e.g. Bharadwaj, 2000; Wade and Hulland, 2004; Liang et al. 2010).
IT capabilities are considered as first-order constructs that are linked to performance by direct causal relationship (e.g., Bharadwaj, 2000; Fink and Neumann 2007). However, only a few studies examine the developmental paths (i.e. path dependency) producing those capabilities (Bhatt and Grover, 2005; Bi et al. 2011). On a more practical level, the number of different viewpoints and conceptualizations of IT capability makes developing these capabilities in an organization a multifaceted and complex challenge. As an organization’s performance is seen as dependent on its IT capabilities, the strategic management of IT is concerned with making informed choices based on an understanding of both the relative benefits of different options and the organization’s ability to deliver those benefits (Peppard and Ward 2004). This, in turn, implies a focus on the ways the organization manages and uses IT, learning explicit lessons from its success and failure, rather than on what technology can do (the means), or on trying to align IT use to achieve business objectives (the ends) (ibid.).

The resource-based view is the dominant conceptual paradigm guiding current research on the business value of IT and IT capabilities (Nevo and Wade, 2010). The main limitations of the resource-based view include its disregard towards resources that are not strategic in and of themselves (i.e. IT assets), the lack of interest on the mechanisms through which resources attain their strategic potential, and its inability to theorize about the outcomes from combinations of IT assets and organizational resources (ibid).

In the *contingency-based view*, alignment or the “fit” between an organization and different kinds of contingency factors leads to superior company performance and misalignment to erosion of performance (e.g. Burns and Stalker, 1961; Lawrence and Lorsch 1967). The contingency-based view emphasizes the importance of fitting or aligning the organization’s strategy with an internal appraisal of the firm and an external assessment of environmental opportunities and threats (e.g. Andrews, 1971; Ansoff, 1965). The central theme is the identification of a set of ideal effective configurations of organizational elements maximizing fit (Iivari, 1992; Johnston and Yetton 1996).

The concept of “fit” or “alignment” is frequently used in the field of strategic management. Minzberg et al. (1998) name a “design school of strategy” as the one, which emphasizes strategic choice and views firms as actively seeking strategic fit. The essential components of “fit” are the extent of congruence between an organization’s internal structure and its external situation (Miles and Snow, 1978; Venkatraman, 1989; Porter, 1996; Tan and Tan, 2005).
Porter (1996) states that a competitive advantage rests on ability to acquire and deploy resources that are coherent with the organization’s competitive needs and further posits that strategic fit between different activities is fundamental to sustained competitive advantage. Venkatraman (1989) defines six different categories of “fit”, those of moderation, matching, mediation, covariation, profile deviation and gestalt, used later in research.

Alignment is important in formulating strategies as well as in their implementation. Implementation is fostered by aligning or harmonizing and adjusting key systems, processes, and decisions within the firm (Peters and Waterman, 1982; Kaplan, 2005). Achieving alignment requires a shared understanding of organizational goals and objectives at various organizational levels and within various units (Kathuria et al. 2007). The literature distinguishes between two types of organizational alignment – vertical and horizontal or lateral (ibid.).

Kathuria et al. (2007) define vertical alignment as “the configuration of strategies, objectives, action plans, and decisions throughout the various levels of the organization” and further note that typically strategy is conceptualized at three levels – corporate, business, and functional. Respectively horizontal alignment is defined as cross-functional and intra-functional integration between and inside different organizational functions (e.g. marketing, finance, HR and IT) (ibid.).

The contingency-based IT business value research has focused on studying how strategic alignment affects organizational performance. (Oh and Pinsonneault, 2007). The positive impact of strategic alignment is generally recognized, however, the relationship between business strategy, IT and performance appears to be complex and findings have often been inconclusive (ibid.). One area of interest is how structural factors, such as the governance and management arrangements, impact alignment (e.g. Chan and Huff 1992; Brown and Magill 1994; Bergeron et al. 2001, 2004; Dahlberg and Kivijärvi, 2006; Kang et al. 2008; Lee et al. 2008). Some authors (e.g. Devaraj and Kohli, 2000) have used contingency theory together with RBV to better understand the relationships between resources performance outcomes (Wiengarten et al., 2013).

During recent years, researches have increasingly started to consider the synergies between IT and a variety of complementary organizational factors (Brynjolfsson and Hitt, 2000; Grover and Kohli, 2012; Wiengarten et al., 2013). The co-alignment between IT and other organizational factors is seen as a source of positive synergies and capabilities that will significantly improve organizational performance (Wiengarten et al., 2013).

Tables 2 – 4 exemplify different streams of business value of IT research.
<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loveman, 1994</td>
<td>An assessment of the productivity impact of IT</td>
<td>The gross marginal benefits from IT did not deviate significantly from zero</td>
</tr>
<tr>
<td>Hitt and Brynjolfsson, 1996</td>
<td>Productivity, Business Profitability and Consumer Surplus: Three Different Measures of Information Technology Value</td>
<td>IT has increased productivity and customer value creation. However, these benefits have not resulted in exceptional profitability.</td>
</tr>
<tr>
<td>Brynjolfsson and Hitt, 1996</td>
<td>Paradox Lost? Firm-level Evidence on the Returns to Information Systems Spending</td>
<td>Findings indicate, that IS spending makes a significant contribution to the output of companies.</td>
</tr>
<tr>
<td>Brynjolfsson, 1996</td>
<td>The Contribution of Information Technology to Consumer Welfare</td>
<td>IT investments generate roughly three times their cost in customer value</td>
</tr>
<tr>
<td>Dewan and Min, 1997</td>
<td>The Substitution of Information Technology for Other Factors of Production: A Firm Level Analysis</td>
<td>Confirms earlier findings on positive returns to IT investment. Evidence on excess returns relative to labor input and ordinary capital.</td>
</tr>
<tr>
<td>Lee and Barua, 1999</td>
<td>An Integrated Assessment of Productivity and Efficiency Impacts of Information Technology Investments: Old Data, New Analysis and Evidence</td>
<td>Demonstrates significant positive returns from IT investments</td>
</tr>
<tr>
<td>Devaraj and Kohli, 2000</td>
<td>Information Technology Payoff in the Health-Care Industry: A Longitudinal Study</td>
<td>Support for the IT-performance relationship that is observed after certain time lags.</td>
</tr>
<tr>
<td>Brynjolfsson and Hitt, 2000</td>
<td>Beyond Computation: Information Technology, Organizational Transformation and Business Performance</td>
<td>IT impacts growth through a number of complementary organizational factors (multifactor productivity) making much larger contribution to the economy than previously believed.</td>
</tr>
<tr>
<td>Devaraj and Kohli, 2003</td>
<td>Performance Impacts of Information Technology: Is Actual Usage the Missing Link?</td>
<td>&quot;Actual usage&quot; (as opposed to investment) may be a key factor in explaining the performance impact.</td>
</tr>
<tr>
<td>Barua et al., 2004</td>
<td>An Empirical Investigation of Net-Enabled Business Value</td>
<td>Supplier-side digitalization impacts customer-side digitalization, leading to better financial performance.</td>
</tr>
<tr>
<td>Neirotti and Paolucci, 2007</td>
<td>Assessing the strategic value of Information Technology: An analysis on the insurance sector</td>
<td>IT increased productivity regardless of IT management capabilities.</td>
</tr>
</tbody>
</table>

Table 2: Sample of BVIT research based on production function view
<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clemons, 1991</td>
<td>Corporate Strategies for Information Technology: A Resource-Based Approach</td>
<td>Innovations can confer advantage if they use resources available to the innovator.</td>
</tr>
<tr>
<td>Mata et al., 1995</td>
<td>Information technology and sustained competitive advantage: A resource-based analysis</td>
<td>Managerial IT skills are can provide sustainable competitive advantage.</td>
</tr>
<tr>
<td>Ross, et al., 1996</td>
<td>Develop Long-Term Competitiveness Through IT Assets</td>
<td>Building and leveraging inimitable IT assets can generate sustainable competitive advantage for a firm.</td>
</tr>
<tr>
<td>Powell and Dent-Micallef, 1997</td>
<td>Information technology as competitive advantage: The role of human, business, and technology resources</td>
<td>IT in itself does not provide sustainable competitive advantage. However, using IT to leverage complementary human and business resources can provide firm-level advantages.</td>
</tr>
<tr>
<td>Bharadwaj, 2000</td>
<td>A resource-based perspective on information technology capability and firm performance: An empirical investigation</td>
<td>Companies with high IT capability tend to outperform a control sample of firms on a variety of profit and cost-based performance measures.</td>
</tr>
<tr>
<td>Santhanam and Hartono, 2003</td>
<td>Issues in linking information technology capability to firm performance</td>
<td>Companies with superior IT capability exhibit superior current and sustained performance when compared to industry average.</td>
</tr>
<tr>
<td>Dehning and Stratopoulos, 2003</td>
<td>Determinants of a sustainable competitive advantage due to an IT-enabled strategy</td>
<td>The findings suggest that managerial IT skills are positively related to sustainable competitive advantage.</td>
</tr>
<tr>
<td>Tippins and Sohi, 2003</td>
<td>It Competency and Firm Performance: Is Organizational Learning a Missing Link?</td>
<td>Based on RBV, the authors develop the concept of IT competency and show that the effect of IT competency on performance is mediated by the organizational learning.</td>
</tr>
<tr>
<td>Ravichandran and Lertwongsatien, 2005</td>
<td>Effect of information system resources and capabilities on firm performance: A resource-based perspective</td>
<td>Drawing on RBV, results suggest that variation in firm performance is explained by the extent to which IT is used to support and enhance a company’s core competencies.</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Title and Summary</td>
<td></td>
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</tr>
<tr>
<td>Tanriverdi, 2006</td>
<td>Performance effects of information technology synergies in multibusiness firms</td>
<td>The synergies arising from the use of a complementary set of IT resources and management processes have significant effects on corporate performance.</td>
</tr>
<tr>
<td>Aral and Weill, 2007</td>
<td>IT Assets, Organizational Capabilities, and Firm Performance: How Resource Allocations and Organizational Differences Explain Performance Variation</td>
<td>The findings show that IT investment allocations and IT capabilities explain differences in performance. Additionally, a system of organizational IT capabilities also strengthens and broadens the effects of IT assets.</td>
</tr>
<tr>
<td>Doherty and Terry, 2009</td>
<td>The role of IS capabilities in delivering sustainable improvements to competitive positioning</td>
<td>Not all IS capabilities are equal in leveraging and sustaining competitive advantage. A successful application of IS capabilities require a presence of other complementary organizational resources.</td>
</tr>
<tr>
<td>Dale Stoel and Muhanna, 2009</td>
<td>IT capabilities and firm performance: A contingency analysis of the role of industry and IT capability type</td>
<td>The relationship between IT and organizational performance is more complex than previously theorized. The effect of the external environment appeared to be significant.</td>
</tr>
<tr>
<td>Nevo and Wade, 2010</td>
<td>The Formation and Value of IT-Enabled Resources: Antecedents and Consequences of Synergistic Relationships</td>
<td>The findings indicate, that the relationship between IT assets and organizational resources are synergistic – IT assets can be strategic when combined with other assets.</td>
</tr>
<tr>
<td>Grover and Kohli, 2012</td>
<td>Cocreating IT Value: New Capabilities and Metrics for Multifirm Environments</td>
<td>Cocreation of value through IT emerges from four layers: relational assets, knowledge sharing, complementary capabilities and effective governance.</td>
</tr>
<tr>
<td>Chen, 2012</td>
<td>The synergistic effects of IT-enabled resources on organizational capabilities and firm performance,</td>
<td>The findings show, that IT-enabled resources have significant sub-additive and super-additive synergistic effects on organizational capabilities.</td>
</tr>
<tr>
<td>Otim et al., 2012</td>
<td>The Impact of Information Technology Investments on Downside Risk of the Firm: Alternative Measurement of the Business Value of IT</td>
<td>Using downside risk as an alternative to performance, the findings indicate, that IT investments can reduce organizational downside risk relative to competitors.</td>
</tr>
<tr>
<td>Chen et al., 2014</td>
<td>IT capability and organizational performance: the roles of business process agility and environmental factors</td>
<td>IT capabilities fulfill the VRIN characteristics stipulated by RBV, however their impact on performance is mediated by business process agility.</td>
</tr>
</tbody>
</table>

*Table 3: Sample of BVIT research based on RBV*
<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Powell, 1992</td>
<td>Organizational Alignment as Competitive Advantage</td>
<td>The findings indicate, that some organizational alignment can extraordinary profits and thus alignment can be considered as a strategic capability.</td>
</tr>
<tr>
<td>Baets, 1992</td>
<td>Aligning Information Systems with Business Strategy</td>
<td>Ex-post IS alignment will seldom be a success, instead IS strategy should be an on-going management process linked with overall corporate strategy.</td>
</tr>
<tr>
<td>Sabherwal and Kirs, 1994</td>
<td>The Alignment between Organizational Critical Success Factors and Information Technology Capability in Academic Institutions</td>
<td>Alignment between CSFs and the IT capability facilitates both perceived IT success and organizational performance. Furthermore, sophisticated IT management facilitates both alignment and perceived IT success.</td>
</tr>
<tr>
<td>Raymond et al., 1995</td>
<td>Matching Information Technology and Organizational Structure: An empirical study with implications for performance</td>
<td>The findings suggest, that IT sophistication is positively related to structural sophistication, IT usage is positively related to organizational performance, and the relationship between IT management and structural sophistication is stronger among the better performers.</td>
</tr>
<tr>
<td>Chan et al., 1997</td>
<td>Business Strategic Orientation, Information Systems Strategic Orientation, and Strategic Alignment</td>
<td>The findings suggest, that business strategic orientation, IS strategic alignment, and IS effectiveness have positive impact on business performance.</td>
</tr>
<tr>
<td>Teo and Ang, 1999</td>
<td>Critical Success Factors in the Alignment of IS Plans with Business Plans</td>
<td>The findings indicate, that top management commitment to the strategic use of IT, IS management knowledge about business, and top management confidence in the IS department are the top three alignment related success factors.</td>
</tr>
<tr>
<td>Reich and Benbasat, 2000</td>
<td>Factors that Influence the Social Dimension of Alignment Between Business and Information Technology Objectives</td>
<td>Investigates the social dimension of alignment and identifies factors that either enable or inhibit alignment.</td>
</tr>
<tr>
<td>Kearns, and Lederer, 2000</td>
<td>The effect of strategic alignment on the use of IS-based resources for competitive advantage</td>
<td>Both senior and IS executives share an understanding of the importance of alignment between IS planning and business planning in creating competitive advantage from IS investments.</td>
</tr>
<tr>
<td>Source</td>
<td>Title</td>
<td>Research Focus</td>
</tr>
<tr>
<td>--------</td>
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</tr>
<tr>
<td>Sabherwal, and Chan, 2001</td>
<td>Alignment Between Business and IS Strategies: A Study of Prospectors, Analyzers, and Defenders</td>
<td>The findings further support the argument, that alignment affects business performance and suggest that alignment between business and IT strategy is associated with business success.</td>
</tr>
<tr>
<td>Cragg, et al., 2002</td>
<td>IT alignment and firm performance in small manufacturing firms</td>
<td>The findings show that the positive relationship between alignment and business performance exits also in small firms.</td>
</tr>
<tr>
<td>Tallon and Kraemer, 2003</td>
<td>Investigating the relationship between strategic alignment and IT business value: the discovery of a paradox.</td>
<td>The study brings forth a so-called Alignment Paradox: alignment can lead to increased payoffs, however, this is valid up to a certain point beyond which, further increases in alignment lead to lower IT payoffs.</td>
</tr>
<tr>
<td>Kearns, and Sabherwal, 2006</td>
<td>Strategic Alignment Between Business and Information Technology: A Knowledge-Based View of Behaviors, Outcome, and Consequences</td>
<td>The findings highlight the importance of joint participation and shared domain knowledge between managers in business and IT planning as contextual factors to alignment.</td>
</tr>
<tr>
<td>Byrd et al., 2006</td>
<td>The leveraging influence of strategic alignment on IT investment: An empirical examination</td>
<td>The findings indicate, that there is a synergistic relationship between alignment and IT investment with firm performance.</td>
</tr>
<tr>
<td>Shpilberg et al., 2007</td>
<td>Avoiding the Alignment Trap in IT</td>
<td>The results uncover an &quot;alignment trap&quot;: a narrow focus on alignment can reflect a fundamental misconception about the role of IT and solely pursuing alignment can lead to problems.</td>
</tr>
<tr>
<td>Oh and Pinsonneault, 2007</td>
<td>On The Assessment Of The Strategic Value Of Information Technologies: Conceptual And Analytical Approaches</td>
<td>High-end strategic alignment (i.e., fit occurring when business strategy and IT strategy are both high) leads to superior performance compared to low-end strategic alignment.</td>
</tr>
<tr>
<td>Taskin, and Verville, 2010</td>
<td>An Exploratory Study on Strategic Alignment of Enterprise Systems and Business Strategies, Performance, and Flexibility</td>
<td>The results suggest, that alignment has a positive impact on performance and a mediating effect between flexibility and performance.</td>
</tr>
<tr>
<td>Johnson, and Lederer, 2010</td>
<td>CEO/CIO mutual understanding, strategic alignment, and the contribution of IS to the organization</td>
<td>IT strategic alignment generally led to higher IS contribution to the organization.</td>
</tr>
</tbody>
</table>

Table 4: Sample of BVIT research based on contingency-view
2.2 IT-Governance

Managing is about making decisions (Simon, 1960). According to contingency-based view, organizations, in order to survive, need to find congruence with their environment. External adaptation and internal integration of an organization require continuous decision-making at all organizational levels. Strategic management research has highlighted the importance of higher-order integration, alignment, and co-ordination of organizational resources in achieving the goals and objectives. In aligning resources, artifacts and elements, an organization-wide co-ordination and decision-making have been identified as the core enabling mechanisms. To achieve this, organizations need to establish a suitable governance model to distribute decision-making rights and responsibilities among different participants.

Anthony (1965) classifies managerial activity consisting of three categories: strategic planning, management control, and operational control. With strategic planning, Anthony (1965) refers to “the process of deciding on objectives of the organization, on changes in these objectives, in the resources used to attain these objectives, and on the policies that are to govern the acquisition, use, and disposition of these resources.” Strategic decision-making is essentially about conceptual formulation of future, long-term objectives and directions, and resource allocation, as well as formulation of broad policies and enterprise-level objectives. (Anthony 1965).

Management control combines both planning and control. It is “the process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization’s objectives” (Anthony, 1965). This process happens within a context of objectives and policies specified at the strategic planning level. Decisions are non-programmed (Simon 1965): novel, unstructured, and consequential. Management uses its judgment and general capacity for intelligent, adaptive, problem-oriented action. Middle management implements and supports long-range strategies, monitors resource utilization and the performance of operational units, and takes part in tactical planning (Anthony 1965).

Operational control is “the process of assuring that specific tasks are carried out effectively and efficiently” (Anthony 1965). It is concerned with tasks that are specified so that little or no judgment is required in carrying them out. At this level, operational decisions are repetitive and routine, i.e. programmed decisions (Simon 1960).
Governance can be divided into conformance and performance aspects, where the conformance aspect focuses on risks and accountabilities and the performance aspect focuses on strategic planning and execution (IFAC, 2004). Overall, governance includes two main aspects: the behavioral and normative. The behavioral aspect addresses the relationships and desirable behaviors of the different stakeholders, and the normative aspect sets the rules for these relationships and behaviors (Weill and Ross, 2004). Established theoretical perspectives in the governance research include agency theory (Jensen and Meckling, 1976), stakeholder theory (Abrams, 1951), resource dependence theory (Pfeffer and Salancik, 1978) and stewardship theory (Donaldson and Davis, 1991; Davis et al., 1997).

Agency theory (Jensen and Meckling, 1976) states that two problems arise in a principal – agent relationship: (1) the desires or goals of the principal and agent conflict and (2) it is difficult or expensive for the principal to verify what the agent is actually doing. Agency theory views governance mechanisms as deterrents to managerial self-interest (Daily et al., 2003). This teleological stance regards governance as the totality of internal arrangements, external rules and legislation for control and risk management to ensure shareholder interests (Hoogervorst, 2009).

Stakeholder theory (Abrams, 1951) is concerned with balancing the interest of different stakeholders to ensure that each concerned party receives some degree of satisfaction. In some aspects, the stakeholder theory is more suitable to governance research than agency theory by highlighting different constituents of a firm (Coleman, 2008).

Resource dependence theory emphasizes the linkages between the organization and its environment, facilitating the acquisition of resources critical to organization (Daily et al. 2003). The stewardship theory holds that there is no inherent, general problem of executive motivation, rather issue becomes whether or not the organization structure helps the executive to formulate and implement plans for high performance (Donaldson and Davis, 1991).

Hoogervorst (2009) identifies two perspectives to governance: (1) a narrow perspective that is focused primarily on top management supervision and compliance in view of financial/economic aspects and associated reporting, and (2) a broad perspective that also includes the enterprise strategy and execution. In the latter perspective, governance concerns strategy development, the subsequent design of the organization, and the definition and implementation of relevant programs and projects. Thus, governance concerns not merely internal structures and systems for (financial) control, reporting and risk management, but also the strategic development of the enterprise itself (ibid.)
In order to use IT effectively, companies must establish, a priori, the role that IT has in their business, the way the IT architecture is managed, and the way IT activities must be organized within the company (Neirotti and Paolucci, 2007). The construction of an IT portfolio that is unique and not easily imitable is rooted in a continuous series of correct investment decisions supported by appropriate systems of IT management – i.e. IT governance (ibid.).

Governance as a whole defines the structures, processes and mechanisms, which are used to effectively manage and govern an organization (Peterson, 2004). On a high level, IT governance extends overall governance to include leadership and organizational structures, processes and relational mechanisms that ensure that the organization’s IT sustains and extends its strategy and objectives (Grembergen et al., 2004). Essentially, IT governance revolves around alignment, integration and relationships (Ko and Fink, 2010).

There is a need to distinguish between IT governance and IT management. IT management is concerned with the effective and efficient delivery of IT services inside organization (Peterson, 2004), congruent to Anthony’s (1960) management control and operational control. IT governance is focused on performing and transforming IT to meet current and future needs of the organization (Van Grembergen and De Haes, 2010; Peterson, 2004, Rubino and Vitolla, 2014), congruent to Anthony’s (1960) strategic planning.

Prior research on information systems structure, decisions rights and organizational arrangements (e.g. Bowen et al., 2007; Brown and Magill, 1994; Peterson, 2004; Sambamurthy and Zmud, 1999; Weill and Ross, 2004; Xue et al., 2008) discuss how different IT governance arrangements link with IT decision-making. Due to the linkage of business and IT, and tightening regulation, executive management must be more involved in the governance of IT (Weill, 2004). To ensure alignment with the organization’s strategy and goals, the role of IT governance is to establish decision rights and the accountability framework for IT investment decisions and IT portfolio management and institutionalize the processes that are understood and followed by the managers involved (Weill and Ross, 2004).

Peterson et al. (2000) note, that in addition to formal allocation of IT decision-making authority, organizations also need to establish a mechanisms for lateral coordination, i.e. complex mix of formal and informal integration mechanisms at social, functional and structural levels to manage both differentiation and integration (Lawrence and Lorch, 1967). Peterson et al. (2000) further posit, that while structural governance devices are a necessity, functional and social coordination mechanisms are the differentiating capabilities in IT performance.
Early uses of the term “IT governance” include Loh and Venkatraman (1992) and Henderson and Venkatraman (1993), who describe IT governance as a set of mechanisms for ensuring the attainment of necessary IT capabilities and achieving alignment. Later Brown (1997) and Sambamurthy and Zmud (1999) discuss the notion of “IS governance frameworks” or “IT governance frameworks”. However, the interest in IT related decision making is much older, as evidenced by the literature on computer systems management controls (Garrity, 1963), control of information services (Olson and Chervany, 1980), IS organizational structure (Von Simson, 1990), IT management and decision making (Boynton et al., 1992) and locus of IS responsibility (Brown and Magill, 1994), all contributing to our current understanding of the concept of IT governance.

Weill (2004) and Weill and Ross (2004) define IT governance as the framework for decision rights and accountabilities. Van Grembergen et al. (2004) posit IT governance as organizational capacity exercised by the board, executive management and IT management to control the formulation and implementation of IT strategy. Later Van Grembergen and De Haes (2009) expand the definition to encompass the organization’s capacity to ensure the fusion of business and IT. Summarizing previous literature, Simonsson and Ekstedt (2006) define IT governance as “the preparation for, making of and implementation of IT-related decisions regarding goals, processes, people and technology on a tactical or strategic level”.

Jewer and McKay (2012) identify two general streams of IT governance literature, one focusing on the design of decision-making structures at the managerial level, and another focusing on the role of the board. In the first stream, they identify three categories focusing on the design of decision-making structures of IT governance: (1) IT organizational structures; (2) contingencies of these IT governance structures; and (3) Weill and Ross’ IT governance framework (2004), as an extension of the other two categories. In the second stream, they identify normative research, advocating the importance of the board’s role in IT governance, and descriptive research, studying how boards are actually governing IT (ibid.).

Simonsson et al. (2010) differentiate between IT governance maturity and IT governance performance. In their view, IT governance maturity refers to the quality and efficiency of internal IT organization. A maturely governed IT organization is thus defined as an organization that is efficient and aligned with best-practice frameworks. IT governance performance, on the other hand, refers to the external effectiveness that IT organization delivers to the business. It describes the impact of IT organization, as experienced by the business: the perceived business value of IT (ibid.).
To summarize previous definitions, IT governance can be defined as organizational capacity to control the formulation and implementation of the IT strategy via organizational structures and processes to ensure that IT initiatives sustain and extend the organization’s strategy and objectives – i.e. are aligned with strategy (Weill, 2004; Weill and Ross, 2004; Van Grembergen and De Haes, 2009).

IT governance incorporates five main domains (e.g. ITGI, 2003; Webb et al., 2006): (1) Linkage between business and IT planning (strategic alignment); (2) optimizing IT expenses and proving the value of IT (value delivery); (3) securing the investment in and the management of critical IT resources (resource management); (4) ensuring the safety of IT assets, disaster recovery, and business continuity (risk management); and (5) monitoring of project delivery and IT services (performance measurement).

IT governance is seen as a fundamental lever to advocate better alignment between business and IT (e.g. Peterson, 2004; Dahlberg and Kivijärvi, 2006; Bowen et al., 2007; Chan and Reich, 2007b; De Haes and Van Grembergen, 2009; Balocco et al., 2013). Particularly the relational elements are seen paramount for attaining and sustaining strategic alignment, even when the appropriate structures and processes are in place (e.g. Weill and Broadbent, 1998). The importance of IT governance is noted by Weill and Ross (2004), who show the positive relationship between above-average IT governance performance and superior long-term profits.

Implementing IT governance requires structures, processes and relational mechanisms to be efficient on the practical level (Peterson, 2004; Van Grembergen et al., 2004; Weill, 2004; De Haes and Van Grembergen, 2008, 2009). Several different approaches and frameworks to IT governance have been proposed both by academics and practitioners (e.g. Henderson and Venkatraman 1993, ITGI, 2003; Weill, 2004; Weill and Ross, 2004; Van Grembergen et al., 2004). In 2008, ISO/IEC put out a new worldwide standard named “Corporate Governance of IT” (ISO/IEC 38500:2008) that describes six principles for governance of IT, addressing both business’ and IT’ roles and responsibilities to guide IT related decision-making.

However, actual guidance on how organization should implement theories in practice is missing in many of the high-level models presented in literature (e.g. Peterson, 2004; Weill, 2004; Weill and Ross, 2004; ISO/EIC 38500:2008)

Addressing this lack of practical guidance, De Haes and Van Grembergen (2008) propose a set of 33 IT governance best practices (Table 5) to assist practitioners in implementing effective IT governance. The proposed set of IT governance best practices is based on an exploratory case study utilizing Delphi research methodology with a panel of industry experts.
<table>
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<th>Structures</th>
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<th>Minimum Baseline (10 practices)</th>
<th>ITG Best Practices (De Haes and Van Grembergen, 2008)</th>
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<td>S1</td>
<td>IT strategy committee at level of board of directors</td>
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<td>IT project steering committee</td>
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<td>R8</td>
<td>IT leadership</td>
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(1) Included in “key minimum baseline” (De Haes and Van Grembergen, 2009)
Following Peterson’s (2004) classification of horizontal integration capabilities, the IT governance best practices are divided into structures, processes and relational elements. IT governance structures include “structural (formal) devices and mechanisms for connecting and enabling horizontal, or liaison, contacts between business and IT management (decision-making)” (Peterson, 2004). IT governance processes refer to “formalization and institutionalization of strategic IT decision-making or IT monitoring procedures” (Peterson, 2004). The relational mechanisms cover “the active participation of, and collaborative relationship among, corporate executives, IT management, and business management” (Peterson, 2004).

Based on the proposed set of 33 IT governance practices, De Haes and Van Grembergen further present a “minimum baseline” of ten practices (2008) and “key minimum baseline” of seven practices (2009). Both the “minimum baseline” and “key minimum baseline” consists of top-ranking practices in terms of effectiveness and ease of implementation as ranked by the panel of experts. IT governance minimum baseline consists of a of five structural, four process, and one relational practices. The “key minimum baseline” consists of three structural, three process, and one relational practice (c.f Table 5).

As De Haes and Van Grembergen (2008, 2009) note, the proposed set of 33 IT governance practices is based on exploratory research and requires further statistical testing, and especially call for further validation of the accuracy of the defined minimum baseline for IT governance.
2.3 Strategic Alignment

Chan and Reich (2007a) summarize 150 different articles on strategic alignment, an extensive body of research on alignment spanning a variety of topics such as the nature, dimensions and definitions of alignment and the antecedents, challenges, barriers and consequences of attaining alignment. Literature uses several pseudonyms for alignment such as coordination (Lederer and Mendelow, 1989), linkage (Baets, 1992), integration (Weill and Broadbent, 1998), harmony (Luftman et al., 1996), congruence (Teo and King, 1999), bridge (Ciborra, 1997), and fusion (Smaczny, 2001). Also, different terms are used for alignment, such as business–IT alignment, business/IT alignment, business and IT alignment, IT alignment, and alignment of business and IT, all meaning the same. Also the terms IT, ICT and IS are often used interchangeably.

The central theme in alignment literature is defining the business value of IT in terms of the relationship and congruence between the business and IT domains. The notion of alignment has its roots in the “design school” of strategy (Mintzberg et al., 1998), and the contingency-based view (Lawrence and Lorsch, 1967). The emphasis is on the extent of congruence between an organization’s internal structure and its external situation (Miles and Snow, 1978).

Alignment is generally viewed from a strategic perspective, where functional integration at the strategic level represents the link between business and IT goals, strategy, and plans. Strategic alignment requires a continuous effort to integrate the organization’s IT and business activities (Broadbent and Weill, 1993; Henderson and Venkatraman, 1993). Early literature focused on themes such as linking the business plan and IT plan or aligning the IT strategy with the business strategy (McLean and Soden, 1977; King, 1978; Earl, 1983; Baets, 1992). Several models of conceptualizing and modeling alignment have been proposed (e.g. Lederer and Mendelow, 1989; Venkatraman 1989; MacDonald, 1991; Baets, 1992; Henderson and Venkatraman, 1993; Luftman and Brier, 1999; Kearn and Lederer, 2000; Luftman, 2000; Kearns and Lederer, 2003; Grant et al., 2010; Magoulas et al., 2012).

The academic research on alignment is active, as seen from the literature review by Chan and Reich (2007a) and more recently by Kaidalova and Seigerroth (2012) and Aversano et al. (2012). As Kaidalova and Seigerroth (2012) note, the number of academic papers is growing steadily and the main focus seems to be on developing new instrumental support artifacts for alignment.
Henderson and Venkatraman (1993) propose an alignment framework, the Strategic Alignment Model (SAM) that is used widely in later literature. SAM takes into account four domains of strategic choice: business strategy, IT strategy, organizational infrastructure and processes, and IT infrastructure and processes. From the perspective of strategic management, the dimensions of strategic fit and functional integration to obtain strategic alignment are important and business and IT strategies need to be aligned with each other (ibid.).

Based on the four-domain model, Henderson and Venkatraman (1993) further present four cross-domain relationships or processes they name dominant alignment perspectives; those of (1) strategy execution, (2) technology transformation, (3) competitive potential, and (4) service level. In the first two, business strategy acts as a driver, whereas in the latter two, “management explores how IT might enable new or enhanced business strategies with corresponding organizational implications” (ibid.)

Alignment is both internal and external. As Chan and Reich (2007b) note, “externally, organizations must align their business and IT strategies with industry and technology forces while internally organizations must align organizational and IT processes and infrastructure”. Similarly, both Sledgianowski and Luftman (2005) and Galliers (2007) suggest that alignment should influence and be influenced by relationships with customers, suppliers and other partners.

Alignment research has adopted a number of theoretical perspectives, such as resource-based view (Kearns and Lederer 2003), dynamic capabilities (Sun and Chen 2006; Chen et al. 2008; Gogan et al. 2010) and complex adaptive systems (Grant et al., 2010), reaching out to bridge the “gap” between IT, alignment and strategy.

Alignment research is not without critique and especially the practical value of academic alignment literature is open for debate. Previous arguments suggest, that models are not feasible to apply, are purely conceptual, and do not derive from the real world (Ciborra, 1997); validated results are not concise, and models are prone to subjectivity (Zhou and Cai 2011; Avison et al., 2004). Others argue, that the lack of value results form overly mechanistic models, which are unsuitable for contemporary organizations (Hoogervorst, 2009). Much of alignment research follows a functionalist paradigm (Burrell and Morgan, 1979) and resulting models adopt a static, mechanistic and segmented worldview on organizations and technology, in which alignment is conceived as known, quantifiable, achievable and measureable (Hoogervorst, 2009).
Järvenpää and Ives (1993) and Knoll and Järvenpää (1994) question whether tight ‘fit’ or alignment might reduce strategic flexibility in dynamic environments. Their finding is congruent with Ness (2005), who shows that IT flexibility has a stronger relationship with IT performance than strategic alignment.

Ciborra (1994, 1997) criticizes alignment discussion for being too naïve in assuming that enterprise reality is objective, or that it could be controlled and made predictably via linear cause and effect chains. The implicit dominance of a structured strategy process is questionable in contemporary organizations where uncertainty and flexibility predominate and when the articulation of the strategic intent is difficult (bid.). From alignment perspective, this is somewhat a challenge, since most alignment models imply an existing corporate strategy to which an IT strategy can be aligned to (Chan and Reich, 2007b).

Tallon and Kraemer (2003) uncovered a significant positive relationship between alignment and IT payoffs, but they also uncovered so-called ‘alignment paradox’: beyond a certain point, further increases in alignment tend to result in lower IT payoffs. They note that tight alignment can in effect limit organizational flexibility in turbulent environments where organizations strive to alter the strategy (ibid.).

Sphilberg et al. (2007) describe an ‘alignment trap’ – a state where organization aligns business and IT well, but is not effective, and thus increases IT spending without evident benefits. They further posit that the majority of high-performing organizations (i.e. highly aligned and highly effective) first concentrated on increasing the effectiveness of IT while alignment was a secondary importance. In effect, this may require changing the alignment perspective from that of traditional strategy execution to an appropriate alternative (cf. Henderson and Venkatraman, 1993).

Magoulas et al. (2012) argue that much of alignment research adopts a perspective set by SAM and focus on the realization of business strategies and the dyadic relationship between business and IT. They further note, that the focus is still on extrinsic values such as performance whilst omitting intrinsic values like comprehension and acceptance. Based on previous research, they propose an alternative alignment model with four dimensions – structural, functional, socio-cultural, and infological – corresponding to different aspects of business and IT (ibid.).
Similarly Smaczny (2001) argues, that the notion of strategic alignment is outdated. His argument is that underlying assumptions in alignment models; mechanistic view of organizations and structured, planning oriented approaches are not suited in environment where strategies change daily. He argues that, as modern organizations are viewed through a flexible and living organism paradigm, the IT and business should also be seen developing in the same way – in fusion (ibid.)

Chan and Reich (2007b) summarize previous critique as (1) alignment research is mechanistic and fails to capture real life; (2) alignment is not possible if the business strategy is unknown or in process; (3) alignment is not desirable as an end in itself since the business must always change; and (4) IT should often challenge the business, not follow it.

Alignment occurs at multiple levels in the organization (Chan and Reich, 2007b). Alignment at the strategic level means there is a match between business strategy and the overall IT portfolio. Alignment at the tactical level facilitates linkages between IT and the functions in implementations, technology choices, resource allocations, and skill requirements. Both strategic and tactical alignments are needed for effective synchronization of IT with business requirements and opportunities, and to benefit from the use of IT in areas critical to the business. Strategic alignment is needed for identifying applications important for supporting and enabling business strategies, while tactical alignment is necessary for ensuring that envisioned applications are implemented and deployed accordingly (Tarafdar and Qrunfleh, 2009).

At the strategic level, Sabherwal and Kirs (1994) note that alignment between critical success factors for the business and IT capabilities positively affect organizational performance. Teo and King (1996) demonstrated a significant positive relationship between business strategy and IT strategy alignment and the value of IT to organizational performance.

Chan et al. (1997) found that business strategy vs. IT strategy alignment positively influences IT effectiveness and subsequently business performance. Broadbent et al. (1999) found that integrating information and IT needs into planning processes has a positive effect on IT infrastructure capabilities. Sabherwal and Chan (2001) demonstrate, using Miles and Snow’s (1978) typology, that alignment influences business success in prospectors and analyzers.

Tarafdar and Qrunfleh (2009) identify three key processes associated with strategic alignment: (1) linking business and IT planning processes; (2) exploiting IT based strategic opportunities; and (3) active CIO participation in strategic planning.
Respectively, five key processes associated with tactical alignment are: (1) alignment at project level; (2) aligning decision-making between IT and other departments; (3) balancing firm-wide standardization and process-specific customization; (4) formal and informal communication between business and IT; and (5) alignment at the level of IT skills (ibid.). Tarafdar and Qrunfleh (2009) further posit, that it is possible for an organization to have strategic and tactical alignment to varying extents, as well as to have processes for strategic alignment without having those for tactical alignment, and vice versa.

At the tactical level, there is a need for “functional integration” (Henderson and Venkatraman, 1993) between the business side (administrative, infrastructure, processes and skills) and IT side (architecture, management processes and skills). Luftman et al. (1993) propose that communication, knowledge sharing and partnering between business and IT are important antecedents for alignment.

Chan and Reich (2007b) and Grant et al. (2010) summarize the four dimensions of alignment presented in the literature: (1) strategic or intellectual, (2) structural, (3) social and (4) cultural.

The strategic or intellectual dimension sets the direction for the company by having consistent IT and business objectives. This dimension focuses on the fit between the priorities and activities of the business units and IT (Chan 2002). The structural dimension refers to the degree of structural fit between business and IT decision-making (Chan and Reich, 2007b; Sabherwal et al., 2001). The structural dimension consists of both formal and informal structures (Chan, 2002). The formal structure is the fit among technology, business processes, and the people using them. Informal structure is the fit of the relationships that are formed over organizational boundaries inside the organization.

The social dimension looks at the shared understanding between business and IT executives and how committed people are to work as a tribe towards the common goals and ambitions (Grant at al. 2010; Reich and Benbasat, 2000). The cultural dimension is the degree at which the culture supports the collaboration between the IT and business people in sharing values, attitudes and beliefs. Chan and Reich (2007b) note, that alignment needs to be culturally supported in order to be successful.
Reich and Benbasat (1996) distinguish between intellectual and social dimensions of alignment. The intellectual dimension of alignment refers to the state of in which IT and business objectives are consistent and valid, and the social dimension refers to the mutual understanding and commitment between business and IT executives (ibid.). Chan (2002) argues that the social and cultural dimensions, and especially relationships, both formal and informal, among business are critical. The informal organizational structure, which interacts with, and transcends, formal organization structures and strategies is also a key element in achieving and maintaining high level of alignment (ibid.).

Preston and Karahanna (2009) show the existence of a causal relationship between social alignments, in the form of shared understanding, and IS strategic alignment. Peppart (2001) and Reich and Benbasat (2000) argue, that high level of communication between business and IT as the most important predictor of alignment. Lahdelma (2010) notes that departmental division has a significant impact on the perceptions on IT-business alignment and argues, “if the management wants to change the perceptions on IT-business alignment, it has to pay attention to such structures and mechanisms that could break the effect of the departmental silo thinking”.

Kearns and Lederer (2003) describe alignment as an ongoing organizational process in which both IT and business managers participate in the exchange of knowledge. In the same vein, Tan and Gallupe (2006) define alignment, at individual level, as shared cognition between the business and IT executives. Shared knowledge and understanding have a significant effect on alignment (e.g. Chan et al., 2006; Preston and Karahanna, 2009). In this aspect, alignment process can be viewed as boundary spanning activity bridging the communication gap (Brown and Duguid, 2001; Pawlowski and Robey, 2004).

Based on an open systems view of organizations, the concept of boundary spanning describes activities that occur at organizational boundaries, including internal ones that separate different units, functions or knowledge domains. As organizations are increasingly divided by functional, professional, hierarchical and geographical boundaries, recent literature has developed broader views of boundaries as to provide a deeper understanding of organizations (e.g. Santos and Eisenhardt, 2005).
Carlile (2004) define boundary spanning as a set of activities, processes and practices whereas boundary spanners are people who engage in boundary spanning. Boundary spanners, in turn, help align interdependent domains that possess different sets of knowledge by transferring, translating, and transforming information inside and between organizations (ibid.). The objective of boundary spanners is to link isolated sources of information and to facilitate and integrate interrelated tasks and processes in an organization (Valorinta, 2011). In bridging the gap between business and IT, the boundary spanner translates and mediates the communication between business and IT for a common understanding, ensures alignment and integration of business requirements in systems, and appears in IT as the business client demanding new IT solutions and in business as service provider (Eckhardt and Rosenkranz, 2010).

Luftman (2000) propose the strategic alignment maturity model (SAMM) and related assessment instrument to measuring strategic alignment in the organizational context. SAMM defines six criteria for alignment: communications, competency/value measurements, governance, partnership, scope and architecture, and skills, addressing alignment on all four dimensions. These criteria are further divided into 39 sub-criteria. In each six criteria, the maturity of practices is measured in a five-level maturity SAMM has been widely used as an empirical assessment tool (Luftman, 2000; Cumps et al., 2006; Sledgianowski et al., 2006; Luftman and Kempaiah, 2007; De Haes and Van Grembergen, 2009).

Alignment dimension defined by Luftman (Luftman and Kempaiah, 2007):

- Communications: measures the effectiveness of information exchange between business and IT, enabling the creation of shared understanding of strategies, plans and priorities.
- Value measurement: refers to the use of balanced measurements to demonstrate the contribution of IT to the business.
- Governance: defines the IT decision-making authorities and processes at strategic, tactical and operational levels.
- Partnership: assesses the relationship, both formal and informal, between business and IT including trust and mutual perceptions of the other
- Scope and architecture: refers to flexibility, architectural integration and proactiveness in enabling and driving business processes.
- Skills: measures human resource practices such as training and career development, and organization’s change and learning capabilities.

Luftman’s (2000) instrument, as used in this study, is presented in Appendix C.
3 Research Design and Key Results

In order to understand the complex relationship between IT governance and strategic alignment, I chose to apply mixed methods research approach, using conceptual, qualitative and quantitative research designs in a sequential manner.

As stated in chapter 1.4, this study follows critical realism paradigm. Wynn and Williams (2012) posit critical realism as a viable paradigm for conducting research for developing and understanding causal explanations of complex socio-technical phenomenon. In terms of critical realism, the aim of the study to understand social event (strategic alignment) by exploring the underlying causal structures and mechanisms (e.g. IT governance).

The first phase follows a conceptual-analytical approach (Järvinen, 2000), relying on existing theories, models, and frameworks in the literature and logical reasoning in integrating them in building a working hypothesis to be tested in empirical phase.

The second phase, the empirical part of the study, starts with a qualitative phase followed by a quantitative phase, following the “Exploratory Design” described by Bergman (2008). Exploratory design begins by exploring the topic with qualitative methods and then proceeds to a quantitative phase where the initial results may be tested or generalized. The nature of the research process follows emergent mixed methods design (Creswell and Clark, 2007), as details of the design of quantitative phase emerged partly from the results from the qualitative phase. The chosen research design emerges from the need to confirm qualitative experiences with quantitative measures (ibid.).

At first a case study approach is used in order to situate and explore the relationship of IT governance and strategic alignment in more depth and confirm the initial, theory-based hypothesis on the positive impact of IT governance on strategic alignment. Based on the findings of a case study and previous research by De Haes and Van Grembergen (2009) a hypothesis on the positive relationship between IT governance practices and strategic alignment was then further tested using a quantitative survey. The quantitative study explores the nature of the relationship using statistical methods providing validation to initial case-based interpretations.

The research process is summarized in Figure 2.
The conceptual studies (Papers I, II, III) explore the nature and evolution of strategic alignment concept in literature, classify alignment models according to strategic context underpinning different approaches and explore IT governance from the IT capability perspective. The conceptual studies are based on the reviews of previous literature. The nature of the literature reviews is integrative (Torraco, 2005) following concept-centric, systematic approach suggested by Webster and Watson (2002).

The qualitative study (Paper IV) applies a case study approach (Stake, 1995; Yin, 2003) and focus on assessing the maturity of IT governance and strategic alignment in the case organization and analyses the impact, antecedents, and barriers of IT governance best practices on strategic alignment.

The quantitative study (Paper V) applies statistical methods to confirm the impact of IT governance on strategic alignment using two previously validated research instruments: the IT governance best practice model (De Haes and Van Grembergen 2008, 2009) and Strategic Alignment Maturity Model (Luftman, 2000).

I will next introduce the five articles that address the relationship between IT governance practices and strategic alignment.
3.1 Article I: Business and IT – Beyond Alignment

3.1.1 Premise of the article

This paper concentrates on the concept of strategic alignment and its evolution. Based on existing literature, the paper explores different streams of strategic alignment research and then reviews recent developments in contemporary business and technology environment affecting organizations.

Motivation for the paper is to understand the evolution and the ontological foundations and assumptions of the alignment discourse in academic literature.

3.1.2 Data and analysis

The study is based on systematic review of extant academic literature on strategic alignment. The nature of the literature review is integrative (Torraco, 2005), following concept-centric, systematic approach suggested by Webster and Watson (2002). As stating point, we utilized the recent bibliographical study by Chan and Reich (2007a) and expanded the set of articles by looking at more recent research in top IS journals and conferences and expanded the search through forward and backward citation analysis from the key authors and articles.

In order to effectively map the evolution of strategic alignment, previous studies had to be analyzed in some detail. This has limited the number of papers being reviewed. We acknowledge that we have not included every study.

3.1.3 Key findings

The findings of the study suggest that a bulk of previous research on strategic alignment is biased towards conceiving information systems mainly as subordinate and separate operative resources rather than as core value assets of the business. The alignment models emphasize rational planning, where alignment is achieved in a controllable and objectifiable manner. As a concept, alignment is based on the mechanistic and functional worldview.

Previous research has presented a number of alignment models, typologies, frameworks and various methods to assess alignment. On one hand, different contributions and perspectives provide deeper insights into the complex relationship between business and IT. On the other hand, the breadth of frameworks, concepts and models fosters complexity in applying the results in practice.
Common motivator cited in alignment research is that alignment brings strategic benefits. Previous research typically links the impact of alignment to performance and it is commonly accepted that alignment has a positive contribution to performance. However, as alignment is rooted in temporal, environmental, technological and organizational setting, the application of different models in other contexts might be problematic.

As IT is an integral part of strategy in contemporary organizations operating in increasingly complex, technology-induced strategic context, the alignment models that are rooted in a more static notions of strategy, underestimate the systemic complexity of IT that addresses different business needs and at best provides organizations only a partial solution for realizing the benefits of IT in business.

3.1.4 Key contributions

The study explores the development of strategic alignment in literature and concludes that discussion is biased towards conceiving IT mainly as subordinate and separate resource, not core capability.

The study highlights some of the risks associated with strategic alignment that is based on the mechanistic viewpoint upholding the notion of an administrative, supportive role of IT that is in contrast to contemporary business environment characterized by rapid change and the central role of IT in business value chain.
3.2 Article II: Aligning Alignment with Strategic Context

3.2.1 Premise of the article

This paper extends Paper I by exploring the relationship between different strategic alignment research approaches and corresponding schools of thought in strategic management.

The goal is to uncover ontological assumptions underlying alignment research toward strategy and strategizing, contextualize extant and future work and increase understanding on the practical applicability of research topics, methods and results in varying contexts.

3.2.2 Data and analysis

The study is based on systematic review of extant academic literature on strategic alignment and corresponding theories on strategic management. The nature of the literature review is integrative (Torraco, 2005), following concept-centric, systematic approach suggested by Webster and Watson (2002).

After reviewing previous academic literature on strategic alignment and strategic management, we construct a conceptual mapping between different models based on the relationship between alignment models and respective approaches to strategic management. In order to effectively map the evolution of strategic alignment and strategic management, previous studies had to be analyzed in some detail. This has limited the number of papers being reviewed. We acknowledge that we have not included every study or approach.

The mapping is based on the dichotomy between two prominent research streams in strategic management: strategy content and strategy process (Mellahi and Sminia, 2009). In lining up respective approaches and streams, we used our own judgement on focus or “the center of gravity” of each approach and the tone of the discussion by the authors as a guiding principle.

3.2.3 Key findings

Previous research in strategic alignment can be classified to content-based stream concentrating on “what” to align and process-based stream concentrating on “how” to achieve alignment. This division in commensurable with respective schools of strategic thinking and strategy making.
Research on strategic alignment seldom base their arguments on a certain strategic management theory or give explicit definition on strategic stance. A bulk of alignment research adopts a static, mechanistic and segmented worldview on organizations and technology, in which alignment is conceived as known, quantifiable, achievable and measureable. Strategy is seen as a rational, top-down process of deliberate analysis, is in line with prescriptive schools of thought for strategy.

As the business environment is becoming more dynamic, complex, and interdependent, organizations are facing increasingly complex strategic context, challenging the classic alignment models based on the notion of competitive strategy or resource-based view. A narrow focus of alignment underestimates the systemic complexity of IT that addresses different business needs. Instead alignment approaches based on concepts such as dynamic capabilities, co-evolution and organizational ambidexterity represent a more adaptive and more encompassing approach.

### 3.2.4 Key contributions

The study contributes to strategic alignment by clarifying the relationship between different alignment models and strategic management theories. This provides a theoretically grounded model for scholars to identify the gaps and assess the contribution of new studies.

The study also suggests, that as the importance of information and information systems to competitive advantage in modern organizations increases, new perspectives are needed in managing, operating and innovating IT-based business models. Strategic alignment research might benefit by building more on contemporary notions of strategic management, such as co-evolution, dynamic capabilities, and organizational ambidexterity that are better suited to increasingly complex, networked business environment.
3.3 Article III: IT-Governance, Decision-Making and IT Capabilities

3.3.1 Premise of the article

This paper focuses on the concept of IT capabilities in the context of business value of IT research. Previous research has provided multiple definitions of IT capabilities and their relationship to business value of IT. However, the development and management of individual capabilities and their relationship to IT governance remains poorly understood.

3.3.2 Data and analysis

The study is based on integrative review (Torraco, 2005) of extant academic literature. In conducting the review, the study follows concept-centric, systematic approach suggested by Webster and Watson (2002). The search resulted a set of 484 papers, out of which 145 were selected for further analysis. Based on the literature, we constructed a representative sample of different IT capability definitions and discuss our findings in the context of IT governance practices.

3.3.3 Key findings

Conceptually, the bulk of research on IT capabilities focuses on identifying IT capabilities contributing to perceived performance. The identified IT capabilities span from tangible to intangible, from technical infrastructure to knowledge work and managerial skills, from assets and resources to process-adaptive elements and from general to industry or business model specific ones.

A bulk of previous research considers IT capabilities as first-order constructs that are linked to performance by direct causal relationship. More recently, the effect of IT capabilities is seen mediated by other organizational capabilities or IT capabilities are seen as building blocks for higher-order (i.e. dynamic) organizational capabilities.

The relationship between IT governance and IT capabilities seems to be more ambiguous. Some IT capabilities identified fall under IT traditional governance domains but other are – by nature – cross-organizational, business-model dependent or knowledge-based, and as such, are not in the scope of traditional IT governance.
3.3.4 Key contributions

The study clarifies the cross-organizational, multi-faceted nature of IT capabilities identified in previous research. The study contributes to our knowledge of IT governance by exploring the relationship between IT governance practices and IT capabilities. The results suggest that current IT governance practices are geared more towards managing IT assets and resources instead of capability building.
3.4 Article IV: Improving Strategic Alignment: A Case Study

3.4.1 Premise of the article

The fourth paper explores the relationship between IT governance and strategic alignment in a case study setting. Previous research has identified IT governance as a key factor in achieving higher alignment between business and IT (e.g. Dahlberg and Kivijärvi, 2006; Chan and Reich, 2007b; De Haes and Van Grembergen, 2009).

The motivation of the paper is to examine the relationship between IT governance and alignment in actual organizational setting and to uncover important IT governance related factors acting as antecedents of or barriers to alignment.

3.4.2 Data and analysis

The study adopted a case study approach. Yin (2003) defines a case study as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident”. Case studies are one form of empirical studies often employed in IS research in order to investigate a phenomenon within its real-life context (Yin, 2003).

The study can be characterized as a positivist explanatory single case study. The nature of our case is revelatory and it serves intrinsic and instrumental purposes (Stake, 1995; Yin, 2003). A revelatory case is one where problems discovered in a particular case are believed to be common to other cases as well (Yin, 2003). An intrinsic case is one, where a case is studied for the intrinsic interest in the case itself; and instrumental case is one, where a case is chosen to explore an issue or the refinement of theory (Stake, 1995).

The study was conducted in a large Finnish manufacturing and service company operating in a global business environment (labeled ‘Alpha’). There were two main criteria for selecting Alpha as a case organization. First, the organization was large enough that it would be reasonable to implement IT governance practices on a multiple organizational levels as described by De Haes and Van Grembergen (2008). Second, traditional role of IT was to be a supporter and an enabler for business. However, due the ongoing digitalization, the importance of IT-based products and services is expected to increase in the near future – a situation common to many organizations at the moment. In this sense Alpha can be considered as a “typical” case – a single case that is representative of a large number of other cases fitting the theory and likely to confirm the hypotheses (Shanks and Parr, 2003).
In line with guidelines listed by Yin (2003), our case study started with theoretical proposition, the impact of IT governance practices on strategic alignment proposed by previous literature, and relies on multiple sources of evidence - both quantitative and qualitative. The quantitative data is used to assess the current state of alignment and governance maturity, and the qualitative data is used to explore the case-specific elements and factors explaining current situation. Main sources of evidence are semi-structured interviews and company internal documentation. To assess the IT governance practices we used the instrument proposed by De Haes and Van Grembergen (2008, 2009). To measure the maturity of strategic alignment, Luftman’s (2000) strategic alignment maturity assessment was used.

From a case study methodology perspective, the use of a theoretically-grounded framework, a structured (previously-tested) research instruments, multiple key informants, and multiple data sources improve content, construct validity, and reliability (Eisenhardt, 1989; Yin, 2003).

Alpha’s goal, as stated by company documentation, is to be the market leader and most valued partner for the customer in selected business-to-business markets. The main drivers behind the strategy are cost efficiency and high quality. Sales have been growing steadily for the past ten years and profitability is above industry average. Alpha has also a strong technology culture and it seeks to be at the forefront of innovation in its industry, evidenced by R&D spending, which is above industry average. Using Miles and Snow’s (1978) typology, Alpha’s strategic position can be described as Analyzer with innovation. There is a stable domain of core products and markets and a strong focus on maximizing opportunities for growth.

Alpha is organized into three autonomous business units each having their own business strategy and target setting. The company’s management system stresses the results of the business units, whereas the enterprise level strategy defines only some synergies between them. Although independent, the business units are – in practice – strongly interlinked in terms of suppliers, customers, offerings and business processes based on a shared business model of the enterprise.

The traditional role of IT in Alpha is to be a supporter and an enabler for business. This means that IT is used to support the basic services and enable the business processes. The company’s IT department is seen as a support function, which provides services for the independent business units. The IT department and the business units manage the business applications and systems in cooperation. The business units manage IT embedded into the end products and services.
The data collection process was undertaken over a six-month period, and was divided into four phases: (1) assessment of alignment maturity, (2) semi-structured interviews and document collection on the IT governance practices, (3) review of the interview reports, and (4) confirmation of case report by the key informants.

The first step of the case study was the assessment of the alignment maturity using Luftman’s (2000) strategic alignment maturity model. The assessment was done using a questionnaire that was filled together with the interviewer and the interviewee. The interviewee was asked to assess the maturity level of each sub-criterion and supporting questions were asked to ensure that respondents understood what to assess, and conducted the assessment correctly.

Total number of respondents was 24, from which 8 were on the IT side, 8 were business account managers on the IT side, and 8 were business people covering all the business units. The respondents were selected from the strategic, tactical, operational, and project levels. The number of respondents ensured that all business units were covered and that the balance between business and IT people would be maintained. The number of respondents was significantly higher than in most previous alignment maturity studies, where the number of respondents was typically between 5 to 10 people per case organization. The results show that there were no significant differences between scores of the different groups of participants, which suggest that the results of alignment maturity assessment are reliable. The measurement tool has also been validated by other researchers (e.g. Sledgianowski et al., 2006; De Haes and Van Grembergen, 2009).

After assessing alignment maturity, a second round of interviews were conducted to explore Alpha’s IT governance practices in detail. IT governance best practices as proposed by De Haes and Van Grembergen (2008) was used as a template for semi-structured interviews. The second round on interviews was conducted independently from the first round and results of the previous round were not discussed. The instrument and sample questionnaire used in interviews is presented in Appendix C.

The second round of interviews included 13 people in total, from which 8 were from the IT department consisting of the CIO, senior managers and specialists and the remaining 5 people were from the support functions working closely with the IT department, including the CFO. The interviews were conducted for a certain pre-selected practice or group of practices with a person, who was deemed by the organization as the best expert of the area in question. The chosen approach provided an opportunity to discuss each practice separately and in-depth in an interview with the best expert on the subject. Organizing additional interviews to discuss the same issues with multiple informants was not possible due to resource constraints.
In each interview, multiple specific questions were asked for each practice, but the high-level structure for the questions was always following: *Is the practice in use in the organization? How is the practice applied in the organization? What strengths can there be identified in using the practice? What challenges has the organization faced using the practice? What causes these challenges and how could they be overcome? Which maturity level would you select for the practice and why?* The aim of interview structure was to uncover how each practice was actually implemented rather than just measuring its maturity.

All interviews were audio recorded and transcribed to text by the researcher conducting the interview. The transcribed practice descriptions were sent to the interviewees for review to ensure the accuracy of case study data as suggested by Yin (2003). To ensure confidentiality in the interviews, the interviewees were promised that no direct quotes would be published.

In addition to interviews, additional qualitative data used included company internal documentation such as strategy documents, policies, guidelines, process descriptions, organization charts and meeting minutes provided by the interviewees and other key informants (data triangulation). The additional data was used both in corroborating and augmenting the practice descriptions obtained through interviews and gaining additional information about the case organization’s history, current situation, organizational structure, decision-making structures, budgeting process and other factors deemed relevant in understanding current IT governance situation.

In analyzing the case study data and writing the paper, multiple frameworks from the alignment and governance literature were used as a basis for a coding scheme. The dominant alignment perspectives of Venkatraman et al. (1993) were used to analyze the IT and business strategy processes. The alignment barriers of Weill and Broadbent (1998) and the four alignment dimensions (Grant et al., 2010) were used to analyze alignment related problems and barriers. The two-level alignment model by Tarafdar and Qrunfleh (2009) was used to connect the IT governance practices to respective strategic and tactical levels of alignment. The generic alignment descriptions of Luftman and Kempaiah (2007) were used as a template for identifying the overall state of alignment. To ensure inter-rater validity in coding and analysis phase, the process was conducted by two researchers and all disagreements were discussed and reconciled.
3.4.3 Key findings

The study shows that case company’s governance arrangements are designed to fit the role of IT being a supporter and an enabler for business instead of being a strategic driver for business. The research indicates that the most important factors affecting alignment maturity in case company are (1) the organizational mindset that does not acknowledge the strategic role of IT, (2) a high degree of business unit autonomy combined with shared information and processes, (3) the top management not being involved in strategic IT issues and IT department not being involved in formulation of business strategies, (4) the lack of defined strategic IT decision making rights and accountabilities, and (5) the organizational social environment and culture that does not support collaboration between business and IT people.

The study reveals that in the case setting, solely implementing and improving governance practices without considering the organizational context might not improve alignment beyond the current level. In general, implementing best practices on the operational and tactical levels is possible, but their value for business is questionable if the more strategic practices and the strategic direction for the use of IT is missing. Implementing the IT governance practices on the strategic level successfully would require change in the organizational mindset regarding the role of IT in business strategy.

3.4.4 Key contributions

The study illustrates the impact of IT governance practices on tactical and strategic alignment. On tactical level, alignment is achieved through operational level interaction and interfaces between business and IT. Accordingly IT governance practices can have a significant impact on tactical alignment. However, on strategic level, the impact of IT governance practices is more dependent on the top management perception of the value and strategic role of IT. If IT is perceived as enabler and operative resource for business, the impact of IT governance practices on strategic alignment is limited at best. The concept of strategic alignment presumes alignment between business and IT on the strategic level. If an organization does not perceive the role of IT strategic for their business, achieving high alignment is not possible by definition.

The results of the study support the findings by De Haes and Van Grembergen (2009) on the positive relationship between IT governance practices and strategic alignment and, as the previous research was limited to finance sector, confirm the applicability of identified IT governance practices outside financial sector.
3.5 Article V: The Impact of IT Governance Practices on Strategic Alignment

3.5.1 Premise of the article

The final paper explores the relationship between IT governance best practices and strategic alignment maturity using survey-based quantitative research approach. The hypothesis of the paper is that there is a positive correlation between IT governance practice maturity and strategic alignment maturity.

3.5.2 Data and analysis

The study is based on the quantitative analysis on data collected using two surveys utilizing previously validated research instruments. The research instruments are the same as in the previous case study (Paper IV). The surveys were conducted among the participants of a multi-organization research project focusing on IT management and leadership issues in Finland. The participants presented top IT management roles, such as CIO’s, heads of functions and chief architects. Participants were also encouraged to invite other managers and executives from their respective organizations to participate in the surveys in order to maximize the number of respondents.

The first survey was conducted using Luftman’s (2000) strategic alignment maturity assessment instrument. The second survey was conducted using IT governance best practice model proposed by De Haes and Van Grembergen (2008, 2009). The number of completed responses for the first survey was 67 and for the second survey 44. Our final sample consisted of 42 same-respondent replies presenting 29 individual organizations.

In order to minimize common method variance in measuring independent and dependent variables, the surveys were carried out three months apart, providing reasonable temporal separation between independent and dependent variables (Podsakoff et al. 2003, Chang et al., 2010). Common method variance is defined as ‘‘variance that is attributable to the measurement method rather than to the constructs the measures represent’’ (Podsakoff et al., 2003).

The statistical analysis was conducted using SPSS Statistics.
3.5.3 Key findings

The study suggests that there is moderate positive correlation between IT governance best practice instrument and strategic alignment maturity, confirming our initial hypothesis. A more detailed analysis reveals positive correlations between IT governance best practice instrument, IT governance structures and IT governance processes and strategic alignment maturity are all on or close to a moderate level. The correlation between IT governance relationships and strategic alignment is weak. Of all the elements, the IT governance minimum baseline has the highest correlation.

When looking at correlations between individual dimensions of IT governance best practices and strategic alignment maturity model, both IT governance minimum baseline and structural dimension have statistically significant positive correlation with all of the dimensions of strategic alignment maturity model. IT governance processes has significant positive correlation with communication, measurement and governance dimensions of strategic alignment maturity model. IT governance relationship dimension has weak positive correlation only with measurement and governance dimensions of strategic alignment maturity model.

To further explore the relationship between IT governance minimum baseline practices and strategic alignment maturity model, we conducted an exploratory factor analysis with varimax rotation to detect the underlying factors affecting alignment maturity. Exploratory factor analysis reveal two contributing factors covering eight IT governance best practices. Based on the findings, we provide an interpretation of the extracted factors and propose a tentative set of eight key IT governance practices for further scrutiny.

3.5.4 Key contributions

The study confirms previous finding that IT governance best practices have a positive impact on strategic alignment maturity using a larger sample size consisting of multiple industries. The study extends previous research by exploring the relationship between individual dimensions of the instruments in detail.

Based on exploratory factor analysis, the study identifies two underlying factors contributing to alignment on strategic and tactical level, provides an interpretation of extracted factors and proposes a set of eight key IT governance practices to support strategic alignment maturity for further scrutiny.

The proposed model explains 36.6% of the variance in alignment maturity ($R^2=0.366$) and the effect size (Cohen’s effect size $f^2$) is 0.57, which can be considered large (Cohen, 1992).
4 Findings and Limitations

This chapter presents findings and contributions and their limitations.

The research problem of the study is:

What is the impact of IT governance practices on strategic alignment?

The first two research question addressing the research problem, namely (1) “How is strategic alignment operationalized and measured?” and (2) “What is the theoretical relation between IT governance, strategic alignment and business value of IT?” aim to clarify the elements of the research framework and their relationships. The findings of the Papers I – III answer these two questions by exploring the origin and evolution of current thinking in strategic alignment, IT governance and business value of IT and summarize most important strategic alignment models in presented literature. The last research question (3) “how do IT governance practices contribute to strategic alignment?” is addressed in the Papers IV and V based on empirical data.

4.1 Main Findings

Summarizing Papers I - III, literature on strategic alignment is extensive and previous research has presented multiple different conceptualizations for the alignment concept. Overall, strategic alignment is recognized as a complex, multifaceted construct involving a number of dimensions, such as strategic, structural, social and cultural and a number of levels, strategic, operational and tactical. Normative integrated models of strategic alignment usually include multiple variables that determine the level of external and internal alignments. Applying Burrell and Morgan’s (1979) taxonomy, research on strategic and structural alignment is largely based on functional paradigm, whereas research into social and cultural alignment is more interpretive in nature.

Previous research on both business value of IT and strategic alignment agree on the importance of alignment to business value of IT. The positive impact of strategic alignment on business performance and business value of IT is commonly accepted and a number of papers presented plentiful empirical evidence supporting the claims.
The findings of Paper II suggest also, that recent literature on strategic alignment is starting to embrace recent developments in strategic management, such as dynamic capabilities, co-evolution and organizational ambidexterity. These new models and approaches increase our understanding of the role of strategic alignment in a more complex environment, where digitalization is blurring the boundaries inside and between organizations and clarify the dynamic nature of alignment as a process.

The previous research agrees on the importance of IT governance in achieving strategic alignment and business value and one of commonly stated goals for IT governance is “the alignment of business and IT” (Paper III).

The findings of Paper IV reveal that improving IT governance practices is not sufficient to achieve high alignment, when the understanding of strategic value of IT is lacking. In the case company, top management perceives IT to be a supporter and enabler and respective IT governance arrangement have been designed accordingly, IT related decision-making responsibilities are unclear, and in general there is a lack of clear strategic direction for the use of IT.

The Paper IV also suggest, that many aspects of strategic alignment can be considered as boundary spanning activity (Carlile, 2004). Social and cultural alignment requires exchange of knowledge and creating shared understanding between different domains. As Carlile (2004) notes, effective boundary management “furnishes ways for individuals to learn about each others’ differences and dependencies; and facilitates creating common knowledge”.

However, one finding of the Paper IV is that, in the case setting, formal communication channels and appointed account managers (i.e. boundary spanners) seem to be more a barrier than antecedent for improving alignment. This finding is in contrast with Eckhardt and Rosenkranz (2010), who note that the boundary spanners can function as an aligner between business and IT and have a positive effect on alignment. Also, as “business / IT account management” is recommended best practice (e.g. De Haes and Van Grembergen, 2008, 2009), increasing understanding on the impact of formal communication channels and appointed account managers to social and cultural alignment would require further elaboration outside the scope of this study.

The Paper V confirms that IT governance best practices have a positive impact on strategic alignment maturity and extends previous research by exploring the relationship between individual dimensions of the IT Governance Best Practices (De Haes and Van Grembergen, 2008, 2009) and Strategic Alignment Maturity Model (Luftman, 2000). The findings reveal, that IT governance minimum baseline and IT governance structural dimension have largest impact on strategic alignment maturity.
The Paper V further explores the relationship between IT governance practices and strategic alignment maturity using an exploratory factor analysis and simple linear regression. Based on the factor analysis, two underlying factors can be identified from the data. First uncovered factor is named “maturity of planning and organizing the use of IT”, as it consists practices dealing with strategic information systems planning, project and portfolio management and corresponding steering committees. The second factor is named “strategic relationship between business and IT”, as it consists of practices dealing with CIO reporting to CEO, CIO being part of executive committee and the formation of IT strategy committee at the level of board of directors.

Another interpretation for the findings of exploratory factor analysis is that the first factor represents the alignment on tactical and operational levels and the second factor represents alignment on strategic level (e.g. Tarafdar and Qrunfleh, 2010), evidenced in the research instrument as top management involvement in IT decision-making. This interpretation seems logical in the sense, that if the IT is considered having strategic value for organization in question, that would be reflected in top management involvement in IT decision-making (e.g. CIO positioning and board level IT steering committee).

Based on the exploratory factor analysis, Paper V refines the IT Governance Best Practice instrument (De Haes and Van Grembergen, 2008, 2009) and puts forth a tentatively set of eight IT governance practices (Table 6) for further scrutiny. The proposed model explains 36.6% of the variance in alignment maturity ($R^2=0.366$) and the effect size (Cohen’s $f^2$) is 0.57, which can be considered large (Cohen, 1992).

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Table 6: Key Minimum Baseline for IT Governance Practices
Based on the above, the answer to main research problem of this study, “What is the impact of IT governance practices on strategic alignment?” can be summarized as:

1. On tactical and operational levels, IT governance practices have a significant contribution to alignment. Overall, tactical alignment is concerned with identifying and resolving issues in project selection and prioritization, facilitating IT-business collaboration at an operational level, and matching IT and business decision-making structures. Consequently IT governance practices, such as strategic information systems planning, project and portfolio management, IT budgeting and control, and IT service delivery, can contribute directly to alignment on tactical and operational levels.

2. On strategic level, IT governance practices can have only a limited impact on alignment, when the understanding of strategic value of IT is lacking. Achieving high alignment on a strategic level requires linking business and IT planning, building formal and informal relationships between IT and other top management members, and demonstrating the business value of IT to the organization. If top management sees IT as a separate, operational function, whose focus is on efficiency, operational quality and reliability rather than as a source of strategic advantage, the contribution of IT governance practices is limited. The lack of strategic understanding of the value of IT downplays the “competitive potential” alignment perspective and the focuses on “strategy execution” or “service level” perspectives.
4.2 Limitations

No study is without limitations and choosing any research philosophy, approach and contexts necessarily implies a set of limitations and avenues for further inquiry. Each individual paper has their own limitations, but overall there are five main considerations when analyzing the findings of this study.

First, the research focus is on Finnish organizations and therefore findings may suffer from country- or culture-specific biases. However, every effort is taken in attending to the contextual concerns in all studies and previously presented and validated research instruments are used “as-is” without translations or any other localization. Regardless, there might be uncovered elements in Finnish management or governance culture not present elsewhere, which have an effect on the findings.

Second, the empirical data is not quantitatively extensive. The qualitative study examined one case organization and the main source of data is 37 interviews using both quantitative (survey) and qualitative elements (structured interview). Interview data was supplemented with internal company documents and guidelines and the necessary depth of analysis was achieved. However, the results are based on a single revelatory case study and are not necessary generalizable beyond the scope of case organization. As Stake (1995) note, “case study seems a poor basis for generalization,” but propose that the method can add to existing experience and understanding. One should also note that the data is collected from the point of alignment issues relating to the IT governance practices, and qualitative data about other aspects of alignment, such as social and cultural, was not collected.

The number of same-respondent replies in quantitative study is 42 presenting 29 separate organizations from different industries. The biggest sector present is “higher education” (i.e. universities and applied universities) which amount to 28 answers from 19 organizations. Therefore the findings might be biased to portray the situation in “higher education” sector, limiting the external validity of the study. However, the when looking at the data collected in two surveys, there is no significant difference between “higher education” sector and other sectors in terms of averages and variances.
Third, the sample size, 42 same-respondent replies, used for exploratory factor analysis in quantitative study can be considered small. In general, there are two common recommendations in terms of minimum sample size in factor analysis. One argues that the absolute number of cases (N) is important, while another argues that the subject-to-variable ratio (p) is important. Common “rule of thumb” is that factor analysis should not be attempted with sample size less that 100 or that the subject-to-variable ratio should be at least 1:10 or even 1:20.

However, the reliable use of small sample sizes has been demonstrated by De Winter et al. (2009) and MacCallum et al. (1999), among others. De Winter et al. (2009) show, that when number of factors is 2 and factor loadings are around 0.6 or higher, the sample size of 39 is enough for reliable factor analysis with 12 variables or less (i.e. Tucker’s K = 0.955). Based on this, the sample size used in quantitative study can be considered sufficient for exploratory factor analysis. Regardless, the findings of the exploratory factor analysis need empirical confirmation with a larger sample size.

Fourth, this study does not aim to cover the full spectrum of strategic alignment frameworks or address IT governance “best practice” frameworks (e.g. Cobit) used by organizations. Rather, it utilizes a specific research instruments presented in previous literature in exploring the relationship between IT governance and strategic alignment and discusses a number of identified gaps in the previous research and the antecedents of and barrier to improving alignment through selected IT governance practices. Using other research instruments to measure IT governance and strategic alignment maturity can yield different results. Furthermore, the perceived maturity of strategic alignment and IT governance in both qualitative and quantitative studies varies from almost non-existent to medium-high, with a bulk of respondents being below average level (3). Overall, this low-to-average level of maturity might have an effect on the findings, as they might not apply to maturely governed, high-aligned organizations.

Fifth, the review of the previous literature cannot be exhaustive. With the sheer number of articles available on business value of IT, IT governance and strategic alignment, it is possible that this study does not represent the full picture of the field and all the recent discoveries. In reviewing previous literature every effort was made to try to include all the major streams of research into consideration. In any case, important bodies of literature and research might have remained outside the reviews. Furthermore, the review of previous literature was not limited to any specific search engines, publishers or journals, but aimed at building a comprehensive picture of the current body of knowledge on the subjects.
5 Conclusion

This dissertation explores the interrelationship between IT governance and strategic alignment in an organizational settings. By applying mixed methods research approach, using conceptual, qualitative and quantitative research designs in a sequential manner, the study increases our understanding on how the IT governance practices impact strategic alignment and elucidates some of the antecedents and barriers to strategic alignment as observed in actual organizational settings. Mixed methods approach provides complementary insights into complex organizational phenomena, such as strategic alignment. In essence, qualitative and quantitative approaches can be combined with in data collection and/or analysis either concurrently or sequentially, in one or more stages in the research process and to different degrees to explore the phenomenon (Bryman, 2006; Tashakkori and Teddlie, 2010).

5.1 Implications to Theory

This study has several implications for the academia. The research responds to the recognized need for more empirical studies on the impact of IT governance practices on strategic alignment (e.g. Coltman et al., 2015; Wu et al., 2015).

The key contribution of this dissertation is on providing empirical evidence on the complex relationship between IT governance and strategic alignment. The findings show that IT governance practices are an important antecedent for strategic alignment. Although the positive impact of IT governance on strategic alignment is often noted in literature, there are only a few empirical studies addressing the topic.

The study puts forth a tentative set of eight IT governance practices having a moderate effect on strategic alignment for further scrutiny. The study also identifies two underlying factors affecting strategic alignment maturity, namely “maturity of planning and organizing the use of IT” and “strategic relationship between business and IT” corresponding to tactical and strategic levels of alignment respectively.

In summary, the findings of the study extend our understanding and knowledge on how the IT governance practices contribute to achieving strategic alignment that consequently increases business value. The dissertation invites further research to apply diverse research settings and methods to further scrutinize the findings presented herein.
5.2 Implications to Practice

In addition to theoretical contributions, the study also has implications for practitioners, both for IT and business management in particular.

The findings highlight, that the IT governance contributes to tactical and operational alignment by advocating formal processes and mature practices. However, on strategic level, the impact of IT governance is limited, if the top management understanding of strategic value of IT and the requisite strategic direction for the use of IT is lacking. As Heart et al. (2010) note, the effectiveness of IT and business governance systems are contingent on effective IT leadership practices and the capabilities of executives. In order to avoid “alignment trap” (Shpilberg et al., 2007), top management should be technologically and business savvy to set the requisite strategic direction for the use of IT.

A recommendation to practitioners resulting from this study is that the implementing IT governance should start with proposed set of eight IT governance practices. At early stages, the effort should be put in implementing effective IT governance on tactical and operational levels – e.g. practices related to portfolio and project management and steering – where IT governance practices can have a significant impact on alignment. On strategic level however, the impact of IT governance is limited, if the understanding of strategic value of IT is lacking in the organization.

5.3 Future Work

First, in order to ascertain the external validity of the findings, future research should examine the relationship of IT governance practices and strategic alignment in in different contexts and with larger sample sizes. In particular, the set of “eight key practices” uncovered in exploratory factor analysis should be validated in other studies to ascertain whether it can act as a reliable predictor for strategic alignment maturity.

Further research is warranted to increase our understanding of the multifaceted nature of alignment in contemporary organizations with more complex structures and networks. Strategic alignment research might benefit by building more on contemporary notions of strategic management, such as co-evolution, dynamic capabilities, and organizational ambidexterity that are better suited to increasingly complex, networked business environment.
The ongoing digitalization of products and services has important considerations concerning future research on IT governance and strategic alignment. As Tilson et al. (2010) note, IS research should pay more attention to digital infrastructures as they have impact on the everyday reality of organizations. The digitalization of ‘everything’ is profoundly changing the way organizations conduct business. IT has evolved from back-office business support to enabling and front office processes and driving innovation.

From the viewpoint of IT governance and strategic alignment, the concept of digital infrastructure is especially challenging, as it is a relational and ecosystemic concept, cutting across different domain and industries. Traditionally, both IT governance and strategic alignment have focused on internal workings of the organizations, and the changing environment might require some reconceptualization these concepts.

In line with this, Tanriverdi et al. (2010) note that “aligning IS strategy with competitive strategy alone might offer limited and inconsequential results” and call for the reconceptualization of strategic alignment research based on co-evolution with strategy in “dancing rugged competitive landscape”. Coltman et al. (2015) suggest three key themes to guide future IT alignment research: (1) the micro-foundations of alignment; (2) the rise of digital business strategy, and (3) innovation ecosystem and value co-creation. Similarly, Karpovsky and Galliers (2015) call for a more practice-oriented approach to alignment research with a shift of focus from organizations and processes to people and day-to-day actions and their impact on alignment, similar to the strategy-as-practice approach in the field strategic management (c.f. Whittington, 2003; Vaara and Whittington, 2012).
References


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Appendix A. Review information on papers

Below are the review details on the papers included in this thesis.

I. ECMLG 2012 had two-phase blind review. Initially, paper abstracts were read and selected by the conference panel and selected full submissions were double-blind peer reviewed. Out of 203 initial submissions, 57 papers were accepted. Acceptance ratio was 28% (source: conference proceedings).

II. DEDM 2013 had one phase double-blind review. Based on 2 reviewers comments, the revised paper was accepted. Acceptance ratio was 42% (source: conference proceedings).

III. ECMLG 2013 had two-phase blind review. Initially, paper abstracts were read and selected by the conference panel and selected full submissions were double-blind peer reviewed. Out of 145 initial submissions, 45 papers were accepted. Acceptance ratio was 31.7% (source: conference proceedings).

IV. Information Resource Management Journal (ISSN: 1040-1628)
   First version submitted on February 17th, 2014
   1st revised version, June 8th, 2014.
   Accepted for publication, July 10th, 2014
   Published (online), August 19th, 2014
   Published: July 17th, 2015

V. International Journal of IT/Business Alignment and Governance
   First version submitted on May 8th, 2015
   1st revised version, July 13th, 2015
   Accepted for publication, August 18th, 2015
   Published: October 10th, 2015
Appendix B. Related publications

Additionally, some of the issues in the dissertation are discussed in following:


# Appendix C. THE QUESTIONNAIRES

## IT GOVERNANCE BEST PRACTICE MODEL (PAPER IV)

<table>
<thead>
<tr>
<th>Structures</th>
<th>33 ITG Best Practices (De Haes and Van Grembergen, 2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>IT strategy committee at level of board of directors</td>
</tr>
<tr>
<td>S2</td>
<td>IT expertise at level of board of directors</td>
</tr>
<tr>
<td>S3</td>
<td>(IT) audit committee at level of board of directors</td>
</tr>
<tr>
<td>S4</td>
<td>CIO on executive committee</td>
</tr>
<tr>
<td>S5</td>
<td>CIO reporting to CEO and/or COO</td>
</tr>
<tr>
<td>S6</td>
<td>IT steering committee as executive / senior management level</td>
</tr>
<tr>
<td>S7</td>
<td>IT governance function / office</td>
</tr>
<tr>
<td>S8</td>
<td>Security / compliance / risk officer</td>
</tr>
<tr>
<td>S9</td>
<td>IT project steering committee</td>
</tr>
<tr>
<td>S10</td>
<td>IT security steering committee</td>
</tr>
<tr>
<td>S11</td>
<td>Architecture steering committee</td>
</tr>
<tr>
<td>S12</td>
<td>Integration of governance/alignment tasks in roles &amp; responsibilities</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Processes</th>
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<tbody>
<tr>
<td>P1</td>
<td>Strategic information systems planning</td>
</tr>
<tr>
<td>P2</td>
<td>IT performance measurement</td>
</tr>
<tr>
<td>P3</td>
<td>Portfolio management</td>
</tr>
<tr>
<td>P4</td>
<td>Charge back arrangements - total cost of ownership</td>
</tr>
<tr>
<td>P5</td>
<td>Service level agreements</td>
</tr>
<tr>
<td>P6</td>
<td>IT Governance Framework COBIT</td>
</tr>
<tr>
<td>P7</td>
<td>IT governance assurance and self-assessment</td>
</tr>
<tr>
<td>P8</td>
<td>Project governance/management methodologies</td>
</tr>
<tr>
<td>P9</td>
<td>IT budget control and reporting</td>
</tr>
<tr>
<td>P10</td>
<td>Benefits management and reporting</td>
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<tr>
<td>P11</td>
<td>COSO/ERM</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Relationships</th>
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<tbody>
<tr>
<td>R1</td>
<td>Job-rotation</td>
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<tr>
<td>R2</td>
<td>Co-location</td>
</tr>
<tr>
<td>R3</td>
<td>Cross-training</td>
</tr>
<tr>
<td>R4</td>
<td>Knowledge management (on IT governance)</td>
</tr>
<tr>
<td>R5</td>
<td>Business/IT account management</td>
</tr>
<tr>
<td>R6</td>
<td>Executive/senior management giving good example</td>
</tr>
<tr>
<td>R7</td>
<td>Informal meetings between business and IT executive/senior management</td>
</tr>
<tr>
<td>R8</td>
<td>IT leadership</td>
</tr>
<tr>
<td>R9</td>
<td>Corporate internal communication addressing IT on a regular basis</td>
</tr>
<tr>
<td>R10</td>
<td>IT Governance awareness campaigns</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Minimum Baseline (10 practices)</th>
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</thead>
<tbody>
<tr>
<td>S1</td>
<td>IT strategy committee at level of board of directors</td>
</tr>
<tr>
<td>S4</td>
<td>CIO on executive committee</td>
</tr>
<tr>
<td>S5</td>
<td>CIO reporting to CEO and/or COO</td>
</tr>
<tr>
<td>S6</td>
<td>IT steering committee as executive / senior management level</td>
</tr>
<tr>
<td>S9</td>
<td>IT project steering committee</td>
</tr>
<tr>
<td>P1</td>
<td>Strategic information systems planning</td>
</tr>
<tr>
<td>P3</td>
<td>Portfolio management</td>
</tr>
<tr>
<td>P8</td>
<td>Project governance/management methodologies</td>
</tr>
<tr>
<td>P9</td>
<td>IT budget control and reporting</td>
</tr>
<tr>
<td>R8</td>
<td>IT leadership</td>
</tr>
</tbody>
</table>
Sample of the questionnaire used in interviews. Similar questions were used for each of 33 practices in the IT governance best practice model presented above.

**Practice S11: Architecture steering committee**

**Definition of practice:**

Committee composed of business and IT people providing architecture guidelines and advise on their application

- What is the purpose of the architecture steering committee in the organization?
- What kinds of processes are present to guide the activities of the committee?
- How do the processes link to the activities of other governance bodies?
- Are the processes defined and documented?
- Are the processes measured and optimized?
- What activities of the architecture steering committee work well?
- What development areas can there be identified?
- What are the main challenges of the committee?
- Can you think of a way to overcome these challenges?
- Which maturity level (see below) would you assign to this practice?
- Why did you select the particular maturity level?

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5: Optimized</td>
<td>Processes have been refined to a level of good practice based on the results of continuous improvement and benchmarking with other enterprises.</td>
</tr>
<tr>
<td>4: Managed</td>
<td>Management monitors and measures compliance. Actions are taken when processes appear not to be working effectively.</td>
</tr>
<tr>
<td>3: Defined</td>
<td>Processes have been standardized, documented and communicated. Compliance is mandatory, however detecting deviations is unlikely.</td>
</tr>
<tr>
<td>2: Repeatable</td>
<td>Processes have developed to the stage where similar procedures are followed by different people undertaking the same task. A high degree of reliance on the knowledge of individual skills and therefore errors are likely.</td>
</tr>
<tr>
<td>1: Initial</td>
<td>The enterprise has recognized that the issue exists and needs to be addressed. There are no standardized processes, but there are ad-hoc processes that tend to be applied on an individual or case-by-case basis</td>
</tr>
<tr>
<td>0: Nonexistent</td>
<td>Complete lack of any recognisable processes; Issue not recognized.</td>
</tr>
</tbody>
</table>
Welcome to IT Governance Best Practices Survey

This survey is based on “IT Governance Best Practice” framework by Haes and Grembergen (2008).

In the survey you are asked to rate the maturity 33 IT governance practices in your organization. IT governance practices consists of 12 structures, 11 processes and 10 practices related to the relationship between business and IT.

All answers are confidential.

The summary of the results will be delivered to the participating organizations.

### IT Governance Structures

<table>
<thead>
<tr>
<th>Structure Description</th>
<th>Maturity Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT strategy committee at level of board of directors</td>
<td>0 1 2 3 4 5</td>
</tr>
<tr>
<td>Committee at level of board of directors to ensure IT is regular agenda item and reporting issue for the board of director</td>
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</tr>
<tr>
<td>IT expertise at level of board of directors</td>
<td></td>
</tr>
<tr>
<td>Members of the board of directors have expertise and experience regarding the value and risk of IT</td>
<td></td>
</tr>
<tr>
<td>(IT) audit committee at level of board of directors</td>
<td></td>
</tr>
<tr>
<td>Independent committee at level of board of directors overviewing (IT) assurance activities</td>
<td></td>
</tr>
<tr>
<td>CIO on executive committee</td>
<td></td>
</tr>
<tr>
<td>CIO is a full member of the executive committee</td>
<td></td>
</tr>
<tr>
<td>CIO reporting to CEO and/or COO</td>
<td></td>
</tr>
<tr>
<td>CIO has a direct reporting line to the CEO and/or COO</td>
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<tr>
<td>IT steering committee</td>
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</tr>
<tr>
<td>Steering committee at executive or senior management level responsible for determining business priorities in IT investments</td>
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<tr>
<td>IT governance responsibility</td>
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<tr>
<td>Defined responsibility for promoting, driving and managing IT governance</td>
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<tr>
<td>Security/compliance/risk officer</td>
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<tr>
<td>Defined responsibility for security, compliance and/or risk, which possibly impacts IT</td>
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<tr>
<td>IT project steering committee</td>
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<tr>
<td>Steering committee composed of business and IT people focusing on prioritizing and managing IT projects</td>
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<tr>
<td>IT security steering committee</td>
<td></td>
</tr>
<tr>
<td>Steering committee composed of business and IT people focusing on IT related risks and security issues</td>
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<tr>
<td>Architecture steering committee</td>
<td></td>
</tr>
<tr>
<td>Committee composed of business and IT people providing architecture guidelines and advise on their applications</td>
<td></td>
</tr>
<tr>
<td>Integration of governance/alignment tasks in roles &amp; responsibilities</td>
<td></td>
</tr>
<tr>
<td>Documented roles &amp; responsibilities include governance/alignment tasks for business and IT people</td>
<td></td>
</tr>
</tbody>
</table>

Maturity levels:

0. Non existent; complete lack of practise
1. Initial; ad-hoc, chaotic; issue has been recognized; starting
2. Repeatable: no formal practise, some documentation high reliance on individual attitudes and actions
3. Defined; standardized and documented practise, shared understanding; consistency of actions
4. Managed; good practise; compliance is monitored; constant improvement of actions and practises based on experiences
5. Optimized: excellent level of practise
## IT Governance Processes

Please rate the maturity of following processes on the scale of 0 to 5

<table>
<thead>
<tr>
<th>Process</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic information systems planning</td>
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<tr>
<td>Formal process to define and update the IT strategy</td>
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<tr>
<td>IT performance measurement (e.g. IT balanced scorecard)</td>
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<tr>
<td>IT performance measurement in domains of corporate contribution, user orientation, operational excellence and future orientation</td>
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<tr>
<td>Portfolio management (incl. business cases, ROI, etc.)</td>
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<tr>
<td>Prioritization process for IT investments and projects in which business and IT is involved (incl. business cases)</td>
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<tr>
<td>Charge back arrangements - total cost of ownership</td>
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<tr>
<td>Methodology to charge back IT costs to business units, to enable an understanding of the total cost of ownership</td>
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<tr>
<td>Service level agreements</td>
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<tr>
<td>Formal agreements between business and IT about IT development projects or IT operations</td>
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<tr>
<td>IT governance framework</td>
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<tr>
<td>Defined IT governance and control framework in use (i.e. Cobit etc.)</td>
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<tr>
<td>IT governance assurance and self-assessment</td>
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<tr>
<td>Regular self-assessments or independent assurance activities on the governance and control over IT</td>
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<tr>
<td>Project governance/ management methodologies</td>
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<tr>
<td>Processes and methodologies to govern and manage IT projects</td>
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<tr>
<td>IT budget control and reporting</td>
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<tr>
<td>Processes to control and report upon budgets of IT investments and projects</td>
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<tr>
<td>Benefits management and reporting</td>
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<tr>
<td>Processes to monitor the planned business benefits during and after implementation of the IT investments / projects</td>
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<tr>
<td>Internal control / risk-management framework</td>
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<tr>
<td>Defined framework for internal controls and risk management (i.e. COSO/ERM etc.)</td>
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</tbody>
</table>

Maturity levels:

0. Non existent; complete lack of practise
1. Initial; ad-hoc, chaotic; issue has been recognized; starting
2. Repeatable: no formal practise, some documentation high reliance on individual attitudes and actions
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### IT Governance Processes

Please rate the maturity of following processes on the scale of 0 to 5

<table>
<thead>
<tr>
<th>Process</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Job-rotation</strong></td>
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<tr>
<td>IT staff working in the business units and business people working in IT</td>
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<tr>
<td><strong>Co-location</strong></td>
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<tr>
<td>Physically locating business and IT people close to each other</td>
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<tr>
<td><strong>Cross-training</strong></td>
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<tr>
<td>Training business people about IT and/or training IT people about business</td>
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<tr>
<td><strong>Knowledge management (on IT governance)</strong></td>
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<tr>
<td>Systems (bulletin boards, intranet, blogs etc.) to share and distribute knowledge about IT governance framework, responsibilities, tasks, etc.</td>
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<tr>
<td><strong>Business/IT account management</strong></td>
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<tr>
<td>Bridging the gap between business and IT by means of account managers who act as in-between</td>
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<tr>
<td><strong>Executive / senior management giving the good example</strong></td>
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<tr>
<td>Senior business and IT management acting as &quot;partners&quot;</td>
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<tr>
<td><strong>Informal communication between business and IT executives</strong></td>
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<tr>
<td>Informal meetings, with no agenda, where business and IT senior management talk about general activities, directions, etc. (e.g. during informal lunches)</td>
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<tr>
<td><strong>IT leadership</strong></td>
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<tr>
<td>Ability of CIO or similar role to articulate a vision for IT's role in the company and ensure that this vision is clearly understood by managers throughout the organization</td>
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<tr>
<td><strong>Corporate internal communication addressing IT on a regular basis</strong></td>
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<tr>
<td>Internal corporate communication regularly addresses general IT issues</td>
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<tr>
<td><strong>IT governance awareness campaigns</strong></td>
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<tr>
<td>Campaigns to explain to business and IT people the need for IT governance</td>
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</table>

**Maturity levels:**

0. Non existent; complete lack of practise
1. Initial; ad-hoc, chaotic; issue has been recognized; starting
2. Repeatable: no formal practise, some documentation; high reliance on individual attitudes and actions
3. Defined; standardized and documented practise; shared understanding; consistency of actions
4. Managed; good practise; compliance is monitored; constant improvement of actions and practises based on experiences
5. Optimized: excellent level of practise
<table>
<thead>
<tr>
<th>Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>On the questions below, please select the one that best presents the situation in your organization</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>C1: Understanding of Business by IT</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Senior and mid-level IT managers do not understand the business.</td>
</tr>
<tr>
<td>2. Senior and mid-level IT managers have a limited understanding of the business.</td>
</tr>
<tr>
<td>3. Senior and mid-level IT managers have a good understanding of the business.</td>
</tr>
<tr>
<td>4. Understanding of the business by all IT members is encouraged and promoted by senior managers.</td>
</tr>
<tr>
<td>5. Understanding of the business is required (e.g., tied to performance appraisals) throughout the IT function.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>C2: Understanding of IT by Business</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Senior and mid-level business managers do not understand IT.</td>
</tr>
<tr>
<td>2. Senior and mid-level business managers have a limited understanding of IT.</td>
</tr>
<tr>
<td>3. Senior and mid-level business managers have a good understanding of IT.</td>
</tr>
<tr>
<td>4. Understanding of IT by all employees is encouraged and promoted by senior management.</td>
</tr>
<tr>
<td>5. Understanding of IT is required (e.g., tied to performance appraisals) throughout the business.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>C3: Inter/Intra-organizational learning</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ad-hoc/casual methods (employee observation, anecdote sharing, peer meetings, etc.)</td>
</tr>
<tr>
<td>2. Informal methods (newsletters, bulletin boards, computer reports, mail lists etc.)</td>
</tr>
<tr>
<td>3. Regular, clear methods (training, e-mail, phone-mail, intranet, department meetings, etc.) from mid-level management</td>
</tr>
<tr>
<td>4. Formal, unifying, bonding methods from senior and mid-level management</td>
</tr>
<tr>
<td>5. Formal, unifying, bonding methods from senior and mid-level management, with feedback measures to monitor and promote effectiveness of learning</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>C4: Communications protocol and style</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. One-way, from the business; formal and inflexible</td>
</tr>
<tr>
<td>2. One-way, from the business; moderately informal and moderately flexible</td>
</tr>
<tr>
<td>3. Two-way; formal and inflexible</td>
</tr>
<tr>
<td>4. Two-way; moderately informal and moderately flexible</td>
</tr>
<tr>
<td>5. Two-way; informal and flexible</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>C5: Knowledge Sharing</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Knowledge sharing is on an ad-hoc basis.</td>
</tr>
<tr>
<td>2. Knowledge sharing is somewhat structured and/or structure is beginning to be created.</td>
</tr>
<tr>
<td>3. There is structured sharing around key functional unit processes.</td>
</tr>
<tr>
<td>4. There is formal sharing at the functional unit level and at the corporate level.</td>
</tr>
<tr>
<td>5. There is formal sharing at the functional unit level, at the corporate level, and with business partners/alliances</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>C6: Role and effectiveness of IT and business liaisons</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. We do not use liaisons, or if we do, we do so on an ad-hoc, as needed basis.</td>
</tr>
<tr>
<td>2. We regularly use liaisons to transfer IT knowledge to the business and business knowledge to IT. They are the primary contact point for interactions between IT and the business. Liaisons are not usually used to facilitate relationship development.</td>
</tr>
<tr>
<td>3. We regularly use liaisons to transfer IT knowledge to the business and business knowledge to IT. They occasionally facilitate relationship development.</td>
</tr>
<tr>
<td>4. We regularly use liaisons to facilitate the transfer of IT knowledge to the business and business knowledge to IT. Their primary objective is to facilitate internal relationship development.</td>
</tr>
<tr>
<td>5. We regularly use liaisons to facilitate the transfer of IT knowledge to the business and external partners and business knowledge to IT. Their primary objective is to facilitate relationship development across the business and its external partners.</td>
</tr>
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</table>
## Value Measurement

On the questions below, please select the one that best presents the situation in your organization.

### M1: Metrics and processes used to measure IT’s contribution to the business.

1. The metrics and processes we have in place to measure IT are primarily technical (e.g., system availability, response time).
2. We are equally concerned with technical and cost efficiency measures. We have limited or no formal feedback processes in place to review and take action based on the results of our measures.
3. We formally assess technical and cost efficiency using traditional financial measures, such as return on investment (ROI) and activity-based costing (ABC). We are starting to put formal feedback processes in place to review and take action based on the results of our measures.
4. We formally assess technical, cost efficiency, and cost effectiveness using traditional financial measures (e.g., ROI, ABC). We have formal feedback processes in place to review and take action based on the results of our measures.
5. We use a multi-dimensional approach with appropriate weights given to technical, financial, operational, and human-related measures. We have formal feedback processes in place to review and take action based on the results of our measures. These measures are extended to our external partners (e.g., vendors, outsourcers, customers).

### M2: Use of business metrics to measure contribution to the business

1. We do not measure the value of our business investments, or do so on an ad-hoc basis.
2. We are concerned with cost efficiency measures at the functional organisation level only. We have limited or no formal feedback processes in place to review and take action based on the results of our measures.
3. We formally use traditional financial measures, such as return on investment (ROI) and activity-based costing (ABC), across functional organisations. We are starting to have formal feedback processes in place to review and take action based on the results of our measures.
4. We formally measure value based on the contribution to our customers. We have formal feedback processes in place to review and take action based on the results of our measures and to assess contributions across functional organisations.
5. We use a multi-dimensional approach with appropriate weights given to technical, financial, operational, and human-related measures. We have formal feedback processes in place to review and take action based on the results of our measures. These measures are extended to our external partners (e.g., vendors, outsourcers, customers).

### M3: Balanced, integrated IT and business metrics to measure IT’s contribution to the business.

1. We do not measure the value of our IT business investments, or do so on an ad-hoc basis.
2. The value measurements for IT and business are not linked. We have limited or no formal feedback processes in place to review and take action based on the results of our measures.
3. The value measurements for IT and business are starting to be linked and formalized. We are also starting to have formal feedback processes in place to review and take action based on the results of our measures.
4. We formally link the value measurements of IT and business. We have formal feedback processes in place to review and take action based on the results of our measures and to assess contributions across functional organisations.
5. We use a multi-dimensional approach with appropriate weight given to IT and business measures. We have formal feedback processes in place to review and take action based on the results of our measures. These measures are extended to our external partners (e.g., vendors, outsourcers, customers).

### M4: Use of service level agreements (SLAs)

1. We do not use SLAs or do so sporadically.
2. We have SLAs which are primarily technically oriented (response time, length of downtime, etc.), between the IT and functional organisations.
3. We have SLAs which are both technically oriented and relationship-oriented (user/customer satisfaction, IT’s commitment to the business, etc.) that are between the IT and functional organisations and also emerging across the enterprise.
4. We have SLAs which are both technically-oriented and relationship-oriented, between the IT and functional organisations as well as enterprise wide.
5. We have SLAs which are both technically-oriented and relationship-oriented, between the IT and functional organisations, enterprise wide and with our external partners/alliances.
M5: Benchmarking practices;
Informal practices are such things as informal interviews, literature searches, company visits, etc., while formal practices are such things as environmental scanning, data gathering and analysis, determining best practices, etc.
1. We seldom or never perform either informal or formal benchmarks.
2. We occasionally or routinely perform informal benchmarks.
3. We occasionally perform formal benchmarks and seldom take action based on the findings.
4. We routinely perform formal benchmarks and usually take action based on the findings.
5. We routinely perform formal benchmarks and have a regulated process in place to take action and measure the changes.

M6: Extent of formal assessments and reviews of IT investments
1. We do not formally assess and/or review.
2. We assess and/or review only after we have a business or IT problem (i.e., failed IT project, market share loss).
3. Assessments and/or reviews are becoming routine occurrences.
4. We routinely assess and/or review and have a formal process in place to make changes based on the results.
5. We routinely assess and/or review and have a formal process in place to make changes based on the results and measure the changes. Our external partners are included in the process.

M7: Extent to which IT-business continuous improvement practices (e.g., quality circles, quality reviews) and effectiveness measures are in place.
1. We do not have any continuous improvement practices in place.
2. Few continuous improvement practices in place, but no effectiveness measures.
3. Few continuous improvement practices in place and emerging use of effectiveness measures.
4. Many continuous improvement practices in place and we frequently measure their effectiveness.
5. We have well established continuous improvement practices and effectiveness measures in place.

Governance
On the questions below, please select the one that best presents the situation in your organization

G1: Strategic business planning with IT participation
1. We do no formal strategic business planning or, if it is done, is done as-needed.
2. We do formal strategic business planning at the functional unit level with slight IT participation.
3. We do formal strategic business planning at the functional unit levels with some IT participation. There is some inter-organisational planning.
4. We do formal strategic business planning at the functional unit and across the enterprise with IT participation.
5. We do formal strategic business planning at the functional unit, across the enterprise, and with our business partners/alliances with IT participation.

G2: Strategic IT planning with business participation.
1. We do no formal strategic IT planning or, if it is done, it is done on an as-needed basis.
2. We do formal strategic IT planning at the functional unit level with slight business participation.
3. We do formal strategic IT planning at the functional unit levels with some business participation. There is some inter-organisational planning.
4. We do formal strategic IT planning at the functional unit and across the enterprise with the business.
5. We do formal strategic business planning at the functional unit, across the enterprise, and with our business partners/alliances.
G3: The organisation structure of the IT function
1. Centralized, whereby a corporate IT unit (or other central unit) has primary authority for architecture, standards, and application resource decisions.
2. Decentralized, whereby each functional unit within the organisation has primary authority for their IT infrastructure, standards, and application resource decisions.
3. Decentralized, whereby a corporate IT unit (or other central unit) has primary responsibility for architecture, common systems, and standards decisions, while each functional unit has primary authority for application resource decisions.
4. Federated, whereby a corporate IT unit (or other central unit) and functional units share responsibility for architecture and standards decisions, with coordinated common systems and application resource decisions.
5. Federated, with enterprise wide coordination of architecture, systems, and IT investment decisions.

G4: IT function is budgeted as a
1. Cost center, with erratic/inconsistent/irregular/changeable spending
2. Cost center, by functional organisation
3. Cost center with some projects treated as investments
4. Investment center
5. Profit center, where IT generates revenues

G5: IT investment decisions are primarily based on IT’s ability to
1. Reduce costs.
2. Increase productivity and efficiency as the focus.
3. Traditional financial reviews. IT is seen as a process enabler.
4. Business effectiveness is the focus. IT is seen as a process driver or business strategy enabler.
5. Create competitive advantage and increase profit. Our business partners see value.

G6: IT steering committee(s) with senior level IT and business management participation.
1. We do not have formal/regular steering committee(s).
2. We have committee(s) which meet informally on an as-needed basis.
3. We have formal committees, which meet regularly and have emerging effectiveness.
4. We have formal, regular committee meetings with demonstrated effectiveness.
5. We have formal, regular committee meetings with demonstrated effectiveness that include strategic business partners sharing decision-making responsibilities.

G7: Our IT project prioritization process is usually
1. In reaction to a business or IT need.
2. Determined by the IT function.
3. Determined by the business function.
4. Mutually determined between senior and mid-level IT and business management.
5. Mutually determined between senior and mid-level IT and business management and with consideration of the priorities of any business partners/alliances.

Partnership
On the questions below, please select the one that best presents the situation in your organization

P1: IT is perceived by the business as
1. A cost of doing business
2. Emerging as an asset
3. A fundamental enabler of future business activity
4. A fundamental driver of future business activity
5. A partner with the business that co-adapts/improvises in bringing value to the firm

P2: The role of IT in strategic business planning
1. IT does not have a role.
2. IT is used to enable business processes.
3. IT is used to drive business processes.
4. IT is used to enable or drive business strategy.
5. IT co-adapts with the business to enable/drive strategic objectives.
P3: Shared Goals, Risks, Rewards / Penalties:
The sharing by IT and business management of the risks and rewards associated with IT-based initiatives (i.e., a project is late and over budget because of business requirement changes).
1. IT takes all the risks and does not receive any of the rewards.
2. IT takes most of the risks with little reward.
3. Sharing of risks and rewards is emerging.
4. Risks and rewards are always shared.
5. Risks and rewards are always shared and we have formal compensation and reward systems in place that induce managers to take risks.

P4: IT Program Management:
To what extent are there formal processes in place that focus on enhancing the partnership relationships that exist between IT and business (e.g., cross-functional teams, training, risk/reward sharing)
1. We don’t manage our relationships
2. We manage our relationships on an ad-hoc basis.
3. We have defined programs to manage our relationships, but IT or the business does not always comply with them. Conflict is seen as creative rather than disruptive.
4. We have defined programs to manage our relationships and both IT and the business comply with them.
5. We have defined programs to manage our relationships, both IT and the business comply with them, and we are continuously improving them.

P5: IT and business relationship and trust
1. There is a sense of conflict and mistrust between IT and the business.
2. The association is primarily an “arm’s length” transactional style of relationship.
3. IT is emerging as a valued service provider.
4. The association is primarily a long-term partnership style of relationship.
5. The association is a long-term partnership and valued service provider.

P6: Business Sponsor/Champion: IT initiatives
1. Do not usually have a senior level IT or business sponsor/champion.
2. Often have a senior level IT sponsor/champion only.
3. Often have a senior level IT and business sponsor/champion at the functional unit level.
4. Often have a senior level IT and business sponsor/champion at the corporate level.
5. Often have a senior level IT and the CEO as the business/sponsor champion.
### A4: The level of disruption caused by business and IT changes (e.g., implementation of a new technology, business process, and merger/acquisition).

<table>
<thead>
<tr>
<th>Level</th>
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<tbody>
<tr>
<td>1. Not readily transparent (very disruptive)</td>
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<tr>
<td>2. Transparent at the functional level only</td>
</tr>
<tr>
<td>3. Transparent at the functional level and emerging across all remote, branch, and mobile locations</td>
</tr>
<tr>
<td>4. Transparent across the entire organisation</td>
</tr>
<tr>
<td>5. Transparent across the organisation and to our business partners/alliances</td>
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</table>

### A5: The scope of IT infrastructure flexibility to business and technology changes

<table>
<thead>
<tr>
<th>Scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A utility providing the basic IT services at minimum cost</td>
</tr>
<tr>
<td>2. Emerging as driven by the requirements of the current business strategy</td>
</tr>
<tr>
<td>3. Driven by the requirements of the current business strategy</td>
</tr>
<tr>
<td>4. Emerging as a resource to enable fast response to changes in the marketplace</td>
</tr>
<tr>
<td>5. A resource to enable and drive fast response to changes in the marketplace</td>
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</table>

### Skills

**On the questions below, please select the one that best presents the situation in your organization.**

#### S1: The extent the organisation fosters an innovative entrepreneurial environment.

<table>
<thead>
<tr>
<th>Extent</th>
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<tbody>
<tr>
<td>1. Discouraged</td>
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<tr>
<td>2. Moderately encouraged at the functional unit level</td>
</tr>
<tr>
<td>3. Strongly encouraged at the functional unit level</td>
</tr>
<tr>
<td>4. Strongly encouraged at the functional unit and corporate levels</td>
</tr>
<tr>
<td>5. Strongly encouraged at the functional unit, corporate level, and with business partners/alliances</td>
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</table>

#### S2: The cultural locus of power in making IT based decisions

<table>
<thead>
<tr>
<th>Locus</th>
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</thead>
<tbody>
<tr>
<td>1. Top business management or IT management at the corporate level only</td>
</tr>
<tr>
<td>2. Top business or IT management at corporate level with emerging functional unit level influence</td>
</tr>
<tr>
<td>3. Top business management at corporate and functional unit levels, with emerging shared influence from IT management</td>
</tr>
<tr>
<td>4. Top management (business and IT) across the organisation and emerging influence from our business partners/alliances.</td>
</tr>
<tr>
<td>5. Top management across the organisation with equal influence from our business partners/alliances.</td>
</tr>
</tbody>
</table>

#### S3: Readiness for change

<table>
<thead>
<tr>
<th>Readiness</th>
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<tbody>
<tr>
<td>1. We tend to resist change.</td>
</tr>
<tr>
<td>2. We recognize the need for change and change readiness programs are emerging.</td>
</tr>
<tr>
<td>3. Change readiness programs providing training and necessary skills to implement change are in place at the functional unit level.</td>
</tr>
<tr>
<td>4. Change readiness programs are in place at the corporate level.</td>
</tr>
<tr>
<td>5. Change readiness programs are in place at the corporate level and we are proactive and anticipate change.</td>
</tr>
</tbody>
</table>

#### S4: Career crossover opportunities among IT and business personnel

<table>
<thead>
<tr>
<th>Opportunities</th>
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<tbody>
<tr>
<td>1. Job transfers rarely or never occur.</td>
</tr>
<tr>
<td>2. Job transfers occasionally occur within the functional organisation.</td>
</tr>
<tr>
<td>3. Job transfers regularly occur for management level positions usually at the functional level.</td>
</tr>
<tr>
<td>4. Job transfers regularly occur for all position levels and within the functional units.</td>
</tr>
<tr>
<td>5. Job transfers regularly occur for all position levels, within the functional units, and at the corporate level.</td>
</tr>
</tbody>
</table>

#### S5: Job Rotation or Cross-Training

**Opportunities to learn about and support services outside the employee’s functional unit**

<table>
<thead>
<tr>
<th>Opportunities</th>
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</thead>
<tbody>
<tr>
<td>1. No opportunities to learn about support services outside the employee’s functional unit.</td>
</tr>
<tr>
<td>2. Opportunities are dependent on the functional unit.</td>
</tr>
<tr>
<td>3. Formal programs are practiced by all functional units.</td>
</tr>
<tr>
<td>4. Formal programs are practiced by all functional units and across the enterprise.</td>
</tr>
<tr>
<td>5. Opportunities are formally available across the enterprise and with business partners/alliances.</td>
</tr>
</tbody>
</table>
### S6: Interpersonal interaction that exists across IT and business units
(e.g., trust, confidence, cultural, social, and political environment)

1. There is minimum interaction between IT and business units.
2. The association is primarily an “arm’s length” transactional style of relationship.
3. Trust and confidence among IT and business is emerging.
4. Trust and confidence among IT and business is achieved.
5. Trust and confidence is extended to external customers and partners.

### S7: IT organisation’s ability to attract and retain the best business and technical professionals

1. There is no formal program to retain IT professionals.
   Recruiting demands are filled on ‘ad-hoc’ basis.
2. IT hiring is focused on technical expertise.
3. IT hiring is focused equally on technical and business expertise.
   Retention programs are in place.
4. Formal programs are in place to attract and retain the best IT professionals
   with both technical and business skills.
5. Effective programs are in place to attract and retain the best IT professionals
   with both technical and business skills.