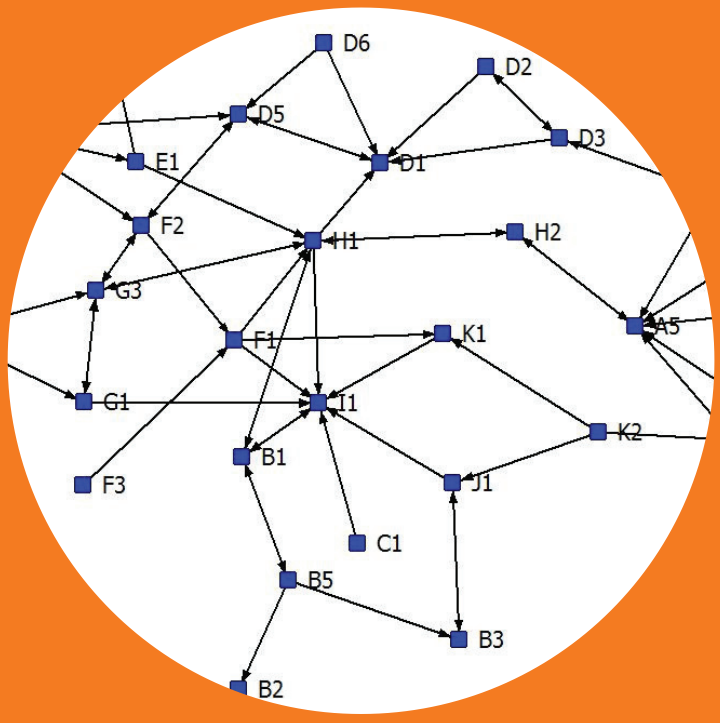
Department of Information and Service Economy

Network Adjacency in Shaping Intra-Organizational Perceptions about Strategic IT-Business Alignment

Pirkko Lahdelma



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Abstract

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Pirkko Lahdelma

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Abstract

The strategic alignment between IT and business has continued as one of the top concerns of IT executives for decades. One reason for alignment being such a persistent concern for IT executives can be the differing views on alignment level within companies. As the overall research question of this study is "What explains (dis-)similarities in the perceptions on strategic IT-business alignment within an organization", the study focuses on the social dimension of strategic IT-business alignment. The research question is divided into two sub-questions, in which the perceived IT-business alignment is examined in relation to following constructs: interaction patterns and formal structures. The focus is especially on the adjacency in these structures. In addition, the objective is to search for alternative explanations for the (dis-)similar perceptions of strategic IT-business alignment with the following constructs: perceived shared domain knowledge, relational similarity in age, education, gender, organizational tenure, and experiences from a recent IT-decision.

The research methodology was to use quantitative methods designed for social network analysis in one empirical research setting. Data was gathered by using a questionnaire. Formal structures, informal networks, and true interaction patterns within the company were discovered by sociometric questions.

The results revealed that the department structure has a significant effect on the similarity in the perceived IT-business alignment between a pair of individuals. Ties in discussion and advice networks had an impact on the similarity in the perceived alignment but affection-based informal networks, such as friendship, or formal cross-functional structures, such as steering committees, did not produce significant results. Respondents' age, education, gender, or organizational tenure did not to have any significant effect, either. Experiences from a past IT-decision were important factors for both similarity in the views and for the perceived alignment level.

This study contributes to research as well as practice in several ways. First, the results highlight the importance of a focus on the social dimension of strategic IT-business alignment. Secondly, a key principle of social network theory to focus on the relationships between individuals was added to alignment research. As a new construct for the alignment research, adjacency in work-related interaction patterns was found to have an effect on the similarity in the perceptions of strategic IT-business alignment, while also the functional department structure was confirmed to be an important factor. In terms of the managerial implications, the results highlight the importance of understanding the network dynamics within an organization because they contribute to the formation of the perceptions of strategic IT-business alignment.

Keywords strategic IT-business alignment, perceptual congruence, shared knowledge, intra-organizational networks, social network analysis, network adjacency

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Tiivistelmä

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Väitöskirjan nimi
Yrityksen sisäiset verkostot IT:n ja liiketoiminnan strategista yhteensovittamista koskevien näkemysten muokkaajina

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Tutkimusala Tietojärjestelmätiede

Tiivistelmä

Informaatioteknologian (IT) ja liiketoiminnan välinen strateginen yhteensovittaminen on ollut IT-johtajien huolena jo vuosikymmenten ajan. Yksi mahdollinen syy tähän voi olla se, että yritysten sisällä on usein suuria näkemyseroja yhteensovittamisen tasosta ja tilasta. Tutkimuksen tavoitteena oli tunnistaa näkemyserojen syntyyn vaikuttavia tekijöitä. Tutkimuksessa IT:n ja liiketoiminnan yhteensovittamista koskevia näkemyksiä tarkasteltiin sekä muodollisten organisaatiorakenteiden että todellisten vuorovaikutussuhteiden avulla. Lisäksi tavoitteena oli etsiä vaihtoehtoisia selityksiä näkemyseroille mm. yhteisen tietämyksen asteesta, samankaltaisista taustoista liittyen ikään, sukupuoleen, koulutukseen ja yrityksen palveluksessa vietettyyn aikaan, sekä tuoreeseen IT-päätökseen liittyvistä kokemuksista.

Tutkimusmenetelmänä käytettiin sosiaalisen verkostoanalyysin kvantitatiivisia menetelmiä yhden empiirisen tutkimusasetelman puitteissa. Tiedot kerättiin kyselylomakkeen avulla energiatoimialalla toimivan yrityksen johdolta, IT-henkilöstöltä sekä heidän kanssaan tiiviissä vuorovaikutussuhteissa olevilta henkilöiltä. Todellisten vuorovaikutussuhteisten selvittämisessä käytettiin sosiometrisia kysymyksiä.

Tulokset osoittavat, että organisaation osastorakenteella on merkittävä vaikutus näkemysten samankaltaisuuteen. Tärkeä tekijä näkemysten samankaltaisuuden muodostumiselle on myös henkilöiden välinen työasioihin liittyvä keskustelu- tai neuvonantosuhde, jonka ei tarvitse noudattaa muodollista organisaatiorakennetta. Sen sijaan ystävyyssuhteet tai osastorajoja rikkovat muodolliset organisaatiorakenteet eivät osoittautuneet merkittäviksi tekijöiksi. Myöskään vastaajien ikä, sukupuoli, koulutus tai yrityksen palveluksessa vietetty aika eivät näyttäneet vaikuttavan näkemyksiin tai niiden samankaltaisuuteen. Sitä vaston kokemukset juuri toteutetusta IT-päätöksestä osoittautuvat tärkeiksi tekijöiksi sille, millaiseksi IT:n ja liiketoiminnan yhteen sovittaminen koettiin.

Tutkimus korostaa IT:n ja liiketoiminnan strategisen yhteensovittamisen sosiaalista ulottuvuutta ja tarjoaa tiedeyhteisölle uuden tutkimussuunnan lisäämällä IT:n ja liiketoiminnan yhteensovittamista koskevaan tutkimukseen yksilöiden väliset suhteet. Erityisesti työasioihin liittyvä vuorovaikutussuhde on yhteensovittamista koskevan tutkimuksen kannalta uusi merkittävä käsite. Liikkeenjohdon näkökulmasta tutkimustulokset korostavat verkostodynamiikan tunnistamisen tärkeyttä yhteensovittamista koskevien näkemysten muodostumisessa.

Avainsanat IT:n ja liiketoiminnan strateginen yhteensovittaminen, näkemysten samankaltaisuus, yrityksen sisäiset verkostot, sosiaalinen verkostoanalyysi

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Helsinki, February 8, 2013

Pirkko Lahdelma

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1 Introduction

For several years, alignment between IT and business has been one of the key issues for IS researchers and IT executives alike. Even though there has been a lot of research on both the antecedents (e.g. Brown and Magill 1994; Sabherwal and Chan 2001; Chan et al. 2006) and the outcomes of the alignment (e.g. Sabherwal and Chan 2001; Kearns and Lederer 2003; Byrd et al. 2006; Kearns and Sabherwal 2006), it remains among the top concerns. IS research community and IT executives are searching for effective ways of linking IT and the business.

The Society for Information Management (SIM 2008; SIM 2009; SIM 2010) annually conducts a survey targeted to CIOs and other IT executives. The results have shown that alignment between IT and business maintains its positions among the top issues. In 2008, the alignment was the first position on the list of top issues; in 2009, it was ranked as the second important issue; and in 2010, it was in the third on the list.

Alignment of IT and business is an issue in Finnish organizations, too. In Finland, the Finnish Information Processing Association (TTL, Tietotekniikan liitto in Finnish) conducts an annual survey on how Finnish companies see the importance of information technology for their business (TTL 2009; TTL 2010). Both in 2009 and in 2010, especially the ratings on the dialogue between business and IT executives indicated that the mutual interaction is not on an adequate level in the majority of the firms. In 2009, only approximately a half of the respondents considered being able to align the IT goals with business goals and measure the achievement of these goals. In 2010, the proportion was only 39% and thus, had deteriorated if compared with the figures in 2009.

1.1 Earlier research on IT and business alignment

Prior research (e.g. Avison et al. 2004; Campbell et al. 2005; Luftman and Kempaiah 2008; Luftman et al. 2009) suggests several reasons why

strategic IT-business alignment persistently continues as one of the top concerns of IT executives.

First, the role of IT in all kinds of business continues to increase, and therefore, the demands for IT to deliver measurable business value have intensified further during the last decade. By now, IT has entered most business processes, products, and services as an enabler and a facilitator. Furthermore, IT has been instrumental already for decades in inter-organizational transactions and relations. IT is treated as a valuable asset and resource in all the meanings of contemporary business strategy literature (Bharadwaj 2000; Kayworth et al. 2001; Ravichandran and Lertwongsatien 2005; Aral and Weill 2007). An IT executives' objective is to provide efficient IT solutions that support and serve the business goals of a company as well as possible. The IT-business alignment with IT efficacy is believed to be a key to this (Shpilberg et al. 2007).

According to Luftman and Kempaiah (2008), another reason for why alignment remains among the top concerns is that too many organizations are still just aligning IT with business without seeing it as a bi-directional practice. They suggest that IT should be regarded as a partner to business, not as a subordinate. Indeed, identifying and implementing novel ways to apply information technology need to be understood as a joint-effort between business and IT (Swanson and Ramiller 2004).

In addition, Luftman and Kempaiah (2008) deliberate that setting up information technology is not enough in itself but organizations must address other issues too, such as processes, human resources, and organizational design. These complementary assets are needed to accompany IT investments in order to obtain the intended benefits (Kohli and Devaraj 2004).

Moreover, alignment is a complex and in many sense vague construct that it has proven difficult to measure. Neither researchers nor practitioners have been able to develop a generally accepted instrument for the measurement of IT-business alignment level. Luftman has developed one of the few operationalized measurement tools for assessing alignment (Luftman 2003; Sledgianowski and Luftman 2006) but the amplitude of its use in practice has not been reported.

In the past decades, research has dwelled on the outcomes and consequences of alignment. By and large, IT-business alignment is expected to have a positive influence on performance: organizations, that manage to align business and IT, have been found to be able to use IT for competitive

advantage or perform better (Sabherwal and Chan 2001; Kearns and Lederer 2003; Byrd et al. 2006; Kearns and Sabherwal 2006). Since the outcomes of alignment can be considered attractive, alignment is viewed as a desirable and worthy goal.

Finally, earlier studies suggest that most IT executives are well aware that views on the IT-business alignment level often vary even substantially within organizations. In a study among IS executives and business planners, Teo and King (1997a) found that in almost 40% of the organizations that responded to the survey the perceptions of the degree of integration varied considerably between business planners and IS executives. On a similar note, Rathnam et al. (2004) uncovered perceived alignment gaps in a large financial services company, and Peppard and Ward (1999) noted the existence of perceived alignment gaps between IT organization and the rest of the business. Reich and Benbasat (1996) found evidence of discrepancies in the perceptions between IT and business executives. Studies on IT governance (Dahlberg et al. 2006; Dahlberg and Kivijärvi 2006; Lahdelma and Dahlberg 2006; Dahlberg and Lahdelma 2007) among 27 enterprises revealed significant differences in the views of business and IT executives concerning IT management practices and alignment of IT and business. There were differences not only between IT and business executives' perceptions but interestingly, also between individual business executives. Indeed, the discrepancies in perceptions have been found to be difficult to manage.

1.2 Research Gap

Based on the above discussion, it is evident that more research is needed on the topic of strategic IT-business alignment. This study aims at shedding light on the subject by providing deeper understanding and a new approach for capturing the essence of IT-business alignment better.

The majority of prior research (e.g. Chan, Huff and Copeland 1997; van der Zee and De Jong 1999; Croteau and Bergeron 2001; Sabherwal et al. 2001; Avison et al. 2004; Byrd et al. 2006) on strategic IT-business alignment has been heavily built on the strategic alignment model of Henderson and Venkatraman (1993). Usually, the different definitions for alignment refer to matching an organization's strategies and structures within business, within information technology, and between these two. A lot of attention has been paid to the antecedents and outcomes of alignment (e.g. Brown and Magill 1994; Sabherwal and Chan 2001; Kearns and

Lederer 2003; Byrd et al. 2006; Chan et al. 2006). Despite the long research tradition, strategic IT-business alignment has not disappeared from the list of CIOs' top concerns. Hence, IT-business alignment research needs a new viewpoint: instead of focusing on the strategic and structural dimensions, one should concentrate on the social dimension of strategic IT-business alignment, which has been less studied thus far.

Strategic IT-business alignment has been defined as a multi-dimensional concept with four dimensions (Chan and Reich 2007b): strategic, structural, social, and cultural. A new way to approach strategic IT-business alignment is to focus on **why the perceptions of alignment can differ so much within an organization**. This question relates to the less studied social dimension of strategic IT-business alignment, which includes the knowledge sharing aspects. The social dimension of alignment can be defined as *the state in which business and IT representatives within an organization understand and view the strategic dimension of IT-business alignment similarly* (modified from Reich and Benbasat 2000). Understanding why the perceptions of strategic IT-business alignment either differ from or are similar to each other enables the active development of them in the desired direction.

In few earlier studies on the social dimension of strategic IT-business alignment, the focus has been mainly on the relationship between the chief information officer (CIO) and the chief executive officer (CEO) or the top management team as a collective one. The relationships between organizational networks and the perceptions of strategic IT-business alignment within an organization have not been investigated, yet. Hence, the purpose of this study is to better understand the effect of organizational and knowledge sharing structures on the perceptions of strategic IT-business alignment.

1.3 Key Concepts

Before introducing the research questions, a brief introduction of the key concepts used in this research is presented. The first sub-chapter features the concepts of strategic IT-business alignment, whereas the following sub-chapters cover the concepts of shared knowledge, knowledge sharing and organizational structures, and other key concepts.

1.3.1 Concepts of Strategic IT-Business Alignment

For this study, both a definition for IT and a definition for strategy with its sub-concepts are needed. Further, I will also define the concept of strategic IT-business alignment as being a focal one for this study.

Information technology (IT) refers to all the technologies, applications, processes, and other resources, such as IT personnel and skills, needed for manipulation, storage, and communication of information within an organization (cf. Sabherwal and Kirs 1994).

Strategy is defined as a combination of a plan (a direction, a course of action, or guidelines to address a future situation) and a pattern (a reflection of the past behavior and realized action) (cf. Mintzberg 1987; Mintzberg et al. 1998).

In turn, **business strategy** refers to the competitive strategy of a business unit, and **IT strategy** refers to the strategic choices concerning information technology. As strategy is defined as a combination of a plan and a pattern in this study, also these choices can be those already implemented or still in the form of plans.

Strategic alignment between IT and business, also called **strategic IT-business alignment**, refers to a multi-dimensional concept with four dimensions (Chan and Reich 2007b): strategic, structural, social, and cultural. The main foci of this study – the social and strategic dimensions of alignment – are defined building on the work of Reich and Benbasat (2000). In this study, the social dimension of the alignment is defined as *the state in which business and IT representatives within an organization understand and view the strategic dimension of IT-business alignment similarly*; and the strategic dimension of alignment is *the state in which a high-quality set of inter-related, intended and realized IT and business plans exist*. Moreover, the concept of **perceived strategic IT-business alignment** refers to the perceptions of the strategic dimension of strategic IT-business alignment.

1.3.2 Concepts of Shared Knowledge

In this research, **a perception** refers to a view and opinion, not to a sense-driven observation. Consequently, **perceptual congruence** can be defined as "*the degree to which individuals view matters similarly*" (Huisman and Iivari 2006, p. 30). Henceforth, similar perceptions, similar

views, and similarity in perceptions are used as synonyms to denote perceptual congruence.

Knowledge is a true justified belief, which is held by an individual (Kogut and Zander 1992; Nonaka 1994; Nonaka and Takeuchi 1995; Grant 1996b). Even though individuals are constrained by their subjective experiences, assumptions, and beliefs, their views usually represent the truth to their holders until they are proven false. Consequently, **shared knowledge** refers to similar understanding and similar views within a group of individuals holding the knowledge. **Shared domain knowledge**, in turn, refers to "*the ability of different (sub-)groups from different domains to understand and respect each other's contribution and challenges, and even to participate in each other's processes, contribution, and challenges*" (Reich and Benbasat 2000, p. 86).

1.3.3 Concepts of Intra-Organizational Networks and Structures

Intra-organizational networks and structures refer to the relationships within organizational boundaries (Johanson 2001). These relationships can refer both to formal structures, which are planned by the management, or and to actual interaction patterns that emerge from both formal structures and informal networks within an enterprise (cf. Ibarra and Andrews 1993; Burkhardt and Brass 1990).

Formal structures are "*a network comprising all the various cooperative ties between organizational positions that have been intentionally created to safeguard economic processes*" (Rank 2008, p. 147).

Interaction patterns refer to how individuals tend to connect with each other in practice. They are recurrent, systematic relationships within a group of people. People prefer certain people over others when discussing work-related matters, asking and giving advice to each other in their daily work, and socializing more informally, for example, by having coffee breaks together. Interaction patterns can be the result of formal arrangements but also of the employees' own actions (Selznick 1948). Interaction patterns can be informal ties defined as "*voluntary cooperative relationships between organizational actors*" (Rank 2008, p. 147).

An advice network refers to relationships based on giving and asking for advice on work-related problems (Krackhardt 1990; Ibarra and Andrews 1993; Yang and Tang 2004), whereas **a discussion network** refers to relationships based on discussing and sharing information about issues,

which are topical in the organization (Ibarra 1993). **A friendship network** consists of informal relationships, in which both parties consider each other as a friend (Krackhardt 1990; Ibarra and Andrews 1993).

In social network theory, individuals or other social entities, such as groups, departments, or companies, are called **actors** (Wasserman and Faust 1994). Actors linked to one another by social **ties** form the **nodes** of the network (Wasserman and Faust 1994). In social network analysis, **adjacency** refers to whether there is a tie between actors or not within a network (Wasserman and Faust 1994). In this study, **network adjacency** refers to whether a tie exists in some of the intra-organizational structures or networks.

A **bridge** is a connection between two nodes in a network, the removal of which would result in a disconnected network structure (Wasserman and Faust 1994, p. 114) that can also be called a **structural hole** (Burt 2001).

Tie strength refers to a valued relationship, where the value can represent, for instance, the intensity or interaction frequency of a relationship between two parties (Granovetter 1973; Marsden and Campbell 1984; Hansen 1999).

Attributes relate to actors' characteristics, qualities, or properties, including attitudes, opinions, and behaviors (Scott 2000). When the research focus is only on the attributes of an individual or of a group as a whole, the unit of analysis is said to be **monadic**, whereas when the interest is in the relations between pairs of individuals or groups, the unit of analysis is called **dyadic** (Wasserman and Faust 1994, p. 22; Borgatti and Everett 1997; Knoke and Yang 2008, p. 13).

The number of connections of a node is called **a degree** of a node (Wasserman and Faust 1994, p. 100). The **density** of a network is the number of connections in a network expressed as a proportion of the maximum possible number of connections (Wasserman and Faust 1994, p. 101). It describes the general level of cohesion. In a dense network, **the mean value of the degrees of all the nodes** is high, whereas in a scarce network the value is low.

In the case of **homophily**, the attitudes or other attributes of an individual actor might have an influence on relationship development. For instance, interest in the same things can bring people together (McPherson et al. 2001). In the case of **diffusion** (or contagion), the patterns of relationships bring people into contact with the attitudes and behaviors of other individuals within the organization (Ibarra and Andrews 1993;

Burkhardt 1994; Meyer 1994). Existence of either one or both of these two types of relationship patterns may assist in explaining similar attitudes toward organizational or job-related matters.

Relational similarity refers to the comparative demographic characteristics of members of dyads or groups who are in a position to engage in regular interactions (Tsui and O'Reilly 1989; Young and Buchholtz 2002). The same kind of professional background, similar experiences, and common interests or experiences can be regarded as a manifestation of relational similarity (Preston and Karahanna 2004).

1.3.4 Other Key Concepts

In this study, the **Chief Information Officer** (CIO) refers to the most senior person in an enterprise responsible for the information technology and computer systems (Preston et al. 2006). He or she does not necessarily need to report the CEO and thus, be a part of the top management team.

The **top management team** (TMT) is defined as a group consisting of the CEO and those senior executives who report directly the CEO (Finkelstein 1992; Preston et al. 2006).

An **IT steering group**, also called an IT steering committee, is a team of high-level representatives from multiple divisions or functions formally appointed to the group. Typically, it sets a strategic direction for IT, match corporate concerns with technological potential, and build commitment to policies (Karimi et al. 2000).

1.4 Research Questions

As evidenced by earlier research (e.g. Reich and Benbasat 1996; Ward and Peppard 1996; Teo and King 1997a; Rathnam et al. 2004; Lahdelma and Dahlberg 2006), perceptions about strategic alignment between IT and business vary in organizations. Differing perceptions can lead to ineffective use of IT, poor compromises in prioritizing IT investments, and wasting potential competitive advantage that IT could provide (Davern and Kauffman 2000; Cohen and Toleman 2006; Ray et al. 2007). Therefore, the main research question is as follows:

RQ: **What explains the (dis-)similarity in the perceptions of the strategic IT-business alignment within an organization?**

As the strategic IT-business alignment can be regarded as the responsibility of the top management (Ross and Weill 2002; ITGI 2005), their perceptions about the alignment are deemed of greatest interest. However, the perceptions at the lower levels of the organization are also important: even though strategy is developed at executive level, it is essentially implemented at lower organizational levels (Chan and Huff 1992; Davies 1993; Campbell et al. 2005).

The main emphasis in this study is on the less studied social dimension of the alignment, *the state in which business and IT representatives within an organization understand and view the strategic dimension of IT-business alignment similarly*. Earlier research has larger ignored the relationships between organizational networks and the perceptions of strategic IT-business alignment within an organization. Hence, the focus of this study is on building perceptual congruence on strategic IT-business alignment, and particularly on the enabling structures.

The main research question can be further divided in two sub-questions. Intra-organizational networks and structures are central for knowledge sharing within a company. Furthermore, both the emerging interaction patterns and the pre-defined, formal structures are expected to have an important role for perceptions of strategic IT-business alignment. According, two sub-questions can be formulated as follows:

RQ1: *Do intra-organizational interaction patterns have an effect on the perceptions of strategic IT-business alignment?*

RQ2: *Do formal intra-organizational structures have an effect on the perceptions of strategic IT-business alignment?*

The research framework of this study, which is introduced in Chapter 5, builds on the multi-dimensional view on strategic IT-business alignment (Chan and Reich 2007b). In the empirical context of this study, the focus is on the social dimension but the strategic or intellectual (Reich and Benbasat 2000) dimension is assessed as well. The strategic dimension is seen as *the state in which a high-quality set of inter-related, intended and realized IT and business plans exist*. The concept of perceived strategic IT-business alignment is divided into two sub-concepts: first, how well the business and IT plans reflect each other and secondly, how well the IT systems support the value disciplines that an organization prefers.

While intra-organizational networks and other structures are expected to be salient factors contributing to the (dis-)similarity in the perceptions of strategic IT-business alignment, also the perceived level of shared domain

knowledge within the organization and individuals' perceptions of their own IT competence may explain the perceptions of strategic IT-business alignment (e.g. Reich and Benbasat 2000). The similarity in these or in other personal characteristics, such as education or work-related experiences (e.g. Tsui and O'Reilly 1989; Preston et al. 2006), could offer reasons for the similar perceptions of IT-business alignment. Therefore, a further aim of this study is to examine the relationships between all of the abovementioned factors and perceptions of IT-business alignment as a cause of the perceptual congruence.

In addition to focusing on structural factors and personal characteristics, also the temporal factor is of great interest. A person often finds it easier to remember recent events or occurrences better than those occurred longer ago, and thus, the perceptions of more recent events are easily available. A tendency to make judgments or decisions by the ease with which relevant instances come to mind, also called **availability heuristics**, can lead to cognitive bias, and thus, distort the perceptions towards recent experiences. This kind of behavioral outcome is known as the ***recency effect*** (Tversky and Kahneman 1974). In the context of this study, it is also possible that recent experiences of IT-related decisions follow the same pattern as before, and thus, influence the perceptions of organizational-level issues. Therefore, I have also set an objective to study the relationship between a recency effect and perception of IT-business alignment as an alternative explanation.

In order to better understand the perceptions and their similarity, the research question, the two sub-questions and other research objectives are examined at three different analysis levels: company-level, tie-level (focusing on pairs of individuals), and individual-level. At the company-level, the focus is on whether there is perceptual congruence on strategic IT-business alignment within the company. Tie-level analysis is used in examining the relationships, while individual-level analysis concentrates on the attributes of an individual.

1.5 Methodology

In this research, I lean to some extent towards the paradigm of critical realism, which is described in Chapter 5.2. My orientation towards critical realism is shown in the discussion on the role of the researcher in Chapter 9.4. As critical realism does not prevent to use quantitative methods as the methodology, the primary methodology in this study is to use quantitative

methods designed for social network analysis in one empirical research setting.

The applicability of social network analysis has been recognized for IT management studies (Wasko and Faraj 2005; Cucchi and Fuhrer 2007; Cross, Dowling, et al. 2010; Cross, Gray, et al. 2010) but prior to this study, it has not been used in the context of strategic IT-business alignment: this study is the first to approach the social dimension of strategic IT-business alignment through social network analysis.

This study is conducted in one empirical research site, which is justified for at least two reasons. First, data needs to be collected from all network members (Ibarra and Andrews 1993), because the social network studies are especially sensitive for missing data (Knoke and Yang 2008). This excludes the use of surveys, in form of collecting mainly quantitative data from a (random) sample of the population. Secondly, the boundaries of the network must be defined in advance even if the names of the respondents are not yet known (Scott 2000), because all methods of social network analysis must be applied to a finite set of enumerable actors (Wasserman and Faust 1994). A thorough understanding about the context of the network helps in this task.

The aim was to reach a large number of individuals within an organization. As data collection had to be carried out in a limited timeframe set by the research site, a questionnaire was selected as a tool for data collection. Hence, the data is mainly quantitative in nature.

The empirical data was analyzed with quantitative methods designed for social network analysis. It is important to take into account that the data is non-random, and observations may depend on each other. Therefore traditional statistical analyses are not applicable as such (Hanneman and Riddle 2005). In social network analysis, there are alternative numerical approaches to estimate standard errors for network statistics. For example, permutation approaches create sampling distributions based on thousands of random trials. The chosen software tool, UCINET 6.0 (Borgatti et al. 2002), provides parameter-free, permutation-based statistical tests to assess the statistical significance of relationships within the data set.

In this study, the focus is on the similarity in perceptions of strategic IT-business alignment within an organization. As stated in the previous sub-chapter, I have three different levels of examination with one focusing on company-level data, one on tie-level data, and one on individual-level data. Thus, the data analysis methods differ from each other depending on the

level. In company-level analysis, the unit of analysis is an organization, and hence, the focus is on the network as a whole. To analyze the relationship between the company-level perceptual congruence and intra-organizational interaction patterns, the coefficients of variation for perceived strategic IT-business alignment and the density of different networks are calculated. In addition, the company is divided into smaller sub-units (e.g. the top management team vs. others, IT representatives vs. others) and the differences between them are examined by **t-test** analyses.

In tie-level analysis, the analysis can be carried out either with the ***dyadic units of analysis*** or with ***a mix of the dyadic and monadic units of analysis*** (Wasserman and Faust 1994). In this study, I have mixed dyadic-monadic hypotheses, in which the network structure is suggested to influence the perceptions of the actors. This phenomenon is known as ***autocorrelation***. It can be a sign of homophily, where people who see themselves as similar are more likely to form a social connection, or it can also be a sign of diffusion or contagion, where the views and attitudes spread through the social connections. Both **Moran's *I*** (Moran 1950) and **Geary's *C*** (Geary 1954) statistics are used to analyze whether there is autocorrelation.

At the individual-level of analysis, the focus is on an individual's personal attributes. In social network analysis, attribute data relate to the attitudes, opinions, and behavior of actors, as they can be regarded as the properties, qualities, or characteristics that belong to them (Scott 2000). Similarly, in this study, the perceptions of an individual can be considered to be attributes. The appropriate analysis methods for attribute data are those of variable analysis. Permutation-based, nodal-level tests for detecting significant differences in the means of two or more groups can be used. For instance, UCINET provides a two-group **t-test** and an **ANOVA** for several groups. Another analysis method for the individual level is a **regression model**, where the relationship between a single dependent variable and one or more independent variables is analyzed. In order to include the adjacency in a network, that is the effects of the neighbors, into a regression model, use of a ***spatial-effects model*** (Anselin 1999; Getis and Aldstadt 2002) or ***network-effect model*** (Ibarra and Andrews 1993) is called for.

1.6 Scope and Delimitations

The scope of this dissertation is limited to intra-organizational networks and structures within one organization. According to Tsai and Ghoshal (1998), a study involving a single site reduces the opportunity for generalized findings. However, network analysis studies are usually single-site studies (e.g. Krackhardt 1990; Ibarra 1993; Cucchi and Fuhrer 2007), where pre-defined network boundaries outline the borderline of the research site, too. The generalizability of the findings is enhanced by designing the research so that it can be easily repeated in similar contexts.

The empirical research site was chosen based on pre-defined criteria that the organization had to meet. The first criterion is that IT should be in a focal role in business processes. This is fundamental from the research problem's point of view. Secondly, the IT function of the selected organization should be either a centralized or federal (hybrid). In these kinds of organizations, the need for collaboration between IT department and other business units or departments is greater than in organizations with fully decentralized IT function (Brown 1999).

The questions on trust and power have been delimited for purposes of scope, even though their importance in communication and knowledge sharing is acknowledged (e.g. Lee and Choi 2003; Levin and Cross 2004; Blomqvist and Levy 2006; Yang and Farn 2009; Lin and Huang 2010). Trust and power are present only implicitly in this study as built in the communication behavior and the development of different social networks.

1.7 Main contributions

The key findings of this study have multifold implications for future IT-business alignment research.

In the literature review part of this thesis, I have examined the concept of strategy, which is an elementary building block for strategic IT-business alignment, and found it to be prone to several different interpretations. A switch in the mindset from prescriptive schools to descriptive can direct the research stream into new understanding of alignment. The conclusion from the literature review is that researchers conducting studies on strategic IT-business alignment should explicitly express their definitions for strategy. The results should be discussed with respect to the theoretically choices over the concept of strategy.

Secondly, this study contributes by further developing the definition for the social dimension of strategic IT-business alignment to refer to the state in which business and IT representatives within an organization understand and view the strategic dimension of IT-business alignment similarly. Furthermore, the definition for strategic dimensions of IT-business alignment is developed further to refer to the state in which a high-quality set of inter-related, intended and realized IT and business plans exist. The modifications made in the definitions if compared to for instance those of Reich and Benbasat (2000) are small but significant as they can direct the research into new areas, such as formation and development of shared cognitions.

Thirdly, the modified definitions of these two key concepts in this study also resulted in adjustments in measurement. Perceived strategic IT-business alignment was measured by combining the instruments of Kearns and Lederer (2000) and Tallon (2007). Furthermore, a construct of perceptual congruence, which reflects the social dimension of strategic IT-business alignment, was measured with a coefficient of variation of perceived strategic IT-business alignment.

Moreover, the study contributes by enhancing the IT-business alignment research by incorporating the key concepts of social network theory to it. A key principle of social network theory to focus on relationships was added to strategic IT-business alignment research. The concepts taken from social network theory are adjacencies in different socially constructed networks, such as a network consisting of work-related interaction patterns or a friendship network. Thus, this study has shown that in addition to traditionally used monadic units of analysis, where the focus is on the attributes of single actors, also the dyadic units of analysis, where the focus is on a relationship between two actors, can be used in research on strategic IT-business alignment.

Finally, the empirical findings of the study contribute by identifying factors having an effect on the (dis-)similarity in the perceptions regarding strategic IT-business alignment in a relatively stable company with functional organization structure. While the functional department structure was confirmed to be an important factor in affecting the perceptions of strategic IT-alignment, adjacency in other work-related networks was also found to have an impact on the similarity in the perceptions of strategic IT-business alignment. In addition, similar views regarding a recent IT-related decision offered also an explanation for similar views regarding the overall alignment level in the company. This

study opens up a question on how the experiences from the development and use of IT and the interaction patterns and structures influence each other. In contrast to the factors having an effect on the similarity in perceptions on IT-business alignment, friendship between two individuals did not appear to contribute it. Respectively, whether two individuals belong to the same cross-functional formal group or not, it appeared to have no major impact on the similarity of their perceptions on IT-business alignment if the working culture in these groups is passive and people tend to work in silos.

In summary, the findings of the study extend our understanding and knowledge on how the views regarding strategic IT-business alignment take shape within organizations.

1.8 Study Outline

This dissertation is organized in the following ten chapters. The first chapter is an introduction, which provides a description of the background, the purpose of this study, and the research problem addressed in the study. It also summarizes the main contributions.

In the second chapter, the concept of shared knowledge is discussed because of the interest to study the similarities in individuals' perceptions of strategic alignment between IT and business. Definitions for shared knowledge and similar perceptions are provided.

In the third chapter, the focus is on knowledge sharing structures and social network analysis. As both formal and informal structures are used in exchanging information and knowledge, both are discussed. Because the methodology is social network analysis, this chapter also introduces how to map and represent relational structures.

The fourth chapter is about the concepts of strategy and strategic IT-business alignment. In particular, the emphasis is on how the concepts of knowledge sharing and the similarity in views appear in prior research on strategic IT-business alignment. This chapter also addresses how prior literature has defined and measured strategic IT-business alignment.

In the fifth chapter, the research framework to approach the research problem is presented. The boundaries for this study, the philosophical foundations, and the research approach are discussed. This chapter provides also the arguments for the research strategy, the formulation of

the hypotheses, and the operationalization of the constructs using the prior literature.

The sixth chapter relates to the research site. This chapter contains not only the description of the company, but also how data collection was carried out. The respondents are also described in this chapter.

The seventh chapter presents an overview of the data and minor revisions on the operationalization of the constructs.

The eighth chapter contains the data analysis principles and methods used in the study. It also includes the results from testing the hypotheses.

In the ninth chapter, the key findings are discussed. The reliability, validity, and limitations of this research are considered. In addition, the role of the researcher is discussed.

Finally, the tenth chapter concludes by presenting both theoretical and practical contributions as well as opening new research avenues for the future.

2 Similar Perceptions and Shared Knowledge

As this research is about the similarity or dissimilarity in perceptions about strategic IT-business alignment within an organization, similar perceptions and shared knowledge are discussed first in order to give them proper definitions. Here, a perception refers to a view or an opinion, not to a visual observation or a sensation. Therefore, both perceptions and knowledge can be regarded as the outcomes of cognitive processes, even though there are some differences in meanings. The significance of these differences depends on the philosophical foundations, later discussed in context of whether knowledge is subjective or objective.

2.1 Concept of Knowledge

In order to define shared knowledge, the concept of knowledge needs to be discussed. Prior literature approaches this concept from many different aspects. One aspect is about whether knowledge is passive or active in nature. Another concentrates in who holds the knowledge. A third focuses on whether knowledge can be articulated or not. Finally, one of the aspects is whether knowledge is subjective or objective.

2.1.1 Knowledge and Knowing

Even though knowledge and knowing relate conceptually, they have nuances in meaning. For instance, knowledge is often thought to be static, more like a stock or a storage, whereas knowing is considered to be dynamic work where knowledge is put in action and has effects on the actor and the environment (Cook and Brown 1999; Orlikowski 2002).

Even though, knowledge, as such, does not get things done in organizations, it is a necessity for it. Only the active use of knowledge, i.e. knowing, can create a competitive advantage (Nahapiet and Ghoshal 1998;

Cook and Brown 1999). These two concepts are actually intertwined so closely that it is not necessary to separate them for this study.

2.1.2 Individual and Collective Knowledge

The basic assumption for the theory of organizational knowledge creation (Nonaka 1994; Nonaka and Takeuchi 1995) and the knowledge-based theory of a firm (Kogut and Zander 1992; Grant 1996b) is that individuals hold knowledge. However, knowledge is socially constructed within the community where an individual belongs (Kogut and Zander 1992). Thus, knowledge communities or networks have an impact on individuals' knowledge. When individuals encounter and exchange knowledge, they simultaneously create new knowledge, or reconfigure their previous knowledge.

In an organizational context, a firm is a body or a community where individuals create, exchange and apply knowledge through the social ties and structures of a firm (Grant 1996b). In a firm, knowledge rests in the organizing of human resources, in other words, knowledge is embedded in the organizing principles by which people cooperate in organizations (Kogut and Zander 1992).

Tsoukas and Vladimirou (2001) define knowledge as the individual capability to draw distinctions, within a domain of action, based on an appreciation of context or theory, or both. They define organizational knowledge as the capability that members of an organization have developed to draw distinctions in the process of carrying out their work, in particular concrete contexts, by enacting the sets of generalizations whose application depends on historically evolved collective understandings.

I follow the ideas that individuals hold knowledge, but acknowledge the role of a firm as a body for the organization-specific, unique collection of individuals' knowledge, which as a collective can bring competitive advantage for a company.

2.1.3 Explicit and Tacit Knowledge

Polanyi's idea (1966) that individuals' knowledge can be either explicit or tacit has spread widely (e.g. Nonaka 1994; Grant 1996b; Spender 1996). Explicit knowledge can be characterized as codified knowledge that is transmittable in formal, systematic language. In contrast, tacit knowledge is not expressed in language but is revealed through its application. Therefore, sharing tacit knowledge is time consuming, costly, and uncertain (Kogut

and Zander 1992; Spender 1996). It is much more difficult to share or transfer tacit knowledge than explicit knowledge. Quite often, it requires personal, face-to-face interaction for a longer period.

There has been a discussion on whether tacit and explicit knowledge represent two separate forms of knowledge (Nonaka and Takeuchi 1995); if they are two opposite ends of a continuum (Kogut and Zander 1992), or whether they represent the inseparable dimensions of all knowledge (Tsoukas 1996). However, one can study both components, tacit and explicit, without committing to one of these viewpoints – especially if the focus is not specifically on the type of knowledge but on knowledge in general (Bassellier et al. 2001). I take this stance in my research.

2.1.4 Subjective and Objective Knowledge

If one assumes individuals to hold knowledge, is knowledge always subjective by nature? In positivist research, there are strong ontological assumptions about the existence of the true world (e.g. Burrell and Morgan 1979; Lincoln and Guba 2000; Chen and Hirschheim 2004). Positivists are convinced that it is possible to catch an objective view of this true world, and therefore, knowledge can be objective – even if an individual holds it. In the positivist research stream, knowledge is often defined as true justified belief (e.g. Nonaka and Takeuchi 1995; Sveiby 2001). This definition originates from Plato, according to whom we can claim knowing something if it is true, we actually believe it, and there is sufficient evidence for it.

However, the assumptions about the existence of the true world do not necessarily require knowledge to be objective but the epistemological stances can also represent subjective views (Weber 2004; Becker and Niehaves 2006; Niehaves and Becker 2006). Here, the epistemological stance is interpretivism or constructivism, according to which the subject determines the relationship of cognition and the object of cognition.

Not everyone accepts the assumptions regarding the existence of the true world. Most of those with interpretivism or constructivism as an epistemological stance also rest on the same ontological stance (Iivari et al. 1998). They think that there is no such thing as a real, independent world but the world is a construct depending on human consciousness (Burrell and Morgan 1979; Iivari et al. 1998). Naturally, there are intermediate forms between the positivist and interpretivist ideologies. For instance, a critical realist wants to make an ontological difference between the natural

or materially real world and the social world (Fleetwood 2005). In the latter, the objects of investigation do not exist independently of our knowledge of those objects (Bhaskar 1979; Kanellis et al. 1999; Mingers 2004).

Perceptions can refer either to pure sense-driven observation or to views and opinions. When a perception is regarded as a view, it links closely with the concept of knowledge. However, if a perception is defined only as a pure sense-driven observation, it cannot be treated as knowledge. For example, illusions and sensory mistakes can distort observations. To regard an observation as a representation of the truth or not, we have to consider carefully and critically if the evidence is not only sufficient but also reliable. This judgment distinguishes a view from a pure observation. In this study, perceptions refer to views, not to sense-driven observations. Even though individuals are constrained by their subjective experiences, assumptions, and beliefs, the views usually represent the truth to their holders until they are proven false. Accordingly, perceptions and knowledge are close concepts in this study.

2.2 Shared Knowledge

The Chapter 2.1.2 debated whether knowledge is individual or collective. As I took the stance that individuals hold knowledge (Kogut and Zander 1992; Nonaka 1994; Nonaka and Takeuchi 1995; Grant 1996b), the concept of shared knowledge refers to the similar views of individuals.

Perceptual congruence can be defined as "*the degree to which individuals view matters similarly*" (Huisman and Iivari 2006, p. 30). Perceptual congruence has been found to have a positive effect on an organization in general (Schnake et al. 1990), as perceptual congruence reduces uncertainty and ambiguity between individuals (Wexley and Pulakos 1983). Therefore, perceptual congruence can be regarded as a desired state in organizations.

In the literature, there are actually several concepts referring to perceptual congruence. One might find a concept of the shared **mental models** (Mathieu et al. 2000; Mohammed and Dumville 2001; Osborne et al. 2001), or of the shared **frames of reference** (Orlikowski and Gash 1994; Davidson 2002; Gugerty and Brooks 2004; Eskerod and Riis 2009). Even the studies about achieving **a consensus** are, more or less, about perceptual congruence (e.g. Kappos and Rivard 2008).

The significance of shared knowledge is justified for instance by Grant (1996b), whose theory of **knowledge-based view of a firm** is an outgrowth of the resource-based view of a firm (Barney 1991; Peteraf 1993). According to the resource-based view of a firm, valuable firm resources are usually scarce, imperfectly imitable, lacking in direct substitutes, and thus, enable a firm to achieve and sustain competitive advantage. The knowledge-based view of a firm regards knowledge as the most strategically important of the firm's resources. The importance of possessing physical resources has diminished, as far more important is to know where and how to acquire them when needed.

The **theory on social capital** proposes that networks of relationships build a valuable resource for conducting social affairs (Nahapiet and Ghoshal 1998). The relationships provide access to other valuable resources needed for a competitive advantage. These relationship structures are difficult to be imitated or transferred, and thus, the theory of social capital can be regarded as closely related to the knowledge-based view of a firm. Shared knowledge and networks of relationships, through which there is an access to create new knowledge, can also be called collectively-owned capital (Nahapiet and Ghoshal 1998). The connection structures contribute the value creation (Balkundi and Kilduff 2005).

Another term sometimes used for shared knowledge in an organization is intellectual capital, which refers to the knowledge and knowing capability of an organization (Nahapiet and Ghoshal 1998; Reich and Kaarst-Brown 2003). Intellectual capital emphasizes the capability for action based on knowledge and knowing.

Several studies have managed to show a positive impact of shared knowledge on business performance (e.g. Boynton et al. 1994; Nelson and Cooprider 1996; Ranganathan and Sethi 2002). In these studies, shared knowledge has referred to **shared domain knowledge**, which can be defined as "*the ability of different (sub-)groups from different domains to understand and respect each other's contribution and challenges, and even to participate in each other's processes, contribution, and challenges*" (Reich and Benbasat 2000, p. 86). This positive impact has increased the interest to understand better, how shared knowledge is created and maintained.

As shown, there are a plenty of concepts referring to shared knowledge. Due to this study's definitions for the concept of knowledge, shared

knowledge is defined as perceptual congruence. This also fits well with this study's methodological choices, which are presented in Chapter 5.3.

In general, perceptual congruence is regarded as beneficial. The consensus was found to relate with increased performance (Bourgeois 1980), whereas conflicts have found to reduce productivity and overall satisfaction (Gladstein 1984). In the context of organizations, cognitive conflicts usually refer to task-oriented differences in judgment among group members (Forbes and Milliken 1999). They are disagreements about the content of the tasks being performed, including differences in viewpoints, ideas, and opinions (Priem and Price 1991; Jehn 1995). According to Hatfield and Huseman (1982), cognitive conflict can be described as semantic-information distance, semantic barriers, cognitive dissimilarity, or perceptual incongruence. It can be regarded as the evidence of communication problems. However, a conflict can also be useful (Bourgeois 1985; Eisenhardt and Schoonhoven 1990). It depends on the type of conflict and the structure of the group in terms of task type, task interdependence, and group norms (Jehn 1995). For instance, when addressing groups performing non-routine tasks, disagreements sometimes turned out to be advantageous by improving the quality of the decisions.

2.3 Summary of the Chapter

In this chapter, the concepts of shared knowledge and knowledge sharing have been discussed because of the interest to study similarities in individuals' perceptions of strategic alignment between IT and business. In this study, one of the assumptions is that individuals hold knowledge (Kogut and Zander 1992; Nonaka 1994; Nonaka and Takeuchi 1995; Grant 1996b). Even though individuals are constrained by their subjective experiences, assumptions, and beliefs, knowledge represents the truth to its holder until it is proven false. The concepts of knowledge and knowing are not separated in this study because they are intertwined very closely. I do not commit to either tacit or explicit components of knowledge but my focus is on knowledge in general.

In this study, a **perception** refers to a view, not to a purely sense-driven observation. Accordingly, perceptions and knowledge are close concepts in this study. Therefore, shared knowledge can be defined as **perceptual congruence**, which refers to "*the degree to which individuals view matters similarly*" (Huisman and Iivari 2006, p. 30).

3 Social Network Analysis for Studying Interaction Patterns and Structures

As in this study, shared knowledge and perceptual congruence are close concepts and treated almost as synonyms, this chapter starts with defining knowledge sharing and identifying the issues related to it. This is followed by a review on which kinds of interaction patterns and structures can be found within an organization. Finally, the key notions of social network analysis in order to map and study interaction structures are presented.

3.1 Knowledge Sharing

Knowledge sharing is a process of creating a common stock of knowledge among individuals (Kogut and Zander 1992). Knowledge sharing can be considered an essential part of knowledge integration, which can be regarded as a capacity to renew an organization's competencies in order to meet the changing business environment (Grant 1996a). Knowledge sharing is realized through both direct and indirect interactions. When these interactions are recurrent, they form interaction patterns, which, in turn, are a part of structures for knowledge sharing. Usually, knowledge sharing involves communication, which can strengthen the unique knowledge of a community and improves its ability to take the knowledge of other communities into account (Boland and Tenkasi 1995).

Sometimes knowledge sharing has been called knowledge transfer (Tsai 2001) or knowledge exchange (Thomas-Hunt et al. 2003). However, knowledge sharing is a more expressive and broader concept than is pure knowledge transfer. In knowledge transfer, the source of knowledge simply passes knowledge to a recipient but the aspect of collaboration is missing. Knowledge sharing involves knowledge transfer but also a creation of the common knowledge base, which can consist of language, other forms of symbolic communication, the commonality of specialized knowledge,

shared meaning, and recognition of individual knowledge domains (Grant 1996b). This last type knowledge is knowledge about who knows what. It can be regarded as collective mind (Weick and Roberts 1993) or a transactive memory system (Wegner et al. 1991). When individuals interrelate and exchange knowledge, a common knowledge base between them facilitates their interaction.

Knowledge sharing can meet several challenges. According to Szulanski (1996), the knowledge itself may be context-specific, complex, or tacit in nature. The source of knowledge might lack motivation or he or she is not perceived as reliable. The recipient of knowledge may also lack motivation being reluctant to receive information, does not have adequate absorptive capacity, or suffers from lack of retentive capacity. There might be causal ambiguity in the knowledge sharing process, or there might be difficult relationships, complicated organizational structures, or other problematical factors for the knowledge transfer (von Hippel 1994).

3.2 Intra-organizational Interaction Patterns and Structures

Knowledge sharing takes place in human interactions, which can be either direct (face-to-face interactions) or indirect (using artifacts or human mediators). Structures for interaction among team members for sharing their perspectives and development of shared understanding are also called **systems of knowing** (Armstrong and Sambamurthy 1999), which can be either formal structural arrangements or social systems of knowing referring to the frequency of informal interactions, communication, and socializing (Preston et al. 2006).

Within an organization, an individual is attached to several groups or clusters. Some are more formal and explicitly defined (organizational units, departments, committees, clubs, reporting relationships, etc.) whereas others are informal and their existence emerges from more latent and obscure factors (e.g. a friendship network, or a group of people connected to each other because of their daily interactions). These groups form intra-organizational knowledge sharing structures.

Rank (2008) defines the *formal* structure of an organization as "*a network comprising all the various cooperative ties between organizational positions that have been intentionally created to safeguard economic processes*" (p. 147). In identifying the formal structure, assignments, tasks, and responsibilities have a key role. In contrast, *informal* ties are defined as "*voluntary cooperative relationships between*

organizational actors" (Rank 2008, p. 147). Selznick (1948) suggests that the actual patterns, which form an intra-organizational network, are a result of formal arrangements and of the employees' own actions.

Social network theory utilizes methods that specifically allow the investigation of the relational aspects of social structures. It has long been recognized (e.g. Reif et al. 1973), that leaving either informal or formal aspect out of scope would be a mistake when trying to improve organizations. By mapping the relationships or interactions between individual actors within a network, we can uncover not only the formal structures but also the emergent and informal patterns present in an organization. In this study, a pattern refers to recurrent interaction between individuals. Even though possible motives, formats, and rules governing the communication are often considered to be focal in the formation of interaction pattern (Barley and Tolbert 1997; Gunawardena et al. 1997), they are out of scope in this study.

Social network theory distinguishes between the *instrumental* network links and *expressive* network relations (Ibarra and Andrews 1993). Expressive ties usually link people who are similar on a variety of personal characteristics, and these ties tend to be strong. Contrasting this, instrumental connections, which arise in the course of work-related performance, are usually weaker and they tie together people who differ in personal characteristics. However, expressive links are affected by adjacency, and therefore, dense friendship networks can develop within organizational subunits or departments. Because expressive links carry greater potential for influencing opinions, they are often of more interest than instrumental links.

People interact with each other in different kinds of networks, which can be combinations of instrumental and expressive network relations. **An advice network** refers to relationships based on giving and asking for advice about work-related problems (Krackhardt 1990; Ibarra and Andrews 1993; Yang and Tang 2004), whereas **a discussion network** refers to relationships based on discussing what is going on in the company for information and knowledge sharing, and testing the ideas (Ibarra 1993). **A friendship network** refers to informal relationships where both parties consider each other as a friend (Krackhardt 1990; Ibarra and Andrews 1993).

As the patterns of interaction enable people to meet the attitudes and behaviors of other individuals within the organization, these recurrent

relationships may assist in explaining the development of certain attitudes toward organizational or job-related matters (Ibarra and Andrews 1993; Burkhardt 1994; Meyer 1994). This phenomenon can be regarded as **diffusion** or even contagion. On the other hand, the attitudes or other individual attributes might have an influence on the relationship development. For instance, interest in the same things can bring people together (McPherson et al. 2001). This phenomenon is called **homophily**. In summary, it is possible that either people's attributes can influence in relationship development (i.e. homophily) or the relationships can influence attribute development (i.e. diffusion).

Hence, the main characteristics of social network theory are to look for the linkages and gaps in social systems, to find reasons why these linkages and gaps are created, and to discover what the consequences of these linkages and gaps are. The main emphasis is on the ties between actors rather than on the attributes of actors (Tichy et al. 1979; Wasserman and Faust 1994; Scott 2000). Human behavior is seen as embedded in networks (Granovetter 1985).

3.3 Network boundaries

The natural **boundaries** of a network may exist, but the determination of boundaries in a research project is the outcome of a theoretically informed decision about what is significant in the situation under investigation.

The **positional approach** is taken when the researcher samples from among the occupants of particular formally defined positions or group memberships (Tichy et al. 1979; Knoke and Yang 2008). This approach requires some kind of enumerated list that covers the whole of the target population. In the **reputational approach**, no comprehensive listing is available (Tichy et al. 1979; Knoke and Yang 2008). The so-called **snowballing technique** is applied when a small number of informants are studied and each is asked to nominate others for study (Scott 2000; Knoke and Yang 2008). In turn, these nominees are interviewed and asked for further nominations. In this technique, the social relation itself is used as a chain of a connection to building the group. A snowball sample is likely to be organized around the connections of the particular individuals who formed its starting point. The method of selection tends to determine many of the relational features of the resulting social network. The researcher must decide how far to continue snowball. The assumption in snowball sampling is that the connected segment of the network that forms the

sample network is representative of all the other segments of the network. Snowballing makes it possible to try to estimate which features of the structure may be an artifact of the sampling method itself and so to control for these in the analysis.

In the reputational approach, network data can be collected using either the *recall* or the *recognition* method. The recall method counts on a respondent's ability to nominate people, with whom they have ties without any assistance. In the recognition method, a respondent can use a roster from where he or she can pick up the names of those with whom they have a relationship. Some researchers (e.g. Ibarra 1993) propose that the reliability of network indices grows when measures are taken to facilitate individuals' capacity to recall and report their network links accurately. The use of rosters assists in recalling all the network links including the weak ties (Granovetter 1973). Others claim that respondents' moods may affect the stability of a network identified with the recognition method (Hlebec and Ferligoj 2002), and therefore, reliability when using the recognition method may decrease. However, one has to keep in mind that in general, sociometric questions focus on the relatively stable patterns of communication in an organization (Zwijze-Koning and de Jong 2005). Regardless of the approach, dominant patterns can be discovered relatively easily.

3.4 Key Notions of Social Network Analysis

Some of the key concepts of this study will utilize the key notions of **social network analysis**. Even though the key concepts and their operationalization are discussed later in Chapter 5, some key techniques for both mapping and representing the relationships are presented here.

In order to get an idea of mapping the relationships, we should first look at the main concepts in the social network analysis. Individuals or other social entities, such as groups, departments, or companies, are called **actors** (Wasserman and Faust 1994). They are the **nodes** of the network. Furthermore, the nodes are linked to one another by social **ties** (Wasserman and Faust 1994). Moreover, social ties are social constructs that are produced based on the definitions of the situation made by group members (Scott 2000; Knoke and Yang 2008). An example of a social tie could be "friendship". **Tie strength** refers to the closeness and interaction frequency of a relationship between two parties (Granovetter 1973; Marsden and Campbell 1984; Hansen 1999). A **bridge** is a connection in a

network, which, if removed, would result in a disconnected structure (Wasserman and Faust 1994, p. 114), which can also be called a **structural hole** (Burt 2001). **Attributes** relate to actors' characteristics, qualities, or properties, including attitudes, opinions, and behaviors (Scott 2000). If the research focus is only on the attributes of an individual or of a group as a whole, the unit of analysis is **monadic**, whereas when the interest is in the attributes of pairs of individuals or groups, the unit of analysis is **dyadic** (Borgatti and Everett 1997).

Two nodes that are connected by a line are said to be adjacent to one another (Scott 2000, p. 67). Adjacency is the graph theoretical expression of the fact that two actors, which are represented by nodes, are directly related or connected with one another. In social network analysis, we operate with **adjacency matrices** (Scott 2000, p. 44). Instead of using matrix representation, one can present adjacency matrices graphically using **sociograms** (Scott 2000, p. 45). Relational data can be either binary or valued. It can also be either undirected or directed. One can also attach attributes to nodes but the emphasis of the analysis is in the relationships, not in the attributes of individual actors.

A **data matrix** is a case-by-affiliation matrix where affiliations are the organizations, events, or activities in which these actors are involved (Scott 2000, p. 38). Data matrices are usually applied in traditional statistical analyses. A data matrix can be transformed into an **adjacency matrix** (Scott 2000, p. 44). Therefore, it can also be illustrated as a sociogram.

The more connections a network node has, the more central it is. The number of connections of a node is called **a degree** of a node (Wasserman and Faust 1994, p. 100), and thus, a node is locally central if it has a high degree. A high degree refers to a big neighborhood, i.e. nodes to which a particular node is adjacent. One can make a distinction between connections based on its direction: **indegree** is the total number of other nodes that have lines directed towards the node, and **outdegree** is the total number of other nodes to which the node directs lines (Wasserman and Faust 1994, p. 125-126). Some have criticized degree centrality because it does not acknowledge indirect ties to all others in a network but only concentrates on immediate neighbors (Freeman 1979). An actor can have a high degree but is central only in a local neighborhood and rather disconnected from the network as a whole. Hence, the degree can be regarded as a measure of local centrality. Relative local centrality is the actual number of connections in relation to the maximum number a node

could sustain. Other measures for local centrality are, for instance, closeness and betweenness.

However, if we examine the network more broadly and concentrate in global centrality, we have to study not only the neighboring nodes but also the position of a particular node in relation to all the other nodes. To calculate the global centrality, we measure the lengths of a path to all the other nodes in the network. A length of a path is the minimum number of connections needed to reach another node. Network centrality can be regarded as a source of power (Astley and Sachdeva 1984). Central individuals can be actors who integrate otherwise disconnected resources. In this way, they can also strengthen their own position by creating dependencies through this resource exchange. Peripheral nodes are the nodes with the lowest centrality. Actors who have more ties to other actors may be in better positions than are others. They are in central positions by having access to various resources. They can act as brokers for others, which gives them more power compared with others.

If we want to focus on a particular node, we call it an **ego** (Wasserman and Faust 1994, p. 42). Those who have ties to an ego are called **alters**. Rather than the whole network, we can study **an ego-centric network** with the same measurement indices (Wasserman and Faust 1994).

Network centrality is a property of a node. Sometimes we want to examine the properties of the network as a whole. In that case, instead of centrality values, we calculate the density or the centralization of a network. **Density** is the number of connections in a network expressed as a proportion of the maximum possible number of connections (Wasserman and Faust 1994, p. 101). It describes the general level of cohesion. In a dense network, **the mean value of degree** is high and variance is low, whereas in a scarce network the mean value is lower. If a network is dense, information is assumed to diffuse quickly within a network. **Centralization** describes the extent to which this cohesion is organized around particular focal nodes (Scott 2000, p. 90).

Human interactions, which enable knowledge sharing, can be represented as a network of ties and nodes. The network structure and the properties of the relationships, in particular tie strength, can give us valuable insight to the mechanisms of knowledge sharing. Many studies have shown that **strong ties** are usually easily accessible, willing to be helpful (Krackhardt 1992), and important channels of useful knowledge (Szulanski 1996; Uzzi 1997; Hansen 1999), thereby facilitating knowledge integration (Tiwana

2008). In creating collective knowledge, a dense network with strong ties is the most appropriate (Coleman 1988). One reason for knowledge exchange flourishing in strong ties is trust and perceived trustworthiness between a pair of individuals (Tsai and Ghoshal 1998; Levin and Cross 2004).

However, in a search for new information, **structural holes** (Burt 1980) and weak ties (Granovetter 1973) have been found to be efficient. A network with non-redundant ties is more efficient than a network with strong but redundant connections. In scarce networks, the role of bridging ties is significant. A bridging tie is that which spans a structural hole. In other words, a bridging tie that connects actors separated by structural holes enables an access to new information (Burt 1980; McEvily and Zaheer 1999; Burt 2000). If a bridge does not succeed in knowledge sharing, the knowledge provided by the initial source will not diffuse to the rest of the network. Successful knowledge sharing through bridging ties is more likely, if the bridging ties favor spreading the views on the subject, the recipients consider them trustworthy, and the recipients are capable of absorbing new views.

If a bridging tie is strong, it should efficiently span the gaps between organizational cliques, but simultaneously it facilitates a creation of new direct ties between those who are first connected only via a bridge. Thus, a network not only attains more cohesion but also more inefficiency due to the growing redundancy. The **strength of weak ties** is in connecting two cliques but not turning it to a set of redundant ties (Granovetter 1973; Granovetter 1983; Levin and Cross 2004).

3.5 Summary of the Chapter

The concept of the similar perceptions directed this study to the theories focusing on building shared knowledge. As the interaction patterns and structures used in information and knowledge exchange were present strongly in the theories about knowledge sharing, this study concentrates particularly on them and utilizes social network theory as a theoretical foundation. In addition, the central concepts of social network theory have also been presented in this chapter.

4 Strategic IT-Business Alignment

This chapter concentrates in the prior research on strategic IT-business alignment. As the focus of this study is in whether there are similar perceptions of strategic IT-business alignment within an organization, the lens for the literature review filter is particularly how the concepts of knowledge sharing and similarity in the views appear in the prior research on strategic alignment between IT and business.

This chapter is organized as follows. First, the concept of strategy is discussed as it is in a salient position in the concept of strategic IT-business alignment. The concepts of business strategy, IT-strategy and their relationship in general are presented. Then, this chapter proceeds to the concept of alignment in general and in the context of IT. Thereafter, the earlier studies on strategic IT-business alignment are reviewed by focusing especially on the knowledge sharing and similarity in the views on alignment within an organization. Finally, the chapter concludes by reviewing how the prior research has measured IT-business alignment.

4.1 Strategy

This sub-chapter discusses how ambiguous and nuanced the concept strategy is. Both the most common definitions and different classifications of the schools of thought for strategy are introduced. The different classifications are compared and the standpoint for this study is selected.

4.1.1 Multiple Definitions for Strategy

Strategy is a word commonly used in the English language usually without connections to its military origins. However, the primary definition for strategy according to the Oxford English Dictionary (accessed in 2011) has a strong military emphasis: "*The art of a commander-in-chief or the art of projecting and directing the larger military movements and operations of a campaign*". The secondary definition is more business oriented: "*In (theoretical) circumstances of competition or conflict, as in the theory of*

games, decision theory, business administration, etc., a plan for successful action based on the rationality and interdependence of the moves of the opposing participants". Importantly, it defines strategy as a plan, which is its most common interpretation.

However, there are a number of competing interpretations for the term 'strategy'. Mintzberg (1987) has recognized five different conceptual definitions for strategy, which he calls **the five Ps for strategy**. These are a plan, a pattern, a position, a perspective, and a ploy. **A plan** refers to a direction, a course of action, or guidelines to address a future situation. It can be called *an intended strategy*. It is often written into strategy documents or strategic plans. Usually, it is an outcome of a strategic planning process, which is regarded as mostly top-down, analytic, and control-oriented. Whereas a plan looks to the future, **a pattern** reflects past behavior and realized action. A pattern – or *a realized strategy* – may be a result of purposeful plans, i.e. *a deliberate strategy*, – or it might have been developed unintentionally as *an emergent strategy*. Sometimes an intended strategy can turn out to be *an unrealized strategy*. Figure 1 visualizes the abovementioned types of strategies. **A position** is a means of locating an organization in relation to its environment. Whereas a position is set by factors outside the firm, **a perspective** is regarded as defined by the collective strategist, who examines the world from inside an organization. In other words, strategy as a perspective is a shared vision, which guides choices that determine the nature and direction of an organization. The fifth P, **a ploy**, is conceptually close to a plan. It is a tactical movement to outfox competitors.

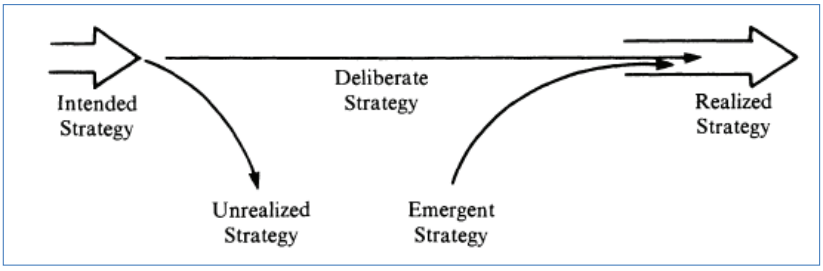

Figure 1. Types of Strategies (Mintzberg 1978)

As Mintzberg himself notes, these five different definitions are interrelated. Although one can consider them competing, they also complement each other. Each definition brings new viewpoints to our understanding about strategy. It is the time perspective that makes the difference between a plan and a pattern. Between a perspective and a

position, it is the angle of view that matters. However, without explicitly defining the term 'strategy' there is a chance to misinterpret its meaning.

In this research, I adopt a wide view for a term of strategy, and hence, I refer to both plans and patterns with it.

As the interest of this study is in strategic alignment between IT and business, I examine later how the strategy has been defined in the previous IT-business alignment literature. The expectation is that the concepts of intended strategies will dominate.

4.1.2 Numerous Schools of Thought for Strategy

Besides the multiple definitions for strategy, there are in fact several schools of thought with respect to strategy (e.g. Mintzberg et al. 1998; Whittington 2001; Johnson et al. 2008; French 2009). Mintzberg et al. (1998) have identified ten different schools of thought, which differ from each other in many ways. Some of the schools can be considered prescriptive, as they focus on how strategies should be formulated. These schools regard strategy as a design (Johnson et al. 2008). They provide guidelines and frameworks for management and business practitioners. Another group of schools of thought can be characterized as descriptive, since they concentrate on how strategies are made in reality. They want to understand why the realized strategies develop. These schools vary in focusing on different viewpoints. The strategy can be seen as an experience, an idea, or a discourse (Johnson et al. 2008). Finally, Mintzberg et al. recognize one school of thought, which they consider a hybrid of the others, and call it the school of configuration.

Next, these different kinds of schools of thought are examined to see what has been emphasized in each of them. Mintzberg et al. recognize at least three different **prescriptive schools of thought**. The ***design school*** considers strategy formation a process of conception. Its roots are in the books of Selznick (1957) and Chandler (1962), as well as in the ideas of Andrews (e.g. in Christensen et al. 1982). The idea is to find a fit between the external environment and internal factors. According to the design school, strategy formulation is a deliberate process of conscious thought, which should be the responsibility of the CEO. Strategy appears as a perspective, being one of a kind, tailored to the individual case. It must be articulated explicitly for implementation. The origins of the SWOT (strengths, weaknesses, opportunities, and threats) analysis are in the design school of thought.

The ***planning school*** regards strategy formation as a formal process. This school is based on the ideas of Ansoff (1965). Strategy is seen as objectives or plans, which can be decomposed into hierarchical sub-plans. If compared with the design school, the strategy formulation process is more formal. It can almost be characterized as mechanical programming. Other premises are quite similar to the design school's premises.

According to the ***positioning school***, strategy formation is an analytical process. The representatives of this school build on the idea that strategies are generic, identifiable positions in the marketplace, which is economic and competitive. In the strategy formation process, analysts help managers to select one of the generic positions, which is followed by the articulation and implementation of the chosen strategy. The representatives of this school of thought build heavily on the ideas of Michael Porter (1985). Porter's (1996) claim is that a position depends on unique activities and trade-offs, which is consistent with the principles of the resource-based view of a firm (Barney 1996). There are several different typologies for the generic strategies, e.g. Porter (1985), Treacy and Wiersema (1995). The typology of Miles and Snow (see Miles et al. 1978) does not have its roots in the resource-based view or dynamic capabilities of a firm but it categorizes firms' behaviors in respect of other actors in the market. Thus, this typology follows the thoughts of the positioning school.

All these schools of thought are prescriptive in nature in respect of strategy formation. They can be considered as representing a classical approach to strategy (Whittington 2001), which regards strategy as a rational, top-down process of deliberate analysis for maximizing the profits of a company. This approach attempts to identify an ideal way to create a strategy and to give textbook answers to practitioners. Organizations are seen as hierarchies, rational systems and mechanisms by which strategy can be put into effect (Johnson et al. 2008).

This mechanistic view on strategy has received critiques for neglecting the dynamic environment wherein a company operates (Farjoun 2002). Both the resource-based view of a firm (Barney 1996) and the theory of competitive strategy (Porter 1985) are accused of not taking into account the function of time, i.e. the dynamics that a time span brings. Later, Porter defended his theory by adding or emphasizing the longitudinal problem as a part of a dynamic process by which competitive positions are created (Porter 1991). Furthermore, Teece et al. (1997) have expanded the resource-

based view into the theory of dynamic capabilities in order to meet this criticism.

The **descriptive schools of thought** concentrate on explaining or understanding how strategies are created in reality. The representatives of these schools focus on understanding why realized strategies do not necessarily match with the plans.

When a strategy formation is considered a visionary process, Mintzberg et al. call this the ***entrepreneurial school of thought***. This school is very similar to the ideas of the design school as emphasizing the role of one visionary leader with unique perspectives but the strategy is seen as an emergent one, not as a planned process (Westley and Mintzberg 1989). The context for this school of thought is simple with centralized organizations where the role of one leader and his or her personality is considerable.

The ***cognitive school of thought*** has at least two representatives: the more positivist representatives consider knowledge as an objective picture of the world (Schwenk 1988), whereas others see a strategy as a subjective interpretation of the world (Hendry 2000; Fu-Lai Yu 2003). However, both representatives of the cognitive school emphasize building the shared meanings of the strategy within an organization.

In the ***learning school of thought***, the emphasis is not on a strategy formulation but on strategy formation, which is regarded as an emergent process. Strategy making is a collective process of learning over time (Thomas et al. 2001). It is about knowledge creation, where an organization builds shared understanding as an outcome of a dynamic, continuous learning process (Collins and Porras 1991; Vera and Crossan 2004).

According to the ***power school of thought***, strategy making is a process of negotiation, where power and politics play a major role. Scarce resources are competed for within an organization by playing political games (Salancik and Pfeffer 1974; Eisenhardt and Zbaracki 1992). Actors build coalitions and other power structures in order to gain as many benefits as possible. Power games take place not only within an organization but also in the external environment. Strategic alliances and partnerships are significant in order to success in the market. Owing to these games, strategy can be seen to be emergent.

In the ***cultural school of thought***, strategy making is understood as a collective process. Organizational culture, referring to the shared beliefs reflected in habits, traditions, stories, and symbols, is a body for

organizational processes. Hence, strategy formation is a deliberate process of social interaction wherein beliefs and shared views play a significant role (Fombrun 1983; Golden 1992; Detert et al. 2000).

If one is to follow the ***environmental school of thought***, strategy formation is a reactive process to the changes in organization's environment. To survive in the market, the organization needs to respond to environmental forces. The approach resembles population ecology (Hannan and Freeman 1977) and evolutionary theories (Nelson and Winter 1982).

Mintzberg et al. view the ***configuration school of thought*** as **a hybrid** that includes features from both the prescriptive and descriptive schools of thought. Most of the time an organization can be regarded as a stable configuration of its characteristics but occasionally it encounters changes that result in processes of transformation, and thus in a new configuration. Strategic management is about managing the lifecycles of an organization by sustaining stability most of the time and by steering a company through the periods of transformation when needed. Depending on the lifecycle phase, the company can focus on either planning or recognizing the emergent nature of the strategy.

These descriptive schools of thought question rational decision-making, which is a basis of the classical views on strategy making. However, they differ from each other concerning whether the role of a company is considered active or passive. For example, the environmental school sees a company as reacting to environmental changes, and thus, as relatively passive, whereas the learning school of thought views a company as a collective one, taking actions actively. Whittington (2001) suggests grouping the approaches by emphasizing the emergent nature of the strategy formation to evolutionary and processual depending on the view of the outcomes: is a company focusing on the profit-maximizing, or does it have plural goals?

Not only how the concept of strategy has been defined in the prior research in terms of strategic alignment between IT and business is interesting, but also to examine what strategy schools of thought dominate this literature. The expectation is that prescriptive schools of thought dominate this stream of research. Knowledge can play a role both in prescriptive and in descriptive schools of thought but the concept of knowledge may vary more in the descriptive schools. Knowledge is probably regarded as a strategic resource in the prescriptive schools of

thought, whereas knowledge might have more definitions and interpretations in the descriptive schools of thought.

4.1.3 Business Strategy, IT Strategy, and Their Relationship

In the previous sub-chapters, the purpose was to show how nuanced and ambiguous the concept of strategy is. The existence of a wide variety of the schools of thought for strategy was emphasized. In this sub-chapter, the concepts of business strategy and IT strategy are discussed, because they play a focal role in IT-business alignment research.

When one is talking about concepts such as **business strategy** and **IT strategy**, one usually follows the ideas of the planning school of thought. This breaks down a strategy into sub-strategies (Mintzberg et al. 1998); IT strategy can be understood as a sub-strategy of a business strategy, which in turn is a sub-strategy of a corporate strategy. Thus, a firm's strategy is a hierarchical plan (e.g. Henderson and Sifonis 1988). First, a *corporate strategy* defines in which businesses an enterprise should be. Secondly, there are *business strategies*, which are sub-strategies for the corporate strategy. They define how a firm achieves a sustainable competitive advantage in its industry. Thirdly, there are functional strategies, which in turn are sub-strategies of business strategies. They are usually short or medium term plans derived from business strategy. However, they are not necessarily the responsibility of one unit. For example, a technology strategy may go beyond the area of IT function.

Business strategy usually refers to the competitive strategy of a business unit. There are a variety of terms used in relation to business strategy; among them are, e.g. business models (Magretta 2002; Seddon et al. 2004; Osterwalder et al. 2005), strategic capabilities (Johnson et al. 2008), and enterprise architecture. The latter has been used as a synonym for strategy in the title of the book by Ross et al. (2006). **A business model** describes the structure of a product, service and information flows and the roles of different parties. According to Osterwalder et al. (2005), a business model is a description of the value that a company offers and of the architecture of the firm and its network of partners. **Strategic capability** is the ability to create and implement a wide range of strategies successfully undertaking action intended to affect its long-term growth and development (Lenz 1980; Prahalad 1983). **Enterprise architecture** is "*the organizing logic for a firm's IT infrastructure and business process capabilities to address the firm's need for business process integration and standardization*" (Ross and Beath 2006, p. 182). According to Ross et al.

(2006), the linkage of enterprise architecture to the strategic IT-business alignment is that effective enterprise architecture is dependent on successful alignment between business strategy and IT capabilities. Ross et al. (2006, p. 6) criticizes the hierarchical planning process, which, in her opinion, results in IT solutions, not in IT capabilities. In my study, business strategy refers to the competitive strategy of a business unit, and as, in the study, a strategy is defined as a combination of a plan and a pattern business strategy can also already have been implemented or it can be still in the form of plans.

Widely spoken, **IT strategy** refers to strategic choices concerning information technology. There is often a distinction between three different strategies: IS strategy, IT strategy, and IM strategy (Earl 1989; Ragu-Nathan et al. 2001; Sabherwal and Chan 2001). IS strategy discusses systems or business applications of IT, whereas IT strategy is concerned with technological solutions, such as architecture, technical standards, and security levels. IM strategy relates to information management, i.e. the structures and roles for the management of IS and IT. However, this distinction is not universal but as Hirschheim and Sabherwal (2001) note, there is a wide range of IS/IT strategy typologies. Some authors make a strict distinction between IS (information systems) and IT (information technology), while others use the term 'IT' to cover both areas. However, all these definitions represent the prescriptive, classical views on strategy. IT strategy is a functional strategy in a hierarchical set of plans in an organization. Sometimes the IT strategy is seen as the use of IT to support business strategy, whereas at other time it is regarded as a master plan of the IT function (Chen et al. 2010). For example, Hirschheim and Sabherwal (2001) view IS/IT strategy as a multi-dimensional concept, which includes the role of IS, the sourcing principles, and the structure of IS function. Chan and Huff (1992) build IT strategy on three dimensions according to Henderson and Venkatraman (1993): information technology scope, systemic competences, and IT governance. In my study, IT strategy refers to the strategic choices concerning information technology being either already implemented or still in the form of plans.

In summary, research on the strategic IT-business alignment builds on the very abstract and complicated concepts, of which there are many different variants. If the perspectives and assumptions are not articulated explicitly, there is a risk that the research results will be interpreted incorrectly. This issue was brought out in order to better analyze the existing literature on the strategic alignment between IT and business.

4.2 Concept of Strategic Alignment

Alignment is a term that has been used in the context of strategy for decades. Being almost as a vague concept as strategy is, I start by checking its definitions in the Oxford Dictionary (accessed in 2011). According to the first definition, alignment is "*arrangement in a straight or other determined line*". Another definition brings in military aspects by calling alignment an '*arrangement of soldiers in a line or lines'*. A third definition refers to an action where one '*draws a straight line in such a position that it shall pass through a particular point*'. When we use a term of alignment in the context of abstract concepts, such as strategy, we easily meet challenges with the interpretations. Alignment research has suffered from inadequate definitions. In this sub-chapter, first the focus is on how alignment – or fit – has been defined. Then, some thoughts from the critics on these definitions are given.

As there are multiple schools of thought for strategy, there are also a number of views on what strategic alignment is. In the research on strategic alignment, the concept of 'fit' may be found in different ways. Venkatraman and Camillus (1984) provide an excellent summary on the concept of 'fit' in strategic management. In fact, Venkatraman (1989) takes the analysis further by giving advice on how to approach each definition in to research. These analyses have provided a foundation for the research of the fit in the context of IT; i.e. research on the strategic alignment between business and IT.

Because there are several different ways to define a fit, Venkatraman (1989) has proposed a conceptual framework that consists of six different perspectives of fit. He suggests that fit could be defined and studied as the following ways: moderation, mediation, matching, gestalts, profile deviation, and co-variation. Next, I will describe each briefly.

When fit is defined as **moderation**, it is conceptualized as the *interaction between two variables*. These two variables both have an effect on a third, dependent variable. In addition, together they have a covariation effect on the dependent variable but do not depend on each other. The perspective of **mediation** suggests that there is an intervening variable between an antecedent variable and the consequent variable. Fit can be seen as a transitive effect. In the **matching** approach, it is a theoretically defined match between two related variables. There is no reference to a criterion variable. According to the **covariation** perspective, fit is a pattern of internal consistency among a set of underlying theoretically related

variables. When fit is seen as **profile deviation**, one examines deviations from an assumed ideal profile. The **gestalts** perspective regards fit as a set of relationships, which are in temporary a state of balance. A fit is a multivariate perspective. It can be considered the degree of internal coherence among a set of theoretical attributes. A pattern is formed with the frequently recurring clusters of attributes.

Venkatraman (1989) classifies the abovementioned definitions into two groups. The first group is criterion-specific, i.e. the fit is anchored to a particular criterion such as effectiveness or another performance criterion. Moderation, mediation, and profile deviation represent this group. The second is criterion-free, and the rest of the types of fit (i.e. matching, covariation, and gestalts) relate to this notion.

Research with the concept of fit – and especially the criterion-specific approach –usually builds on contingency theory, which assumes that there is no universal or best way to organize, but rather the design of an organization must fit with the environment and between its subsystems. Fit is usually studied between strategy, structures, and sometimes external environments (Miller 1987). An organizational design that is effective in some situations may not be successful in others. Contingency theory has be criticized a great deal (e.g. Weill and Olson 1989). In general, it builds on managerial views. Contingency theory assumes that the better the fit among contingency variables the better the performance, which however, is usually defined narrowly from the perspective of the management using such measures as return on investment, or profit. Another assumption is that organizational actors are rational and reach for organizational effectiveness together. However, regardless of the assumed consensus on goals, in reality there may be very mixed views of the objectives. Contingency theory is also accused of building on a static vision, and thus, contingency studies tend to lack processual questions.

Porter (1996) has tried to integrate dynamic, active elements into the definition of fit by suggesting first-order, second-order, and third-order fit, which all differ from each other with regard to the degree of dynamics. According to Porter, first-order fit is the simple consistency between each activity (function) and the overall strategy. Second order fit occurs when activities are reinforcing. Third-order fit refers to the optimization of effort. However, the managerial view is still emphasized in each of these refinements.

Owing to managerial perspectives, it is not usually taken into account that the concept of fit is ambiguous and rather there might be several different interpretations for alignment or fit within a company (Schoonhoven 1981). In addition, human action is also ignored as a potential cause for observed relations (Barley 1990). Some have tried to solve the problems of missing human aspects by studying the antecedents of alignment. Among these antecedents are social factors, such as executives' competences (Bassellier et al. 2001; Bassellier and Benbasat 2004), the relationship between a function head and the top management team (Armstrong and Sambamurthy 1999), and shared domain knowledge (Reich and Benbasat 2000; Kearns and Lederer 2003; Chan et al. 2006; Preston and Karahanna 2009). However, the contribution of most of the social factors evolves over a long-term basis (Avison et al. 2004).

Rather than considering the social factors as antecedents, they can be regarded as one dimension of strategic alignment. The **social dimension of strategic alignment** has been introduced at least in the context of IT management by, for instance, Reich and Benbasat (2000), who define it in terms of "*the state in which business and IT executives within an organizational unit understand and are committed to the business and IT mission, objectives, and plans*"(p. 82). Tan and Gallupe (2006) have followed this view in their research.

If one considers human aspects to be one dimension of strategic alignment, the other dimensions also need to be identified and defined. Chan and Reich (2007b) provide a conceptual framework with four dimensions for clarifying the concept. The first is **strategic alignment**, which can also be called **intellectual alignment** so as to be distinguished from the upper level concept, and in the IT management context, it focuses on the fit between the priorities and activities of the IS function and those of the business unit (Chan 2002). Reich and Benbasat (2000) define the strategic dimension as "*the state in which a high-quality set of inter-related IT and business plans exist*" (p. 82). The second dimension focuses on the structures. In the context of IT management, **structural alignment** examines the degree of structural fit between IS and the business, specifically in the areas of IS decision-making rights, reporting relationships, (de)centralization of IS services and infrastructure, and the deployment of IS personnel (Ein-Dor and Segev 1982; Chan 2002). Therefore, the structural dimension is defined as *the state in which there is a fit between business and IT (decision-making) structures* (Sabherwal et al. 2001). The third is a **social dimension** with the definition given in the

previous paragraph. The fourth dimension is the **cultural dimension** covering such aspects as shared values, attitudes, and beliefs, and is defined as *the state in which organizations share some basic values, attitudes, and beliefs* (Bresnen and Marshall 2000).

Chan and Reich (2007b) note that the most attention has been given to the strategic, i.e. intellectual, dimension but the structural dimension has also been studied to some extent. Due to the strong influence of contingency theory, most attention has been paid to the relationship between strategic and structural dimensions (Tavakolian 1989; Das et al. 1991; Brown 1997; Brown and Magill 1998). Both dimensions are present in Henderson and Venkatraman's (1993) strategic alignment model. However, some of the relationships between different dimensions are less examined. The relationships of the cultural dimension to other dimensions and of the social dimension to other dimensions especially need further studies.

Given the research question of this study, I do not have to take a stance on how alignment influences business performance. Therefore, the criterion-specific definitions are not relevant here. In my research, alignment can be considered as a match or gestalt between business and IT strategies. I also regard alignment as a multi-dimensional concept wherein a social dimension is one of the dimensions (Chan and Reich 2007b). I adopt and modify the definition for the social dimension of strategic alignment from Reich and Benbasat (2000) as follows: *the state in which business and IT representatives within an organization understand and view the strategic dimension of IT-business alignment similarly*. Accordingly, following my definition for strategy, the strategic dimension of alignment is *the state where a high-quality set of inter-related, intended and realized IT and business plans exist*.

In summary, not only the concept of strategy and thoughts on strategy formulation are ambiguous, but the concept of fit (or alignment) also has several definitions and viewpoints. Next, the focus is on how the concept of alignment has surfaced in the prior research on strategic IT-business alignment.

4.3 Strategic IT-Business Alignment

This sub-chapter includes a literature review focusing on prior research on strategic alignment between business and IT. The focus is on how the concept of strategy is defined, what kind of school of thought these studies represent, and how the concept of alignment is defined.

In the prior research on strategic alignment, the focus has often been between strategy, structures, and external environment. In particular, the number of studies focusing on strategic alignment between IT and business has been substantial; for instance, Chan and Reich (2007b; 2007a) have collected a wide set of IT-business alignment studies and collated a summary on alignment research. I have utilized this bibliography in my literature review as a basis, but completed it with further other citations. As Chan and Reich's bibliography reaches only until 2006, in complementing, I have paid attention to studies that are more recent. I also removed those citations that I found irrelevant. The complete list of the literature is presented in Appendix 1

4.3.1 Dominance of Prescriptive Schools of Thought

In the following table (Table 1), there is a summary of whether a prescriptive or descriptive school of thought is present in the prior literature on strategic alignment between IT and business, and how strategy is regarded.

	Number (%)	Strategy as...	Examples
All papers	151 (100%)		
Prescriptive schools of thought	121 (80%)	Intended 110 (73%)	Brown and Magill (1994); Burn and Szeto (2000); Chung *et al.*(2003); Dutta (1996); Hartung *et al.*(2000); Huang and Hu (2007); Kearns and Sabherwal (2006); Luftman (2000); Pollalis (2003); Preston and Karahanna (2009); Teo and Ang (1999)
		Realized 3 (2%)	Hussin et al.(2002); Chan *et al.*(2006); Johnson and Lederer (2010)
		A mix 8 (5%)	Tallon (2007);
Descriptive schools of thought	21 (14%)	Intended 0 (0%)	-
		Realized 5 (3%)	Levy *et al.*(2001); Orlikowski (1996); Yetton *et al.*(1994)
		A mix 16 (11%)	Bensaou and Earl (1998); Campbell (2005)
Not applicable; e.g. a literature review	9 (6%)		Booth and Philip (2005); Chan and Reich (2007b)

Table 1. The concept of strategy in the literature on IT-business alignment

The dominance of the prescriptive schools of thought is considerable (80%). Evidenced by the fact that 110 of 121 those studies representing the prescriptive schools of thought saw strategy as an intended plan, the alignment research stream can be perceived as very conservative. In these

studies, the basic underlying assumption is that organizations are seen as hierarchical, rational systems where strategy can be put into effect.

Some of abovementioned studies have also examined the concept of shared knowledge as an antecedent for formulating such plans where both business and IT support each other (e.g. Bassellier et al. 2003; Avison et al. 2004; Bassellier and Benbasat 2004; Chan et al. 2006; Chen 2010). In these studies, shared knowledge is not considered in the concept of strategy.

Instead, some of the descriptive schools of thought, particularly the cognitive schools, consider shared understanding as an elemental part of the concept of a strategy. However, the concept of shared knowledge is not necessarily always present in the studies that are categorized as belonging to the descriptive schools of thought. Some of them focus, for instance, on the emerging nature of strategy (e.g. Ciborra 1997). Nevertheless, some of those who have studied shared knowledge have defined such notion, or shared understanding, to belong to the concept of strategy as a social or cognitive perspective (e.g. Tan and Gallupe 2006). The conceptual thinking with regard to the relationship between cognitive systems and strategy differs between the descriptive and prescriptive schools of thought.

I include features from the cognitive school of thought into this research because the research question is about the similarity in the perceptions of strategic IT-business alignment. The views of different people within an organization are important, not only the views of the CEO or the CIO. The shared view within an organization is emphasized as a part of strategic alignment, not as a factor influencing it.

4.3.2 Various Definitions for Fit in Alignment Literature

In several studies, strategic alignment between IT and business has been defined as **a fit between IT strategy and business strategy** (Chan, Huff, Copeland, et al. 1997; Palmer and Markus 2000; Chan et al. 2006; Tallon 2007). However, the concept of alignment has not been simple and unambiguous in IS research. In the literature, one can find such terms as integration (Henderson and Venkatraman 1993; Broadbent et al. 1999), harmony (Luftman and Brier 1999; Weill and Ross 2004; Chan et al. 2006), and linkage (Henderson and Venkatraman 1993; Kearns and Lederer 2000) – just to mention a few. Yet, all these terms refer to the same idea; finding a fit between business and IT strategies (Chan 2002; Avison et al. 2004).

In the research stream on the alignment between strategy and IT, different perspectives of the concept of fit (Venkatraman 1989) have been utilized, but the most dominant have been moderation and match (Bergeron et al. 2001). However, not all authors explicitly define the perspective they are resting on, regardless of the fact that different conceptualizations, verbalizations, and methods of analysis of fit will lead to different results, particularly in studies where alignment's effect on organizational performance is examined. Therefore, for instance Bergeron et al. (2001) recommend that authors should also theoretically support their choice before conducting their study and discuss the results with respect to the theory and the selected perspective of fit.

Table 2 shows a summary how the concept of fit is present in the alignment literature.

	Number (%)		Examples
All papers	151 (100%)		
The concept of fit explicitly defined	27 (18%)	Moderation	Hussin et al.(2002); Palmer and Markus (2000); Papp (1999)
		Mediation	Croteau and Bergeron (2001)
		Match	Cumps et al.(2009); Lee (2006)
		Profile deviation	Hirschheim and Sabherwal (2001); Sabherwal et al.(2001)
		Covariation	Croteau and Raymond (2004)
		Gestalts	Brown and Magill (1994); Johnston and Yetton (1996); Pollalis (2003); Yetton and Craig (1995)
The concept of fit present	106 (70%)	Integration	Avison et al.(2004); Johnston and Carrico (1988); Kim and Michelman (1990); Teo and King (2000)
		Harmony	Bleistein et al.(2006); Sledgianowski and Luftman (2005)
		Collaborative process	Choe (2003)
		Linkage	Kearns and Lederer (2000); Reich and Benbasat (1996)
		Fusion	Smaczny (2001)
Various definitions given for the concept of fit, OR an explicit definition not relevant (e.g. literature review, or the focus is on the antecedents)	18 (12%)		Grover and Sabherwal (1989); Kaarst-Brown and Robey (1999); Orlikowski (1996)

Table 2. The concept of fit in the literature on IT-business alignment

If the fit was explicitly defined by using the categorization set out by Venkatraman (1989), I have also shown into which categories the definitions fall. If the fit was present but defined more inaccurately, I have

gathered the examples of the descriptions or characterizations on the alignment. Part of the alignment literature has not defined alignment at all, but either concentrated on the antecedents or have been literature reviews, where a variety of different definitions are presented.

The concept of fit was explicitly defined according to the different perspectives presented by Venkatraman (1989) in only 18% of the studies reviewed. In the other studies, the concept was vague or only implicitly expressed, or there were no causal relationships studied regarding the fit.

The concept of fit in Table 2 refers mainly to the intellectual dimension of strategic IT-business alignment. The social dimension is not discussed at all in the studies where a fit for has been explicitly defined. In other studies where the concept of fit is present but not explicitly defined, the social dimension of alignment was clearly brought up in six studies. Reich and Benbasat (1996; 2000) were the first to present it, whereas Campbell et al. (2005), Martin et al. (2005), Gregor et al. (2007), and Tan and Gallupe (2006) have referred to and applied the concept of social dimension in their studies. Campbell et al. (2005) found that intellectual and social dimensions should be investigated not separately, but together, because these two dimensions were closely intertwined, both having an effect on the other. Martin et al. (2005) studied whether the factors, which are considered influencing on the social dimension of alignment, also influenced the intellectual dimension of alignment. Yet, they have not measured the social dimension of alignment as such, but simply focused on such mechanisms as overt management support and business planning style. Their results are in line with Campbell et al. (2005). Respectively, Gregor et al. (2007) also focused only on alignment mechanisms, including both intellectual and social, but did not examine the level of shared understanding. They found that enterprise architecture could be used as a tool, which brings people together and strengthens the social ties. In contrast to the studies focusing on alignment mechanisms, Tan and Gallupe (2006) left them out of scope but instead, focused on the outcomes, and found a strong link between the intellectual and social dimensions of alignment.

In terms of the strategic IT-business alignment literature, the social dimension of alignment, as such, has been studied very little thus far. The research question of this study focusing on the (dis-)similarity in the perceptions of the strategic IT-business alignment within an organization tackles this with the social dimension of alignment and advances this specific research stream.

4.3.3 Shared Knowledge in Alignment Literature

In IT management research, shared knowledge can be present in various concepts. For instance, congruent **technological frames** involve similar expectations, assumptions and knowledge about the role of technology in business, the nature of technological use, or the type and frequency of support and maintenance (Orlikowski and Gash 1994). Among various concepts of shared knowledge are also **organizing visions** (Swanson and Ramiller 1997), and **perceptual congruence** (Huisman and Iivari 2006). In addition to shared knowledge, one can sometimes find concepts such as **shared understanding** (Enns et al. 1997; Kearns and Lederer 2000; Reich and Benbasat 2000; Preston and Karahanna 2004; Preston et al. 2006; Tan and Gallupe 2006; Fonstad and Subramani 2009) and **shared view or similar views** ((Johnson and Lederer 2007; Chen et al. 2010).

Next, I examine whether the concept of knowledge sharing has been brought up or not in the alignment literature. Table 3 presents an analysis.

	Number (%)		Examples
All papers	151 (100%)		
The concept of knowledge in the research focus	27 (18%)	(Shared) knowledge as a strategic resource or capability as an antecedent for alignment, i.e. as an independent variable	Chan et al.(2006); Kearns and Sabherwal (2006);
		Shared knowledge as a dependent variable or the research focus in general	Bassellier et al.(2003); Reich and Benbasat (2000); Preston and Karahanna (2009)
The concept of knowledge indirectly present	59 (39%)	The participation, communication, and/or collaboration or other knowledge-related concept as an antecedent for alignment or highlighted otherwise	Benbya and McKelvey (2006); Broadbent and Weill (1996); Bruce (1998); Chan (2002); Chen et al.(2010); Chung et al.(2003); Kearns and Lederer (2004); Lederer and Mendelow (1989)
		Participation, communication, and/or collaboration or other knowledge-related concept as a dependent variable	-
The concept of knowledge not present	65 (43%)		Bergeron et al.(2004); Burn (1996); Chan and Huff [1992]; Lederer and Salmela (1996)

Table 3. The concept of knowledge in the literature on IT-business alignment

In the alignment literature, the concept of knowledge is often present, but it is regarded as a strategic resource or capability, not as one dimension of alignment. In these cases, shared knowledge often refers to shared domain

knowledge, which does not mean the same as the similarity in views regarding alignment. Shared domain knowledge can be defined as the ability of different (sub-)groups from different domains to understand and respect each other's contribution and challenges, and even to participate in each other's processes, contribution, and challenges. Shared knowledge is not only regarded as a resource but also seen to develop over time. Thus, this resource is valuable, heterogeneously distributed across firms, and not subject to low-cost imitation, and hence, it can be a source of competitive advantage (Johnston and Carrico 1988).

In the alignment studies focusing on shared knowledge, different factors have been identified as antecedents for shared knowledge: a common language (Preston and Karahanna 2004), relational similarity between different parties with regard to a professional background, experiences, and interests (Preston and Karahanna 2004), efficient communication (Coughlan et al. 2005; Sledgianowski and Luftman 2005; Johnson and Lederer 2007), attitudes and involvement of the management (Edwards 2000; Martin et al. 2005), formal structures and processes (Preston and Karahanna 2004), informal structures and processes (Preston and Karahanna 2004), and skills and knowledge of individuals (Jarvenpaa and Ives 1991; Luftman and Brier 1999; Hartung et al. 2000; Bassellier et al. 2003; Bassellier and Benbasat 2004). Next, the prior findings on formal and informal structures are discussed, since the research questions of this study focus especially on them.

When expanding the context to the research on IT management more widely, we can notice that **formal intra-organizational structures** have been studied in many ways. Evidence from Preston et al. (2004; 2006) and Armstrong and Sambamurthy (1999) demonstrated that structural systems of knowing can be an important antecedent for shared understanding regarding the role of IT within an organization.

The **role and position of CIO** has been especially emphasized. Some have suggested that CIOs should be permanent members of the top management team or at least report directly to the CEO (Feeny et al. 1992; Armstrong and Sambamurthy 1999; Luftman and Brier 1999; Preston et al. 2006). The reporting distance from the CEO is often measured with a rank in the organization hierarchy. With these kinds of arrangements, a tie between CIO and CEO is argued to become stronger and communication between them more frequent (Law and Ngai 2007), even though there are studies with opposing findings (Smaltz et al. 2006). Many of the studies on the shared knowledge in the context of IT-business relationship (Feeny et

al. 1992; Jones et al. 1995; Johnson and Lederer 2010) have concentrated on **the link between the CEO and the CIO** neglecting other members of the top management team and the middle management. This approach is based on the assumption that other managers are likely to follow the lead of the CEO (Jarvenpaa and Ives 1991; Earl and Feeny 2000).

The other members of the top management team have seldom been examined as individuals but in the studies about the relationship between the CIO and the top management team, the latter has often seen as **a collective one** (Armstrong and Sambamurthy 1999; Preston and Karahanna 2004; Kearns 2006; Liang et al. 2007). Although differing views among business executives have been recognized (Reich and Benbasat 2000; Ward et al. 2007), they have not been studied much in the context of strategic IT-business alignment.

Even though the strategic alignment model (Henderson and Venkatraman 1993) suggests that alignment should occur not only at the strategic level, but also at the tactical and operational levels, the research focus has been on the fit between the business and IT plans. Recently, it is increasingly recognized that alignment IT-business can occur at multiple levels in the organization (Campbell et al. 2005; Chan and Reich 2007b). Alignment mechanisms for the operational or tactical level have been identified (e.g. Tarafdar and Qrunfleh 2010), but in the studies having a focus on shared understanding, middle management representing the tactical and operational levels has not been included. It is possible that even when the executive level is aware of the business and IT strategies, the middle management may not be, and this leads to possible gaps between strategy and execution.

In addition to functional organization structure, a company may have several **formal cross-functional groups**, which are established for collaboration and coordination. These cross-functional groups provide a stage for knowledge exchange and thus, are assumed to develop a shared understanding. For instance, Reich and Benbasat (2000) found a connection between a shared view and the presence and meeting frequency of cross-functional teams. With regard to strategic IT-business alignment, one way to foster lateral knowledge sharing on IT-related issues is to establish **an IT steering group,** or in other words, an IT steering committee (Brown 1999; Karimi et al. 2000; ITGI 2005). Steering groups are seen to be effective in keeping top management involved. If they are not involved, the expectations of the top management are more likely to fail (Somers and Nelson 2003). This kind of cross-participation is assumed to

expose the tacit knowledge that often remains undiscovered (Johannessen et al. 2001). The existence of steering groups had found to result in higher IT sophistication, referring to better alignment between IT and business (Karimi et al. 2000). However, creating working relationships between IT groups and line management may take several years (Bharadwaj 2000).

There are some guidelines on how to make an IT steering group more efficient. The CEO should be a member of the IT steering group at least to some extent (Raghunathan and Raghunathan 1992). An IT steering group must have clear goals understood by all members (Sheard and Kakabadse 2002; Bowen et al. 2007) and high participation by members is needed on a variety of activities and decisions (Mealiea and Baltazar 2005). The focus should be kept on strategic issues and the IT steering group should not be allowed to degrade into project review or budget approval committee (Reich and Benbasat 1996; Reich and Benbasat 2000). If a firm succeeds in following these guidelines, it is more likely to succeed in aligning IT and business.

Informal structures have been studied more seldom but their importance has been recognized. In prior research, some evidence of significance of interaction patterns relating to perceptions about strategic IT-business alignment comes from the studies of Chan (2002), who demonstrated with snapshots from eight different companies that informal organizational structures were repeatedly mentioned as preconditions for successful IT-business alignment. However, these structures were not explored further. Reich and Benbasat (2000) found a connection between a shared view and whether the IT and business executives communicated outside of formal cross-functional teams or not. Preston et al. (2004; 2006) and Armstrong and Sambamurthy (1999) studied the effect of approximate frequency of the CIO's social contacts with any member of the top management team on shared understanding or, consequently, on the level of IT assimilation, however, leaving the work-related interaction patterns without further examination. The results were mixed, whereas Armstrong and Sambamurthy did not find a significant relationship, the results of Preston et al. appeared to depend on the national culture. Based on the literature review, informal structures need more investigation; further studies could benefit especially from including work-related interaction patterns as a part of informal structures.

Interaction patterns and knowledge sharing structures can be a combination of formal and informal structures, but they have seldom been in the research focus. Even though **social network analysis** provides a

well-organized way to study actual knowledge sharing structures, this has not been utilized in the context of strategic IT-business alignment. Especially in the context of IT management, there are only few studies: it has been applied to analyze the interaction patterns within companies to improve collaboration (Cross, Gray, et al. 2010) or to facilitate transition from regional to global IT function (Cross, Dowling, et al. 2010). Depicting the interaction patterns may expose local collaboration silos that need to be broken in order to advance more efficient communication or to meet the requirements of the new organization. If we examine the information systems science more widely, we can find that social network analysis has been also applied to studies on electronic communities (Wasko and Faraj 2005; Cucchi and Fuhrer 2007), IS development (Yang and Tang 2004) and on analyses of IS journals (Polites and Watson 2009). Clearly, the applicability of social network analysis has been noticed but it has not yet been used in the context of strategic IT-business alignment.

4.3.4 Research Methods and Measurement in Alignment Studies

The social dimension of the strategic alignment brings in some thoughts on **measuring the alignment**. In fact, some researchers, who represent more descriptive schools of thought with regard to strategy, claim that it is not possible to measure the degree of alignment (e.g. Ciborra 1997). Most of the more positivist-oriented researchers have approached the operationalization and measurement of this ambiguous concept focusing on mainly the intellectual and/or structural dimensions of alignment. The definitions of fit have assisted in this kind of operationalization. However, the social dimension of alignment is often neglected.

In the literature review, research methods and measurement approaches used in the most in the strategic IT-business alignment research were also examined. The following table (Table 4) shows a summary of the literature review. The full table is presented in Appendix 1.

Research Method	Number	Percentage	Examples
Case study	54	36%	
Qualitative data	41		Avison *et al.* (2004); Fonstad and Subramani (2009); Hirschheim and Sabherwal (2001); Peak *et al.*(2005);
Quantitative data with multiple informants per company	13		Baets (1996); Brown and Magill (1994); Tan and Gallupe (2006)
Survey	61	40%	
Informants only from IT	10		Kearns and Lederer (2003); Preston and Karahanna (2004); Segars and Grover (1998)
Informants only from business	3		Bergeron *et al.*(2004)
Matched pairs (a company-level analysis)	11		Chan (2001); Oh and Pinsonneault (2007); Teo and King (1996)
One or more informants per company (an individual-level analysis)	37		Croteau and Raymond (2004); Kearns and Sabherwal (2006); Lee (2006); Papke-Shields and Malhotra (2001); Zviran (1990)
Conceptual papers with no empirical data	30	20%	Ciborra (1997); Henderson and Venkatraman (1993); Luftman (2000)
Pure literature reviews	6	4%	Booth and Philip (2005); Chan and Reich (2007b)
	151	100%	

Table 4. The research methods used in the articles included in the literature review

I found that 61 (40%) of 151 papers had used a survey as a research method. It is generally accepted that if there is no objective measure of the phenomenon to be studied, one can lean on the subjective perceptions because they estimate the reality well enough (Dess and Robinson 1984; Venkatraman and Ramanujam 1986; Chan and Huff 1992). For instance, Tallon and Kraemer (2000) claim that perceptions are accurate enough to approximate the objective measure. Almost every survey of those listed in the literature review has utilized subjective perceptions given by one or more informants per company to measure alignment.

Only eleven of survey-based studies applied matched IT-business pairs and used a company as a unit of analysis. Instead, ten of them used only IT executives as respondents, which is justified by claiming that "*a particularly damaging confound in utilizing an organizational informant is a lack of knowledge*" (Segars and Grover 1998, p. 147) referring to business executives assumed lack of IT knowledge. Many of the previous studies (e.g. Gupta et al. 1997; Bergeron et al. 2001; Choe 2003; Kearns and Lederer 2004) apply only one or two responses per organization, who have responded on behalf of their organization. However, usually the second

respondent is the one, to whom the first respondent has forwarded a questionnaire, as he or she was asked to send it to a colleague (e.g. Tallon and Kraemer 2007). Quite often, the second respondent is a close co-worker to the first with relatively similar views.

Previous studies have shown that views can differ substantially within a company (Reich and Benbasat 1996; Teo and King 1997a; Baker 2004; Rathnam et al. 2004; Lahdelma and Dahlberg 2006). Who of the executives are the best to rate the success of the organization's alignment efforts? How should potential variance in the executives' perceptions be considered? Or, if strategy is defined as a realized pattern seen at every organizational level, are the executives' views the most accurate? The definition of strategic IT-business alignment should outline the key informants to be involved in the study. When focusing only on the intellectual dimension of alignment, selecting the right informants for a survey is critical. Using more than one respondent from one company not necessarily measures the intellectual dimension of alignment more accurately, but it measures the social dimension of alignment.

4.4 Summary of the Chapter

This chapter has focused on the concept of strategic IT-business alignment. The chapter started with the definitions of strategies. For this study, I adopt a wide view for a term of strategy referring to both plans and patterns. Business strategy refers to the competitive strategy of a business unit, and as, in this study, strategy is defined as a combination of a plan and pattern, business strategy can be that which has already be implemented or it can still be in the form of plans. IT strategy refers to the strategic choices concerning information technology being either already implemented or still in the form of plans.

In defining the concept of strategic IT-business alignment, given the research question of this study, I do not have to take a stance on how alignment influences business performance. Therefore, criterion-specific definitions are not relevant here. In this study, alignment can be considered as a match or gestalt between business and IT strategies. Alignment can also be regarded as a multi-dimensional concept wherein a social dimension is one of the dimensions (Chan and Reich 2007b). I adopt and modify the definition of the social dimension of strategic alignment from Reich and Benbasat (2000) as follows: *the state in which business and IT representatives within an organization understand and view the strategic*

dimension of IT-business alignment similarly. Accordingly, given my definition for strategy, the strategic dimension of alignment is *the state where a high-quality set of inter-related, intended and realized IT and business plans exist*.

This chapter has also concentrated in how the concepts of knowledge sharing and the similarity in the views appear in the prior research on strategic IT-business alignment. I noted that the social dimension of alignment, which includes knowledge-sharing aspects, has been less studied in the context of strategic alignment. One reason for this has been that many of the previous studies have adopted the views of the prescriptive schools of thought with regard to strategy and built on the ideas of contingency theory. Features from the cognitive school are included in this research because the research question is about the similarity in the perceptions of strategic IT-business alignment. The shared view within an organization is emphasized as a part of strategic alignment, not as a factor influencing it.

Finally, I noted that the applicability of social network analysis has been recognized in terms of IT management but it has not yet been used in the context of strategic IT-business alignment. The approach to apply social network analysis in this study on strategic IT-business alignment is one that is new.

5 Research Design

In this chapter, I present the research framework, whereby the research problem is approached and the boundaries for this study are set. Thereafter, the philosophical foundations for this research are set and the methodological choices are explained. The constructs and hypotheses about their relationships are built using the prior literature. Finally, the key constructs are operationalized.

5.1 Research Framework and Boundaries

To frame my research on strategic alignment between IT and business, I organize around the conceptual framework provided by Chan and Reich (2007b). They summarize alignment research in the MIS literature and find that alignment has been studied from four different dimensions. They call the first dimension **strategic dimension**, which can be also called **intellectual alignment** to be distinguished from the upper level concept, and it focuses on the fit between the priorities and activities of the IS function and those of the business unit (Chan 2002). Reich and Benbasat (2000, p. 82) have defined the strategic dimension as "*the state in which a high-quality set of inter-related IT and business plans exist*". I have modified this given my definition of strategy. Hence, in this study, the strategic dimension of alignment is *the state where a high-quality set of inter-related, intended and realized IT and business plans exist*.

The second dimension focuses on structures. In the context of IT management, **structural alignment** examines the degree of structural fit between IS and the business, specifically in the areas of IS decision-making rights, reporting relationships, (de)centralization of IS services and infrastructure, and the deployment of IS personnel (Ein-Dor and Segev 1982; Chan 2002). Therefore, the structural dimension is defined as *the state in which there is a fit between business and IT (decision-making) structures* (Sabherwal et al. 2001).

The third is the **social dimension**, which Reich and Bensabat (2000, p. 82) have defined in terms of "*the state in which business and IT executives within an organizational unit understand and are committed to the business and IT mission, objectives, and plans*." In this study, I have focused on this dimension of the alignment, and I have defined it further leaning on the definition of Reich and Benbasat (2000); hence, it is as follows: *the state in which business and IT representatives within an organization understand and view the strategic dimension of IT-business alignment similarly*.

The fourth dimension is the **cultural dimension** covering aspects, such as shared values, attitudes, and beliefs, and defined as *the state in which organizations share some basic values, attitudes, and beliefs* (Bresnen and Marshall 2000).

The multi-dimensionality is illustrated in Figure 2. In addition, the relationships between the dimensions are included in the figure.

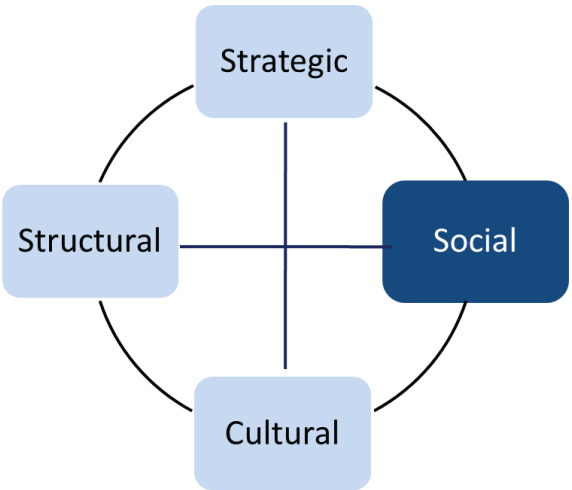

Figure 2. Four dimensions of strategic alignment; adopted from Chan and Reich (2007b)

As the similarity or dissimilarity in the perceptions of the strategic alignment between IT and business is the main research interest of this study, the focus is on the social dimension of IT-business alignment by investigating perceptual congruence about the strategic – also called intellectual – dimension of IT-business alignment. By this, I mean that as a researcher, I focus especially on the social dimension of the alignment in an organization by collecting and analyzing the data from the research site's individuals whose perspective of the alignment is mainly on the strategic

dimension. The concept of perceptual congruence is selected due to methodological choices, which I discuss later in this chapter. Perceptual congruence is examined by studying the similarity in the views of individuals within an organization.

In IT-business alignment literature, alignment is usually examined at a company-level, i.e. whether a company's IT is aligned with business in general. There are some attempts to study alignment at a more detailed level, e.g. at a process-level (Tallon 2007) or a level of a business unit (Chan, Huff and Copeland 1997; Slaughter et al. 2006). In this study, the mainstream is followed and the respondents' perceptions of strategic alignment are examined at a company-level. In the data collection, the point of view is on how well a company has managed to align its business and IT in general.

The perceptions and their similarity are examined at multiple levels. The degree of perceptions is studied at an individual level. The perceptual congruence is studied both between pairs of respondents and within the whole network. The main research interest in this study is not between companies or organizations but within a company, which guides to study smaller units of analysis. Therefore, the research questions and other objectives are approached mainly at a tie-level and an individual-level. As interaction patterns are one of the core concepts in this study, the first research sub-question is also studied at a company-level. By doing so assists in obtaining a better picture of the organization as a context for this study.

The following figure (Figure 3) illustrates the different levels of examination.

Level of examination	Focus
A company (a network)	Similarity in perceptions
A tie (a pair of actors in a network)	Similarity in perceptions
An individual (an actor)	Degree of perceptions

Figure 3. Different levels to study the perceptions and similarity in the perceptions.

The underlying assumption is that perceptual congruence is achieved with communication, which flows through different organizational relationship structures. These structures expose the interaction between the individuals in an organization. In social network analysis, individuals are often called actors, whereas the relationships are called ties. Some of the structures are emergent, whereas others can be intentionally planned.

This study concentrates in how different knowledge sharing structures relate with the perceptions of IT-business alignment. The emphasis is on formal and informal structures and networks at multiple levels. The levels are illustrated in the following figure (Figure 4).

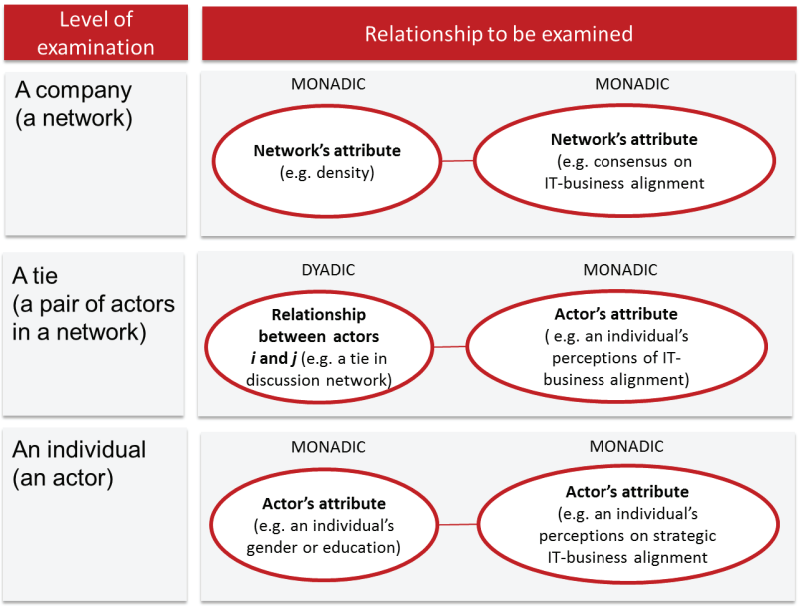

Figure 4. Relationships to be examined on different levels

In company-level analysis, the unit of analysis is an organization, and hence, the focus is on the network as a whole, not on the relationships between actors.

When the level of examination is pairs of actors, the analysis can be conducted with the dyadic units of analysis or with ***a mix of the dyadic and monadic units of analysis***. Dyadic units refer to ties between pairs of actors, whereas monadic units stand for actors, who represent the nodes in a network. In dyadic hypotheses, network structure (i.e. ties) are suggested influencing another network structure, whereas in mixed dyadic-monadic hypotheses, the network structure is suggested influencing the

opinions or perceptions of the actors. In this study, tie-level analyses are carried out through a mix of dyadic and monadic units of analysis.

When the unit of analysis is an individual, the focus is on his or her attributes. Perceptions of an individual as well other characteristics can be considered attributes, which are treated as variables.

Alternative explanations for the perceptions and their similarity or dissimilarity at all levels are considered, too.

5.2 Philosophical Foundations

Next, the philosophical foundations of this study are discussed. This is needed as information systems research is multi-disciplinary by nature, and thus, represents a rich variety of diverse research methods and paradigms. Information systems research has connections from behavioral sciences to computer science, and from business administration to information science, to mention but a few. Different research paradigms differ from each other from the ontological and/or epistemological points of view. Usually, these viewpoints also influence methodological choices.

Ontology is concerned with the nature of being or existence. It can be regarded as a philosophical study of reality in general. The interest is in the structure and properties of the basic building blocks that make up the phenomena or objects to be investigated (Iivari et al. 1998). One way to comprehend the reality in social sciences is to adopt the ideas of natural sciences, which are grounded on realism. Realists think that there is a "real" reality with certain deterministic causality, which scientists are supposed to be able to expose with the means of science. Relativists and nominalists represent a different standpoint by thinking that reality is locally and specifically constructed, possibly co-created by mind and given cosmos.

Epistemology is concerned with what constitutes acceptable knowledge in a field of study (Saunders et al. 2007). Thus, epistemological assumptions are concerned with the nature of knowledge and the proper methods of the procedures or means by which we can obtain knowledge (Iivari et al. 1998). In epistemological debates, two opposing stances are 'positivism' and 'anti-positivism', as Burrell and Morgan (1979) have represented. Positivists believe that a researcher can act as an external observer who can objectively search for facts about regularities and causal relationships in the social world for explanatory and predictive purposes. In contrast, anti-positivists reject this view and believe that the social world cannot be examined by searching for facts but rather by understanding it

from the point of the individuals who are directly involved in the activities that are to be studied. Neither can a researcher be an objective observer but he or she always participates and influences the research process and findings to some extent. The knowledge gained in the research process is always the subjective knowledge reflecting the values, beliefs, and experiences of the researcher.

However, the terminology in the philosophical debate has been somewhat ambiguous. As Burrell and Morgan (1979) use the word "positivism" mainly in the epistemological context, there are some other discussions where positivism has a wider meaning representing the whole paradigm also covering ontological and methodological aspects.

There are some slightly different frameworks for contemporary **paradigms** (e.g. Burrell and Morgan 1979; Lincoln and Guba 2000). By a paradigm, I refer to the set of practices that define a scientific discipline at a particular period of time (Kuhn 1996). For instance, Burrell and Morgan (1979) have used two criteria to categorize paradigms: the assumptions about the nature of social science and the assumptions about the nature of society. Thereby, they suggest four paradigms for the analysis of social theory: functionalist, interpretive, radical structuralist, and radical humanist. In contrast, Lincoln and Guba (2000) have identified five paradigms differing from each other on the ontological, epistemological, and methodological grounds: positivism, post-positivism (being less strict in epistemological assumptions on objectivistic and true research findings if compared with positivism), critical theory, constructivism, and participatory paradigm.

Assumptions on the nature of society seldom appear in information systems science. Therefore, the most common paradigms appearing in the information systems science are **positivism** and **interpretivism** (Chen and Hirschheim 2004). However, even though there is a clear increase in the number of studies using qualitative methods and leaning towards interpretivist assumptions, the positivist research paradigm (which in this context equates with Burrell and Morgan's functionalism) and quantitative methods have so far dominated information systems research (e.g. Orlikowski and Baroudi 1991; Hirschheim 1992; Iivari et al. 1998; Chen and Hirschheim 2004). The historical discourse of the research community has an effect on a researcher's epistemological focus (Chen and Hirschheim 2004; Becker and Niehaves 2006), and therefore, the dominance of the positivist research paradigm has been significant.

According to the **interpretivist** view, knowledge is always subjective and no such thing as objective knowledge exists. On the other hand, **positivists** believe that objective knowledge about the real world can be achieved (Niehaves and Stahl 2006). Iivari et al.(1998) have noted that even if ontology, epistemology, and research methodology do not depend on each other in principle, they tend to be interrelated in practice. A researcher who ontologically represents a realist view most probably follows a positivist epistemology and therefore prefers empirical surveys or laboratory experiments. Therefore, **positivism** and **interpretivism** are usually regarded as paradigms that differ from each other not only from the epistemological point of view but also from the ontological point of view. However, this does not need to be the case since they can have the same ontological foundations (Becker and Niehaves 2006; Niehaves and Stahl 2006). As Niehaves and Stahl state, although many interpretivists support the idea that no real world exists, an interpretivist can also build on the same assumption as a positivist: a real world is existent.

Critical realism can be regarded as a form of post-positivism. According to critical realists, a "real" reality with certain deterministic causality does exist. There are objects, entities and structures that generate the events that we observe (Mingers 2004). However, we have perceptual experience of the world, and thus, scientists always have a subjective view, too. Due to this subjectivity, those who established their research on the principles of critical realism need to reflect the duality of structure and agency (Dobson et al. 2007). In particular, social situations can be difficult to be examined, as the researcher is more or less a part of them regardless of the research approach. Even if the researcher selects a survey as a research method, for example, the questions in the survey are still always the subjective choices of the researcher.

In this research, I lean to some extent towards the paradigm of **critical realism.** The methodological choices do not support the ideas of this paradigm in all aspects but accepting the epistemological ideas of the researcher as subjective actor within the research process, I discuss the role of researcher later in this dissertation (see Chapter 9.4). Otherwise, this study rests on positivism, in particular for its ontological groundings.

5.3 Research Approach and Methodological Considerations

Even though critical realism encourages adopting an inductive approach in looking for the underpinning mechanisms and structures, it is important to

note that critical realism excludes neither deductive reasoning nor quantitative modeling, such as simulation. According to Mingers (2006, p. 216), "*quantitative modeling can be very useful as way of discovering patterns of events that reveal the presence of underlying structures*". As it is possible to draw theoretical suggestions from the previous research, I have chosen **deductive reasoning** to be my research approach. In deductive reasoning, formulating and testing hypotheses play a major role. A test that runs contrary to the predictions of a hypothesis falsifies the hypothesis, whereas a test that meets the predictions of a hypothesis corroborates the hypothesis and thus, the theory, too. Therefore, hypotheses are tools for testing out possible explanations.

The research strategy of this study is to conduct a social network study within one company. It can be regarded as an *ex post facto* study (Kerlinger 1973). Here, a study within one company follows similar ideas as a case study, which, according to Yin (2003), "*is 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*" (p. 13). In the context of case studies, Yin defines a case as the unit of analysis, which could be e.g. an individual, a decision, a process, or an event. Another definition comes from comparative social science where a case is defined as boundaries around places and time, and can be regarded either as an empirical unit or as a theoretical construct (Ragin and Becker 1992). The latter depends on the ontological standpoint: realists see cases as either given or empirically discoverable, whereas nominalists see them as the consequences of theories or of conventions. In this study, a single research setting can also be referred to as a case, because the case study is a research strategy which focuses on understanding the dynamics present within single settings (Eisenhardt 1989).

Methodology refers to the procedures, i.e. research methods, used to acquire knowledge about the target (Iivari et al. 1998). As Weick (1984, p. 121) states, "*methods are simply ways to systematize observation*". By systematized observation, Weick means sustained, explicit methodological observing and paraphrasing of social situations in their naturally occurring contexts. Weick proposes that observers should adopt methods that are less compatible with their theoretical leanings so that they can discover new properties of organization-technology interactions.

The variety of methods includes both **nomothetic** methods and **idiographic** methods (Burrell and Morgan 1979). Nomothetic methods include formal mathematical analysis, experimental methods (laboratory

and field experiments), and non-experimental methods such as field studies and surveys, are "*epitomized in the approach and methods employed in the natural sciences, which focus upon the process of testing hypotheses in accordance with the canons of scientific rigor*" (Burrell and Morgan 1979, p. 6). In contrast, idiographic methods, such as case studies and action research, place "*considerable stress upon getting close to one's subject and exploring its detailed background and life-history*" (Burrell and Morgan 1979, p. 6). Nomothetic methods do not exclude the use of idiographic methods, and vice versa. Rather, methodology can vary from a mono-method to mixed-methods and to a multi-method (Saunders et al. 2007). In information systems science, there is a long tradition for combining both qualitative and quantitative methods. For example, in 1989, Weill and Olson (1989) called for the use of wider selection of methodologies in MIS research and recommended using a combination of qualitative and quantitative measures in the same study. In the same year, Kaplan and Duchon (1989) reported on this kind of study in MIS Quarterly. Perhaps one of the most distinguishable advocates for the use of multiple methods is John Mingers, who promotes critical realism as a new research paradigm and encourages towards a pluralistic method (Mingers 2001).

In social sciences, language always plays an important role, regardless of whether a researcher applies either nomothetic or idiographic methods. Constructs and measurement items are formulated and interpreted by using language. Data on attitudes, perceptions, observation, and views can be codified, quantified, and analyzed with quantitative methods – as long as we understand that the data rests on the language used in the data collection. If researchers and the subjects of the research have similar backgrounds and they are a homogeneous group, the language will not be as big an issue as in more heterogeneous environment. However, the researcher should always reflect the effect of the language and its various interpretations.

The aim was to reach a large number of individuals within an organization. As data collection had to be carried out in a limited timeframe set by the research site, I preferred using a questionnaire for data collection. Hence, the primary methodology in this study was to use **quantitative methods designed for social network analysis in one empirical research setting**. A study in just one research site is justified for at least for two reasons. First, data needs to be collected from all network members (Ibarra 1993), because the social network studies are especially sensitive for missing data (Knoke and Yang 2008). This excludes the use of surveys,

which, here, refer collecting mainly quantitative data from a random sample of the population. Secondly, the boundaries of the network must be defined in advance even if we do not yet know the names of the respondents (Wasserman and Faust 1994; Scott 2000), because all methods of social network analysis must be applied to a finite set of enumerable actors (Wasserman and Faust 1994). A thorough understanding about the context of the network helps in this task.

In order to assure the research methodology to be as rigor as possible, I applied case study guidelines (Yin 2003; Gibbert et al. 2008) in this single-site study. Among these guidelines are the use of multiple sources of evidence, the following of a case study protocol, and the use of theories as a driver. The use of multiple sources gives a better understanding about the research context; a case study protocol makes it possible to repeat the study either in the same context or elsewhere; and the use of theories as a driver differentiates the study from non-scientific reports.

In this study, the selected **time horizon** is cross-sectional rather than longitudinal research. The research question itself would have supported a longitudinal study but practical reasons, particularly the limited timeframe available for this study in the research site, forced me to choose a cross-sectional study.

5.4 Hypotheses

As the research approach of this study is **deductive reasoning**, where formulating and testing hypotheses play a major role, the hypotheses to be tested in this study are formulated next. A hypothesis refers to a statement that can be either verified or disproven. It does not necessarily have to be tested statistically but with other reasoning. The key concepts, constructs and the measurement items are described later in this chapter. Some of the hypotheses relate directly to the research questions, whereas some represent alternative explanations.

5.4.1 Company-Level Hypotheses

First, the focus is on the company-level perceptions. Here, I refer to all the respondents who are expected to represent the whole company. These respondents should include the top management team, and a representative sample of the middle management, experts and operatives. I assume that an organization's perceptual congruence on strategic IT-business alignment depends on knowledge sharing, which includes efficient knowledge

exchange structures. Cohesive and dense networks are assumed to be efficient ways to communicate and thus, exchange knowledge and contribute similar views (Coleman 1988; Reagans and McEvily 2003). This assumption also entitles a positive direction for the hypothesis. Therefore, the first hypothesis is the following:

H1: *The density in the interaction networks has a positive effect on perceptual congruence on strategic IT-business alignment.*

The company-level examination is limited to only intra-organizational interaction patterns as justified in the Chapter 5.1.

5.4.2 Tie-Level Hypotheses

Next, the similarity in the perceptions between pairs of actors within an organization is examined. Here, actors refer to individuals. The network relationships are dyadic variables, which describe ties between pairs of actors.

Communication relationships can be captured with sociometric questions (Zwijze-Koning and de Jong 2005). The respondents are asked to name the people in their company with whom they discuss what is going on in the company. In this way, the communication network can be defined. The relationship is encoded as one, if both of them report a tie. Direct ties link the actors together and create a social context, where actors are more likely to develop similar views (Salancik and Pfeffer 1978; Ibarra and Andrews 1993). The hypotheses H2a, H2b, and H2c are about the effect of interaction patterns on the similarity in the views of two actors.

Communication may flow in an organization in a different way than according to the formal organization charts (Hansen 2002). Communication networks may vary depending on needs. One situation for communication is giving and asking for advice about work-related problems (e.g. Krackhardt 1990; Ibarra and Andrews 1993; Yang and Tang 2004). The next hypothesis is the following:

H2a: *Individual actors i and j will be more likely to have similar perceptions of the strategic IT-business alignment if they are in a relationship of asking and giving advice in an organization.*

Another situation for communication is a need just to discuss what is going on in the company (Ibarra 1993). Discussion networks are not for problem solving but for information and knowledge sharing, and testing the ideas,

and therefore, an assumption is that they contribute to similarity in perceptions:

H2b: Individual actors i and j will be more likely to have similar perceptions of the strategic IT-business alignment if they are discussion partners.

Friendship is an informal tie between two actors, which I measured with a sociometric question in the questionnaire. The respondents are asked to nominate those whom they consider their friends (Krackhardt 1990; Ibarra and Andrews 1993). According to the friendship literature, people are more likely to identify psychologically with friends, not only because friendship shows similarities in attitudes but also because friends are normatively expected to identify with each other (McDonald and Westphal 2003). Hence, the next hypothesis is developed on the friendship's effect of the perceptions of IT-business alignment:

H2c: Individual actors i and j will be more likely to have similar perceptions of the strategic IT-business alignment if they are friends.

Formal organization structures represent the power structures defined by the management (Tushman and Romanelli 1983; Rank 2008). Dividing into functional departments is one way to organize an organization's operations. Next, hypotheses on the effect of formal structures on the perceived strategic alignment between IT and business are set.

Membership in the same department refers to whether a pair of actors belongs to the same department or not. For instance, Ibarra and Andrews (1993) found departmental affiliation to have significant effects on the job-related perceptions, and therefore, the next hypothesis is the following:

H3a: Individual actors i and j will be more likely to have similar perceptions of the strategic IT-business alignment if they belong into the same department.

In order to ensure lateral knowledge sharing, companies often establish different cross-functional work groups or committees (Galbraith 1973; Brown 1999). Steering groups are one example of these kinds of groups (Earl 1993; Karimi et al. 2000). As one of the main purposes of these structures is to guarantee efficient knowledge sharing across different departments, the next hypothesis is the following:

H3b: Individual actors i and j will be more likely to have similar perceptions of the strategic IT-business alignment if they belong into the same cross-functional groups.

All the above-mentioned five hypotheses suggest that a tie between a pair of actors influences the similarity in their perceptions of the strategic alignment between business and IT positively. The next hypotheses are at a tie-level as well, but they concentrate on explanations other than networks and organizational structures.

Relational similarity refers to the comparative demographic characteristics of members of dyads or groups who are in a position to engage in regular interactions (Tsui and O'Reilly 1989; Young and Buchholtz 2002). The same kind of professional background, similar experiences, and shared common interests or experiences can be regarded as a manifestation of relational similarity, and thus, these have been suggested explaining why similar views are created (Preston and Karahanna 2004). Because relational similarity attracts people and brings them together more easily, it can be expected that it can contribute the creation of similar views (Tsui and O'Reilly 1989).

If a pair of actors has a similar view on their own IT competence (Bassellier et al. 2003), they are relationally similar by definition. In this case, they share knowledge in the domain of IT. In addition, the similar views of shared domain knowledge (Reich and Benbasat 2000; Chan et al. 2006) can be regarded as a sign of relational similarity, too.

H4: Individual actors i and j will be more likely to have similar perceptions of the strategic IT-business alignment if they have similar views on shared domain knowledge.

Relevant background characteristics in this study include age, gender, and education, which consists of both the field of education and the degree of education (Tsui et al. 1992). The job-related background information is organizational tenure and the duration of the current job. Similarity in background characteristics concerns the following hypothesis:

H5: Individual actors i and j will be more likely to have similar perceptions of the strategic IT-business alignment if they have similar backgrounds.

The availability of the recent information causes a bias in judgments (Tversky and Kahneman 1974). The recency effect has been analyzed, for instance, in auditing (Guiral-Contreras et al. 2007), recruiting decisions

(Farr and York 1975; Shaheen 2010), and service quality evaluations (Abernathy and Engelland 2001), and found to create a significant source of bias in decisions and evaluations. Hence, it is possible that the perceptions of strategic IT-business alignment can also be explained with the experiences of other recent events related to IT-business alignment (Tversky and Kahneman 1974), as they are easier to be recalled. In the context of strategic IT-business alignment, a recent IT-decision's perceived ability to support business goals and needs may influence the general perceptions of strategic alignment, too. Therefore, the following hypothesis was developed:

H6: Individual actors i and j will be more likely to have similar perceptions of the strategic IT-business alignment if they have similar views on the recent IT-related decision.

5.4.3 Individual-Level Hypotheses

Next, the perceptions are examined at an individual level. The impact of interaction patterns and social networks can be examined by focusing on an individual's position in a network. The dependent variable for the following hypotheses is the perceived strategic IT-business alignment, whereas the others are the independent variables explaining the perceived strategic alignment.

Those who are close to an individual actor are also those through which information flows the best (Rice and Aydin 1991). Therefore, an individual's perceptions can be examined by comparing it with his or her alters' perceptions. Thus, the following hypotheses were formulated:

H7a: The perceptions of an individual actor's neighbors in advice network have an effect on an individual actor's perceptions of strategic alignment between IT and business.

H7b: The perceptions of an individual actor's neighbors in discussion network have an effect on an individual actor's perceptions of strategic alignment between IT and business.

H7c: The perceptions of an individual actor's neighbors in friendship network have an effect on an individual actor's perceptions of strategic alignment between IT and business.

Formal organization structures refer to all the various cooperative ties between organizational positions that have been intentionally created to safeguard economic processes (Rank 2008). I expect department

membership to have an effect on the perceptions (Salancik and Pfeffer 1978; Pfeffer 1980), as it can be considered a lens through which an individual examines the job-related environment. The views are expected to be different in different departments.

As different kinds of horizontal mechanisms are built for improving information exchange and knowledge transfer (Galbraith 1973; Brown 1999; Luftman 2000; Hansen 2002), I expect that affiliations with cross-functional groups or teams increase knowledge, and thus, also have an effect on the perceptions of strategic IT-business alignment. A formal rank referring to the organizational hierarchy is associated with power and thus, with access to resources, such as knowledge (Astley and Sachdeva 1984). Hence, I also expect a rank to have an effect on perceived strategic IT-business alignment.

The following hypotheses about the affiliations to formal intra-organizational structures were developed:

H8a: *The department to which an individual actor belongs has an effect on an individual actor's perceptions of strategic alignment between IT and business.*

H8b: *The number of cross-functional groups to which an individual actor belongs has an effect on an individual actor's perceptions of strategic alignment between IT and business.*

H8c: *An individual actor's rank in an organizational hierarchy has an effect on an individual actor's perceptions of strategic alignment between IT and business.*

The alternative explanations for the perceptions of strategic alignment can be drawn from personal attributes, including an individual's perceptions about competence and knowledge.

IT-business alignment is found to be more sophisticated if the individuals are competent in IT (Bassellier et al. 2003). If an individual's knowledge of IT is high, it is more likely that he or she understands a company's IT as a whole and not only through personal IT use experiences. Therefore, they are more likely to have different perceptions of strategic alignment between IT and business than does an individual with low knowledge on IT. The same occurs if an individual is interested in IT. Together with the knowledge, the interest constitutes an individual's personal IT competence.

In addition to an individual's personal IT competence, I expect an individual's perceptions of shared domain knowledge to have an impact on

the perceived strategic IT-business alignment. After all, shared domain knowledge has been recognized as one of the factors influencing strategic alignment in companies. (Reich and Benbasat 2000; Chan et al. 2006). Therefore, the following hypotheses were developed:

H9a: An individual actor's personal IT competence has an effect on his or her perceptions of strategic alignment between IT and business.

H9b: An individual actor's perceptions of shared domain knowledge within an organization have an effect on his or her perceptions of strategic alignment between IT and business.

Next, the hypotheses concerning individual's personal attributes, which can be regarded as background characteristics, were developed. Among these characteristics are gender, age, a degree of education, organizational tenure, and the duration of the current organizational position (Tsui and O'Reilly 1989).

H10: An individual actor's background characteristics have an effect on his or her perceptions of strategic alignment between IT and business.

The perceptions could also be explained with the experiences on recent events related to IT-business alignment (Tversky and Kahneman 1974). If an individual considers a recent IT-decision as capable of supporting business goals and needs, the views may also influence the general perceptions of strategic IT-business alignment. Hence, the sign of the effect is expected to positive.

H11: An individual actor's perceptions of how a single recent IT-decision was carried out have a positive effect on his or her perceptions of strategic alignment between IT and business.

In the hypotheses from H2a to H6, the focus is on the relationships between the actors, whereas in the hypotheses from H7a to H11, the focus is on the attributes of the actors.

5.5 Constructs and Variables

This chapter focuses on the key constructs used in this study. The guiding principal was to use established instruments whenever applicable. The process for development of the questionnaire is described in the chapter (Chapter 6.2). In the following, the measurement items intended to capture the constructs are presented in their final forms.

5.5.1 Perceived Strategic IT-Business Alignment

One of the most important constructs of this study is the *perceived strategic IT-business alignment*, which refers to how individuals see the strategic dimension of strategic IT-business alignment in their organization at an enterprise level in general.

Here, the construct of perceived strategic IT-business alignment is divided into two sub-constructs: first, how well the business and IT plans reflect each other (Kearns and Lederer 2000), and secondly, how well the IT systems support the value disciplines that an organization prefers (Tallon 2007).

The first sub-construct has two variables: 1) how business plans reflect IT plans, and 2) how IT plans support business plans. Kearns and Lederer (2000) pointed out that the alignment between business plans and IT plans must be bidirectional. Not only should the IT plans reflect the business plans but also the business plans should reflect the IT plans, including specific applications and technologies. According to them, this indicates that business executives acknowledge the importance of IT and information resources. This, in turn, increases the likelihood that a firm identifies strategic IT-enabled opportunities as well.

For these two variables, the relevant items of the instrument of Kearns and Lederer (2000; 2003) are applied. However, not every item is adopted as such but, in some items, minor changes have been made to fit the questions better both with the study and its research questions and with the research site. The variables are measured as the mean value of measurement items. These items with the scales can be found in the following table (Table 5).

IT plans reflect business plans Our IT plans reflect the business plans. Our IT goals reflect the business goals. Our IT plans support the business strategies. Our IT plans are realistic.	Scale from 1 to 5 in which: 1 = highly disagree 2 = disagree 3 = neutral 4 = agree 5 = highly agree
Business plans reflect IT plans Our business plans include an IT plan or they refer to an IT plan. Our business plans refer to specific applications and/or information technologies. Our business plans utilize our IT capabilities. Our business plans include realistic expectations for IT.	Scale from 1 to 5 in which: 1 = highly disagree 2 = disagree 3 = neutral 4 = agree 5 = highly agree

Table 5. Variables and measurement items for how well the business and IT plans reflect each other

The second sub-construct has also two variables. The first of these two variables concentrates on how well the current IT systems in use help to achieve different kinds of business goals, which were classified according to the value disciplines of Treacy and Wiersema (1995). The other variable focuses on the IT systems that are still pending.

The three value disciplines used in this study were operational excellence, customer intimacy, and product/service leadership. The value disciplines of Treacy and Wiersema were applied e.g. by Palmer and Markus (2000), Weill and Ross (2004), and Tallon (2007). According to Tallon, the concept of value disciplines uses more meaningful labels than Porter's typology, to which Treacy and Wiersema's typology parallels closely. Compared with Porter's typology, that of Treacy and Wiersema suggests that different technologies, applications, and infrastructure are required for each of the value disciplines. The next table (Table 6) shows the measurement items for how well the IT systems support the value disciplines preferred by an organization.

Giving weights to different value disciplines reveals views on a company's business strategy. Instead of calculating the profile deviation (Sabherwal and Kirs 1994; Tallon and Kraemer 2006), the mean value of how the current IT systems support achieving business goals is calculated and weighted by the importance of different value disciplines.

Our current IT systems help in achieving our business goals. How much weight does the value discipline of ... ... operational excellence get in your business? ... customer intimacy get in your business? ... product/service leadership get in your business? How much do your current IT systems help to achieve goals related to... ... the operational excellence? ... the customer intimacy? ... the product/service leadership?	Scale from 1 to 5 where: 1 = not at all 2 = little 3 = some 4 = much 5 = very much
Our pending future IT systems help in achieving our business goals. How much weight does the value discipline of... ... operational excellence get in your business? ... customer intimacy get in your business? ... product/service leadership get in your business? How much do your pending future IT systems help to achieve goals related to ... ... the operational excellence? ... the customer intimacy? ... the product/service leadership?	Scale from 1 to 5 in which: 1 = not at all 2 = little 3 = some 4 = much 5 = very much

Table 6. Variable and measurement items for how well the IT systems support the value disciplines preferred by an organization

The measurement items for perceived strategic IT-business alignment are also used in studying the perceptual congruence, which is defined as "*the degree to which individuals view matters similarly*" (Huisman and Iivari 2006, p. 30). Operationalization of perceptual congruence will be used with the coefficient of variation (c_v), which is a relation of the standard deviation and the mean value. The coefficient of variation is more discussed in the Chapter 8.3.

5.5.2 Interaction Patterns

The next key construct is the *interaction patterns*. It refers to **how individual actors are recurrently connected with each other in reality.** These interaction patterns are emerging structures that relate to the individuals' relationships with each other. Communication, advice, and friendship networks are common emerging structures (Brass 1984; Gibbons 2004). Communication and advice networks are more instrumental, whereas a friendship network can be considered more expressive (Ibarra 1993).

Table 7 presents the items with which I measure if a pair of actors is reciprocally connected or not in three different networks. These measurement items are mainly binary, i.e. the tie either exists or does not. They are adopted from Ibarra (1993).

A tie in an advice network Whom do you prefer to contact when you need work-related advice? Who tends to contact you when in need for work-related advice?	Binary ties; A combination of multiple choice from a roster and a recall approach
A tie in a discussion network With whom do you discuss most often what is going on in your company?	
A tie in a friendship network With whom are you a friend?	

Table 7. Variables and measurement items for relationships in different networks of interaction

As the interaction patterns form networks, some focal variables are related. The *network density* is an aggregate measure and examines the network as a whole, not actors within it. It is measured with the number of connections in a network expressed as a proportion of the maximum possible number of connections.

5.5.3 Affiliations to Formal Intra-Organizational Structures

The second key construct is the *affiliations to formal intra-organizational structures* within an organization. It refers to **how individual actors are connected to formal structural systems**, which can be characterized as intentional and defined.

Departmental structure – as an example of formal structural systems – is a manifestation of the views of the management on how to organize the functions of a company and is often illustrated in organization charts (Daft 2007). In some organization structures, such as in matrix organizations, an actor can belong to several organizational units or departments, whereas in a traditional functional organization an actor is usually attached to only one unit.

Even if an organization structure is a functional hierarchy, there can be several lateral structures in addition (Galbraith 2002; Daft 2007). These structures may be either temporary or more permanent. For instance, projects represent temporary structures, whereas steering groups or working groups might have been established for purposes that are more permanent.

Affiliation to the organizational department(s) is measured by allowing the respondent to choose his or her department from a list that included all the departments in an organization. A list for choosing the cross-functional groups is provided but also an option to add other groups, which are missing from the list, is offered. The questions are listed in the Table 8.

Department What is your organizational department or unit?	Selection from a list of multiple choices plus an open question
Affiliations to cross-functional groups To which cross-functional groups or committees do you belong?	

Table 8. Variables and measurement items for affiliations to formal intra-organizational structures

In this study, affiliation data is transformed into adjacency matrices when needed for the analysis purposes. This way, a tie-level variable on whether two actors belong to the same departments or groups or not is obtained.

In addition to the abovementioned questions, the reporting structure and the hierarchical position in the company are investigated. The following table (Table 9) contains the measurement items for studying the reporting structures (Armstrong and Sambamurthy 1999; Preston et al. 2006) and finding out the hierarchical positions, i.e. organizational *ranks*.

A tie in reporting structures To whom do you report?	Open question (NAME REQUIRED)
Rank How many reporting levels are there between you and the CEO?	Selection from a list: None (you report directly to the CEO) 1 (your direct supervisor reports directly to the CEO) 2 3 4 or more

Table 9. Variables and measurement items for reporting structures

5.5.4 Perceived Shared Domain Knowledge

One of the focal constructs included in the study in order to investigate the alternative explanations suggested in Chapter 1.4 is perceived shared domain knowledge. This can be defined as the perceptions of "*the ability of different (sub-)groups from different domains to understand and respect each other's contribution and challenges, and even to participate in each other's processes, contribution, and challenges*" (Reich and Benbasat 2000, p. 86). In this study, the concept of perceived shared domain knowledge splits into two sub-constructs. The first is that of an individual's own perceived domain knowledge, where a domain refers to IT. The second is perceived shared domain knowledge, where a domain refers to both business and IT.

An individual's own perceived IT knowledge can conceptually be defined more broadly than simply as IT-related skills. A popular concept, which is appropriate for this study, is competency (Athey and Orth 1999), which is also called competence for instance by Basselier et al (2001). They discuss the concept of competence and bring up the fact that the term

"competence" has been used in several areas and in various meanings. They want to keep a performance aspect out and to see competence purely as the potential that leads to effective behavior, i.e. performance. I adopted this viewpoint and studied the IT competence of individual respondents. Here, the construct of personal IT competence consists of two variables: IT knowledge and IT interest. Both are measured with self-reports, which may be biased from reality but reflect the respondents' self-image.

As knowledge has both explicit and tacit dimensions, Basselier et al. (2001) have separated these two dimensions in their study on IT knowledge. They measured both explicit IT knowledge, by splitting it into very specific areas, and tacit knowledge, which can be regarded as the cognition and use of IT. As dividing the concept into explicit and tacit dimensions or studying the knowledge in very specific areas, such as technology or systems development, is not relevant to my research, I decided to use an aggregate measurement item with which a respondent can give an overall rating.

Lack of interest in IT may be an obstacle to developing personal IT knowledge. It reflects the lack of motivation known as a source of internal stickiness in knowledge transfer (Szulanski 1996). Consequently, high interest in IT is more likely to build an individual's IT knowledge. It can be considered a mindset (Yoon 2008) or attitude (Athey and Orth 1999) towards IT. In the following table (Table 10), the measurement items for both variables are presented.

IT knowledge How well do you know the current IT solutions in your company?	Scale from 1 to 5 where: 1 = not at all 2 = poorly 3 = to some extent 4 = well 5 = very well
I am knowledgeable with IT related terms, special vocabulary and terms, or abbreviations.	Scale from 1 to 5 in which: 1 = highly disagree 2 = disagree 3 = neutral 4 = agree 5 = highly agree
IT interest I am interested in information technology. I enjoy discussing information technology. I follow actively the development and trends of information technology.	Scale from 1 to 5 in which: 1 = highly disagree 2 = disagree 3 = neutral 4 = agree 5 = highly agree

Table 10. Variables and measurement items for the personal IT competence

For the second sub-construct, that is perceived shared domain knowledge, I followed the same principle of using aggregate measurement items for measuring business executives' IT knowledge and IT executives' business knowledge as I did for measuring an individual's IT knowledge. The following table (Table 11) presents the measurement items.

Business knows IT In your opinion, how well do those who are responsible for business know the current IT solutions in your company?	Scale from 1 to 5 in which: 1 = very poorly 2 = poorly 3 = to some extent 4 = well 5 = very well
IT knows business In your opinion, how well do those who are responsible for IT know your company's business?	

Table 11. Variables and measurement items for the perceived shared domain knowledge

5.5.5 Perceived Business Support of the IT Decision

When the IT function is centralized, it can be difficult for other than IT experts to assess how IT decisions fit with the existing and planned technological architecture. Instead, the fit with business is much easier to evaluate. Therefore, this study focuses on the experiences from a previous IT-related decision from the perspective of perceived business support of the IT decision. It refers to how well the business needs are taken into account in an IT decision. It has one variable with two measurement items depicted in Table 12.

Business is taken into account in IT decision How well are the business needs taken into account in this decision?	Scale from 1 to 5 in which: 1 = very poorly 2 = poorly 3 = not poorly neither well 4 = well 5 = very well
How well does this decision support achieving the business goals?	

Table 12. Variable and measurement items for how well IT decision supports needs and goals of business

5.5.6 Background characteristics

Personal background characteristics are measured with the following categorical variables: the gender, age, field of education, and degree of education. The measurement items came from the previous literature on organization theories (Tsui et al. 1992; Tsui et al. 2002), where the relational similarity has been successfully used for explaining e.g. organizational attachment and subordinate-supervisor relationships. The scales for each variable are represented in the following table (Table 13):

Personal background variables	
Gender	Male Female
Age	less than 20 years 20 – 29 years 30 – 39 years 40 – 49 years 50 – 59 years 60 or over
Field of education (*	General education Teacher education and educational science Humanities and arts Social sciences and business Natural sciences Technology Agriculture and forestry Health and welfare Services Other or unknown field
Degree of education (*	Basic level education Upper secondary level education Lowest level tertiary education Lower-level tertiary education Higher-level tertiary education Highest-level tertiary education (doctoral) Level unspecified or unknown

*) classification from Statistics Finland (www.tilastokeskus.fi)

Table 13. Measurement items of personal background variables

In addition to the affiliations to different organizational structures, some other organization-related background characteristics are measured with the following variables in Table 14:

Organization-related background variables	
Organizational tenure (the year when entered this company)	2008 – 2009 2003 – 2007 1998 – 2002 1993 - 1997 1988 – 1992 1987 or earlier
Duration of the current position (the year when started in the current position)	2008 – 2009 2005 – 2007 2002 – 2004 1998 - 2001 1997 or earlier

Table 14. Measurement items of organization-related background variables

5.6 Summary of the Chapter

This chapter represented the research framework and boundaries for this study. Different levels of examination have been considered. The philosophical foundations for this study have been discussed, the research approach was chosen and arguments for choosing a single-site study with quantitative methods as the primary methodology were presented. This chapter introduced the hypotheses, operationalized constructs, variables, and measurement items used in the questionnaire to capture them.

6 Research Site and Data Collection

In this chapter, the research site used in this study is introduced by first explaining how it was selected, and then by describing it in more detail. The research protocol and data collection process are also described.

6.1 Research Site

The research site was required to meet the pre-defined criteria. The first criterion was that IT should be in a focal role in business processes. This was fundamental from the research problem's point of view. Secondly, the organization should have either a centralized or federal (hybrid) IT function. In these kinds of organizations, the need for collaboration between IT department and other business units or departments is greater than in fully decentralized organizations. In order to get useful information about the context, a research site should preferably be easy to access and cooperative to work with (Stake 1995). Therefore, I proceeded by contacting the companies, which on the one hand, fulfilled the pre-defined criteria, and on the other hand, I was familiar with through having contacts with an executive level person.

The organization chosen as the research site met all these requirements. The organization, Zeta (a pseudonym) is a Finnish company, which operates in the **energy industry**. The products and services in the energy industry traditionally are not regarded as particularly information-intensive but the role of information technology is increasing. The automated industrial processes have been built on technology for a long time but a need to incorporate information into the enterprise systems has grown during the past decades.

The research strategy was not only to examine the perceived organizational-level strategic alignment between IT and business but also to study how IT-related decisions are made in practice. Using a concrete example gives more insight to the context. Together with Zeta's CIO and one of the Vice Presidents, we chose a recent IT-related project to be

examined more closely. At the time, Zeta was in the middle of an implementation of **a new intranet system, ZetNet** (a pseudonym). The pre-defined criteria for an IT-related decision to be examined were that it should have (1) easily recognizable effect on business, (2) an impact on the majority of the organization, and (3) it should be rather recent. The decision on ZetNet met all these criteria. The CIO brought this suggestion up to the top management team to get permission for the study. The research proposal was presented to the top management team members who all agreed to participate personally by responding to a web-based questionnaire.

6.2 Data Collection

A web-based questionnaire (see Appendix 2) was used to collect the primary source of data. It was targeted to all the members within the pre-defined network boundaries. The web-based questionnaire was built with Webropol (http://www.webropol.fi), which enabled the tracking of the non-respondents easily. The collecting letters were easy to be addressed to those who had not read the e-mail with the link to the questionnaire or who had not yet completed the questionnaire.

Interviews with the key informants and certain organizational documents, i.e. annual reports, organization descriptions, organization charts, and written reports, served as the secondary data source.

The data collection started with the discussions with one of the Vice Presidents and the CIO, who gave an overview of the business and helped to specify the research plan. In these meetings, some of the organizational documents were shown or received. Some of the documents were publicly available from the company website. After this, the data collection phase continued with a use of web-based questionnaire and finally by conducting three interviews.

6.2.1 Questionnaire as the primary source of data

The primary source of data is based on a questionnaire, which included both open and structured questions. The development of the questionnaire started with a review of the previous empirical and theoretical literature. Whenever applicable, the questions were adopted as such from the previous studies. Some questions were applied with few changes to fit better with the study and its research questions. For most of the questions, five-point Likert-type scales were used (highly disagree to highly agree). A part of the

structured questions consists of *sociometric* questions, which are very appropriate for network studies and help to figure out both formal and informal network structures in quite an efficient way (Zwijze-Koning and de Jong 2005). In sociometric questioning, a respondent maps social contacts around him or her. If a respondent himself or herself is a part of a contact or a tie, the mapped network is called an ego-centered network. I used ego-centered sociometric questions in the questionnaire to map the friendship, advisory, and communication networks.

The development of the questionnaire involved a pre-test with IS practitioners and management consultants. Based on the feedback received in the pre-test, I made minor changes in the wordings of certain items and rearranged the order of some items. The changes clarified the questionnaire and made it easier to fill out. The terminology was checked with the key informants of Zeta. In addition, I cross-checked the terminology used in the questionnaire with the organization-specific documents. The previous chapter (Chapter 5.5) presents the questions in their final form.

The final questionnaire consisted of seven different parts. In the first part, I asked a respondent to define his or her organizational position. The second part included sociometric questions about informal network structures. The next section concentrated in the enterprise-level questions about the strategic IT-business alignment. One part of the questionnaire focused on the shared knowledge and knowledge sharing behavior in IT-business relationship on organizational and personal level. The fifth section included questions about the IT-related decision, which in this case was the ZetNet. The sixth part contained the questions about individuals' demographic information and their attitudes towards IT. The questions in the last section addressed the organizational culture but in this dissertation, I have limited the cultural aspects and placed them out of the scope. Organizational culture will be examined in future studies. The questionnaire as a whole is attached as Appendix 2.

Some of the questions were only used to write up an organization-specific report to Zeta.

I built a web-based questionnaire in which the respondents could reply when it best suited them. As an option, I also offered an opportunity to participate in an interview instead of filling in a questionnaire. However, everyone selected a questionnaire over the interview.

6.2.2 Secondary sources of data

In addition to the questionnaire-based data, I held one-to-one **interviews** with the CIO, the Development Manager, and the Vice President responsible for Business Planning. These informants hold a central position in the intranet project. In addition, the Vice President responsible for Business Planning was able to give insight on the top management team. The purpose of these interviews was to provide versatile background information in order to understand the context better. The interviewed persons were the initiators for this particular decision and the experts on the IT planning process. They could also assist in explaining why some of the responses were difficult to give. The focus of the interviews was on IT-related decision, formal structures, and knowledge exchange practices. The interview protocol is presented in Appendix 3. The interviews were tape-recorded and transcribed, and in addition, the notes were taken during the interviews. The interview data was analyzed by identifying both the pre-defined and emerging themes. Only one researcher analyzed the transcribed interviews, which is one of the limitations of the study.

Other sources of evidence, which were available during the study, consist of annual documents starting from 2001, the company websites, and some training material relating to ZetNet. Even though the written documents included high-level organization charts, the CIO presented more detailed organization charts in a meeting where I was able to document this information. In addition to the training material about ZetNet, I was shown a demonstration of it and its main functionalities.

6.2.3 Determining Network Boundaries

For a network analysis, one needs to determine the boundaries of the network. Without appropriate pre-set boundaries, the network structure may be distorted. I defined my data collection to cover the intra-organizational connections of the top management team members and of those who the top management team identified as a discussion partner in organizational matters, a trusted partner to whom they turn in a need for advice, or a friend. The strategic alignment between IT and business can be regarded as the responsibility of the top management (Ross and Weill 2002; ITGI 2005), and hence, I wanted to explore their perceptions of the alignment. I also consider the perceptions at the lower levels of the organization to be important, because, even though developed at executive level, strategy is essentially implemented at lower levels (Chan and Huff

1992; Davies 1993; Campbell et al. 2005). However, I limit to the representatives of the lower levels that have a reciprocal relationship with any member of the top management team in any of the networks or structures studied in this research. All the actors, which the top management team nominated in their responses, were included in the network, and therefore, they were contacted. In this way, I could check if the connection was reciprocal.

Because I did not know the exact number of the network members or their names at the beginning of the study, I used both the positional approach and the **snowball technique** to track the network (Wasserman and Faust 1994; Scott 2000). The first person contacted was the CIO of Zeta. The next data collection phase consisted of the people, who the CIO named in his response. Among these names were all the top management team members. In this second phase, some new names came up. Therefore, the new ones were contacted in the third round. However, everyone who was considered as external from Zeta's perspective was excluded. All the top management team members responded in the second round. That is why the data collection finished after the third round.

Using the snowball technique expands the network until the predefined boundaries are met. One of the disadvantages of this method is that it excludes the isolates. All the actors are connected to each other either directly or indirectly. However, this was not an issue in our study since we managed to reach all the top management team members with this technique.

Figure 5 demonstrates the principles on how the data collection process proceeded. An arrow points from a respondent to those that he or she has named. In this example, two people (#2 and #6) have suggested an external consultant who was not approached due to his or her external position. All the top management team members were contacted in the second round, and therefore we did not contact those (#8) whose name came up in the third round. The data collection process reached its end in the third round. Note that this is only an illustrative example on the data collection principles.

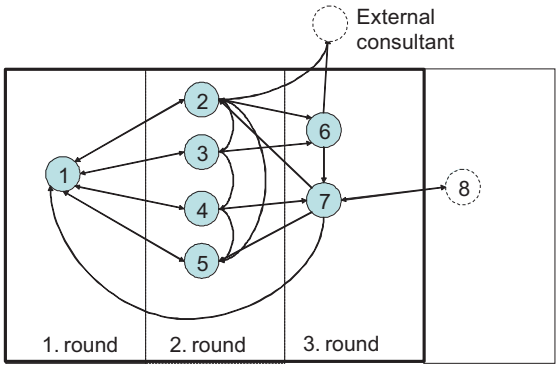

Figure 5. Principles for determining the interview rounds

6.2.4 Data Collection Process

The data collection started on the 16th of April in 2009 when the CIO received the questionnaire. The second round with 14 invitees started on the 27th of April and ended on the 13th of May. The third round began on the 18th of May, when I invited 21 new people to join the study. The third round ended on the 4th of June. During both the second and the third round, I had to send reminders to those whose responses were late. Table 15 illustrates how the data was accumulated.

	Sending date	The number of sent invitations or reminders	The cumulative number of responses
1. round: the CIO	16th of April.	1	1
2. round:			
* invitation	27th of April	14	7
* the 1st reminder	30th of April	8	13
* the 2nd reminder	12th of May	2	15
3. round			
* invitation	18th of May	29	22
* the 1st reminder	22nd of May	21	32
* the 2nd reminder	29th of May	11	35
* the 3rd reminder	3rd of June	7	37

Table 15. The data collection

The participation in this study was voluntary. Nevertheless, I received a high number of responses. Everyone in the top management team responded. The top management nominated 29 people, of which 22 replied. It turned out that three people were on a leave of absence, and therefore they were not reached. Four people did not reply despite the reminders. The total number of responses was 37 out of 44, which results in the response rate of 84%. The CIO considered the response rate very high if compared with the response rate in other surveys in Zeta.

The data collection for this study started in April and ended at the beginning of June. As the roll-out of ZetNet was in March 2009, the responses concerning ZetNet reflected the first user experiences.

6.3 Respondents

Responses were received from every organization unit. The following table (Table 16) shows the distribution of the responses to different organization units.

Organization unit [1]	Number of invitations	Number of responses	Number of missing responses
1a Business planning (excluding IT)	5	5	
1b IT	7	7	
2 Production	3	2	1
3 Finance	2	2	
4 HR	2	2	
5 New business	5	3	2
6 Investments	7	4	3
7 Sales	5	4	1
8 Services	6	6	
9 Brokerage	1	1	
CEO	1	1	
Total	**44**	**37**	**7**

Table 16. The organizational distribution of the responses

Geographically, the majority of the respondents (62%) were from the headquarters, which is located in the metropolitan area. The representation from the second biggest office was 22%, and the rest of the respondents came from three smaller offices.

By looking at the organizational positions of the respondents, it can be noted that ten of 37 respondents represent the top management, 19 represent middle management, and the rest of respondents experts or operatives. Eight of the top management team belong to the IT steering group, which has ten members in total. In addition to the top management team members, IT steering group employs the CIO and one representative of middle management.

With regard to the education level, the respondents were very homogeneous. The majority (62%) had a university degree, and in addition, everyone in the top management team held an academic degree. The

[1] The names of the organization units are not from the organization chart as such but they are converted into more general descriptions to maintain the anonymity of the case organization

education of the respondents was mainly either from the branch of technology or from social sciences, such as business administration. Table 17 illustrates the education level and fields of education represented among the respondents.

	Field of education			
Education level	Technology	Business administration or other social science	Missing	**Total**
Higher-level tertiary education	11	7	1	19
Lower-level tertiary education	4	0	0	4
Lowest-level tertiary education	6	2	0	8
Upper secondary level education	2	1	0	3
Basic level education	0	0	1	1
Other	1	1	0	2
Total	24	11	2	37

Table 17. Education

The turnover in personnel is relatively low in Zeta. Thus, the majority of the respondents had long careers in the organization (see Table 18). Many of them had held the same position for many years (Table 19).

The year when the respondent started in Zeta	Organizational tenure	# of respondents	% of respondents	Cumulative %
1988 or earlier	More than 21 years	7	19%	19%
1989 – 1992	17 – 21	11	30%	49%
1993 – 1997	12 – 16	5	14%	62%
1998 – 2002	7 – 11	3	8%	70%
2003 – 2007	2 – 6	10	27%	97%
2008 or later	Less than 2 years	1	3%	100%

Table 18. The length of the careers among the respondents

The year when the respondent started in his/her current position	Positional tenure	# of respondents	% of respondents	Cumulative %
1997 or earlier	More than 11 years	8	22%	22%
1998 – 2001	8 – 11	4	11%	33%
2002 – 2004	5 – 7	6	17%	50%
2005 – 2007	2 – 4	11	31%	81%
2008 or later	Less than 2 years	7	19%	100%

Table 19. The length of the current position among the respondents

The age structure of the respondents was distributed quite evenly between people in their thirties, forties, and fifties (Table 20).

Age	# of respondents	% of respondents	Cumulative %
20 – 29 years	1	3%	3%
30 – 39 years	13	35%	38%
40 – 49 years	12	32%	70%
50 – 59 years	10	27%	97%
60 year or more	1	3%	100%

Table 20. The age structure of the respondents

The proportion of male respondents was 70%, whereas 30% of the respondents were female. This represents very well the organizational demographics.

6.4 Description of the Research Site

Next, I describe the research site in more detail. The description of the site is mainly based on the secondary source of data, particularly the analyses of the interviews, but the data received with the questionnaire has also been used here. The themes and findings of the interviews are embedded to the description of the research site.

As stated previously, Zeta operates in the **energy industry**. The financial turnover of the company has had an upward trend but in the same year when the data was collected, there was a downswing in turnover. However, the return on equity was high on that particular year. In recent years, the CEO has emphasized the importance of product and service innovation as a response to a growing number of new customers craving for a diverse set of new services. The customer base consists of domestic households and private customers as well as industrial enterprises and municipal energy companies. However, at the same time, the Energy Market Authority has been demanding more cost-efficiency. Hence, the objectives are rather contradictory.

Zeta's head office is located at the metropolitan region and the majority of its personnel work there. However, Zeta has offices in other Finnish cities as well. If measured by a number of employees, Zeta with 200 employees can be classified as a medium-sized organization, and therefore, it provides a manageable environment for mapping a network structure. The personnel turnover has been relatively low; the percentage of people who have been working in Zeta for ten years or more is almost 60%. The proportion of executives, managers and experts is 34%, whereas the staff and other operatives represent 66% of the personnel.

The structures in Zeta have developed over years and many have held their current positions for a long time. Zeta could be described as a stable organization – or, one can even get an impression of a static firm. Zeta has nine **functional departments** of which three represent administrative functions, such as finance, human relations, and business planning.

During recent years, there have been some changes in the organization and there is a slow transformation phase in progress. The subsidiaries have been integrated more tightly to the parent company in order to avoid redundancies particularly in administrative activities and to seek synergy for instance in the use of information technology. Zeta has been changing from a one-product-strategy to many-services-strategy. New services have been developed and new types of customers have been found.

The top management team consists of nine executives. The team has reorganized its way of action by establishing several working committees. The most occupied top management member belongs to six working committees, whereas the CEO represents the opposite, by not belonging to any of the working committees. The average number of working committees per top management team member is three. The more detailed discussions are carried out in the working committees while the top management team concentrates on more high-level issues. The working committees were established a couple of years ago to decrease the workload in the meetings of the top management team.

The communication culture within Zeta is, at least in principle, open but it is rather limited. The Vice President stated, "*regarding our internal communication, we lack initiative*". The Development Manager admitted that there have been no specific efforts to develop communication but communication has been stabilized to certain patterns: "*I just know who I should contact*." These patterns can be regarded as **an informal organization**.

6.4.1 IT Function

The IT is organized as a centralized function. It is a part of the business planning function. The IT department has seven employees, including the CIO[2] as a head of the department. The headcount is rather low resulting in a high workload. The IT personnel are very technically oriented. They do not

[2] In this study, the CIO (Chief Information Officer) refers to the most senior person in an enterprise responsible for the information technology and computer systems. He or she does not necessarily need to report to the CEO or to be a part of the top management team.

participate in the bi-weekly meetings of the Business Planning department, as the agenda of these meetings is more business-oriented, and thus not considered very useful for IT experts. As the Vice President stated, "*they* [IT experts] *are different by nature. They* [other people in the Business Planning department] *are more academically educated whereas the IT experts are heavily focused on their own operational activities*." The Development Manager said, "*IT department holds their own meetings* [not participating in the Business Planning department's meetings]. *Weekly information exchange is lacking. After the IT department moved to another floor a year ago, we did not see them daily any longer*." Thus, **the isolation of the IT department** from the rest of the organization is clear.

The CIO has a long career in Zeta, and thus, not being a freshman, knows the business by now. The IT knowledge of business people is mainly on his responsibility, since his department is reported being the main source of new IT knowledge for most of the personnel in Zeta. The majority of the respondents reported Zeta's own IT department to be among the sources of new IT knowledge, and the CIO is the most knowledgeable person in IT-related issues.

As Zeta is a function-based organization, the business planning process is also carried out **in silos** without properly integrating the plans (Martin et al. 2005). The IT plan receives its input from the business plans, and the IT plan is discussed within the IT steering group before it is approved. Thus, the planning process is one-way planning with sequential integration although there are attempts to move to two-way planning with reciprocal integration (Teo and King 1997b). The CIO stated, "*it* [IT plan] *is mainly an exercise of my own. If there are new* [strategic] *initiatives in business, I don't get information about them early enough* [...] *We are lacking the means to identify IT-enabled opportunities in our business planning process. I should be in the beginning of the planning process in order to react early enough, as not everything is written down*."

As the planning horizon keeps on shortening and the significance of IT for business continues to increase, there are growing needs for fully integrated planning in the future. The new IT-enabled opportunities cannot be easily recognized and utilized if planning takes place in silos. Once having the one-product-strategy matched well with centralized structures, including centralized IT. However, as the company diversifies, centralization causes challenges. It becomes more difficult to meet all the needs in the company, as everything becomes more complex and requirements for information

processing multiply (Galbraith 1973; Bergeron et al. 2004). In practice, this can lead to situations where the principle of centralized IT is violated. As the CIO puts it, "*if they need something* [e.g. an application] *in the business process, they acquire it on their own without negotiating with us first and without understanding the whole picture but being guilty on partial optimization* [...] *If there has been no understanding of the whole picture of enterprise-level IT, things have usually turned sour*." Obviously, there has been experience on **the limited understanding of enterprise-wide IT** in Zeta.

In Zeta, the CIO is not a member of the top management team. Neither does he report to the CEO. However, to facilitate the communication between business executives and IT function, Zeta has established an IT steering group to which the CIO represents the IT initiatives. The IT steering group consists of the members of the top management team excluding the CEO. In addition to the top management team members, there are two other managers present. The IT steering group meets four times a year. The meeting agenda depends on the on-going phase of the annual planning process. For example, the IT Balanced Scorecard is discussed in the first half of a year. Additionally, once a year, the IT steering group gets together for a full-day workshop. However, **the working culture is somewhat passive**. According to the CIO, "*they are not sharing their views or business insight but they are more or less just listeners*." The Development Manager stated that "[in the IT steering group meetings], *there should be more discussion and participation instead of walking through status reports.*"

6.4.2 Intranet Project as an IT-Related Organizational Decision

As the idea was not only to examine the perceived organizational-level strategic alignment between IT and business but also to study how IT-related decisions are made in practice, a recent IT-related project, a new Intranet system called ZetNet, was chosen to be examined more closely. As this IT-project was rather typical for Zeta, it concretizes Zeta's decision-making in IT-matters. The average rating for whether ZetNet was a typical IT-related decision was 3.83 in the scale from 1 to 5, where 1 refers to "very untypical" and 5 to "very typical".

By applying Weill and Aral's classification for IT assets (Weill and Aral 2006), the new Intranet system, ZetNet, is an informational investment providing information for different purposes, such as reporting, compliance, and communication. The primary objective for ZetNet was to

provide a platform for a new integrated **management system**. The old system based on Lotus Notes had become obsolete. Descriptions, templates and other documentation of policies, practices, and procedures were spread out all over the organization and the latest versions were difficult to be traced. There was no big picture available on Zeta's management system available. Neither did the old system support process-oriented thinking, which was recently launched. Zeta had been looking for a new system for a long time – at least for five years – but there had been no applicable solutions on the market until Microsoft SharePoint technology.

The Development Manager who was responsible for the management system shared his concerns with the CIO, and together they started to search for a solution the most applicable to Zeta. One of the Vice Presidents joined this team and they had thorough conversations on the needs and requirements for a new system. When they were familiarized with a solution based on Microsoft SharePoint technology, they realized that it would be reasonable to renew the intranet system as well, and to integrate it better with the management system. The existing intranet was not very old and it was working rather well but its renewal came almost as in a bargain with the new management system. The new intranet would have functionalities that are more modern. Among these would be Wikipedia, blogs, and tags. Even though the development of management system was the original driver for the project, the intranet functionalities were heavily emphasized in communication. Thus, the project was primary regarded as an intranet project. The Vice President commented that "*we did not realize that the old intranet was thought to be owned by Zeta's Communication Group, which belongs to the Business Planning department. So, the ZetNet project turned out to be a project responding to the requirements of internal communications and not focusing as much on the management systems as it was originally thought*."

The team consisting of the CIO, the Development Manager, and one of the Vice Presidents presented the suggestion first to the IT steering group, and thereafter, they made an investment proposal for the top management team on acquiring a system, which combines the management system and the intranet. The top management team accepted the proposition and the implementation project was set up in spring of 2008. From Zeta, there was a small team of five people attached to the project. The implementation was bought from a vendor, which Zeta considered a trustworthy partner and from whom Zeta had earlier bought services. During the implementation project, the vendor was merged with another service provider but this did

not cause any changes in project personnel. However, both the budget and the schedule were exceeded due to unexpected problems that the vendor had. In Zeta, there were some doubts about whether the vendor had tested the technology adequately in advance. Thus, people in Zeta got an impression that the vendor had introduced an unaccomplished solution. The Vice President said that "*it was the problem that the vendor had not developed the solution as far as they let us understand. They did not have a completed and tested application.*" The CIO also stated, "*there were technical problems. There were such new issues also for the vendor that they had not met earlier. This is why the timeframe did not hold.*"

In addition, there was an organizational change in the management system that took effect at the beginning of 2009. The project team was not prepared for this kind of change, and therefore, they decided to roll out the system over several phases. The first release covered the renewed intranet but the majority of the management system's functionality was left to the later releases.

In the previous intranet project, the users were engaged in the systems development. However, the benefits of user-participation were not obvious, and the users' impact on the contents of the outcome was not significant. The CIO stated that "*previously we have gathered ideas and feedback from the users* [in the development phase] *but we found it useless. We only wasted our time.*" This time, user engagement was intentionally smaller in order to achieve higher efficiency in the project. According to the CIO, a broader user engagement would simply have retarded the project and brought only very little if any new value. Instead, the project team decided to put effort in communication and training. The project team set up a road show, in which they gave an overview of a new system in the department. The road show consisted of PowerPoint presentations and small demonstrations on the system. Participation in road show events was not mandatory but they were open to everyone interested to learn about the new system.

The first release of the system was rolled out in March 2009 three months behind the original schedule. Afterwards, the Vice President admitted that "*our approach was too light*". He conceded being "*naïve in assuming that they* [functionalities and involvement of the users] *would come automatically*". In summary, the approach in the **implementation project was carried out in a too light and naïve way** in order to meet the forthcoming challenges.

6.5 Summary of the Chapter

In this chapter, the research site was introduced by first explaining how it was selected. The research site needed to meet three pre-defined criteria. Firstly, the organization must not be too large or multifaceted. The second criterion was that IT should be in a focal role in business processes. Thirdly, the organization should have either a centralized or federal (hybrid) IT function.

In addition, the research site was described. In summary, Zeta is a Finnish company, which operates in the energy industry and can be classified as a medium-sized organization with 200 employees. Therefore, it provides a manageable environment for mapping a network structure. Zeta has nine functional departments of which three represent administrative functions, such as finance, human relations, and business planning. The IT is organized as a centralized function, which is a part of the business planning function. The top management team consists of nine executives. The CIO is not a member of the top management team. Neither does he report to the CEO. Zeta has established an IT steering group to which the CIO represents the IT initiatives. The IT steering group consists of the members of the top management team excluding the CEO.

This chapter also included a description of the data collection, which was primarily carried out using ***a web-based questionnaire*** targeted to all the members within the pre-defined network boundaries. The data collection for this study started in April 2009 and ended at the beginning of June 2009.

7 Overview on the Data

The primary data of the study was captured with a web-based questionnaire (see Appendix 2). The data consists of several constructs. In this chapter, the data and minor revisions to the operationalization of the constructs are described. In addition, the missing data is addressed.

7.1 Some Remarks on the Data

It is important to take into account that the data is not independent and therefore the traditional statistical analyses are not applicable as such (Hanneman and Riddle 2005). However, statistics provide some useful tools for summarizing and describing the data and even testing hypotheses about the network data.

One has to remember that social network analysis is about relations among actors, not about relations between variables (Wasserman and Faust 1994; Scott 2000; Knoke and Yang 2008). In social network analysis, there are alternative numerical approaches to estimate standard errors for network statistics. For example, bootstrapping and permutation approaches create sampling distributions based on thousands of random trials (Hanneman and Riddle 2005).

7.2 Missing Data

Despite the high response rate, the collected data included some missing values. For some items, the number of missing values was relatively high, whereas for some items only a few respondents did not respond. Many of the items did not include missing values at all.

Some items had to be excluded due to the considerable number of missing values from the quantitative analysis. However, these items with a great number of missing values tell valuable information on where the gaps in knowledge concerning these areas in the organization are.

Some of those items that were included in the variables and further analysis had some missing values, too. The missing values are assumed to reflect the ignorance, not the reluctance to respond. In order to maintain the network as such and not to exclude any respondents, it was not possible to use observations with complete data only (Hair et al. 1998) but imputation methods were used. The missing data was replaced with estimated values based on other information available. In this case, substitutes based on the mean value were used. This method has three disadvantages: it affects the distribution, the variance by diminishing it, and the correlation between variables by decreasing it (Hair et al. 1998). In turn, this can easier lead to the type II error, where one fails to reject the null hypotheses when it is actually false. However, this imputation method is easy to implement and enables the use of all cases (Hair et al. 1998), which is important for my research purposes.

7.3 Description of the Data

The main construct in this research – perceived strategic alignment – is formative in nature, which means that the variables do not need to correlate together (Gefen et al. 2000; Straub et al. 2004; Cenfetelli and Bassellier 2009). However, such constructs can be decomposed into sub-constructs and variables that can be examined separately. They are measured with items, which are reflective in nature (Gefen et al. 2000). For example, in this study the perceived strategic alignment is a construct with four different variables: IT plans' reflections of business plans, business plans' reflections of IT plans, the support of current IT systems for achieving the business goals, and the estimated support of pending future IT systems for achieving the business goals. Two of these four variables are measured with multiple items, which are supposed to be reflective. If the measurement items reflect the same thing, they should correlate with each other. This can be tested statistically. Despite the special nature of the network data should be kept in mind, the internal consistency of a multi-item construct is measured by calculating the Cronbach's alphas with IBM SPSS Statistics (version 19.0.0). In other analyses, the version 6.289 of UCINET 6 for Windows (Borgatti et al. 2002), which is destined for network data, is used.

Respondents and their background information are described previously (see Chapter 6.3).

7.3.1 Perceived Strategic IT-Business Alignment

As presented in Chapter 5, one of the main constructs of this study is the *perceived strategic IT-business alignment*, which refers to how individuals see the strategic IT-business alignment in their organization at an enterprise level in general.

As this concept consists of two sub-constructs, the focus is first on how well the business and IT plans reflect each other (Kearns and Lederer 2000). The measurement items were adopted from Kearns and Lederer (2000; 2003). In this set of data, the items for how well IT plans support business plans appear to be consistent as a high value (0.91) of Cronbach's alpha indicates. The variable AL_ITP measures how well IT plans reflect business plans and it is the mean value of its measurement items' values.

However, Cronbach's alpha for the how well business plans reflect IT plans is relatively low (0.68). The attempts to improve the alpha value by dropping out items did not result in better values. I decided to hold to all the items I had included in the questionnaire. After all, the construct has been validated well in previous studies, and even though the alpha value is low, it is still more than 0.6 which is a cutoff for unsatisfactory internal consistency reliability (George and Mallery 2000). The variable AL_BP measures how well business plans reflect IT plans and it is the mean value of its measurement items' values.

The scales were the same for how well IT plans support business plans and for how well business plans reflect IT plans. Thus, these two variables can be compared. One can notice that the respondents rated the IT plans' support for business (the mean value of 3.30) higher than business plans' reflections of IT (the mean value of 3.01). This observation is reasonable when the strategic planning process in Zeta is taken into account. In practice, the IT plans are created after the business plans by mostly reacting to them. In contrast, when the business plans are created, IT is seldom involved.

To find out how well the IT systems support the value disciplines that an organization prefers (Tallon 2007), the respondents were asked to describe how well the current IT systems help to achieve different kinds of business goals, which were classified according to the value disciplines of Treacy and Wiersema (1995). The three value disciplines used in this study were operational excellence, customer intimacy, and product/service leadership. Some examples of each value discipline were given in order to increase the reliability of the responses.

The respondents were asked to give weights to different value disciplines to reveal respondents' views on the business strategy in Zeta. The mean value of how the current IT systems supported achieving business goals was calculated and it was weighted by the importance of different value disciplines. As the variable of AL_CURR regards to how well current IT systems support the value disciplines that an organization prefers. It is measured just with only one aggregate item; therefore, the Cronbach's alpha is not applicable here.

The same approach was used to discover how well the pending future IT systems are believed to support achieving business goals. However, the number of missing values was considerable, and this sub-construct had to be excluded. As much as 22% of the respondents did not know the pending systems in the IT portfolio, and therefore, they could not assess or guess their effect on achieving the business goals. As the CIO said afterwards, *"Our project portfolio is not yet implemented properly[...] The long-term plan is not delivered or communicated openly."*

The following table (Table 21) contains a summary on the constructs, variables, and the measurement items used in the data analysis. It also provides descriptive statistics on the variables and measurement items.

In addition, the respondents were allowed to rate how satisfied they were with the current IT solutions. The average rating was 3.43 with the standard deviation of 0.81. However, the satisfaction with the IT solutions does not necessarily relate to strategic IT-business alignment, and thus, it is not a part of this construct.

CONSTRUCT / Variable; Measure		Mean	Std. Dev	Cronbach's α
PERCEIVED STRATEGIC ALIGNMENT				
IT plans support business plans Our IT plans reflect the business plans. Our IT goals reflect the business goals. Our IT plans support the business strategies. Our IT plans are realistic.	**AL_ITP** ITP1 ITP2 ITP3 ITP4	3.30 3.18 3.25 3.44 3.32	0.769 0.956 0.816 0.752 0.935	α = 0.91
Business plans reflect IT plans Our business plans include an IT plan or they refer to an IT plan. Our business plans refer to specific applications and/or information technologies. Our business plans utilize our IT capabilities. Our business plans include realistic expectations for IT.	**AL_BP** BP1 BP2 BP3 BP4	3.01 2.90 2.87 2.97 3.30	0.599 1.010 0.905 0.763 0.630	α= 0.68
Current IT supports achieving business goals: Our current IT systems help in achieving our business goals.	**AL_CURR**[3]	2.98	0.687	n/a
Future IT supports achieving business goals:[4] Our pending future IT systems help in achieving our business goals.	**AL_FUT**			

Table 21 Variables for the perceived strategic alignment between IT and business with descriptive statistics

7.3.2 Interaction Patterns

Network ties represent true interaction patterns in an organization. The studied interaction patterns were the discussion network, the advice network, and the friendship network. In this study, I expected the friendship network to represent an expressive network and the other networks to represent instrumental networks. All these networks can be presented as adjacency matrices by nature as they are mapped by identifying the ties.

In a graphical presentation, it is possible to identify actors with the labels. The labels of those actors who are members in the IT department begin with a letter "A". The actor with the label "A1" is the CIO of the company. Other actors with a label ending with "1" are members in the top management team. The first letter represents the department to which they belong.

Advice Network. In the questionnaire, the respondents were asked to nominate those to whom the actors tend to turn in need for advice. This

3 A mean value of how IT supports goals related to different value disciplines weighted with the perceived importance of each value discipline

4 Omitted due to the large number of missing data

data can be represented in an adjacency matrix. They were also asked to nominate those who tend to turn to them in need for advice. This data was used to build up an adjacency matrix, which was transposed. In this way, the relationship pointed in the correct direction. By combining these two matrices, it was possible to build an adjacency matrix that included only those relationships, which are confirmed by both members of a relationship. In these relationships, an actor *i* nominates an actor *j* as one who turns to him or her for a piece of advice, and simultaneously actor *j* nominates actor *i* to be the one to whom he turns to for a piece of advice. Hence, both members in the dyad identify the relationship. The data in the matrix is binary.

The advice network's matrix with directed ties is asymmetric. Therefore, both in-degree and out-degree values were calculated. The mean value of the in-degree in an advice network is 2.135, which is 5.931 as normalized value. The normalized value of the degree is the degree divided by the maximum possible degree expressed as a percentage. This is moderately low. In this case, the mean value of out-degree happens to be the same as for the in-degree. The density of the advice network is only 0.0593 with the actual number of ties being 79.

The following figure (Figure 6) is a graphical representation of the advice network in Zeta.

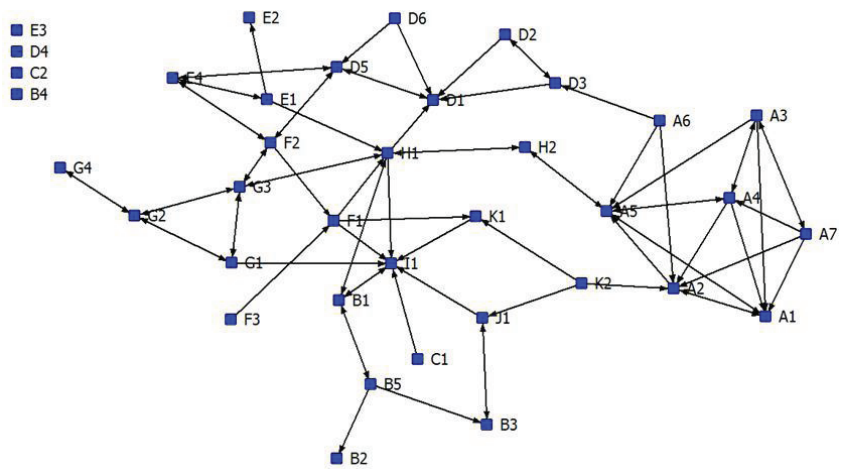

Figure 6. Advice network

As can be noticed, people in the IT department are in general not seeking advice outside their own department. Only two of seven people look for advice from elsewhere, too. In addition, people in other departments do not

turn to IT department when they seek advice in their work-related matters. The CIO (A1) has a relatively large ego network but the shortest path to the closest member of the top management team is quite long: the length of the path is three steps, i.e. there are two people between them.

In this particular network, there are four isolates. One of them (E3) did not wanted to provide any data at all about his relationship within Zeta but he was nominated three times as a person who was seeking advice from other people. Because he did not confirm these relationships, these ties were omitted from this network. One person also nominated E3 as a person to whom he turns when seeking advice. As this tie was not confirmed either, it was dropped out.

Another isolate, B4, was a member in ZetNet project team. There were two people, who turn to him in advice seeking purposes, but he did not confirm these ties. He nominates several people from whom he seeks advice but for some reason, nobody confirms this. The same is for C2 from HR department who has recognized several people who either turn to her in a search for advice or to whom she turns. Instead, D4 did not recognize any people for asking advice from him – or to whom he would turn in a need for advice.

If I focus on the top management team, it can be noticed that four out of nine top management team members (C1, K1, I1, and F1) sought advice only from other top management team members. The CEO (I1) appears to be isolated from the lower level employees, as all his alters are executives. Some of these executives (C1, K1) were heads of administrative functions not being responsible on business.

Discussion Network. The respondents were asked to name those with whom they most often discuss the organization-related matters. This data was converted into a matrix showing that whom an actor *i* has nominated to as his or her discussion partner. The data was refined and a matrix, which included only the reciprocal relationships, was created: an actor *i* nominates an actor *j* as a discussion partner, and simultaneously the actor *j* nominates the actor *i* to be his or her discussion partner as well. The relationship is identified both members of the dyad. As in the advice network, the data in this matrix is binary, too.

The discussion network's matrix used in this study is symmetric. Hence, the ties are undirected. The mean value of the degree in the discussion network is 2.378 and, as normalized value, 6.607. As in the advice network, also the degree in the discussion network is rather low. The density of the

advice network is low being only 0.0661 with the actual number of ties being 88.

Figure 7 is a graphical representation of the discussion network in Zeta.

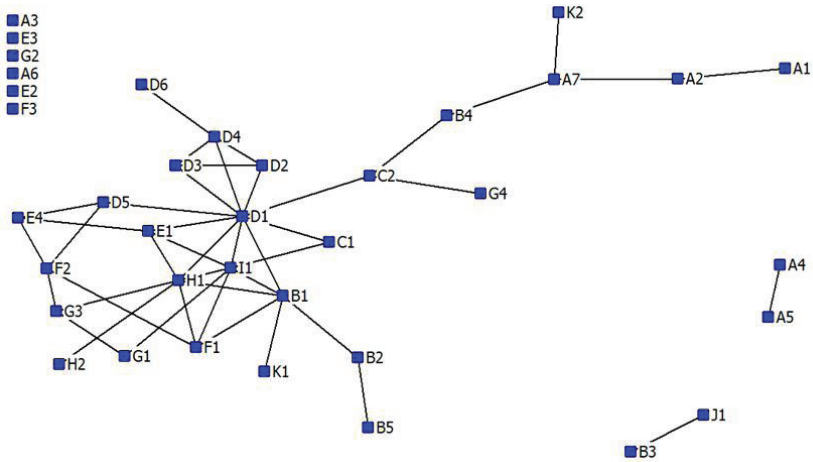

Figure 7. Mutual discussion network

As it can be noticed, there is a long path between the CIO (A1) and the members of the top management team. The shortest path of five steps is to D1, to whom the distance is shorter than to the CIO's supervisor (B1 with six steps). In general, the IT personnel are not connected to the others. As the only exception, A7 has mutually recognized discussion ties with others. The isolation of the IT personnel is considerable. As in the advice network, some of the top management team members (the CEO, i.e. I1, C1, and K1) discuss only with their colleagues at the same organizational level.

The number of isolates in the discussion network is little higher than in the advice network. However, the isolated actors are not the same except E3 who deliberately did not inform about his ties in Zeta. Two of the six isolates are from IT department.

Friendship Network. The respondents were asked to appoint those whom they regard as friends. With this data, an adjacency matrix for friendship relationships in Zeta was created. The ties, which were not reciprocal, were excluded. The friendship matrix included only the connections in which an actor *i* nominates an actor *j* to be his or her friend, and simultaneously the actor *j* nominates the actor *i* to be his or her friend as well. The relationship is identified both members of the dyad. As in the advice and discussion networks, the data also in this matrix is binary.

The ties in the friendship network are undirected, and therefore, the friendship network's matrix is symmetric. The mean value of the degree is very low being 0.865 and, as normalized value, 2.402. The density of the friendship network is only 0.0240 with the actual number of ties being 32.

Figure 8 is a graphical representation of the friendship network in Zeta.

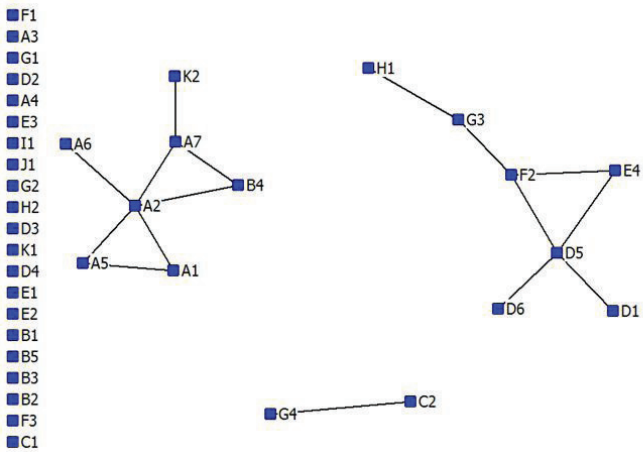

Figure 8. Mutual friendship network

In the friendship network, there are three isolated groups. IT personnel dominate one of them with five nodes. However, the rest of the IT personnel (A3, A4) are not in this group of friends but isolated.

In general, the members in the top management team are not connected to others in the friendship network. Only two of them (D1, H1) have friendship ties while the other seven top management team members are isolated. These two members of top management team having friends in Zeta did not have a friendship tie between them. Within the top management team, there are no mutual friendship ties.

In general, there were quite a few mutually nominated friendship ties in Zeta. Actually, as many as 21, which represents 57% of the respondents, did not have friendship relations in the way I defined for the purposes of this study.

7.3.3 Affiliations to Formal Intra-Organizational Structures

Affiliations to different departments and other groups defined by the management within an organization reflect the power structure and the ways how the management supports and controls the communication and

knowledge exchange. The affiliations to different groups can be measured by asking whether an actor belongs to a group or not. The affiliation data can be transformed into adjacency matrices where the relationship between two actors is about whether they share the same groups or not. The number of shared groups represents the tie between them.

Departmental Structure. The respondents were asked to tell to which organizational department they belong. A respondent was allowed to choose a right alternative from the organizational chart encoded in the questionnaire. Zeta's organization is function-based, and therefore, a respondent usually belongs only to one department. Thus, the ties in a sociomatrix displaying the departmental structure are binary: if actors *i* and *j* belong to the same department, the value of the tie is one. Otherwise, the value is zero. However, there is one node (D3) attached to two departments. She is a controller, who is attached simultaneously both to business and to the financial department. If there were another actor in exactly the same position, the ties would not be binary any longer. However, these kinds of dual roles are uncommon in Zeta, and in this adjacency matrix, the ties are binary.

The affiliations to the same departments are depicted in Figure 9.

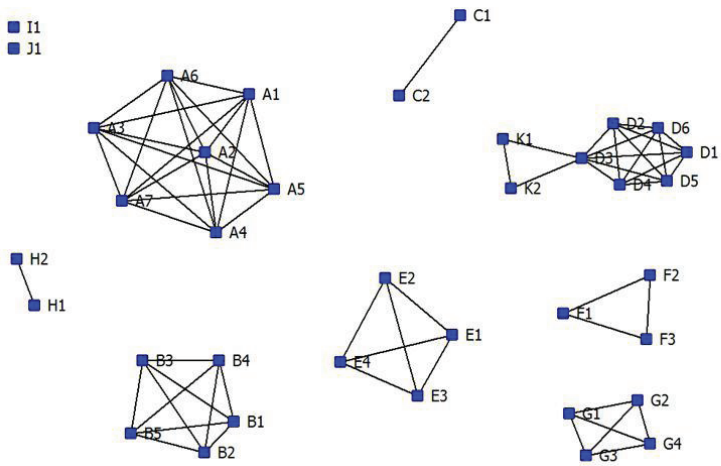

Figure 9. Departmental memberships in Zeta

Cross-functional Groups. In organizations, there are several cross-functional teams or groups, such as project teams, work groups, steering groups, or committees, where the departmental borders are crossed. Some of them are temporary while others may be more permanent. The

respondents were asked to tell into which teams or groups they were attached. Some of the groups and committees were provided for a respondent to be chosen from, and in addition, the respondents were asked to complete the list with the names of the groups they were attached but for some reason not among the multiple choices. Here, the ties are not binary but the value of the tie represents the number of units that a pair of actors shares. The more shared units they have, the stronger their relationship is. The matrix is symmetric. Therefore, the directions of the ties are not relevant. The affiliations to the same cross-functional groups are illustrated in Figure 10.

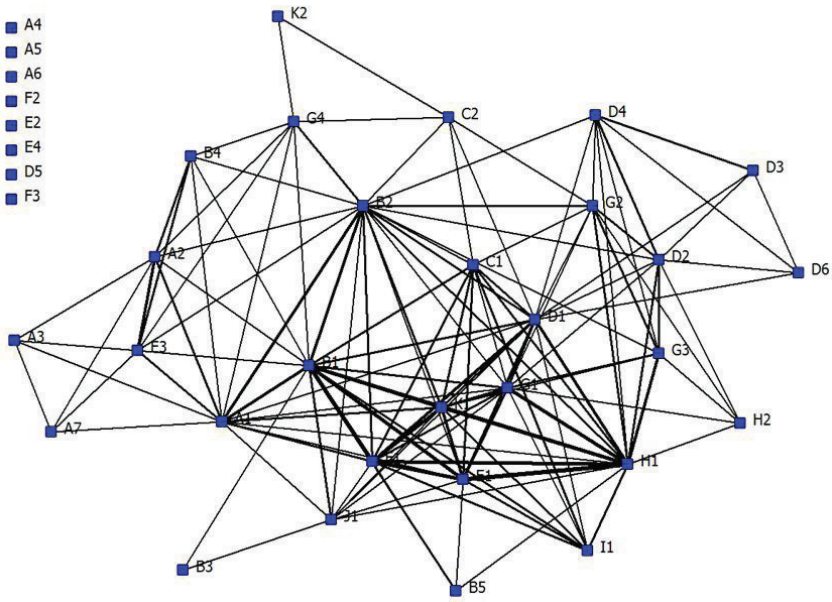

Figure 10. Shared memberships in formal cross-functional groups in Zeta

In Zeta, the top management team is divided into several committees, which explains the number of ties between the top management team members. The CIO has connections to most of the top management team members because of IT steering group. However, the IT steering group is the only forum for the CIO to meet the most of them.

Many of these groups meet relatively seldom. For example, the IT steering group has half-day meetings only four times a year. The top management team and its sub-committees meet once a month. Project teams are naturally exceptions with a more frequent meeting schedule.

7.3.4 Perceived Shared Domain Knowledge

Perceptions of one's own domain knowledge are likely to be biased but the differences in the responses more probable still to reflect the true differences on competence between individuals. Here, the Cronbach's alpha (0.73) is acceptable for the degree of IT knowledge, even though the two items measuring the IT knowledge produced slightly different results. The responses to the second item, i.e. the question about the knowledge of used IT vocabulary, were rated clearly lower than to the question about the knowledge of the current IT solutions.

The other variable, i.e. the degree of IT interest, has a very good value for the Cronbach's alpha (0.93) showing that the items reflect the construct well. The values of the responses are very high and thus probably biased but as in the case of IT knowledge, the differences are likely to reflect the true differences.

The following table (Table 22) shows a summary on the variables and the measurement items used in the data analysis.

CONSTRUCT/ Variable; Measure		Mean	Std. Dev	Cronbach's α
PERCEIVED IT COMPETENCE				
The degree of IT knowledge	**COMP_KN**	3.42	0.741	α = 0.73
How well do you know the current IT solutions in your company?	IT_KNOW	3.70	0.702	
I am knowledgeable with IT related terms, special vocabulary and terms, or abbreviations.	IT_LANG	3.14	0.948	
The degree of IT interest	**COMP_INT**	3.71	0.854	α = 0.93
I am interested in information technology.	IT_INTEREST	3.95	0.848	
I enjoy discussing information technology.	IT_DISCU	3.76	0.863	
I follow actively the development and trends of information technology.	IT_FOLLW	3.43	1.015	

Table 22. Variables for perceived personal IT competence with descriptive statistics

Perceptions of shared domain knowledge reflect the experiences and beliefs on whether business and IT people have a sufficient common knowledge base in both domains, i.e. regarding business and IT.

As these variables are single-itemed, the Cronbach's alpha is not applicable here. The results indicate that it is easier for IT people to absorb knowledge about the business than for business people about the IT. The difference in the mean values is clear. The following table (Table 23) shows the descriptive data on these two variables.

CONSTRUCT/ Variable; Measure		Mean	Std. Dev	Cronbach's α
PERCEIVED SHARED DOMAIN KNOWLEDGE				
The degree of how well business knows IT In your opinion, how well do those who are responsible for business know the current IT solutions in your company?	**SK_BUSIT**	2.97	0.897	n/a
The degree of how well IT knows business In your opinion, how well do those who are responsible for IT know your company's business?	**SK_ITBUS**	3.31	0.775	n/a

Table 23. Variables for perceived shared domain knowledge with descriptive statistics

7.3.5 Perceived Business Support of the IT-Decision

A recent decision on a new intranet, ZetNet, was used as an example of how IT decisions were made in Zeta. At the time of the data collection, ZetNet represented a recent IT-related decision, which had an enterprise-wide impact and was typical for Zeta. It was very recent as the system was rolled out a month earlier. The respondents considered this decision typical for IT-related decision-making in Zeta. The average value of the typicality was as high as 3.838 with a scale where a "5" stands for very typical and a "1" for very uncommon. The standard deviation was only 0.546, which indicates quite a unanimous view. Only one person out of 37 viewed this decision as an atypical way for Zeta, whereas 31 people regarded it as typical.

The perceived business support of the IT-decision was measured with two items. The Cronbach's alpha was high (0.91) showing that the items were reflecting the same construct. The following table (Table 24) shows the descriptive data on this construct.

CONSTRUCT / Variable; Measure		Mean	Std. Dev	Cronbach's α
BUSINESS SUPPORT OF IT DECISION				
The degree of how well IT-decision takes business needs and goals into account	**D_ALIGN**	3.23	0.787	α = 0.91
How well are the business needs taken into account in this decision?	D_BUSNEEDS	3.16	0.855	
How well does this decision support achieving the business goals?	D_BUSGOALS	3.30	0.766	

Table 24. Variable for how well ZetNet supports business needs and goals with descriptive statistics

7.4 Summary of the Chapter

This chapter includes an overview of the data and some minor revisions on the variables. Some of the variables are single-itemed, whereas some have several measurement items. The dependent variable, perceived strategic IT-business alignment, is measured with multiple items. However, due its formative nature, it has been decomposed into three variables, which can be examined separately.

To sum up the overview of the data, the perceptions of how well IT plans support business plans were clearly higher than the perceptions of how well business plans reflect IT plans. People were rather satisfied with the current IT solutions but did not think that the systems fully supported achieving the business goals. This was also the case with the new intranet system. People believed that they knew their own IT solutions but were more unfamiliar with IT jargon. They were convinced that IT professionals knew the business of Zeta better than business people knew the IT.

The work-related networks, that is advice network and discussion network, were reported being relatively sparse but the expressive, more informal friendship network was clearly the sparsest. With regard to the networks within Zeta, the CIO appears to be very distant not only to the CEO but to the top management team in general. As expected, the CEO is in a focal role in work-related networks regarding the top management team. However, his interest in IT is limited. Even though being organized functionally, Zeta has set up many cross-functional teams, of which some are projects and some more permanent structures. All top management team members but the CEO were involved in a number of cross-functional teams.

8 Analyzing the Data and Testing the Hypotheses

In this chapter, the focus is on analyzing the data and testing the hypotheses. This chapter starts with an introduction to the principles with regard to analyzing the network data and the most important analyses methods used in this study. Thereafter, the hypotheses are tested one by one. At the end of this chapter, the key findings are summarized.

8.1 Principles on Analyzing Network Data

It is important to take into account that the data is non-random, but rather are observations that may depend on each other. Therefore traditional statistical analyses are not applicable (Hanneman and Riddle 2005). However, statistics provide useful tools for describing the data and testing hypotheses. In social network analysis, there are alternative numerical approaches to estimate standard errors for network statistics. For example, bootstrapping and permutation approaches create sampling distributions based on thousands of random trials.

This study examines the similarity in perceptions about the strategic IT-business alignment within an organization. As I have different levels of examination, the data analysis methods differ from each other at each level.

In company-level analysis, the actor is an organization. The unit of analysis, that is an organization, is ***monadic***. When the units of analysis are monadic, the focus is on the actors, not on the relations between actors (Wasserman and Faust 1994; Scott 2000; Knoke and Yang 2008). Here, the density of an organization's interaction patterns and the overall perceptual congruence on strategic IT-business alignment are measured and compared.

When the level of examination is pairs of actors, the analysis can be conducted with the dyadic units of analysis or with ***a mix of the dyadic and monadic units of analysis***. Dyadic units refer to ties between pairs

of actors, whereas monadic units stand for actors, who represent the nodes in a network (Wasserman and Faust 1994, p. 22; Borgatti and Everett 1997; Knoke and Yang 2008, p. 13). In dyadic hypotheses, network structure (i.e. ties) is suggested influencing another network structure. In mixed dyadic-monadic hypotheses, the network structure is suggested influencing the opinions or perceptions of the actors (or vice versa), which is known as ***autocorrelation*** (Leenders 2002). It can be a sign of homophily (Marsden 1990; McPherson et al. 2001), where people who see themselves as similar are more likely to form a social connection, or it can also be a sign of diffusion or contagion (Burkhardt and Brass 1990; Ibarra and Andrews 1993; Burkhardt 1994; Meyer 1994), where the views and attitudes spread by means of social connections. I will produce both **Moran's *I*** (Moran 1950) and **Geary's *C*** (Geary 1954) statistics to analyze whether there is autocorrelation. In this study, tie-level analyses are carried out through a mix of dyadic and monadic units of analysis.

When the unit of analysis is an individual, the focus is on his or her attributes. Perceptions of an individual as well other characteristics can be considered attributes, which are treated as variables. Permutation-based, nodal-level tests for detecting significant differences in the means of two or more groups can be used (Hanneman and Riddle 2005). For instance, UCINET provides a two-group **t-test** and an **ANOVA** for several groups. Another analysis method for the attribute level is a **regression model**, where the relationship between a single dependent variable and one or more independent variables is analyzed. If one wants to include the adjacency in a network or the effects of the neighbors into a regression model, one needs to use a ***spatial-effects model***, also known as a ***network-effect model*** (Ibarra and Andrews 1993; Anselin 1999; Getis and Aldstadt 2002).

8.2 Data Analysis Methods

Here, the data analysis methods used in this study are introduced. First, the ANOVA and two-group t-test are presented. Then, the Moran's *I* and Geary's *C*, both for applicable for the studying of autocorrelation, are discussed. Finally, the spatial-effects model is introduced.

The ANOVA or t-test with significance based upon a permutation test. Analysis of variance, ANOVA, is used to determine if samples of two or more groups come from a population with equal means. The t-test is a special case of ANOVA for two groups. Normally, the ANOVA assesses the

statistical significance of the difference between two or more independent sample means. To test if there are differences in responses between different organizational groups in a research setting where the assumptions for independent variables are violated, one should use an ANOVA or a t-test with significance based on a permutation test rather than the statistical tests. In the t-test, for example, I will use the default of 1,000 trials to create the permutation-based sampling distribution of the difference between the two means. For each of these trials, the scores for the variable are permuted randomly, i.e. the scores are randomly assigned to members of the group or non-members, proportional to the number of each type. The standard deviation of this distribution based on random trials becomes the estimated standard error for the test.

As the sample size in this study is low (N = 37), the effect size (ES) needs to be large to increase the power to not reject the true H_0. For ANOVA and t-tests, the effect size is measured with an eta squared (η^2), which can be calculated in the following way:

$$\eta^2 = \frac{SS_{effect}}{SS_{total}}$$

where: SS_{effect} = the sums of squares for whatever effect is of interest SS_{total} = the total sums of squares for all effects, interactions, and errors in the ANOVA

According to Cohen, a value of less than 0.0099 indicates no effect, values between 0.0099 and 0.0587 indicate small effect, values between 0.0588 and 0.1378 refer to medium effect, and values of more than 0.1378 indicate large effect (Cohen 1988).

Moran's *I*. One measure for the autocorrelation is Moran's *I* statistic (Moran 1950), which is based on weighting the differences between each actor's score and the mean by the cross-products:

$$I = n\,\frac{\sum_{i,j} w_{ij}(x_i - \bar{x})(x_j - \bar{x})}{\sum_{i,j} w_{ij} \sum_i (x_i - \bar{x})^2}$$

Also in this equation, w_{ij} indicates the adjacency of nodes i and j, and x_i indicates the score of node i on attribute x. The value of I can vary from -1 to +1. In the case where $I = \frac{-1}{n-1}$, there is no dependence between the network structure and attribute values, while $I > \frac{-1}{n-1}$ indicates positive autocorrelation and $I < \frac{-1}{n-1}$ indicates negative autocorrelation. In practice, the value of $\frac{-1}{n-1}$ is very close to zero.

The interpretation of Moran's I is similar to the interpretation of the product moment correlation coefficient, where anything greater than 0.5 is considered large, values between 0.3 and 0.5 are moderate, values between 0.1 and 0.3 are small, and anything smaller than 0.1 is insubstantial (Cohen 1992). I follow these guidelines when interpreting the results.

Geary's *C*. Another statistic to study autocorrelation is Geary's C statistic (Geary 1954), in which the differences between the scores of each pair of actors are weighted by their adjacency:

$$C = (n-1)\frac{\sum_i \sum_j w_{ij}\,(x_i - x_j)^2}{2\sum_{i,j} w_{ij} \sum_i (x_i - \bar{x})^2}$$

In the equation, w_{ij} indicates the adjacency of nodes i and j, and x_i indicates the score of node i on attribute x (i.e. in this study, a perception of the alignment between business and IT). The value of C can vary from 0 to 2, or in some extreme cases, to 3. If $C = 1$, there is no dependence between the network structure and attribute values, while $C > 1$ indicates negative autocorrelation and $C < 1$ indicates positive autocorrelation. The strength of positive autocorrelation grows as the value of C grows, and respectively, the strength of negative autocorrelation increases when the value of C approaches the zero. However, unlike for Moran's I, there are no strict, commonly agreed rules to determine whether the autocorrelation is strong or weak. One way to interpret the results is to use the equivalent scales, where any value of C lower than 0.5 or higher than 1.5 can be regarded as an indicator of large or strong connection. If the value of C falls between 0.5 and 0.7 (or between 1.3 and 1.5), the autocorrelation is medium. Likewise, the value of C between 0.7 and 0.9 (or between 1.1 and 1.3) indicates small autocorrelation. The values between 0.9 and 1.1 show no autocorrelation.

Geary's C and Moran's I differ from each other in terms of the focus: with Geary's C, it is possible to study similarities and dissimilarities between each pair of actors. With Moran's I, it is possible to examine similarities and dissimilarities between each pair of actors and the overall average in the whole network. Therefore, the Geary statistic can be regarded as a local measure, whereas the Moran statistic gives a more global view.

If data includes values with a lot of variation and non-normal distribution, the Geary statistic is likely to give rather different impressions about the effects of the network adjacency on similarity of attributes if compared with the Moran measure. Hanneman and Riddle (2005) recommend computing both, unless there are strong theoretical priors that suggest that one is superior for a particular purpose. However, it is important to note that the

values of Moran's *I* index and Geary's *C* index should be not interpreted in the similar way.

A spatial-effects model, i.e. a network-effects model. One technique to study the effect of adjacency is *a spatial-effects model*, which is sometimes called *a network-effects model* (Ibarra and Andrews 1993; Anselin 1999; Getis and Aldstadt 2002). A spatial–effects model resembles the linear regression model but includes a matrix of ties connecting actors in the network:

$$y = \rho W y + \beta X + \varepsilon$$

In this equation, y is the dependent variable. W is a weight-matrix consisting of the network ties and used take the neighboring values of the dependent variable into account. The rho-coefficient (ρ) is the parameter estimate for the average effect of neighboring values of dependent variable on one's own value. X denotes a matrix of observations on independent variables, whereas β denotes the regression coefficients. The ε refers to the error term.

If the weight-matrix consists of the ties with direct neighbors only, it is relatively easy to calculate the neighboring value of the dependent variable by using *an average value of an ego's alters*. This spatially lagged variable can be included in the nodal-level regression model in UCINET. If the average is close to an ego's perceptions, the network adjacency is more likely to correlate with an actor's perceptions.

As in all regression models, the effect size can be measured with R^2 or Cohen's f^2 measure, which is defined as the following:

$$f^2 = \frac{R^2}{1-R^2} \text{ where } R^2 \text{ is the squared multiple correlation.}$$

Correlation coefficients between matrices. Different correlation coefficients can be used to study if a tie between two particular actors in one network is likely to result in a tie between them in another network. The correlation coefficient to be used depends on the type of relations of the network. When relations in both matrices are binary, both the simple matching coefficient and the Jaccard coefficient are reasonable measures (Hanneman and Riddle 2005). These similarity indices can be defined as the size of the intersection divided by the size of the union of the sample

sets.[5] The Jaccard coefficient takes into account only the positive matches, i.e. the tie between two actors exists in both matrices, whereas the simple matching coefficient also uses the negative matches in calculating the coefficient measure.

Effect sizes. Finally, the standards used in this study to interpret the practical significance of the test results are summarized. As the sample size is a constant in the analysis stage, the statistical permutation-based significance and effect size are the variables to influence the power.

	η^2	*r* and Moran's *I*	Geary's *C* (positive autocorrelation; decreasing)	Geary's *C* (negative autocorrelation; increasing)	Cohen's f^2
Effect size					
Small	0.0099	|0.1|	0.9	1.1	0.02
Medium	0.0588	|0.3|	0.7	1.3	0.15
Large	0.1379	|0.5|	0.5	1.5	0.35

Table 25. Standards for effect sizes used in this study

8.3 Company-Level Perceptual Congruence

Here, the context is set up by studying whether there is an overall perceptual congruence or incongruence in Zeta. If there were an overall perceptual incongruence but still very dense networks structures enabling efficient knowledge exchange, the theoretical assumptions for this study would not hold true.

As the efficient structures for information exchange can be characterized as dense (Coleman 1988; Kogut and Zander 1992; Alguezaui and Filieri 2010), the following hypothesis can be formulated:

H1: The density in the interaction networks has a positive effect on perceptual congruence on strategic IT-business alignment.

In the previous studies, perceptual congruence has been approached by examining the differences in opinions between IT executives and business executives. Different analyses of variance, such as a one-way ANOVA or t-tests, are often used to test if IT representatives' responses differ from

[5] The total number of each combination of attributes for both A and B are specified as follows: M11 represents the total number of attributes where A and B both have a value of 1. M01 represents the total number of attributes where the attribute of A is 0 and the attribute of B is 1. M10 represents the total number of attributes where the attribute of A is 1 and the attribute of B is 0. M00 represents the total number of attributes where A and B both have a value of 0. Each attribute must fall into one of these four categories, meaning that M11 + M01 + M10 + M00 = n. The Jaccard similarity coefficient, J, is given as J = M11 / (M01 + M10 + M11).

business representatives. I start my analyses with the similar approach by studying if there are significant differences in perceptions between different organizational groups by using t-tests with significance based upon permutation tests. I examine whether the perceptions of the top management team, IT steering group, and IT personnel differ from the perceptions of the other respondents. Significant differences would be the evidence of perceptual incongruence among the respondents but they would also offer one explanation for incongruence as such.

The following table (Table 26) consists of the results of the t-tests.

Construct[6]	Others	Top Management Team (TMT)	*p*-value		η^2
AL_CURR	3.053	2.768	0.163	for TMT < Others	0.033
AL_ITP	3.359	3.111	0.226	for TMT > Others	0.020
AL_BP	3.147	2.583	0.004**	for TMT < Others	0.167
	Others	IT	*p*-value		η^2
AL_CURR	2.893	3.371	0.047 *	for IT > Others	0.076
AL_ITP	3.119	4.071	0.001**	for IT > Others	0.242
AL_BP	2.903	3.466	0.014*	for IT > Others	0.139
	Others	IT Steering Group (IT SG)	*p*-value		η^2
AL_CURR	3.027	2.868	0.269	for IT SG < Others	0.011
AL_ITP	3.271	3.375	0.365	for IT SG > Others	0.004
AL_BP	3.097	2.775	0.082	for IT SG < Others	0.058

All significances based on 1,000 permutations.

Table 26. T-test results from comparisons between the top management team and others, and between IT personnel and others

Even though the **top management team's** ratings were lower than others' ratings in general, there was no significant difference between the top management team members and others on their perception of how IT plans were considered supporting business plans. Neither was there any significant difference in perceptions of how the current IT systems assisted in achieving the business goals. However, there was a significant difference in perceptions of how business plans reflect IT plans. The top management team gave lower scores than others.

In the case of the differences between the **IT personnel** and the others, all the values were significantly higher among IT personnel than among the others.

[6] Explanations of the labels of the constructs:

- AL_CURR: How the current IT systems' support for achieving business goals
- AL_ITP: How IT plans support business plans
- AL_BP: How business plans reflect IT plans

Regarding the **IT steering group**, there were no significant differences between the responses of the IT steering group members and the rest of the organization.

Next, whether there is perceptual congruence on the strategic IT-business alignment within the above-mentioned groups is analyzed. Perceptual congruence is often studied using various statistical analyses, such as variance tests (e.g. ANOVA). However, sometimes one wants to operationalize it with a single indicator. Within one variable, one could choose standard deviation as an indicator for perceptual congruence, but I will use the coefficient of variation (c_v), which is a relation of the standard deviation and the mean value:

$$c_v = \frac{\sigma}{|\mu|}$$

The coefficient of variation enables comparisons between data sets with different units or means, and thus, is more general.

The results are presented in the following table (Table 27). The values are calculated for all the data and for the subsets of the top management team, IT steering group, and IT personnel.

	All respondents	Top Mgmt Team	IT Steering Group	IT personnel
AL_CURR	0.230	0.173	0.257	0.118
AL_ITP	0.233	0.276	0.301	0.098
AL_BP	0.199	0.145	0.187	0.206

Table 27. The degree of perceptual congruence on strategic alignment between IT and business measured by a coefficient of variation

There are no standard rules or guidelines to assess whether the variation is strong or not, but the values have to be interpreted a case by case. In a consensus, the coefficient of variation would get a value of 0, and in total dispersion, the value would be 1. Here, the values for the coefficient of variation range from 0.199 to 0.233 among all the respondents, which I interpret as reflecting a moderate variation.

Within the top management team, they appear to have less variation in two variables (AL_CURR and AL_ITP) if compared with all the respondents. However, the views in the top management team conflict regarding how well IT plans reflect business plans, as c_v has a value of 0.276.

There is a same observation within the IT steering group with c_v having a value of 0.301; however, there is considerable overlap in the compositions

between the top management team and IT steering group, which explains the similarities in the observations.

Among the IT personnel, the values for the coefficient of variation are clearly lower for two variables (AL_CURR and AL_ITP), if compared with other groups, indicating perceptual congruence within a group. However, regarding the third variable (AL_BP), the values were the most divergent within this particular group compared with all other groups, as c_v having a value of 0.206.

To sum up, there is **some evidence of perceptual incongruence** among all the respondents and within the top management team, IT steering group, and to some extent within IT personnel. IT personnel's high ratings for how well IT plans support business plans (AL_ITP) may affect perceptual incongruence for this variable among all the respondents and within IT steering group because IT personnel are present in these groups. However, incongruence within the top management team cannot be explained with the presence of IT personnel, as the CIO does not belong to the top management team.

Next, **the densities of the interaction networks** are studied. In a dense, cohesive network, all actors within the network are connected to each other (Alguezaui and Filieri 2010). The closer to "1" the density is, the more cohesive the network. Respectively, if the value of density is close to zero, the network is sparse. Other indicators for the cohesion are the number of ties, which is used for calculating the density, and the mean value of degree.

In the following table (Table 28), there are network-level descriptive statistics relating to the cohesion for all the networks representing true interaction patterns.

	Density	# of ties	Mean value for degree
Friendship network	0.0240	32	0.865
Discussion network	0.0661	88	2.378
Advice network	0.0593	79	2.135 Indegree 2.135 Outdegree

Table 28. Network-level descriptive statistics in Zeta

The densities for all the networks are very low, and hence, the **networks can be regarded to be sparse**.

On the grounds of the company-level data, the co-existence of sparse networks and moderate perceptual incongruence conform to hypothesis H1,

which suggests a positive relationship between the density and perceptual congruence.

8.4 Tie-Level Perceptual Similarities

Even though, there is no clear perceptual congruence at an organizational level in Zeta, the perceptions might be similar between a pair of actors or within a smaller group. Next, the effect of different organizational structures on the similarity in perceptions of the strategic alignment between IT and business is studied. The following hypotheses are based on a mix of dyadic and monadic units of analysis.

8.4.1 Hypotheses on Tie-Level Interaction Patterns and Formal Structures

The next hypotheses concern the potential autocorrelation between the network ties and perceptions:

H2a: *Individual actors i and j will be more likely to have similar perceptions of the strategic IT-business alignment if they are in a relationship of asking and giving advice in an organization.*

H2b: *Individual actors i and j will be more likely to have similar perceptions of the strategic IT-business alignment if they are discussion partners.*

H2c: *Individual actors i and j will be more likely to have similar perceptions of the strategic IT-business alignment if they are friends.*

H3a: *Individual actors i and j will be more likely to have similar perceptions of the strategic IT-business alignment if they belong into the same department.*

H3b: *Individual actors i and j will be more likely to have similar perceptions of the strategic IT-business alignment if they belong into the same cross-functional groups.*

Hypotheses H2a, H2b, and H2c relate to the informal adjacency networks. In contrast, hypotheses H3a and H3b refer to the matrices representing the ties in formal intra-organizational structures.

Table 29 presents Moran's *I* autocorrelation statistics for the perceived strategic IT-business alignment and different network ties. The impact of

the isolates on the results was eliminated by excluding them in the following analyses. According to Moran's *I*, the department structure and the advice network correlate to some extent with the constructs for the perceived strategic alignment while the effect size can be considered medium. However, autocorrelation is not strong because all the values are less than |0.5|, and hence, I do not consider Moran's *I* statistics to support any of the hypotheses concerning the effect of the interaction patterns or formal structures.

	AL_CURR How the current IT systems' support for achieving business goals	AL_ITP How IT plans support business plans	AL_BP How business plans reflect IT plans
Tie in... ...advice network	0.258*	0.431**	0.220*
...discussion network	0.184	0.019	0.043
...friendship network	0.065	0.014	-0.219
Shared department	0.234*	0.492***	0.114
Shared cross-functional groups	0.065	0.018	0.077

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (all significance based on 1,000 permutations)

Table 29. Autocorrelations for network ties and the perceived strategic alignment between IT and business with Moran's *I* [7]

The principles for Geary's *C* autocorrelation test are similar to those of autocorrelation Moran's *I* test, but the autocorrelation value is calculated differently. Hence, the interpretation of the values is also different.

Table 30 presents Geary's *C* autocorrelation statistics for the perceived strategic IT-business alignment and different network ties. The isolates were excluded similarly as in calculating Moran's *I* autocorrelation statistics. The strongest autocorrelation values were those between the discussion network and AL_CURR (0.475) and between the shared department and AL_ITP (0.491).

7 For networks including all the respondents, a value of -0.028 indicates perfect independence. The corresponding values for the networks without isolates are: ´
- the advice network with $n = 33$: -0.030
- the discussion network with $n = 34$: -0.031
- the friendship network with $n = 15$: -0.071
- the network of sharing departments with $n = 35$: -0.029
- the network of sharing cross-functional groups with $n = 29$: -0.036

	AL_CURR How the current IT systems' support for achieving business goals	AL_ITP How IT plans support business plans	AL_BP How business plans reflect IT plans
Tie in…			
…advice network	0.565**	0.614**	0.798
…discussion network	0.475**	0.751	0.640*
…friendship network	0.891	0.934	1.345
Shared department	0.678*	0.491***	1.032
Shared cross-functional groups	0.681*	1.080	0.688

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (all significance based on 1,000 permutations)

Table 30. Autocorrelations for network ties and the perceived strategic alignment between IT and business with Geary's *C*

In Geary's *C* autocorrelation test, permutation trials are used to create a sampling distribution. In this test, 1,000 trials were used. For example, in these random trials in measuring the autocorrelation between the adjacency in the discussion network and the perceptions of how current IT systems support business, the average observed value was 1.005. Respectively, it was 0.997 for the advice network, 1.003 for the friendship network, 1.011 for the department structure, and 1.005 for cross-functional groups. The differences in observed results compared with the average of 1,000 random trials are statistically significant in all the networks except in the friendship network when assessing the autocorrelation between perceptions of how the current IT systems support achieving the business goals (AL_CURR) and a tie in a network. Statistical significant results for AL_ITP were obtained within the advice network and department structure, whereas for AL_BP the results were significant within the discussion network.

Because I assume local closeness to have more effect on the perceptions, Geary's *C* is more interesting. Geary's *C* also provided results with stronger autocorrelation, which indicates that local network structures correlate with the views on the strategic alignment between IT and business. Geary's *C* indicated support to the hypotheses H2b and H3a, and weak support to the hypotheses H2a and H3b.

Next, the **interdependencies between interaction networks and formal structures** are studied in order to find out if the networks overlap or depend on each other. For this purpose, the networks in Zeta are compared by computing similarity measures between the entries of two square matrices and by looking at the proportion of random trials that would generate a coefficient as large as the statistic actually observed. In this way, the association between networks can be tested.

In this network data, the most of the networks contain binary data. As positive matches, for instance, whether actors who are friends also discuss with each other the most, are the most interesting, the Jaccard coefficient measures are the most relevant. However, when a matrix with valued relationships is compared with a matrix with binary data, then Goodman-Kruskall gamma coefficients are the most appropriate. Here, one of the matrices included valued relationships, but I decided to dichotomize the data in order to obtain comparable Jaccard coefficient values for network comparisons. Table 31 contains the Jaccard coefficients for network comparisons.

	Advice network	Discussion network	Friendship network	Departments	Cross-functional groups
Advice network	1.000				
Discussion network	0.336 ***	1.000			
Friendship network	0.220 ***	0.224 ***	1.000		
Departments	0.298 ***	0.185 ***	0.095 **	1.000	
Cross-functional groups	0.127 ***	0.221 ***	0.035	0.151 **	1.000

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (all significance based on 1,000 permutations)

Table 31. Jaccard coefficients for network comparisons

As Jaccard coefficients show, none of these networks is the same but there is most similarity between discussion and advice networks. These networks present the daily interactions, and therefore, should theoretically be the most significant knowledge sharing structure in face-to-face communication. One reason for low Jaccard coefficients is that the degrees in these networks are low, and therefore, the sensitivity of Jaccard coefficient is relatively high.

8.4.2 Hypotheses Related to Alternative Tie-Level Explanations

Alternative explanations for the similar perceptions at tie-level were hypothesized in H4, H5, and H6.

H4: Individual actors i and j will be more likely to have similar perceptions of the strategic IT-business alignment if they have similar views on shared domain knowledge.

In order to change actor-level attributes into dyadic data for tie-level analysis, the Euclidean distances between the actors' views are calculated. The threshold distance for each variable is specified to determine the minimum distance for two respondents be considered "neighbors" (Anselin et al. 2005). Even though the measurement scale is the same for all the items, the cut-off points differ according to the variance of the responses.

Next, Moran's *I* and Geary's *C* are calculated for testing the possible autocorrelation. In the first table (Table 32), are presented the results for Moran's *I*, and in the second table (Table 33), the results for Geary's *C*.

		AL_CURR How the current IT systems' support for achieving business goals	AL_ITP How IT plans support business plans	AL_BP How business plans reflect IT plans
Sharing views in…				
…on IT people's business knowledge	SK_ITBUS	-0.007	0.053***	-0.014*
…on business people's IT knowledge	SK_BUSIT	-0.024	0.057**	-0.005*
…on own interest in IT	IT_INTEREST	0.016	0.052	-0.003
…on own IT knowledge	IT_KNOWLEDGE	-0.037	0.032*	0.045*

* p < 0.05, ** p < 0.01, *** p < 0.001 (all significance based on 1,000 permutations)

Table 32. Moran's *I* on the relation between similar views on shared domain knowledge and perceived strategic IT-business alignment [8]

According to Moran's *I* statistics, there is no autocorrelation between the similar perceptions of the knowledge related items and the perceived strategic IT-business alignment. Some of the values are statistically significant but the values are very small, and thus, the autocorrelation is non-existent.

		AL_CURR How the current IT systems support for achieving business goals	AL_ITP How IT plans support business plans	AL_BP How business plans reflect IT plans
Sharing views in…				
…on IT people's business knowledge	SK_ITBUS	0.941	0.830***	0.856***
…on business people's IT knowledge	SK_BUSIT	0.991	0.974	0.983
…on own interest in IT	IT_INTEREST	0.838	0.924	0.932
…on own IT knowledge	IT_KNOWLEDGE	1.056	0.933	0.879

* p < 0.05, ** p < 0.01, *** p < 0.001 (all significance based on 1,000 permutations)

Table 33. Geary's *C* on the relation between similar views on shared domain knowledge and perceived strategic IT-business alignment

Geary's *C* shows small autocorrelation between the similarity in the respondents' views on how well IT people knew business and two of the

[8] As the $n = 37$ for all the networks, a value of -0.028 indicates perfect independence in all the cases.

alignment constructs – both referring to the alignment of plans. Otherwise, no autocorrelation is detected.

Next, the focus is on whether people with the similar backgrounds tend to have similar views on the strategic alignment as the hypothesis H5 suggests:

H5: *Individual actors i and j will be more likely to have similar perceptions of the strategic IT-business alignment if they have similar backgrounds.*

The adjacency matrices were built by defining a pair of actors to have a similar background if the categorical variable measuring the background information had the same value for both of the actors. These background variables describe the gender, the age, the field of education, the degree of education, the organizational tenure, and the duration of the current position. First, the results of Moran's *I* are presented in the following table (Table 34).

	AL_CURR How the current IT systems' support for achieving business goals	AL_ITP How IT plans support business plans	AL_BP How business plans reflect IT plans
Same age group	-0.030	-0.024	-0.064
Same gender	-0.002	-0.041	-0.011
Same field of education	-0.036	-0.017	0.013
Same degree of education	-0.044	-0.018	0.086
Similar organization tenure	-0.044	-0.082	-0.116*
Similar duration in the current position	-0.021	-0.018	-0.011

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (all significance based on 1,000 permutations)

Table 34. Moran's *I* on the relationship between the similarity in the background characteristics and the perceived strategic IT-business alignment

The next table (Table 35) contains the results from Geary's *C* statistics on the relationship between similar backgrounds and the views on strategic alignment.

	AL_CURR How the current IT systems' support for achieving business goals	AL_ITP How IT plans support business plans	AL_BP How business plans reflect IT plans
Same age group	1.042	1.029	1.053
Same gender	1.108	1.103	1.010
Same field of education	1.040	1.080	1.041
Same degree of education	1.085	0.941	0.832
Similar organization tenure	1.050	1.061	1.086
Similar duration in the current position	0.969	0.932	1.060

* p < 0.05, ** p < 0.01, *** p < 0.001 (all significance based on 1,000 permutations)

Table 35. Geary's *C* on the relationship between the similarity in the background characteristics and the perceived strategic IT-business alignment

According to this data, the similarity in the backgrounds does not at all seem to relate with the views on strategic alignment.

The last hypothesis (H6) of those at a tie-level concerns a recent IT-related decision. The recent experiences might affect the overall view on the strategic IT-business alignment, as they are easy to recall.

H6: Individual actors i and j will be more likely to have similar perceptions of the strategic IT-business alignment if they have similar views on the recent IT-related decision.

Both the results from Moran's *I* and Geary's *C* are presented in the following table (Table 36). Moran's *I* does not support the hypothesis, but Geary's *C* gives weak support to it since the effect can be considered small-sized.

	AL_CURR How the current IT systems' support for achieving business goals	AL_ITP How IT plans support business plans	AL_BP How business plans reflect IT plans
Moran's *I* for sharing views on how well the recent IT decision supports business (D_ALIGN)	0.125**	0.054**	0.159***
Geary's *C* for sharing views on how well the recent IT decision supports business (D_ALIGN)	0.744**	0.748**	0.713**

* p < 0.05, ** p < 0.01, *** p < 0.001 (all significance based on 1,000 permutations)

Table 36. Geary's *C* and Moran's *I* on the relation between similar views on a recent IT-decision's business support and perceived strategic IT-business alignment

8.5 Individual-Level Perceptions

In the following, individuals' perceptions of strategic IT-business alignment are studied. Here, the emphasis is on what has an effect on the perceptions.

When one is studying the attributes of single actors, who simultaneously form a group and thus perhaps influence each other, a normal linear regression model with typical statistical tools, such as SPSS or SAS, is not a good choice, since it requires independent observations. UCINET 6 also provides a permutation-based regression analysis for nodal data, which was used in the study.

8.5.1 Hypotheses on Individual-Level Interaction Patterns and Formal Structures

In the next hypotheses, the effect of network neighbors on an individual's perceptions is examined. The adjacency is assumed to have an effect, i.e. the perceptions tend to be similar with the neighbors.

H7a: *The perceptions of an individual actor's neighbors in advice network have an effect on an individual actor's perceptions of strategic alignment between IT and business.*

H7b: *The perceptions of an individual actor's neighbors in discussion network have an effect on an individual actor's perceptions of strategic alignment between IT and business.*

H7c: *The perceptions of an individual actor's neighbors in friendship network have an effect on an individual actor's perceptions of strategic alignment between IT and business.*

An actor-level spatial-effects model is used to study whether the perceived IT-business alignment depends on adjacency in some of the networks included in this study. A separate model has been built for each variable to find out the effect of each particular variable. As there are isolates with no alters in their egocentric networks in some of the networks in this set of data, the adjacency effect may be difficult to observe without dropping the isolates out. Therefore, the adjacency effect is studied without the isolates. Table 37 presents the results.

Isolates removed	AL_CURR How the current IT systems' support for achieving business goals ρ or β	*p*-value	AL_ITP How IT plans support business plans ρ or β	*p*-value	AL_BP How business plans reflect IT plans ρ or β	*p*-value
Intercept	0.560400		1.017578		2.337745	
Adjacency in advice (ρ)	0.802427 **	0.001	0.675740 **	0.002	0.234753	0.192
R^2	0.26 **	0.002	0.25 **	0.003	0.03	0.368
Cohen's f^2	0.351		0.333		0.031	
Intercept	1.580174		2.766663		2.259055	
Adjacency in discussion (ρ)	0.476722 *	0.024	0.152884	0.323	0.246675	0.178
R^2	0.13 *	0.047	0.01	0.643	0.03	0.345
Cohen's f^2	0.149		0.010		0.031	
Intercept	2.77070		3.362172		3.667130	
Adjacency in friendship (ρ)	0.137880	0.375	0.026247	0.473	-0.161065	0.303
R^2	0.01	0.736	0.00	0.941	0.02	0.597
Cohen's f^2	0.010		0.000		0.020	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (all significance based on 1,000 permutations)

Table 37. Regression model with network-effect for perceived strategic IT-business alignment using the adjacencies in different interaction patterns as independent variables

Adjacency in both advice and discussion networks produced a significant effect on perceptions of how well the current IT systems support for achieving business goals. In addition, adjacency in advice network produced a significant effect on perceptions of how well IT plans support business plans. The effect size varied from medium (Cohen's f^2 with values of 0.149 and 0.333) to large (Cohen's f^2 with a value of 0.351). However, perceptions of how well business plans reflect IT plans were not influenced by adjacency in any of the networks examined in this study.

Next, the possible effects of formal structures on an individual actor's perceptions are considered with the following three hypotheses.

H8a: The department to which an individual actor belongs has an effect on an individual actor's perceptions of strategic alignment between IT and business.

The department is a categorical variable and thus, cannot be used as such in regression models. A better way to test the hypothesis H8a is to use a one-way ANOVA. The results are presented in Table 38.

	AL_CURR How the current IT systems' support for achieving business goals			AL_ITP How IT plans support business plans			AL_BP How business plans reflect IT plans		
Source	Mean	F-stat.	Sign.	Mean	F-stat.	Sign.	Mean	F-stat.	Sign.
1a Business planning	3.183	3.0072	0.0104*	3.310	3.6055	0.0028**	3.125	1.1424	0.3839
1b IT	3.371			4.071			3.466		
2 Production	2.163			2.875			3.018		
3 Finance	3.344			2.773			2.663		
4 HR	3.282			3.024			2.625		
5 New business	3.469			3.537			2.814		
6 Investments	2.425			2.266			2.493		
7 Sales	2.438			2.813			2.878		
8 Services	2.659			3.417			3.157		
9 Brokerage	4.500			4.500			3.500		
10 CEO	3.000			3.750			2.500		
η^2	0.305			0.581			0.536		

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (all significance based on 1,000 permutations)

Table 38. The results from a one-way ANOVA testing the differences between departments for the perceived strategic IT-business alignment

The results from the one-way ANOVA with department as an independent variable show significant results for both AL_CURR and AL_ITP. As the η^2 with values of 0.305 and 0.581 indicates large effect size, the results have practical significance, too. In contrast, there were no significant differences between the departments on AL_BP.

Next, the focus is on whether the number of cross-department groups, to which an individual belongs, has an effect on the perceptions of IT-business alignment by testing the following hypothesis.

H8b: The number of cross-functional groups to which an individual actor belongs has an effect on an individual actor's perceptions of strategic alignment between IT and business.

Table 39 presents the results from an actor-level regression model.

	AL_CURR How the current IT systems' support for achieving business goals		AL_ITP How IT plans support business plans		AL_BP How business plans reflect IT plans	
	β	*p*-value	β	*p*-value	β	*p*-value
Intercept	3.128111		3.320554		3.262273	
Number of cross-functional groups	-0.052841	0.162	-0.007901	0.457	-0.092516 **	0.019
R^2	0.03	0.330	0.00	0.895	0.11*	0.045
Cohen's f^2	0.031		0.000		0.126	

* p < 0.05, ** p < 0.01, *** p < 0.001 (all significance based on 1,000 permutations)

Table 39. The regression model for perceived strategic IT-business alignment by using the number of memberships in cross-functional groups as an independent variable

The number of cross-functional groups did not produce any significant results concerning AL_CURR and AL_ITP. However, the number of cross-functional groups and AL_BP appear to have a weak negative relationship.

Next, the hypothesis on the relationship between an individual's organizational rank and his or her perceptions of strategic IT-business alignment is tested.

H8c: An individual actor's rank in an organizational hierarchy has an effect on an individual actor's perceptions of strategic alignment between IT and business.

The following table (Table 40) shows the results from a regression model where the organizational rank is the independent variable.

	AL_CURR How the current IT systems' support for achieving business goals		AL_ITP How IT plans support business plans		AL_BP How business plans reflect IT plans	
	β	*p*-value	β	*p*-value	β	*p*-value
Intercept	3.278804		3.774887		4.006719	
Rank	-0.096571	0.272	-0.155826	0.175	-0.326448 **	0.002
R^2	0.01	0.536	0.03	0.324	0.20**	0.006
Cohen's f^2	0.010		0.031		0.25	

* p < 0.05, ** p < 0.01, *** p < 0.001 (all significance based on 1,000 permutations)

Table 40. The regression model for perceived strategic IT-business alignment by using the rank in organizational hierarchy as an independent variable

The results are very similar to those concerning the relationship between the number of cross-functional groups and the perceptions of strategic IT-business alignment. There is no significant relationship between the rank and AL_CURR or AL_ITP but a significant negative effect on AL_BP is detected.

In summary, the hypotheses about the effect of actor-level attributes concerning the informal and formal structures with regard to actor-level perceptions of strategic IT-business alignment have been tested. Next, the focus is on the alternative actor-level attributes that potentially have an effect on the perceptions.

8.5.2 Hypotheses Related to Alternative Individual-Level Explanations

The alternative explanation for a centrality or adjacency network based on interaction-patterns or the formal position is that an individual's personal characteristics determine the perceptions of strategic IT-business alignment. The first hypothesis of alternative individual-level explanations is about an individual's personal IT competence.

H9a: *An individual actor's personal IT competence has an effect on his or her perceptions of strategic alignment between IT and business.*

In the following table (Table 41), there are the results from two regression models, of which the first has an interest in IT (COMP_IT) as an independent variable and the second has an individual's own self-rated knowledge on IT (COMP_KN) as an independent variable.

	AL_CURR How the current IT systems' support for achieving business goals		AL_ITP How IT plans support business plans		AL_BP How business plans reflect IT plans	
	β	*p*-value	β	*p*-value	β	*p*-value
Intercept	2.631538		1.924855		2.075405	
COMP_INT (IT interest)	0.094920	0.244	0.370197 **	0.006	0.251711 *	0.015
R^2	0.01	0.493	0.17 *	0.011	0.13 *	0.030
Cohen's f^2	0.010		0.205		0.149	
Intercept	2.058361		1.952746		1.954261	
COMP_KN (IT knowledge)	0.270702 *	0.037	0.393762 *	0.010	0.308714 *	0.011
R^2	0.09 †	0.079	0.14 *	0.020	0.15 *	0.020
Cohen's f^2	0.099		0.163		0.176	

† $p \leq 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (all significance based on 1,000 permutations)

Table 41. The regression model for perceived strategic IT-business alignment by using interest in IT and knowledge in IT as independent variables

The results show that both COMP_INT and COMP_KN have a positive relationship with both AL_ITP and AL_BP. In contrast, AL_CURR has no significant relationship with either of these two independent variables.

Next, I present the results from testing the hypotheses on the effect of perceived shared domain knowledge on the perceptions of strategic IT-business alignment.

H9b: *An individual actor's perceptions of shared domain knowledge within an organization have an effect on his or her perceptions of strategic alignment between IT and business.*

The following table (Table 42) includes the results from two regression models, where the independent variable is either the perceived IT-knowledge level of business people (SK_BUSIT) or the perceived business-knowledge level of IT people (SK_ITBUS).

	AL_CURR How the current IT systems' support for achieving business goals		AL_ITP How IT plans support business plans		AL_BP How business plans reflect IT plans	
	β	*p*-value	β	*p*-value	β	*p*-value
Intercept	2.601621		2.171705		2.263746	
SK_BUSIT (Business knows IT)	0.128610	0.166	0.379280 **	0.003	0.250990 *	0.011
R^2	0.03	0.322	0.20 **	0.006	0.14 *	0.022
Cohen's f^2	0.031		0.250		0.163	
Intercept	2.109261		1.579125		1.919259	
SK_ITBUS (IT knows business)	0.264578 *	0.036	0.520275 **	0.001	0.329878 **	0.004
R^2	0.09 †	0.072	0.28 **	0.001	0.18 **	0.008
Cohen's f^2	0.099		0.389		0.220	

† $p \leq 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (all significance based on 1,000 permutations)

Table 42. The regression model for perceived strategic IT-business alignment by using how well business knows IT and how well IT knows business as independent variables

The results are very similar to those concerning the relationship between IT competence (COMP_IT and COMP_KN) and the perceptions of strategic IT-business alignment. There is no significant relationship between the perceptions of the shared domain knowledge and AL_CURR but significant effects of both SK_BUSIT and SK_ITBUS are detected on both AL_ITP and AL_BP.

Next, the hypothesis concerning an individual's background characteristics is tested.

H10: *An individual actor's background characteristics have an effect on his or her perceptions of strategic alignment between IT and business.*

First, the focus is on whether the gender of the respondent has an effect on his or her perceptions of strategic alignment between IT and business. As the gender is a dichotomous variable, a t-test can be used to test the hypothesis. The results are shown in Table 43.

	AL_CURR How the current IT systems' support for achieving business goals			AL_ITP How IT plans support business plans			AL_BP How business plans reflect IT plans		
Gender	Mean	Diff. in means	Sign.	Mean	Diff. in means	Sign.	Mean	Diff. in means	Sign.
Male	2.881	-0.347	0.083 †	3.331	0.108	0.348	3.046	0.123	0.286
Female	3.228			3.223			2.923		
η^2	0.055			0.004			0.009		

† $p \leq 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (all significance based on 1,000 permutations)

Table 43. The t-test results on the effect of the gender on perceived strategic IT-business alignment

Gender does not appear to have a significant effect on the perceptions of strategic IT-business alignment. The significance of the differences between males and females is almost significant, but the practical significance is small as η^2 is less than 0.06.

The other background characteristics are measured by using variables with more than two categories, and hence, their related hypotheses are tested using ANOVA-tests. Table 44 contains the results from the ANOVA-tests. None of the background characteristics proves to have any significant effect on any of the variables for the perceived strategic IT-business alignment.

	AL_CURR How the current IT systems' support for achieving business goals			AL_ITP How IT plans support business plans			AL_BP How business plans reflect IT plans		
Source	Mean	F-stat.	Sign.	Mean	F-stat.	Sign.	Mean	F-stat.	Sign.
Age:									
20 – 29 years	3.320	0.6384	0.6599	3.298	0.5990	0.6915	2.325	0.5734	0.6641
30 – 39 years	3.175			3.472			3.123		
40 – 49 years	2.861			3.380			2.972		
50 – 59 years	2.807			2.981			2.903		
60 or over	3.400			3.250			3.750		
η^2	0.074			0.070			0.067		
Organizational tenure:									
Less than 2 years	2.333	0.7983	0.5619	3.500	0.4543	0.8164	3.250	0.2443	0.9448
2 – 6 years	3.112			3.335			2.935		
7 – 11 years	2.716			3.333			3.314		
12 – 16 years	3.305			3.660			2.894		
17 – 21 years	2.771			3.283			2.988		
More than 21 years	3.114			2.973			3.069		
η^2	0.114			0.068			0.038		
Duration of the current position:									
Less than 2 years	2.621	1.2382	0.3225	3.107	0.5844	0.6607	3.174	1.0793	0.3929
2 – 4 years	3.088			3.218			2.833		
5 – 7 years	2.989			3.230			3.117		
8 – 11 years	3.523			3.828			3.423		
More than 11 years	2.860			3.195			2.823		
η^2	0.134			0.068			0.119		
Field of education:									
Technology	3.002	1.0711	0.3873	3.432	0.9443	0.4617	3.164	1.2134	0.3143
Social sciences and business	2.783			3.116			2.754		
Other	3.200			2.750			2.500		
η^2	0.089			0.079			0.099		
Degree of education:									
Lower secondary education	4.000	1.5243	0.2048	2.500	0.5864	0.6513	3.050	1.0793	0.3646
Upper secondary education	2.839			2.854			3.102		
Post-secondary non-tertiary education	3.038			3.287			3.192		
Lower first stage of tertiary education (B.Sc.)	3.150			4.188			3.625		
Upper first stage of tertiary education (M.Sc.)	2.854			3.229			2.791		
Other	3.382			3.305			2.971		
η^2	0.082			0.068			0.119		

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (all significance based on 1,000 permutations)

Table 44. ANOVA-test's results on the background characteristics' effect on perceived strategic IT-business alignment

Next hypothesis is about whether there is a positive correlation between perceptions of how a single, recent IT-decision contributes to the achievement of the business goals, and perceptions of strategic alignment between IT and business.

H11: *An individual actor's perceptions of how a single recent IT-decision was carried out have a positive effect on his or her perceptions of strategic alignment between IT and business.*

A node-level regression analysis was performed to determine if there is a significant relationship between the perceptions of how well a single IT-decision supports achieving the business goals and the perceptions of the strategic IT-business alignment. As the data is not independent, the estimation of standard errors is simulated with permutations. The results of the analysis are in Table 45.

	AL_CURR How the current IT systems' support for achieving business goals		AL_ITP How IT plans reflect business plans		AL_BP How business plans reflect IT plans	
	β	*p*-value	β	*p*-value	β	*p*-value
Intercept	1.405017		1.575852		1.815483	
D_ALIGN	0.488850	0.000 ***	0.533523	0.000 ***	0.369767	0.001 **
R^2	0.314	0.000 ***	0.298	0.000 ***	0.236	0.001***
Cohen's f^2	0.458		0.425		0.309	

* p < 0.05, ** p < 0.01, *** p < 0.001 (all significance based on 1,000 permutations)

Table 45. The regression model for perceived strategic IT-business alignment by using the variable on how well a recent IT-related decision supports business as an independent variable

There is some evidence that the perceptions of the recent IT-decision can explain the strategic alignment between IT and business but the effect size is only medium-sized, although being very close to the standards for the large-sized effect.

8.6 Summary of the Chapter

This chapter includes a presentation on the data analysis principles and methods used in this study. It also contains a report on testing the hypotheses of this research. Some hypotheses reached support, whereas others did not. In the following tables, there is a summary showing whether the hypotheses were supported or not.

First, the company-level hypothesis is presented. Then, the tie-level hypotheses are shown, and finally, the results concerning the individual-level hypotheses conclude this chapter.

Table 46 includes the findings relating to the first hypothesis, which relates to the first research question (R1) at a company-level. The hypothesis (H1) on the interaction patterns receives weak support.

		AL_CURR How the current IT systems' support for achieving business goals	AL_ITP How IT plans reflect business plans	AL_BP How business plans reflect IT plans
H1	The density of the interaction patterns has a positive effect on perceptual congruence on strategic IT-business alignment.	Support: $c_v > 0.2$ and the density in all interaction patterns < 0.1	Support: $c_v > 0.2$ and the density in all interaction patterns < 0.1	Weak support: $c_v > 0.18$ and the density in all interaction patterns < 0.1

Table 46. Key findings on the company-level hypothesis

In the next table (Table 47), there are the key findings on the tie-level hypotheses. The three first hypotheses (H2a, H2b, and H2c) concern informal networks, while the next two (H3a and H3b) are about formal structures. The remainder of the hypotheses in the following table concerns the alternative hypotheses, where the effect of similar perceptions of shared domain knowledge and a respondent's own IT competence – as well as similar personal background characteristics – is examined. The last of the hypotheses (H6) in the following table is about the relationship between perceived strategic IT-business alignment and the perceptions of a recent IT-decision.

		AL_CURR How the current IT systems' support for achieving business goals	AL_ITP How IT plans reflect business plans	AL_BP How business plans reflect IT plans
H2a	Individual actors *i* and *j* will be more likely to have similar perceptions of the strategic IT-business alignment if they are in a relationship of asking and giving advice in an organization.	Weak support Geary's *C*: 0.565**	Weak support Geary's *C*: 0.614* Moran's *I*: 0.431**	No support
H2b	Individual actors *i* and *j* will be more likely to have similar perceptions of the strategic IT-business alignment if they are discussion partners.	**Support Geary's *C*: 0.475****	No support	Weak support: Geary's *C*: 0.640*
H2c	Individual actors *i* and *j* will be more likely to have similar perceptions of the strategic IT-business alignment if they are friends.	No support	No support	No support
H3a	Individual actors *i* and *j* will be more likely to have similar perceptions of the strategic IT-business alignment if they belong into the same department.	Weak support Geary's *C*: 0.678*	**Support Geary's *C*: 0.491** Moran's *I*: 0.492****	No support
H3b	Individual actors *i* and *j* will be more likely to have similar perceptions of the strategic IT-business alignment if they belong into the same cross-functional groups.	Weak support Geary's *C*: 0.681*	No support	No support
H4	Individual actors *i* and *j* will be more likely to have similar perceptions of the strategic IT-business alignment if they have similar views on shared domain knowledge.	No support	No support	No support
H5	Individual actors *i* and *j* will be more likely to have similar perceptions of the strategic IT-business alignment if they have similar backgrounds.	No support	No support	No support
H6	Individual actors *i* and *j* will be more likely to have similar perceptions of the strategic IT-business alignment if they have similar views on the recent IT-related decision.	Weak support Geary's *C*: 0.744**	Weak support Geary's *C*: 0.748**	Weak support Geary's *C*: 0.713**

Support: $p < 0.05$ and large effect size
Weak support: $p < 0.05$ and medium effect size

Table 47. Key findings on the tie-level hypotheses

As the construct on strategic IT-business alignment is formative, it has been decomposed. First, the focus is on AL_CURR, which refers to how well current IT solutions are perceived to support achieving the business goals. In both informal networks and formal structures, there is some support for the hypotheses. A tie in a discussion network has a strong, significant

relationship with AL_CURR and a tie in an advice network has a medium-sized, significant relationship as well. If a pair of individuals shares the same department or the same cross-functional groups, they tend to have rather similar perceptions of AL_CURR as well. If the perceptions of a recent IT-decision are similar between a pair of individuals, it is likely that their perceptions of AL_CURR are similar, too.

The other two decompositions of the strategic IT-business alignment construct are about plans. AL_ITP measures whether the IT plans support business plans. Here, the test results point out that those from the same department tend to have similar perceptions of AL_ITP. The autocorrelation value is significant and the effect size is large. As well, those having a tie in an advice network tend to have similar perceptions of AL_ITP but here, the effect size is only medium. The effect size is medium also in the case where those having similar perceptions of a recent IT-decision are likely to have similar perceptions of AL_ITP. Other ties or similarities between two individuals did not produce any autocorrelation with AL_ITP.

AL_BP is a variable measuring how well business plans reflect IT plans. This time, the shared department unit did not have an effect on having similar perceptions of AL_BP. Those having a tie in the discussion network or having similar perceptions of the recent IT-decision tend to have similar perceptions of AL_BP.

In the next table (Table 48), there is a summary of whether the results support individual-level hypotheses about informal networks and formal structures. The hypotheses from H7a to H7c focus on an individual's position in informal networks. The hypotheses from H8a to H8c concentrate on an individual's position in formal structures.

Here, the results are very similar to those of the tie-level analysis. AL_CURR depends on the opinions of neighbors in the advice and discussion network but also the department has an effect on the perceptions of AL_CURR. Furthermore, AL_ITP depends on the department. It might also depend on the views of neighbors in the advice network. However, neither the adjacency in informal networks nor a shared department has an influence on AL_BP. Interestingly, the number of cross-functional groups, to which an individual belong, and an individual's rank indicated a negative effect.

		AL_CURR How the current IT systems' support for achieving business goals	AL_ITP How IT plans reflect business plans	AL_BP How business plans reflect IT plans
H7a	The perceptions of an individual actor's neighbors in advice network have an effect on an individual actor's perceptions of strategic alignment between IT and business.	**Support Cohen's f^2: 0.351**	Weak support Cohen's f^2: 0.333	No support
H7b	The perceptions of an individual actor's neighbors in discussion network have an effect on an individual actor's perceptions of strategic alignment between IT and business.	Weak support Cohen's f^2: 0.149	No support	No support
H7c	The perceptions of an individual actor's neighbors in friendship network have an effect on an individual actor's perceptions of strategic alignment between IT and business.	No support	No support	No support
H8a	The department to which an individual actor belongs has an effect on an individual actor's perceptions of strategic alignment between IT and business.	**Support η^2: 0.351**	**Support η^2: 0.581**	No support
H8b	The number of cross-functional groups to which an individual actor belongs has an effect on an individual actor's perceptions of strategic alignment between IT and business.	No support	No support	No support
H8c	An individual actor's rank in an organizational hierarchy has an effect on an individual actor's perceptions of strategic alignment between IT and business.	No support	No support	Weak support Cohen's f^2: 0.25

Support: $p < 0.05$ and large effect size
Weak support: $p < 0.05$ and medium effect size

Table 48. Key findings on the individual-level hypotheses about interaction patterns and formal structures

In the final table relating to key findings (Table 49), there is a summary of whether the individual-level hypotheses with suggested alternative explanations are supported or not.

Of the individual-level hypotheses, only H11 is supported in the case of AL_CURR. Thus, the perceptions of a recent IT-decision influence the perceptions of how well current IT supports in achieving the business goals in general.

The hypothesis H11 is supported in the cases of AL_ITP and AL_BP. In addition to support for H11, the hypotheses H9a and H9b are also supported.

		AL_CURR How the current IT systems' support for achieving business goals	AL_ITP How IT plans reflect business plans	AL_BP How business plans reflect IT plans
H9a	An individual actor's personal IT competence has an effect on his or her perceptions of strategic alignment between IT and business.	No support	Weak support Significant β-values both variables and the values for Cohen's f^2 were 0.205 and 0.163	Weak support Significant β-values both variables and the values for Cohen's f^2 were 0.149 and 0.176
H9b	An individual actor's perceptions of shared domain knowledge within an organization have an effect on his or her perceptions of strategic alignment between IT and business.	No support	**Support** Significant β-values both variables and the values for Cohen's f^2 were 0.250 and 0.389	Weak support Significant β-values both variables and the values for Cohen's f^2 were 0.163 and 0.220
H10	An individual actor's perceptions background characteristics have an effect on his or her perceptions of strategic alignment between IT and business.	No support	No support	No support
H11	An individual actor's perceptions of how a single recent IT-decision was carried out have a positive effect on his or her perceptions of strategic alignment between IT and business.	**Support** Significant β-value in a model with Cohen's f^2 as 0.458	**Support** Significant β-value in a model with Cohen's f^2 as 0.425	Weak support Significant β-value in a model with Cohen's f^2 as 0.309

Support: $p < 0.01$ and large effect size
Weak support: $p < 0.01$ and medium effect size

Table 49. Summary of the individual-level hypotheses about alternative explanations

To summarize, in this chapter, I have tested the hypotheses that I specified in Chapter 5. Tests were conducted at a company-level, tie-level, and individual-level, and strong or weak support was found for hypotheses H1, H2a, H2b, H3a, H3b, H6, H7a, H7b, H8a, and H11, when the dependent variable is AL_CURR.

In the case of AL_ITP, the following hypotheses were supported either clearly or weakly: H1, H2a, H3a, H6, H7a, H8a, H9a, H9b, and H11. With regard to AL_BP, hypotheses H1, H2b, H6, H8c, H9a, H9b, and H11 were clearly or weakly supported.

9 Results and Discussion

This study has focused on the following research question: what explains the (dis-)similarity in the perceptions of the strategic IT-business alignment within an organization. In this chapter, I discuss how the key findings of this study answered the research question. In addition, the reliability and validity of this study are considered and some limitations are identified. As the study leans, to some extent, on the paradigm of critical realism, the role of the researcher is discussed later in this chapter.

The literature review revealed that the social dimension of IT-business alignment is a dimension less studied in the alignment research stream. However, clearly more research into this is needed in order to understand why alignment persists as one of the top concerns of IT executives.

9.1 Key Findings

In this sub-chapter, the **key findings of the empirical part** of this study are reflected on the research questions and other objectives of this study, whereas the key findings from the literature review are summarized in Chapter 4.4.

This sub-chapter starts by considering the effect of interaction patterns within an organization on the perceptions of the strategic IT-business alignment. After that, the formal intra-organizational structures and their connection with the perceived strategic IT-business alignment are discussed.

9.1.1 Intra-organizational Interaction Patterns

In this study, I investigated whether *intra-organizational* ***interaction patterns*** *have an effect on the perceptions of strategic IT-business alignment* (RQ1). Interaction patterns refer to how individuals are connected with each other in reality. In this study, these work-related interaction patterns were discovered in three networks: **advice,**

discussion, and **friendship networks**. Social network analysis as a method enables detecting whether adjacency in the interaction patterns has an effect on the similarity in the perceptions.

The results of this study demonstrated that intra-organizational interaction patterns – more specifically adjacency in the advice and discussion networks – had an impact on the similarity in the perceptions of strategic IT-business alignment. Thus, **adjacency in interaction networks** was found to be an important factor in explaining the similar perceptions of strategic IT-business alignment. However, there were differences depending on whether the respondents were considering the fit between implemented IT solutions and business objectives or the fit between IT plans and business plans. The perceptions of how well the *implemented IT solutions* supported in achieving the business objectives tended to be similar when the respondents had a tie in the advice network or in the discussion network. The perceptions of how well *IT plans* reflected business plans were likely to be similar when the respondents had a tie in the advice network, whereas the perceptions of how well *business plans* reflected IT plans were likely to be similar when the respondents had a tie in the discussion network. However, there was only weak support for this last finding.

These results are in line with earlier studies (Ibarra 1993; Ibarra and Andrews 1993) that have established the effect of work-related interaction patterns on organizational beliefs, attitudes, and views. Even though, especially in relation to the IT function, work-related interaction patterns in this study partly covered the departmental structure, they still consisted mostly of such relationships that did not match with the formal functional structures, and thus, represented a more informal organization. It is probable that these relationships have developed over time through common experiences, for example through working previously in the same department or project. It is possible that experiences on earlier successful teamwork maintain these work-related interaction patterns. Hence, the existence and importance of these network structures are likely to arise from mutual trust developed previously. The formation and development of these structures is worth studying in more detail in the future.

Regarding the **adjacency in the friendship network,** the results showed that it did not have an effect on the similarity in the perceptions of strategic IT-business alignment. In contrast to earlier studies (e.g. Gibbons 2004; Mehra et al. 2006) that have found friendship ties to be significant in forwarding information and knowledge or in shaping professional values, in

this study, the adjacency in a friendship network did not result in similar views on the strategic IT-business alignment. However, this study is in line with Preston and Karahanna (2004), who found no significant relationship between casual activities and similar views on the role of IT in the organization. In this study, one possible explanation for this result could be that relationships in the friendship network may be more infrequent than relationships in work-related networks. In addition, knowledge exchanged in relationships based on friendship does not necessarily relate with work but other areas of interest. Thus, the views regarding IT do not spread within these networks. Moreover, the friendship network in this particular company was sparse, which means that either friendships did not exist in this workplace, or the respondents did not report them. Friendships might have been regarded too personal to be reported to outsiders on a survey. It is possible that the existence and reporting of friendship ties depend on culture. The potential impact of friendship ties on the perceptions of strategic IT-business alignment might be worth to be investigated in other cultures.

While most of the previous studies on strategic IT-business alignment have looked at the top management team as a collective (e.g. Armstrong and Sambamurthy 1999; Kearns and Sabherwal 2006; Preston et al. 2006) or focused on the communication gap between IT function and business (e.g. Ward and Peppard 1996; Peppard 2001; Luftman 2003; Rathnam et al. 2004; Sledgianowski and Luftman 2006; Gutierrez et al. 2009; Khaiata and Zualkernan 2010), in this study, the scrutiny was on individual members of the top management team. Even though possible tensions within the top management team have been recognized earlier in other research streams (e.g. Ward et al. 2007), they have not been taken into account much in the earlier research on strategic IT-business alignment, aside of only a few exceptions (e.g. Tan and Gallupe 2006). In this study, all the relationships within the whole network, including all the members of the top management team and their mutual ties, were examined. There were clear differences in perceptions within the top management team, in particular with regard to how well IT plans support business. Since the CEO held a central position in the advice and discussion networks of the top management team, he could have influenced the executives' perceptions of strategic IT-business alignment. However, his interest and expertise in IT were limited, and this probably hindered open discussions on the role of IT in the organization. These results confirm that strategic IT-business alignment is not only an issue between the IT function and business, but

there are conflicts on the role and use of IT also between business executives. These also need to be solved in order to reach a state in which business and IT executives understand and are committed to the business and IT mission, objectives, and plans.

While this study postulates that adjacency in the advice and discussion networks results in similar views on alignment, the perceptions were found to be less similar when **examining the network more widely**. In the context of the network as a whole, this study found a weak evidence of the relationship between scarce interaction patterns (networks) and perceptual incongruence. This finding is in line with Coleman (1988) and Reagans and McEvily (2003).

Since only strong ties were identified and their exact strength was not measured in this study, all the ties were considered as equally strong. According to social network theory, strong ties should lead to similar views as they generate new connections through which views diffuse within the network (Granovetter 1973). Therefore, strong ties were expected to result in the similar perceptions of the strategic IT-business alignment also in this study. This was not, however, confirmed by the study. Several possible explanations for this will be discussed next.

Firstly, similar views develop over time. This study, nevertheless, provides a snapshot of the current situation than longitudinal evidence. The CIO's position was peripheral in the networks representing interaction patterns. In spite of being considered a trustworthy primary source in IT matters, at the time of data collection, the views and knowledge of the CIO were not widely spread within the organization. It is possible that in the course of time, the paths connecting the CIO to the members of the top management team with strong ties could eventually lead to knowledge integration. This should be examined with a longitudinal study in which the development of interaction patterns and perceptions of strategic IT-business alignment are looked at in detail.

Secondly, the actors on the path connecting the most distant nodes to the CIO may have several reasons for not forwarding the CIO's views and knowledge to others. For instance, lack of interest and motivation might avert them from discussing the role and uses of IT in the company (Argote et al. 2003; Reinholt et al. 2011). As IT is regarded to be on the responsibility of the IT function, it is typically not on the agenda of business function representatives. It is even possible that IT is not necessarily a critical or visible part of the daily work for the most of the respondents.

Another reason may be that a jargon used by the CIO and others in the IT function complicates knowledge transfer further. If there is no common language, it is difficult for the business function representatives to fully understand most IT related issues and discussions. In other words, sharing specialized knowledge, such as that related to IT, with non-experts can complicate knowledge transfer (Szulanski 1996).

To summarize, in order to answer the research question on whether *intra-organizational* ***interaction patterns*** *have an effect on the perceptions of strategic IT-business alignment,* work-related informal networks and a friendship network within one company were examined. The adjacency in work-related networks appeared to explain similarity in the perceptions of the strategic IT-business alignment, whereas the adjacency in a friendship network had no significant impact. The work-related networks, which are advice and discussion networks, did not fully overlap with the formal department structures but represented a more informal structure.

9.1.2 Formal Intra-organizational Structures

The second research sub-question for this study focused on whether ***formal intra-organizational structures*** *have an effect on the perceptions of strategic IT-business alignment* (RQ2). Formal intra-organizational structures refer to "*a network comprising all the various cooperative ties between organizational positions that have been intentionally created to safeguard economic processes*" (Rank 2008, p. 147). In this study, formal structures included the functional division and departments, the organization hierarchy, and formal cross-functional groups and committees.

The results of this study indicate that formal intra-organizational structures have an effect on the perceptions of strategic IT-business alignment in the following way: if two individuals belong to the same functional department, they tend to have the similar perceptions of strategic IT-business alignment. The department also had an impact on the perceptions of the degree of strategic IT-business alignment: the ratings for alignment varied depending on the department. The departments focusing on production and supply chain management gave lower ratings for the level of strategic IT-business alignment than other departments, whereas for instance, IT department rated strategic IT-business alignment higher than on average in the company.

These results are in line with prior studies that have demonstrated that the views about strategic IT-business alignment are likely to **differ between IT departments and business units and functions** (Teo and King 1997a; Rathnam et al. 2004). In this study, IT department gave considerably higher ratings for the degree of strategic IT-business alignment than on average. One possible reason for this is that many of the IT professionals were isolated from the rest of the organization, forming a clique of experts working in their own silo. While isolated, they did not receive much feedback from the business units, and they seemed to be under the impression that they had performed well. Potential reasons for this isolation are not only the possible language mismatch, but also the fact that the tasks and duties requiring IT expertise strained the IT professionals not leaving them time to collaborate with business representatives.

In addition, there were **dissimilarities also between other departments or functions**. This is in line with earlier studies that have provided evidence on the differences in ratings on strategic IT-business alignment between business units within a company (e.g. Reich and Benbasat 2000). Next, the reasons for the departments' important role for the perceptions of strategic IT-business alignment are considered. The first possible reason is the relational similarity that is assumed to exist in departments. Another one is the multifold role of IT, which can vary for different departments.

Earlier studies building on organization theories have portrayed a department to be in a significant role regarding the attitudes and behavior in organizations (Rousseau 1978; Boone and Ganeshan 2008). The **relational similarity** within a department is suggested being one reason for this. A functional department requires specialized skills, and thus, the employees within a department could be relatively similar regarding their skills and experiences. Consequently, a department can be assumed to consist of individuals who are relationally similar to each other. However, the results of this study did not support the relational similarity relating to the similar perceptions of strategic IT-business alignment. Therefore, the relational similarity at least in age, gender, the length of organizational tenure, or education may contribute to but might not be the best explanation for the department's strong effect on the perceived strategic IT-business alignment. While the effect of the common experiences shared together within a department was not within the scope of this study, it might be highly interesting to investigate in more detail in future research.

One possible reason for conflicting views between departments is the **role of IT**, which can be very different for each department (Hartung et al. 2000; Dewett and Jones 2001). The needs and requirements of each functional department may be multifold and, to some extent, unique. In a company with a centralized IT function, the IT department is typically responsible for responding to these needs. How well and how soon these needs are responded to depends on the prioritization of IT projects and acquisitions, the flexibility of IT architecture, and availability of resources and compatible solutions (Overby et al. 2006). The department-specific technologies and applications should match with the overall IT architecture. Applications common for all the departments, for example enterprise-resource-planning and intranet, are typically included in the enterprise-level IT infrastructure (Weill et al. 2002). The functionalities and characteristics of enterprise-level applications are, however, valued differently depending on the department. When IT has a different role for different departments subject to their function, it is possible that the perceptions are filtered through their own experiences specific to their departments. This could be the case, even though the respondents were asked to evaluate the alignment from a company's perspective. This is even more probable, if a company works in silos, as Zeta does.

Even though a functional department denoted similarity of perceptions, other formal structures were less important. Contrary to the expectations based on earlier research (Galbraith 1973; Grant 1996b; Brown 1999; Reich and Benbasat 2000), belonging to the **same formal cross-functional structures**, such as steering groups or committees, did not result in the similar perceptions of strategic IT-business alignment. In this study, the most relevant formal cross-functional structure for IT related issues was the IT steering group, which was set up to improve coordination and collaboration in IT related decisions. It has been suggested (Karimi et al. 2000) that firms should carefully select for which of the following purposes to establish an IT steering group: control, coordination, or collaboration. However, the results of this study suggest that it is not only the purpose of an IT steering group that should be deliberated, but also the kind of working culture that supports it needs to be considered. Establishing cross-functional structures for collaboration purposes seems to be inefficient unless the working culture of the group is also participative. Further studies on IT steering groups are needed to shed more light on the circumstances that can actually strengthen the social ties between its members.

Even though department as an organizational unit was found to be an important factor for the perceptions of strategic IT-business alignment for its most parts, it did not have an effect on the perceptions of how business plans reflect IT plans. People within most departments were rather unanimous in thinking that business plans reflected IT plans relatively poorly. Another interesting observation from this study concerns the relationship between formal structures and the perceived level of alignment concerning how business plans reflect IT plans. There was a negative effect of both the rank and an increased number of memberships in different cross-functional groups, which means that the higher the organizational position, the poorer the ratings. Since the assignments of the members of the top management team to cross-functional groups were the most numerous within the company, this implies that compared with the rest of the organization, the top management team was more dissatisfied with the level of business plans reflecting IT plans. The executives, being responsible for the business plans, were the best in rating how well business plans reflected IT plans. This finding indicates a one-way planning process where IT function reacts to business plans and has no input in the business planning process (Teo and King 1996).

In summary, the research question on whether ***formal intra-organizational structures*** *have an effect on the perceptions of strategic IT-business alignment* was examined by looking at the functional department structure and formal cross-functional groups within one company. Belonging to the same department appeared to explain similarity in the perceptions of the strategic IT-business alignment, whereas belonging to the same cross-departmental group did not produce a similar impact. Thus, the perceptions of IT-business alignment seem to be filtered through departmental lenses.

9.1.3 Other Results

Prior research has shown that **shared domain knowledge** facilitates in creating such knowledge structures that help in reaching an effective IT-business alignment (Reich and Benbasat 2000; Ranganathan and Sethi 2002; Chan et al. 2006). The findings of this study support this: if an individual perceived shared domain knowledge within the organization, he or she was more likely to consider IT and business being well aligned. This was the case especially regarding the perceived fit between the business and IT plans, which is a rational and expected finding: planning is a knowledge-intensive process, where shared domain knowledge can play a significant

role. However, the perceived shared domain knowledge did not have an effect on the perceptions of how the implemented IT supports achieving business goals. This indicates that the implemented IT did not match with the plans. Expectations awoken by the high-quality plans were not met.

In addition, the **effect of the respondents' recent experiences with company-wide IT-decisions** was examined in this study. The effect of a recent IT-related decision is assumed to be due to the **recency effect**, which means that the event experienced most recently dominates in the overall ratings, which cover a more extensive set of experiences from a longer period. In this study, the views concerning a recent IT-related decision were in line with all the views on the perceived strategic IT-business alignment. It is possible that the ratings for the recent IT-related decision and for the overall IT-business alignment can be explained with the same factors. In this case, the IT-related decision was a typical representative of how IT and business are aligned in practice, and thus, the ratings correlate strongly with the ratings for IT-business alignment. This does not exclude the recency effect on the perceptions of strategic IT-business alignment.

In contrast to earlier studies (e.g. Tsui and O'Reilly 1989), where the similarity in **organizational tenure** has been found to be an important factor for perceived performance, in this study, organizational tenure did not have an effect on the perceived strategic IT-business alignment. The perceptions of those who were relatively new within the company were not different from those with longer tenures. However, for this organization studied, the personnel turnover was low, and the proportion of new employees was very small. It is possible that in this kind of organization, a new co-worker quickly adopts the overall mindset of his or her department.

In a survey, the term **missing data is used to** refer to the items with a great number of non-responses or missing values. This kind of data can also reveal valuable insights into possible knowledge gaps in an organization. In this study, the respondents were either not able to understand the question on how well the IT systems that are pending in the portfolio and not implemented yet, support business strategies, or unable to assess it due to lack of knowledge. In the light of the interview data, it is probable that the respondents were adequately informed about neither the contents of the IT portfolio nor how the future projects were supposed to support achieving the business goals. Evidently, communication about the roadmap from the plans towards up and running IT solutions has not been successful.

9.2 Reliability and Validity of Research

Reliability is a multifaceted concept consisting of stability and accuracy. *Stability* refers to obtaining the same or similar results by using the same or comparable measurement instrument more than once with the same set of objects. In contrast, *accuracy* refers to the truthfulness of the measures obtained from the measurement instrument. Reliability can be improved by writing the items unambiguously, and if not reliable enough, adding more items of equal kind and quality. Giving clear and standard instructions also tends to reduce the errors of measurement (Kerlinger 1973).

In this kind of research, **stability** is always a concern as both the network structures and the perceptions are dynamic and therefore, subject to changes. In the short run, the respondents should still give the same or similar responses. However, this kind of stability is difficult to evidence, as the respondents are unlikely to be motivated to re-take the questionnaires. In particular, the stability aspect has raised some discussion on the reliability of network data in the field of social network research. In this study, the data collection was carried out using a recognition method mixed with a recall method, because the feedback of the pre-test also encouraged to this. If the data was collected in face-to-face interviews, the recall method could have been applicable but in the web-based questionnaire, I needed to provide a list from where to select. Therefore, an alphabetical list of employees was provided as a recognition aid. This list contained the names of the top management team members, the supervisor, the direct subordinates, and equal peers from the respondent's organizational unit. Respondents were not restricted to a fixed number of nominations. In addition, the respondents could add names on blank rows. Some researchers (e.g. Hlebec and Ferligoj 2002) claim that respondents' moods may affect the stability of a network identified with the recognition method and therefore, reliability when using the recognition method may decrease. To decrease the risk of studying unstable non-recurrent relationships, I decided to take into account only the reciprocal relationships.

In addition to stability, attention has been paid to **accuracy** by pre-testing the instrument in advance, both with practitioners outside Zeta and by the first respondent, i.e. the CIO of Zeta. Organization-specific terms were used when applicable, standard language was preferred and special vocabulary was avoided. Short explanations and instructions were used in the items that were more difficult to understand.

Another issue to the reliability of organizational studies is that respondents may be tempted to answer according to the prevailing organizational norms, which might not necessarily match with reality. They might be reluctant to reveal any facts that they may consider sensitive. Applicable non-disclosure agreements, which protect single respondents but still allow us to report our findings to the academia, were used to build confidence and to prevent this scenario of hiding information. The confidentiality of the responses was emphasized.

In addition to increase the reliability, the order of the questions regarding the general organizational-level alignment and the alignment of a recent, single IT-decision was addressed when designing the questionnaire. The questionnaire started with questions on an overall alignment, and only afterwards, focused on a single IT-decision to avoid possible bias, which could have been created, if the respondents were guided to think of a single event from the very beginning of the questionnaire. Hence, the recent experiences were not readily in mind – at least due to the researcher's actions.

Validity refers to whether we are measuring what we think we are measuring. The concept of validity consists of the following: *content validity*, *criterion-related validity*, and *construct validity*.

Content validity is an issue of representation: does the instrumentation (e.g., questionnaire items) pull in a representative manner from all of the ways that could be used to measure the content of a given construct (Kerlinger 1973; Straub 1989; Straub et al. 2004)? To avoid content validity issues, the established instruments were used whenever applicable. The items were well-known both for the perceived strategic alignment (Kearns and Lederer 2000; Kearns and Sabherwal 2006; Tallon 2007) and for capturing the communication, advice, and friendship networks (Ibarra and Andrews 1993; Borgatti and Cross 2003). The questionnaire was also pre-tested and minor modifications were made based on the pre-test.

Criterion-related validity, i.e. predictive validity, establishes the relationship between measures and constructs by demonstrating that a given set of measures posited for a particular construct correlate with or predict a given outcome variable. As criterion-related validity is not generally conceived of as being necessary for scientific authenticity (Straub et al. 2004), this component of validity has not been tested.

According to Bacharach (1989), *falsifiability* determines if a theory is constructed in a way that empirical refutation is possible. The falsifiability

of constructs is examined by **construct validity**. The constructs, which first must meet the requirements of their variables in terms of measurement and coherence, must have good clarity and parsimony. There are two criteria for construct validity. The first one is **convergent validity**, which means that the responses from the alternative measurements of the same construct must share variance. The second one is **discriminant validity**, which means that the identified objects of analysis must not share attributes and must be empirically distinguishable from one another. By meeting these two validity criteria, the existence of clarity and parsimony can be ensured.

Appendix 4 presents three tables; the first contains the descriptive statistics for those items measured with five-point Likert-type scales. It also includes the Cronbach's alpha coefficients of the constructs with multiple items. The second table provides factor loadings through principal component analysis as an extraction method. This investigates the convergent validity as well. There is one problematic item in AL_BP, which was still included, as the Cronbach's alpha did not improve by leaving it out. After all, the construct was validated by Kearns and Lederer (2003). Otherwise, an examination of convergent validity produced good results.

The third table has inter-correlations among those research variables that were measured with five-point Likert-type scales. Kendall's rank correlation was chosen over Pearson's correlation in order to avoid possible violations in assumptions for Pearson's correlation. The correlation coefficient Tau is presented in the table. None of the inter-correlations of those constructs, for which the Cronbach's alpha could be calculated, exceeded the product of the square roots of the Cronbach's alpha coefficient of the respective constructs. As this rule has been used to evaluate the discriminant validity in several studies (Howell 1987; Szulanski 1996; Armstrong and Sambamurthy 1999), following the same procedure the requirements of the discriminant analysis were met.

9.3 Limitations

This study has some limitations that should be considered. The **general limitations of *ex post facto* research** are the inability to manipulate independent variables, the lack of power to randomize, and the risk of improper interpretation (Kerlinger 1973). These limitations were known in advance and considered in the research design. As it is not possible to conclude causal links from the data in *ex post facto* research (Krackhardt

1990), the hypotheses were built from theories beforehand, the alternative explanations were examined, and the instruments used in the study were tested before launching the questionnaire to the respondents. In this study, one can ask whether there is homophily or contagion in the network. In the current study, the theoretical claim underlying the observed association is that network structure leads to similar opinions, i.e. it causes a contagion. However, it is possible that individuals with similar views seek each other's company and form the informal networks in this way.

There are some limitations especially concerning the **measurement** of a membership in the work-related cross-functional groups and teams. In sociometric questioning, respondents can often specify the relationship by defining its frequency, duration, or the medium used. In this study, I decided not to measure other attributes of a relationship but its existence. The respondents were asked to nominate the most important relationships but not to put them into a particular order or to describe them in more detail. Since the questionnaire also contained many other questions, for instance on perceived strategic alignment and on the recent intranet decision, the network related questions were kept simple. If the length of the questionnaire had increased, the response rate would most probably have deteriorated significantly.

The interviews assisted in getting a better understanding of the research site. However, **the number and timing of the interviews** were, to some extent, a limitation. A possibility to conduct interviews during and after the analyses on the quantitative data could have deepened the conclusions, as interesting findings would have been able to be discussed with the company representatives in more detail. Accessing more than three key informants with face-to-face interviews would also have given more insight to the results. Unfortunately, the decisions who a researcher can access – and when and how - are often not under his or her control. Another limitation regarding to the interviews is the use of only one researcher in analyzing the interview data.

The **operationalization of certain constructs**, more specifically shared domain knowledge, **with only one item** is a limitation, which is considered as lowering the reliability of the study. However, there are a growing number of researchers, who do not consider this a major problem (Drolet and Morrison 2001; Bergkvist and Rossiter 2007; Dollinger and Malmquist 2009). There is always a tradeoff between the number of questionnaire items and a high response rate. Here, I considered the high response rate more important as I wanted to expose the network structures

as complete as possible. Adding the second or third item on the construct to be studied contributes little to the information obtained from the first item (Drolet and Morrison 2001). On the other hand, the use of multiple item increases criterion validity (Sarstedt and Wilczynski 2009), whereas the use of single items complicates the use of more sophisticated analysis methods, such as structural equation modeling (Hair et al. 1998; Haenlein and Kaplan 2004). By considering these claims, I defend my choice to favor the response rate at the cost of the reliability and criterion validity.

The **size of the data** sets limitations with regard to what analysis methods are applicable. Here, the number of respondents was only 37, which excludes the regression models with multiple simultaneous independent variables. The reason for this concerns *statistical power*, which refers to the probability on finding a truly existing significant relationship. This, in turn, relates to a risk of making a type II error, which is accepting a false null hypothesis (H_0), which can occur if a test fails to reject it. Sample size, effect size, statistical significance level, and the number of independent variables have direct impacts on power. If the sample size is given, the effect size is defined as large and the statistical significance level as 0.05, there remains only one factor having an effect on power, and that is the number of independent variables. Limiting their number resolves the issues with statistical power.

Finally, the results are from one network only, which leads to the questions of **generalizability**. According to Lee and Baskerville (2003), positivism would claim that scientific research must be nomothetic and thus, it must promote the ideal of discovering universal laws. Therefore, positivism requires generalizing from a theory to different settings. The empirical testing of a theory involves applying the theory to a set of different conditions. However, this does not confirm the validity of the theory in another setting. A researcher may properly claim that the theory is indeed generalizable to another setting, when he or she has actually tested and confirmed the theory in this new setting. Consequently, an increase – even a large one – in the number of the research settings never produces a universal generalization. As the philosophical foundations of my study rest on post-positivism, I acknowledge the generalizability as a limitation because this theory has been tested only in one setting, but at the same time, I know that the theory holds in this particular setting.

9.4 Reflections on the Role of the Researcher

Even though a positivist research tradition regards a researcher as an objective outsider, in my opinion, the role of the researcher still affects research. For instance, the chosen research problem reflects the subjective interests and motivation of the researcher. In this particular study, the phenomenon was familiar from my personal professional background.

All theories are constrained by their **specific critical bounding assumptions**, for instance values, time, and space (Bacharach 1989). Eventually, the researcher is responsible for these assumptions. He or she defines the time and space for a study, as well the value-based boundaries, even though this might not always be done deliberately. In this study, an implicit underlying assumption is that given to the IT executives' concerns as a starting point, an organization should aim at congruence regarding the strategic issues, including the strategic IT-business alignment. The other value-bounded assumption is that IT executives actually aim at a high level of strategic IT-business alignment. Critical realism highlights the duality of structure and agency where agency's actions, which are both constrained and enabled by pre-existing structures, result in reproducing or transforming the initial context of conditioning (Dobson et al. 2007; de Vaujany 2008). Critical realism also supports the idea that a researcher is an actor even if he or she wants to stay as an outsider. The study itself may trigger a change in the research context. The findings of this study may lead to changes in formal intra-organizational structures, which, in turn, may affect informal networks and change the perceptions about strategic IT-business alignment. While conducting a snapshot instead of a longitudinal study, this duality of structure and agency is difficult to be observed. However, it is important to be aware of this.

As this study rests strongly on the data collected with a questionnaire, the role of the researcher is considerable. Eventually, the researcher makes all the **choices regarding the language and wordings of the questions**. My aim was to use general and relatively easy language in order to get the respondents to interpret the questions as similarly as possible. In the initial version of the survey instrument, the wordings came mainly from the prior literature with minor adjustments. As having my own professional roots in management consultancy, I most probably used the consultant language when phrasing the survey items in Finnish, even though I tried to diverge from my own professional background and come closer to the respondents. Next, I employed some practitioners from other companies

and the CIO representing the research site to test and review the questions. We discussed their impressions, interpretations, and experiences on responding to the survey. The most complicated and ambiguous choices of words were detected in this way. For instance, in the research site, no one referred to strategic business and IT documents with a word "*strategy*", and therefore, together with the CIO, I chose to talk about plans, which belonged to the company vocabulary. As another example, the word "*IT investment*" was replaced by "*IT solutions*". Familiarizing with the research site before launching the survey probably lowered the language barriers. The formal structures mentioned in the questionnaire were actually those, which existed in Zeta at the time of the study. The roster containing names of people working in Zeta was also very organization-specific questionnaire item. The questionnaire aimed simultaneously at being both generic to be applicable in other contexts and specific to limit deviation in the respondents' interpretations. Getting a balance between generality and particularity is always a challenge, as it was this time, too. In addition, once validated instruments cannot be changed too much but only minor adjustments can be accepted.

Subjectivity is always present in abstract concepts, such as 'friendship'. Even though one can give short explanations and examples of the meaning of the concept, it is possible that the explanation itself can also be interpreted in many ways. For example, the intensity of the affection related to the concept of 'friendship' might be different for different people. However, I have assumed that the terminology does not lead to severe multiple interpretations. Mild differences in interpretations do not distort the results – and one has to remember that such issues are also always present in all other studies. When using a questionnaire for data collection, the dialogue between the researcher and the respondents is rather limited. Including open questions to the questionnaire allows the respondents express their views more freely but the feedback mechanisms for further dialogue are missing. In this questionnaire, there was an open question for comments. However, the option to respond to the open question was used only to a very small extent.

Not only the interpretations of the respondents, but also the interpretations made by the researcher do matter. For instance, in this study, I had to interpret whether the views of two respondents were similar, and thus, close to each other or not. Similarly, I chose to leave the non-reciprocal relationships out of scope. In other words, my interpretation on a relationship requires it to be mutually recognized.

In the interviews, there is always a better chance to make sure that both the respondents and the researcher interpret the questions and answers in a way they are originally intended to. However, the interviews conducted in this study represent the views of three informants, even though they might have aimed at as objective and truthful responses as possible. In the light of other sources of data and my own impressions received during the visits to company, I chose to trust my interpretations on the views of the interviewees. Therefore, when discussing the findings of the survey, I have taken account of the description of the research site. This, in turn, rests heavily on the interview data.

Finally, the choices of the researcher define not only what is asked – but also **what is left out**. Some of the choices are deliberate but some are made unconsciously. Delimitations are needed, as one cannot cover everything in one study. The unintentional cuts are limitations of the study, which in turn, are partly due to the subjectivity and bias of the researcher.

As writing a dissertation is also a learning process, this research report is a description of a journey where I have acquired a diverse set of skills needed for research. Even though much can be studied through the literature, developing as a researcher is ultimately much about learning by trial and error. Odysseys and other attempts leading to blind alleys cannot be avoided, but in fact, they are a necessity in this journey. I did not report all the tracks followed during this journey, but they have been valuable from a learning perspective even though they have lengthened this journey.

9.5 Summary of the Chapter

To sum up the key findings presented in this chapter, adjacency in local work-related networks appears to explain the similarity in the perceptions of strategic IT-business alignment, whereas the adjacency in friendship networks did not relate to them at all. The advice and discussion networks overlapped only partly with the formal department structures. In addition, the company's overall strategic IT-business alignment appears to be examined subjectively from a department's point of view. The perceptions of IT-business alignment are filtered through departmental lenses.

The reliability and validity of this study were considered and some limitations were recognized. Finally, I wanted to point out that the researcher always makes an impact on any study with her or his value-bounded choices and interpretations even though the research was built as a quantitative study.

10 Conclusions

This final chapter concentrates on recognizing the implications of this study for both practitioners and the academia. Finally, I conclude by opening new avenues for future research.

10.1 Theoretical Contributions

The research problem of this study is related to the fact that perceptions about strategic alignment between IT and business may vary within an organization. This, in turn, can lead to the ineffective use of IT, poor compromises in prioritizing IT investments, and wasting potential competitive advantage that IT could provide. In this study, explanations were searched for **the (dis-)similarity in the perceptions of the strategic IT-business alignment within an organization** by investigating whether the informal interaction patterns and formal organizational structures within an organization connect with the perceptions of the strategic IT-business alignment.

This study has several implications for the academia. The research responds to the recognized need for more research on the social dimension of strategic IT-business alignment (Reich and Benbasat 1996), which has been less studied to date. Next, the contributions and implications are discussed in an order, which more or less follows the structure of this thesis. In this regard, their order is not value-bounded. In other words, the contributions are not represented in an order of importance.

In the literature review part of this thesis, I have examined the concept of strategy, which is an elementary building block for strategic IT-business alignment, and found it to be prone to several different interpretations. However, the concept of strategy seems seldom to be defined explicitly in the studies on strategic IT-business alignment. In addition, an extensive analysis of prior literature on alignment revealed that the prescriptive schools of thought for strategy have dominated the alignment literature. In the prescriptive schools of thought, strategy is regarded a rational, top-

down process of deliberate analysis for maximizing the profits of a company, whereas the descriptive schools of thought tend to focus on how strategies look like in reality. Building the shared meanings of the strategy within an organization is emphasized particularly in the cognitive school of thought. A switch in the mindset from prescriptive schools to descriptive can direct the research stream to new understanding about alignment. It also brings the social dimension of strategic IT-business alignment more strongly in the field of research. Based on the results of the literature review, I suggest that researchers conducting studies on strategic IT-business alignment should explicitly express their definitions for strategy. The results should be discussed with respect to the choices made over the concept of strategy. I also encourage researchers to look for the theories and definitions of more descriptive schools of thought, since this may open up a richer perspective on strategic IT-business alignment.

Secondly, this study contributes by further developing the definition for the social dimension of strategic IT-business alignment to refer to the state in which business and IT representatives within an organization understand and view the strategic dimension of IT-business alignment similarly. Furthermore, the definition for the strategic dimension of IT-business alignment is further developed to refer to the state in which a high-quality set of inter-related, intended and realized IT and business plans exist. Here, the intentions, which often take a form of documents, and actions, through which IT actually supports business, are explicitly incorporated into the concept of strategic IT-business alignment. These two definitions differ slightly from those of Reich and Benbasat (2000). Whereas the definition for the social dimension of strategic IT-business alignment used in the study stresses shared views regarding the level of strategic IT-business alignment including not only the objectives and plans but also the actions, that offered by Reich and Benbasat focuses only on the overall mutual awareness of IT and business objectives and plans. Similarly, the definition for strategic dimension used in the study refers to the state in which there is a high-quality set of inter-related, intended and realized IT and business plans exist, while the definition of Reich and Benbasat fails to articulate whether the plans also refer to realized plans or not. The adjustments made in the definitions if compared with those, for instance, of Reich and Benbasat (2000) are small but significant as they can direct the research into new areas, such as the formation and development of shared cognitions.

Thirdly, the modified definitions of these two key concepts in this study also resulted in adjustments in measurement. Perceived strategic IT-business alignment was measured by combining the instruments of Kearns and Lederer (2000), who focus on the intentions or plans, and Tallon (2007), who highlights the actual outcomes. This construct covers such a definition for a strategy that is a combination of plans and realized actions. Furthermore, a construct of perceptual congruence, which reflects the social dimension of strategic IT-business alignment but has not been studied earlier, was measured with a coefficient of variation of perceived strategic IT-business alignment. This key ratio makes comparisons concerning perceptual congruence between different organizations relatively easy. However, the implication of using a coefficient of variation as a measure is that multiple respondents per a unit of analysis are needed. Thus far, many studies, especially those with a survey as their research approach, have chosen to use a single key informant's subjective view as a measure on both the alignment level and the degree of shared knowledge. Future studies on strategic IT-business alignment should be designed in a way that enables the use of multiple respondents per a unit of analysis.

Moreover, the study contributes by enhancing the IT-business alignment research by incorporating the key concepts of social network theory to it. The key principle of social network theory to focus on relationships was found to fit well with strategic IT-business alignment research. The concepts taken from social network theory were adjacencies in different socially constructed networks, such as a network consisting of work-related interaction patterns or a friendship network. Thus, in the study it has been shown that in addition to the traditionally used units of analysis, where the focus is on the attributes of single actors, also the dyadic units of analysis are applicable in research on strategic IT-business alignment. In the dyadic units of analysis, the focus is on a relationship between two actors. The research on IT-business alignment benefits from a thought that individuals have an effect on each other, as it provides new directions on the currently rather stagnated state of IT-business alignment research.

Finally, the empirical findings of the study contribute by identifying factors having an effect on the (dis-)similarity in the perceptions regarding strategic IT-business alignment in a relatively stable company with functional organization structure. While the functional department structure was confirmed to be an important factor in affecting the perceptions of strategic IT-alignment, adjacency in other work-related networks was also found to have an impact on the similarity in the

perceptions of strategic IT-business alignment. The work-related networks examined in the study refer to those of discussion and advice. They did not represent the formal structures but exposed an informal organization. Hence, future studies should pay more attention on informal organizations, which are based on personal relationships, since they have an important role in shaping the perceptions on strategic IT-business alignment. In addition, similar views regarding a recent IT-related decision offered also an explanation for similar views regarding the overall alignment level in the company. The relationships between the factors identified to have an effect on the similarity of the perceived level of IT-business alignment deserve more research. This study opens up a question on how the experiences from the development and use of IT and the interaction patterns and structures influence each other. It is worth studying whether the interaction patterns moderate the effect of the experiences. On the other hand, the experiences may have an impact on the formation and development of network structures. The recursive interplay between the experiences and network structures should be studied more.

This research also contributes by suggesting the factors not having an effect on the (dis-)similarity in the perceptions about strategic IT-business alignment. Among these factors is a friendship between two individuals, which is an affection-based relationship. Respectively, whether two individuals belong to the same cross-functional formal group or not, it appears to have no major impact on the similarity in their perceptions on IT-business alignment if the working culture in these groups is passive and people tend to work in silos.

In summary, the findings of the study extend our understanding and knowledge on how the perceptions regarding strategic IT-business alignment take shape within organizations.

10.2 Managerial Contributions

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

The results highlight that in addition to the formal structures, it is important to distinguish between and manage different structures within an organization. The approach of mapping the informal networks together with the perceptions of strategic IT-business alignment helps in identifying how communication flows within an organization: where possible bottlenecks, structural holes and weak linkages are, and who are the central

players. This enables targeted and precise actions that make communication more efficient and increase its quality. The holders of the key positions in two-way communication in IT matters can be recognized and analyzed as well. In order to improve knowledge sharing in the IT-business relationship, the CIO can expand his or her ego-centric net by increasing the number of his or her direct ties especially with those who are central in distant cliques.

Furthermore, the results help managers to understand the network dynamics better in shaping the perceptions of IT-business alignment. The goal of management should be to support the number of informal inter-departmental interactions. Managers should not only allow but also organize time for networking.

As the influence of the functional departments on the perceived strategic IT-business alignment was significant, organizations should continue to seek more innovative lateral mechanisms in order to break the impact of silos. It is not probable to develop similar views on the IT-business alignment by only increasing the number of cross-functional structures. Effective cross-functional structures require a participative way of working in order to enable fluent two-way communication. More discussions are needed to achieve a shared understanding about the role of IT for different departments and to see the enterprise-level picture.

10.3 Avenues for Future Research

Finally, I will deliberate on possible directions for future research. First, this study could be replicated in another setting to test if the findings are more generalizable. The settings could be modified in three ways: 1) a more dynamic organization in a more turbulent environment, 2) an organization with a de-centralized IT function, and 3) different network boundaries spanning beyond the organizational boundaries reaching vendors, partners, customers, and other stakeholders.

As network structures appeared to explain the similarity in perceptions about strategic IT-business alignment, the formation and development of network structures is worth studying in more detail in the future. In addition, the explanations for perceptual congruence found in the study are by no means exhaustive. There are probably also other formal and emergent factors, which shape the perceptual congruence. Future studies should focus on discovering them in order to build better understanding on

how perceptual congruence on strategic IT-business alignment can be achieved.

Future research should also address why and how the perceptions of alignment evolve and change in companies. A longitudinal study on the evolution of the perceptions in the context of structural changes in a company could be beneficial for the academia and practitioners alike.

The significance of the formal organization structure raises new questions. While the effect of the common experiences shared together within a department was not within the scope of this study, it might be highly interesting to investigate in more detail in future research.

Moreover, more research is needed to discover how to break departmental thinking and working in silos, which still exists despite different cross-functional structures. How should IT steering groups or committees be arranged in order to facilitate two-way knowledge sharing? What does contribute to knowledge sharing in these kinds of horizontal structures? How would technology-driven collaboration opportunities promote process-oriented thinking?

The case study method adopted here represents such a research tradition, whereby the researcher enters a social setting with *a priori* constructs. However, being such a complex social phenomenon, should it be examined in a more interpretivist way? Should the researcher enter the field without holding any *a priori* constructs but with a good understanding about the literature (Jones and Hughes 2001)? An ethnographic approach would provide an interesting avenue to be followed.

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APPENDICES

Appendix 1: Summary of the literature review

Appendix 2: Questionnaire

Appendix 3: Interview protocol for the key informants

Appendix 4: Descriptive statistics, factor loadings, and intercorrelations

APPENDIX 1: Summary of the literature review

Article	Research method(s)	Message	Prescriptive or descriptive	Strategy as...	Concept of fit	Called as...	Presence of the concept of knowledge	IV/DV
Avison, D., J. Jones, et al. (2004). "Using and validating the strategic alignment model." Journal of Strategic Information Systems 13(3): 223-246.	case study N = 35 projects; material consisting of documents and interviews	Examines Henderson and Venkatraman's SAM with completed projects in the case rganization to validate the practical use of it.	prescriptive	intended	Present	integration	indirectly present	IV
Baets, W. (1992). "Aligning information systems with business strategy." Journal of Strategic Information Systems 1(4): 205-213.	conceptual	McDonald's model and Parker, Benson and Trainor's model were developed further. IT strategy as a platform for technological opportunties which impact the business strategy.	prescriptive	intended	Present	integration	on research focus	IV
Baets, W. R. J. (1996). "Some empirical evidence on IS Strategy Alignment in banking." Information & Management 30(4): 155-177.	case study in three banks including literature review, simulation, interviews, and questionnaire (N = 17, 18 and 16 from each bank)	Alignment as a collaborative process. The main problem in generating improved IS Strategy Alignment is a lack of overall sector knowledge (not skills) amongst banking managers. Awareness of IS issues (even the softer ones) does not cause problems, but the application of these issues in the banking world does.	prescriptive	intended	Present	collaborative process	on research focus	IV
Baker, E. H. (2004). "Leading Alignment." CIO Insight 1(45): 19-20.	survey N = 1100 executives	A wide gap between IT and business views.	prescriptive	intended	Present	alignment	n/a	n/a
Bassellier, G. and I. Benbasat (2004). "Business Competence of Information Technology Professionals: Conceptual Development and Influence on IT-Business Partnership." MIS Quarterly 28(4): 673-694.	scale development; two case organizations: 29 of 46 and 137 of 280 - after cleaning the data only 109 responses	Business competence of IT professionals influences the intentions to develop partnerships with business, which in turn is assumed to be a primary determinant of success in gaining business advantage through IT.	prescriptive	intended	Not relevant	n/a	on research focus	DV
Bassellier, G., I. Benbasat, et al. (2003). "The Influence of Business Managers' IT Competence on Championing IT." Information Systems Research 14(4): 317.	survey within 2 case companies N = 404 business managers from 2 case companies (346/737 and 121/215 originally)	IT knowledge and IT experience explain one third of the variance in managers' intentions to champion IT.	prescriptive	intended	Not relevant	n/a	on research focus	DV

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Article	Research method(s)	Message	Prescriptive or descriptive	Strategy as...	Concept of fit	Called as...	Presence of the concept of knowledge	IV/DV
Benbya, H. and B. McKelvey (2006). "Using coevolutionary and complexity theories to improve IS alignment: a multi-level approach." Journal of Information Technology 21(4): 284-298.	conceptual	Why is alignment so difficult? This paper builds on coevolution-based self-organized emergent behaviour and structure, which provides important insights for dealing with the emergent nature of IS alignment. Considers Business/IS alignment as a series of adjustments at three levels of analysis: individual, operational, and strategic.	descriptive	a mix	Present	Co-evolu-tionary process	indirectly present	IV
Bensaou, M. and M. Earl (1998). "The right mind-set for managing information technology." Harvard Business Review 76(5): 119-129.	conceptual	Japanese framing for IT management differs from Western view. Instead of aligning the IT strategies with business, Japanese use strategic instinct.	descriptive	a mix	Present	fit	indirectly present	n/a
Bergeron, F., L. Raymond, et al. (2001). "Fit in Strategic Information Management Research: An Empirical Comparison of Perspectives." Omega 29(2): 125-142.	survey N = 110 CEOs	The same data and different definitions for fit -> different results; the perspective of the fit should be articulated and justified with theory	prescriptive	intended	Defined	n/a	n/a	n/a
Bergeron, F., L. Raymond, et al. (2004). "Ideal patterns of strategic alignment and business performance." Information & Management 41(8): 1003-1020.	survey N = 110 CEOs	Low-performance firms exhibited a conflictual coalignment pattern of business strategy, business structure, IT strategy, and IT structure that distinguished them from other firms	prescriptive	intended	Defined	n/a	n/a	n/a
Bleistein, S. J., K. Cox, et al. (2006). "Validating Strategic Alignment of Organizational IT Requirements Using Goal Modeling and Problem Diagrams." Journal of Systems and Software 79: 362-378.	theoretical development and case study with N = 1 (Seven-Eleven Japan)	A requirements analysis framework (based on VMOST and BRG models) that enables verification and validation of requirements in terms of alignment with and support for business strategy.	prescriptive	intended	Present	harmony	n/a	n/a
Booth, M. E. and G. Philip (2005). "Information systems management: role of planning, alignment and leadership." Behaviour & Information Technology 24(5): 391 – 404.	literature review	Explores problem areas in the literature that represents gaps within both theory and in the prevalent methodologies employed to examine those theories.	n/a	n/a	Multiple defini-tions	n/a	indirectly present	n/a

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Broadbent, M. and E. Kitzis (2005). "Interweaving business - driven IT strategy and execution: Four foundation factors." Ivey Business Journal 69(3): 1-6.	conceptual	Four ideas: 1) A CIO who provides leadership on both the demand and supply sides of their role, 2) an executive team that takes the time to develop informed expectations for an IT-enabled enterprise, 3) clear and appropriate demand-side IT governance- knowing who's responsible for what, so you can make faster, better decisions, and 4) taking an IT portfolio management approach.	prescriptive	intended	Present	n/a	indirectly present	n/a
Broadbent, M. and P. Weill (1993). "Improving business and information strategy alignment: Learning from the banking industry." IBM Systems Journal 32(1): 152-179.	case study N = 4 banks (material from questionnaire, interviews, documents)	Organizational practices that facilitate alignment were identified. The interdependence of firm-wide and IS practices was emphasized. A key factor is a flexible and issue-oriented strategy-formation process at different organizational levels.	prescriptive	intended	Present	support	indirectly present	n/a
Broadbent, M., P. Weill, et al. (1996). Firm Context and Patterns of IT Infrastructure Capability (Best Paper Award). ICIS 1996 Proceedings, Paper 13.	case study N = 26 large business units (material from questionnaire, interviews, documents)	The identification and achievement of business unit synergies seem to be primary drivers for firm-wide IT infrastructure capability. A deeper consideration of the IT implications for strategic choices leads to more extensive investment in IT infrastructure services	prescriptive	intended	Present	process	indirectly present	n/a
Brown, C. V. and S. L. Magill (1994). "Alignment of the IS function with the enterprise: Towards a model of antecedents." MIS Quarterly 18(4): 371-403.	case study N = 6 firms (3 industry-pairs) with interviews and customized surveys	Patterns of antecendents explaining a firm's choice to centralize or decentralize systems development - and patterns of antecendents associated with highly centralized or decentralized IS structures.	prescriptive	intended	Defined	gestalt	indirectly present	IV
Bruce, K. (1998). "Can you align IT with business strategy?" Strategy and Leadership 26(5): 16-21.	n/a	Managerial guidelines on alignment	prescriptive	intended	Present	Coordi-nation	indirectly present	IV

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Burn, J. M. (1993). "Information systems strategies and the management of organisational change - a strategic alignment model." Journal of Information Technology 8(4): 127-136.	case study N = 56 organizations	Different stages of growth in the use and development of IS require different approaches to strategy. Different approaches to strategy are favoured by different organizational configurations.	descriptive	a mix	Present	linkage	n/a	n/a
Burn, J. M. (1996). "IS innovation and organisational alignment - a professional juggling act." Journal of Information Technology 11(1): 3-12.	longitudial study N = 168 organizations (different organizations in different years; 59 in the first year, 39 in the second, 37 in the third, and 35 in the last year); most probably questionnaire-based	Alignment is not a steady state but will re¯ect a dynamic model of change. In order to foster innovation in IS this change model requires to be managed through a `r'evolutionary cycle.	descriptive	a mix	Present	linkage	n/a	n/a
Burn, J. M. and C. Szeto (2000). "A comparison of the views of business and IT management on success factors for strategic alignment." Information & Management 37(4): 197-216.	survey and a case study N = 88 pairs of CEOs and CIOs	Two perspectives (IT and business) were largely equivalent, except for their overall perception of the factors that contributed to success in strategic alignment. Successful alignment of IT in industries which are highly IT-dependent would require very different perspectives of both IT and business managers although these are still convergent within the organisation	prescriptive	intended	Present	fit	indirectly present	IV
Byrd, T. A., B. R. Lewis, et al. (2006). "The leveraging influence of strategic alignment on IT investment: An empirical examination." Information & Management 43(3): 308-321.	empirical study N = 84 pairs of plant managers and IT managers in SME manufacturing plants	The results indicated that there is a synergistic coupling between strategic alignment and IT investment with firm performance.	prescriptive	a mix	Multiple definitions	multiple (match and moderation)	indirectly present	IV

Article	Research method(s)	Message	Prescriptive or descriptive	Strategy as…	Concept of fit	Called as…	Presence of the concept of knowledge	IV/DV
Campbell, B. (2005). Alignment: Resolving Ambiguity within Bounded Choices. Pacific Asia Conference on Information Systems (PACIS), Bangkok, Thailand, Association for Information Systems.	multiple focus groups with interviews	The major concern of IS managers when considering alignment is the ambiguity surrounding the differences between espoused strategies, strategies in use and the actions of business managers that support self-interest. In coping with this ambiguity IS managers at all levels of an organization adopt one of two coping responses: Technological or Collaborative. The choice of response is bounded by various factors making up the Locus of Comprehension and Locus of Control. Once a coping response has been established, it then becomes extremely difficult to change.	descriptive	a mix	Present	integration	on research focus	IV
Campbell, B., R. Kay, et al. (2005). "Strategic Alignment: A Practitioner's Perspective." Journal of Enterprise Information Management 18(6): 653-664.	focus groups N = 6 managers	Culture of many organizations is impeding the development of this integration. Inter-relationship between social and intellectual dimensions are highlighted.	descriptive	a mix	Present	integration	indirectly present	IV
Chan, Y. E. (2001). Information Systems Strategy, Structure and Alignment. Strategic Information Technology: Opportunities for Competitive Advantage. R. Papp. Hershey, PA, USA, Idea Group Publishing: 56-81.	survey N = 67 CEO-CIO pairs	Of all business strategy factors investigated, having a well-defined participative business strategy formulation process and managing business change smoothly were the factors found to be associated with better business performance. Alignment is more than a simple parallelism between what IS does and what the rest of the business is doing.	prescriptive	intended	Defined	moderation	indirectly present	IV
Chan, Y. E. (2002). "Why Haven't We Mastered Alignment? The Importance of the Informal Organization Structure." MIS Quarterly Executive 1(2): 97-112.	case study N = 8 organizations considered top performers (5 in Canada, 3 in the US); interviews	Formal organization structures do not always improve IS performance but informal structures played more important role than expected.	prescriptive	intended	Present	linkage	indirectly present	IV

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Chan, Y. E. and B. H. Reich (2007). "IT alignment: an annotated bibliography." Journal of Information Technology 22(4): 316-397.	literature review	An extensive literature review	n/a	n/a	Not relevant	n/a	n/a	n/a
Chan, Y. E. and B. H. Reich (2007). "IT alignment: what have we learned?" Journal of Information Technology 22(4): 297-315.	literature review	Divergent views and new perspectives	n/a	n/a	Not relevant	n/a	n/a	n/a
Chan, Y. E. and S. L. Huff (1992). "Strategy: An information systems research perspective." Journal of Strategic Information Systems 1(4): 191-204.	literature review and conceptual paper	Guidelines for IS strategy research	n/a	n/a	Present	congruence	n/a	n/a
Chan, Y. E., R. Sabherwal, et al. (2006). "Antecedents and Outcomes of Strategic IS Alignment: An Empirical Investigation." IEEE Transactions on Engineering Management 53(1): 27-47.	three surveys N1 = 164 (4 respondents per organization), N2 = 62 (2 respondents per organisation, i.e. CEO and CIO), N3 = 244	The importance of alignment, as well as the mechanisms used to attain alignment, vary by business strategy and industry. Not all firms are equally well served by allocating scarce resources to improve IS alignment.	prescriptive	realized	Defined	profile deviation	on research focus	IV
Chan, Y. E., S. L. Huff, et al. (1997). "Assessing realized information systems strategy." Journal of Strategic Information Systems 6(4): 273-298.	instrument development and mail survey; N = 164	The aim was to determine a valid and reliable way of quantifying how information technology is actually used by organizations to provide support for business operations.	descriptive	a mix	Not relevant	n/a	n/a	n/a
Chan, Y. E., S. L. Huff, et al. (1997). "Business strategic orientation, information systems strategic orientation and strategic alignment." Information Systems Research 8(2): 125-150.	mail survey for information-intensive companies (116 U.S. firms, 54 Canadian firms; 164 companies were used); 4 respondents per organization	This study measured business strategic orientation, IS strategic orientation, and IS strategic alignment, and their implications for perceived IS effectiveness and business performance. Positive impact on business performance were found.	prescriptive	a mix	Present	multiple (match and moderation)	n/a	n/a

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Chen, L. (2010). "Business–IT alignment maturity of companies in China " Information & Management 47(1): 9-16.	N = 130 consisting of both business and IT executives from 22 firms; however, the analysis is at an individual level, not at a company-level	An instrument designed tomeasure the six dimensions of business–IT alignment maturity was cross-validated using a sample of companies in China. Then, the instrument was refined to develop a measurement method that offered better reliability and validity in the context of Chinese companies.	prescriptive	intended	Defined	multiple (match and moderation)	indirectly present	IV
Choe, J.-m. (2003). "The effect of Environmental Uncertainty and Strategic Applications of IS on a Firms' Performance." Information & Management 40(4): 257-268.	survey N = 70 Korean organizations (of 200) CIOs as respondents	Perceived environmental uncertainty has an indirect effect on IS strategic application throuhg the facilitators of alignment.	prescriptive	intended	Present	collaborative process	n/a	n/a
Chung, S. H., R. K. J. Rainer, et al. (2003). "The Impact of Information Technology Infrastructure Flexibility on Strategic Alignment and Application Implementations." Communications of the Association for Information Systems 11(11): 191-206.	survey N = 193 CIOs or other IT managers	Connectivity, modularity, and IT personnel make significant, positive impacts on strategic alignment and that all three components of IT infrastructure flexibility + compatibility result in significant, positive impacts on the applications implementation.	prescriptive	intended	Defined	n/a	indirectly present	IV
Ciborra, C. U. (1997). "De profundis? Deconstructing the concept of strategic alignment." Scandinavian Journal of Management 9(1): 67-82.	conceptual	Critisizes the research stream on alignment and calls for research on a different style of research, a style that puts questioning and thinking at the center of our efforts in coping with the management of complex organizations, a style that makes questioning the core activity of management research and practice, more effective.	descriptive	realized	Present	bridge	indirectly present	n/a
Ciborra, C. U. (1998). "Crisis and foundations: an inquiry into the nature and limits of models and methods in the information systems discipline." Journal of Strategic Information Systems 7(1): 5-16.	conceptual	How do these (newly traced) geometrical lines (in SAM) translate into management behaviour and improved performance? The concept of 'strategy' is not defined properly. Thanks to a careful and rigorous research method smart academic researchers discover the ideal, objective world, and then they extract the relevant models; effective managers steer the world towards the models, once they have learnt them.	descriptive	a mix	Not relevant	n/a	n/a	n/a

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Coughlan, J., M. Lycett, et al. (2005). "Understanding the Business-IT Relationship." International Journal of Information Management 25(4): 303-319.	case study (FinCo, a UK bank); semi-structured interviews N = 29 (top management for retail banking and IT were included)	An in-depth understanding of the BIT relationship and the communication practices within an organisation in order to either provide a tailorable solution to the existing problems, or enhance the effectiveness of any 'RM' programme is required.	prescriptive	intended	Present	alignment	on research focus	IV
Cragg, P., M. King, et al. (2002). "IT alignment and firm performance in small manufacturing firms." Journal of Strategic Information Systems 11(2): 109-132.	survey N = 256 organizations (managing directors?)	A significant proportion of small firms had achieved high IT alignment. Furthermore, the group of small firms with high IT alignment had achieved better organisational performance than firms with low IT alignment.	descriptive	a mix	Defined	multiple (match and moderation)	n/a	n/a
Croteau, A.-M. and F. Bergeron (2001). "An information technology trilogy: business strategy, technological deployment, and organizational performance." Journal of Strategic Information Systems 10(2): 77-99.	survey N = 223 Canadian firms (with CEOs and CIOs as respondents; not clear how business and IT responses were treated)	An outward technological profile contributes the performance for analyzers, while an inward profile contributes the performance for prospectors.	prescriptive	a mix	Defined	multiple (match and moderation)	n/a	n/a
Croteau, A.-M. and L. Raymond (2004). "Performance Outcomes of Strategic and IT Competencies Alignment." Journal of Information Technology 19(3): 178-190.	Survey N = 104 (one per firm; e.g. CEO or CIO)	Based on a covariation approach to alignment, results confirm that strategic and IT competencies alignment significantly enhances perceived business performance.	prescriptive	a mix	Defined	covariation	indirectly present	IV
Cumps, B., D. Martens, et al. (2009). "Inferring comprehensible business/ICT alignment rules." Information & Management 46(2): 116-124.	Survey N = 641 (mainly CIOs or IT managers)	The alignment rule set was created using AntMiner+, a rule induction technique. The goal of our study was to describe practical guidelines for managers in obtaining better alignment of ICT investments with business requirements.	prescriptive	intended	Defined	matching	indirectly present	IV

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D'Souza, D. and D. Mukherjee (2004). "Overcoming the Challenges of Aligning IT with Business." Information Strategy: The Executive's Journal 20(2): 23-31.	non-empirical study	The recurring refrain among IT professionals is that successful IT–business alignment is a noble aspiration, but that it poses many practical challenges. This article provides a rationale for why this may have happened and identifies organizational conditions that affect IT–business alignment.	n/a	n/a	Present	match	indirectly present	IV
Das, S., S. A. Zahra, et al. (1991). "Integrating the Content and Process of Strategic MIS Planning with Competitive Strategy." Decision Sciences 22(5): 953-984.	conceptual based on extensive literature review	Framework that links strategic MIS planning and business strategy and relates it to competitive advantage and company performance.	prescriptive	intended	Defined	gestalt	n/a	n/a
Day, J. G. (1996). "An executive's guide to measuring I/S." Strategy and Leadership 24(5): 39-41.	non-empirical study	Key measuring indeces for IS management including measuring indices for alignment	prescriptive	intended	Present	right things	n/a	n/a
DellaVecchia, T., S. Scantlebury, et al. (2007). "Three CIO Advisory Board Responses to "Managing the Realization of Business Benefits from IT Investments"." MIS Quarterly Executive 6(1): 13-16.	response	The focus on business value is correct but a demanding task.	n/a	n/a	Present	n/a	n/a	n/a
Dutta, S. (1996). "Linking IT and Business Strategy: The Role and Responsibility of Senior Management." European Management Journal 14(3 (June)): 255-268.	case study N = 2 banks	A comparative study of how the senior management of two banks have chosen to align IT with their businesses. Guidelines for practitioners.	prescriptive	intended	Present	link	indirectly present	IV
Earl, M. J., J. L. Sampler, et al. (1995). "Strategies for Business Process Reenglneering: Evidence from Field Studies." Journal of Management Information Systems 1995(12): 1.	case study N = 16 BPR projects in 4 UK organizations (semi-structured interviews with 3 - 10 interviewees (senior business managers) per firm)	This paper reports on early results from case study research into the relationship between business process reengineering (BPR) and strategic planning. The "process alignment model" comprises four lenses of enquiry: process, strategy, information systems, and change management and control. A taxonomy of strategies for BPR is derived from the case studies.	prescriptive	a mix	Present	alignment	n/a	n/a

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Edwards, B. A. (2000). "Chief Executive Officer Behavior: The Catalyst for Strategic Alignment." International Journal of Value-Based Management 13(1): 47-54.	conceptual paper	Four clusters of CEO behavior for successful alignment: communication, strategic interaction, resource utilization, leadership	prescriptive	intended	Present	prerequisite	n/a	IV
Feeny, D. F., B. R. Edwards, et al. (1992). "Understanding the CEO/CIO Relationship." MIS Quarterly 16(4): 435-448.	interviews N = 12 CEO-CIO pairs	Successful relationship seem to be linked to a shared vision of the role of IT as an agent of transformation.	prescriptive	intended	Present	alignment	indirectly present	IV
Floyd, S. W. and B. Wooldridge (1990). "Path Analysis of the Relationship between Competitive Strategy, Information Technology, and Financial Performance." Journal	survey N = 127 in retail banks; and complemented with 68 interviews with CEOs	This study evaluates the impact of competitive strategy on information technology (IT) and of IT on organizational performance.	prescriptive	intended	Present	n/a	n/a	n/a
Fonstad, N. O. and M. Subramani (2009). "Building Enterprise Alignment: A Case Study" MIS Quarterly Executive 8(1): 31-41.	an in-depth case study of a global insurance and financial services company	Three components to be key to successful enterprise alignment: (1) Building the capabilities of the shared IT services group so it can provide infrastructure services more reliably and professionally, (2) Introducing opportunities for IT and business managers to collaborate so they can develop mutual trust and understanding, and (3) Creating new mechanisms for business unit leaders to be better informed about IT investment trade-offs and corporate IT leaders to be better informed about the business value of specific shared services.	prescriptive	intended	Present	process	indirectly present	IV
Galliers, R. D., Y. Merali, et al. (1994). "Coping with Information Technology? How British Executives Perceive the Key Information Systems Management Issues in the Mid-1990s." Journal of Information Technology 9(3): 223-238.	survey N = 98 senior executives in UK (66 IS executives and 32 non-IS)	To identify the key issues in managing information systems by comparing the view of IS executives and non-IS executives. Good agreement between the groups regarding the strategic issues but in some other areas not. Improving IS strategic planning is one of key issues.	prescriptive	intended	Present	alignment	n/a	n/a

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Gerth, A. B. and S. Rothman (2007). "The Future IS Organization in a Flat World." Information Systems Management 24(2): 103-111.	non-empirical study with two examples from real-life	The linkage between operational shifts and the changes required by an IS organization to develop new IS capabilities for a flattening world are identified and discussed.Separate subunits are responsible for managing the Business/IS Partnership in firms with high interdependence among the units.	prescriptive	intended	Present	busines driven IS	n/a	n/a
Gregor, S., D. Hart et al (2007). "Enterprise architectures: enablers of business strategy and IS/IT alignment in government" Information Technology & People 20 (2): 96-120	case study N = 1	A detailed case study of the Australian Bureau of Statistics (ABS) showed that an organisation's enterprise architecture can enable the alignment of business strategy and information systems and technology. The study also examined empirically the social aspects and formal mechanisms of organisational alignment, and shows how a formal enterprise architecture mechanism can integrate into a successful alignment process.	prescriptive	intended	Present	linkage	indirectly present	n/a
Grover, V. and R. Sabherwal (1989). "An Analysis of Research in Information Systems from the IS Executive's Perspective " Information & Management 16(5): 233-246.	literature review N = 658 published articles	IS researchers tend to concentrate on narrow technical issues rather than broad managerial issues. IS researchers should pay greater attention to the concerns of practicing managers. E.g. researchers are not paying enough attention to alignment issues.	n/a	n/a	Not relevant	n/a	n/a	n/a
Gupta, Y. P., J. Karimi, et al. (1997). "Alignment of a Firm's Competitive Strategy and Information Technology Management Sophistication: The Missing Link." IEEE Transactions on Engineering Management 44(4): 399-413.	survey N = 213 IT executives from the financial services industry ("the person most knowledgeable about the firm with regard to the variables of interest")	Factors for measuring IT management sophistication are identified first. Then the effects of the competitive strategy on IT management sophistication are tested empirically. Competitive strategy has a direct impact on IT management sophistication. This study proposed and validated a new instrument for measuring IT management sophistication within firms. This study shows that such an alignment can be translated into a particular set of distinctive competencies in IT management for each competitive strategy.	prescriptive	intended	Present	proximity	indirectly present	IV

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Hartung, S., B. H. Reich, et al. (2000). "Information Technology Alignment in the Canadian Forces." Canadian Journal of Administrative Sciences 17(4): 285-302.	case study N = 8 Canadian Forces (interviews with IT officers and personnel/ administrative officers)	Short-term alignment at the CF bases was influenced by communication and shared domain knowledge factors (the communication mediated the impact of shared domain knowledge).	prescriptive	intended	Present	alignment	on research focus	IV
Henderson, J. C. and J. G. Sifonis (1988). "The Value of Strategic IS Planning: Understanding Consistency, Validity, and IS Markets." MIS Quarterly 12(2): 187-200.	case study N = 1	An effective strategic IS planning process must provide for (1) definition of key markets (within the firm) for IS products and services: (2) internal consistency, particularly between the strategic business plan and strategic IS plan; and (3) a means to assess the validity of the planning process.	prescriptive	intended	Present	cooperative behavior	indirectly present	IV
Henderson, J. C. and N. Venkatraman (1993). "Strategic Alignment: Leveraging Information Technology for Transforming Organizations." IBM Systems Journal 32(1): 472-484.	conceptual	A model for conceptualizing and directing the emergingi area of strategic management of information technology.	prescriptive	a mix	Present	consistency	n/a	n/a
Hirschheim, R. and R. Sabherwal (2001). "Detours in the Path toward Strategic Information Systems Alignment." California Management Review 44(1): 87-108.	case study N = 3 organizations	Three alignment profiles which depend on the business strategy are not always achieved: paradoxial decisions, excessive transformations, and uncertain turnaround. Organizational inertia, split responsibilities, or knowledge gaps can explain the first one; the second is explained by underestimation of problems; and the third by organizational inertia and underestimation of problems.	prescriptive	intended	Defined	profile deviation	n/a	n/a

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Ho, C.-F. (1996). "Information technology implementation strategies for manufacturing organizations: A strategic alignment approach." International Journal of Operations and Production Management 16(7): 77-100.	conceptual	A strategic alignment model has been developed in this study for a manufacturing information system. This model is based on the requirement to achieve alignment across structural and infrastructural domains as well as functional integration across manufacturing and IT areas. This model provides an evolutionary process with four different stages which leads towards the goal of a world-class manufacturer.	prescriptive	intended	Present	bivariate fit	indirectly present	IV
Huang, C. D. and Q. Hu (2007). "Achieving IT-Business Strategic Alignment via Enterprise-Wide Implementation of Balanced Scorecards." Information Systems Management 24(2): 173-184.	conceptual with a case example	A case study in which four key elements of IT-business alignment (integrated planning, effective communication, active relationship mgmt, and institutionalized culture of alignment) were enhance by the enterprise-wide implementation of an established strategic mgmt tool (the balanced scorecard)	prescriptive	intended	Present	alignment	indirectly present	IV
Hussin, H., M. King, et al. (2002). "IT alignment in small firms." European Journal of Information Systems 11(2): 108-127.	survey N = 256 (small firms in manufacturing industry with max 150 employees)	An instrument was developed and used to measure IT alignment in small firms. Evidence was gained of high IT alignment in some firms. The study also indicated that IT alignment was related to the firm's level of IT maturity and the level of the CEO's software knowledge, but did not seem to be linked to the CEO's involvement or the firm's sources of external IT expertise.	prescriptive	realized	Defined	moderation	indirectly present	IV
Irani, Z. (2002). "Information systems evaluation: navigating through the problem domain " Information & Management 40(1): 11-24.	case study N = 1	The paper reviews the normative literature in the area of IS evaluation, and then proposes a set of conjectures. These were tested within a case study to analyze the investment justification process of a manufacturing IS investment. Concept justification may be considered integral to a robust IT evaluation process, with the following proposition being proffered.	prescriptive	intended	Present	n/a	indirectly present	IV

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Article	Research method(s)	Message	Prescriptive or descriptive	Strategy as...	Concept of fit	Called as...	Presence of the concept of knowledge	IV/DV
Jarvenpaa, S. L. and B. Ives (1991). "Executive involvement and participation in the management of information technology." MIS Quarterly 15(2): 204-227.	survey N = 55 firms (matched pairs of CEOs and CIOs)	Executive involvement (as a psychological state) is more strongly associated with the firm's progressive use of IT than executive participation (actual behaviors) in IT activities. Executive involvement is influenced by a CEO's participation, prevailing organizational conditions, and the executive's functional background.	n/a	n/a	Present	progressive use of IT	indirectly present	IV
Jarvenpaa, S. L. and B. Ives (1993). "Organizing for global competition: The fit of information technology." Decision Sciences 24(3): 547-580.	survey built on 25 interviews and pre-tests with four senior executives N = 108	In nearly half of the organizations, the way IT activities were organized was inconsistent with with the way the organization was reportedly structured. Several contingency variables were identified that may shed some light to the misfits.	prescriptive	intended	Present	consistency	n/a	n/a
Johnson, A. M. and A. L. Lederer (2010). "CEO/CIO mutual understanding, strategic alignment, and the contribution of IS to the organization " Information & Management 47(3): 138-149.	a paired CEO/CIO survey with 202 pairs	Mutual understanding between the CEO and CIO is thought to facilitate the alignment of an organization's IS with its business strategy, and thereby enhance the contribution of the IS to business performance. Mutual understanding was measured as the role of IS in the organization, using the perspectives of both executives.	prescriptive	realized	Present	support	on research focus	DV
Johnston, H. R. and S. R. Carrico (1988). "Developing Capabilities to Use Information Strategically." MIS Quarterly 12(1): 37-48.	field study N = 90 interviews across 18 firms in 11 industries	Competitive advantage depends on the interaction between industry conditions and internal capability to identify and exploit opportunities.	prescriptive	intended	Present	integration	indirectly present	IV
Johnston, K. D. and P. W. Yetton (1996). "Integrating information technology divisions in a bank merger Fit, compatibility and models of change." Journal of Strategic Information Systems 5(3): 189-211.	case study N = 2	An understanding of organisational and strategic fit at the level of the IT organisation can contribute to effective management of IT integration. They discuss the contingencies underlying use of different models of IT integration, and suggest that 'best of breed' prescriptions may be inappropriate when the IT configurations of merging organisations are incompatible.	prescriptive	intended	Defined	gestalt	n/a	n/a

Article	Research method(s)	Message	Prescriptive or descriptive	Strategy as...	Concept of fit	Called as...	Presence of the concept of knowledge	IV/DV
Kaarst-Brown, M. L. and D. Robey (1999). "More on myth, magic and metaphor: Cultural insights into the management of information technology in organizations." Information Technology & People 12(2): 192-218.	ethnographic case study N = 2	Findings from ethnographic studies of two large insurance organizations to illustrate how cultural assumptions about IT are implicated in IT management. The metaphor of magic as an interpretive lens to generate five archetypes of IT culture: the revered, controlled, demystified, integrated, and fearful IT cultures.	prescriptive	intended	Not relevant	n/a	indirectly present	IV
Kanellis, P., M. Lycett, et al. (1999). "Evaluating business information systems fit: from concept to practical application." European Journal of Information Systems 8(1): 65-76.	case study based on survey	A framework that aims to improve understanding for the researcher and practitioner alike. The formative part of the framework seeks to collect data relating to the fit of the information system and its environment along the dimensions of decision making, innovation and information acquisition and distribution. The latter part of the framework uses repertory grids to gain an understanding of both what is perceived as wrong with the system and what is perceived as wanted from the system; the latter acting as a basis for corrective action.	n/a	n/a	Present	fit	indirectly present	IV
Kearns, G. S. and A. L. Lederer (2000). "The effect of strategic alignment on the use of IS-based resources for competitive advantage." Journal of Strategic Information Systems 9(4): 265-293.	survey N = 107 matched pairs of CIO and CEO	Both CIOs and CEOs share an understanding of the role of ISP-BP in creating competitive advantage from their information systems investments. However, the lack of a shared understanding of BP-ISP alignment may prevent organizations from achieving that advantage.	prescriptive	intended	Present	linkage	indirectly present	IV
Kearns, G. S. and A. L. Lederer (2003). "A Resource-Based View of Strategic IT Alignment: How Knowledge Sharing Creates Competitive Advantage." Decision Sciences 34(1): 1-29.	survey N = 161 CIOs	Information-intensity is an important antecedent to strategic IT alignment which is best explained by multiple constructs which operationalize both process and content measures. Alignment between IT plan and business plan is related to the use of IT for competitive advantage. Knowledge sharing in the alignment process contributes to the creation of superior organizational strategies.	prescriptive	intended	Present	process	on research focus	IV

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Kearns, G. S. and A. L. Lederer (2004). "The impact of industry contextual factors on IT focus and the use of IT for competitive advantage." Information & Management 41(7): 899-919.	survey N = 161 CIOs	A positive and significant impact of the contextual factors on business dependence on IT and the two SISP practices and between these factors and the use of IT for competitive advantage. Data also revealed significant differences between industry types and environmental uncertainty but not information intensity.	prescriptive	intended	Present	linkage	indirectly present	IV
Kearns, G. S. and R. Sabherwal (2006). "Strategic Alignment Between Business and Information Technology: A Knowledge-Based View of Behaviors, Outcome, and Consequences." Journal of Management Information Systems 23(3): 129-162.	survey N = 274	Organizational emphasis on knowledge management and centralization of IT decisions affect top managers' knowledge of IT, which facilitates business managers' participation in strategic IT planning and IT managers' participation in business planning, and both of these planning behaviors affect business–IT strategic alignment. Moreover, the results indicate that quality of IT project planning and implementation problems in IT projects mediate the relationship between business–IT strategic alignment and business effect of IT.	prescriptive	intended	Present	linkage	on research focus	IV
Kim, K. K. and J. E. Michelman (1990). "An Examination of Factors for the Strategic Use of Information Systems in the Healthcare Industry." MIS Quarterly 14(2): 201-215.	case study N = 4	The important factors for the strategic use of IST by examining the multifaceted role of IST in the healthcare context; three propositions are developed from (1) re-examining a variety of successful IST applications both within and outside healthcare organizations, (2) re-applying the integration concept from the literature, and (3) examining field experiences in the healthcare industry. Planning is vital to success. Integration of the existing isolated systems cuts across political boundaries. User participation, including physicians, in the development and applications of IST for strategic advantages is vital to success.	prescriptive	intended	Present	integration	indirectly present	IV
Lederer, A. L. and A. L. Mendelow (1989). "Co-ordination of information systems plans with business plans." Journal of Management Information Systems 6(2): 5-19.	case study N = 20 organizations (interviews)	The presence of a top managemenl mandate for coordinating the plans distinguishes IS executives who did not report the difficulty from IS executives who did.	prescriptive	intended	Present	coordination	indirectly present	IV

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Lederer, A. L. and H. Salmela (1996). "Toward a theory of strategic information systems planning " Journal of Strategic Information Systems 5(3): 237-253.	conceptual	The absence of a theory of strategic information systems planning impedes research in the area. An input-process-output model provides the initial basis for such a theory. Constructs in the final version of a theory are: (1) the external environment, (2) the internal environment, (3) planning resources, (4) the planning process, (5) the information plan, (6) the implementation of the information plan, and (7) the alignment of the information plan with the organization's business plan. The constructs exhibit causal relationships among each other.	prescriptive	intended	Present	fit	n/a	n/a
Lee, J.-N. (2006). "Outsourcing Alignment with Business Strategy and Firm Performance." Communications of the Association for Information Systems 17: 1124-1146.	survey N = 136	It is imperative for organizations to align their outsourcing strategy with their business strategy in order to reap better outsourcing benefits and firm performance. The empirical evidence shows that outsourcing alignment with business strategy significantly influences the outsourcing success and firm performance of defenders, analyzers, and prospectors.	prescriptive	intended	Defined	matching	indirectly present	IV
Lee, S. and R. B. Leifer (1992). "A Framework for Linking the Structure of Information Systems with Organizational Requirements for Information Sharing." Journal of Management Information Systems 8(4): 27-45.	conceptual	This paper describes relations between organizational structures based on requirements for information sharing. Information sharing is defined as a linking concept between organizational and IS structures. Task characteristics, technological interdependency, work teams, and networked structures of organizations determine information sharing requirements.	prescriptive	intended	Defined	matching	on research focus	IV
Leiblein, M., J. Reuer, et al. (2002). "Do Make or Buy Decisions Matter? The Influence of Organizational Governance on Technological Performance." Strategic Management Journal 23(9): 817-833.	case study based on a report of firm-level activity of 176 global circuit manufacturers	The effects of firms' governance decisions are likely to be contingent upon several specific attributes underlying a given exchange. A firm's technological performance is contingent upon the alignment between firms' governance decisions and the degree of contractual hazards.	prescriptive	intended	Defined	matching	n/a	n/a

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Levy, M., P. Powell, et al. (2001). "SMEs: aligning IS and the strategic context." Journal of Information Technology 16(3): 133-144.	longitudial case study N = 27 (SMEs in 3 years period)	This paper develops a model of strategic information systems (IS) investment in small and medium-sized enterprises (SMEs). IS investment is modelled as a function of an SME's strategic context as de□ ned by its strategic focus, i.e. cost reduction versus value added and its market positioning, i.e. few versus many customers.	descriptive	realized	Present	integration	n/a	n/a
Lockamy, A. I. and W. L. Smith (1997). "A strategic alignment approach for effective business process reengineering: linking strategy, processes and customers for competitive advantage." International Journal of Production Economics 50(2-3): 141-153.	case study N = 1	This article presents a conceptual framework and key principles for effective business process reengineering. The principles are derived from a case study of a successful reengineering program instituted by the Cummins Engine Company, and a strategic alignment framework which examines the congruency between a firm's strategy, business processes, and customer requirements.	prescriptive	intended	Present	alignment	n/a	n/a
Luftman, J. (1996). Applying the Strategic Alignment Model. Competing in the Information Age : Strategic Alignment in Practice. Cary, NC, USA, Oxford University Press, Incorporated: 43-69.	conceptual	This chapter describes how organizations 'cycle' around each in turn, finding the place to start by identifying which quadrant of the strategic alignment model offers the largest opportunity for improvement. Also eight new perspectives are added to the SAM:	prescriptive	intended	Present	alignment	indirectly present	IV
Luftman, J. (2000). "Assessing Business-IT Alignment Maturity." Communications of the Association for Information Systems 4(14).	conceptual	Achieving and sustaining alignment demands focusing on maximizing the enablers and minimizing the inhibitors that cultivate alignment. The strategic alignment maturity assessment provides organizations with a vehicle to evaluate these activities.	prescriptive	intended	Present	harmony	on research focus	IV

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Luftman, J. and R. Kempaiah (2007). "An Update on Business-IT Alignment: A Line Has Been Drawn". MIS Quarterly Executive 6(3): 165-177.	survey N = 197	Positive correlations between the maturity of IT-business alignment and (1) IT's organizational structure, (2) the CIO's reporting structure and (3) firm performance. Federated IT structures are associated with higher alignment maturity than centralized or decentralized structures. Companies with CIOs reporting directly to the CEO, president, or chairman have significantly higher alignment maturity than those where the CIO reports to a business unit executive, the COO, or the CFO. And higher alignment maturity correlates with higher firm performance.	prescriptive	intended	Present	alignment	on research focus	DV
Luftman, J. and T. Brier (1999). "Achieving and Sustaining Business-IT Alignment." California Management Review 42(1): 109-122.	survey from multiple years N = 1051 executives from 500+ firms	The six most frequent enablers of alignment are: senior non-IT executives' support for IT, IT involvement in strategy development, IT understanding of the business, business–IT partnership, well-prioritized projects, IT demonstration of leadership. The six most frequent inhibitors of alignment are: lack of close relationship between IT and business, IT does not prioritize well, failure of IT to meet its commitments, IT lack of understanding of business, lack of senior executives' support of IT, IT management lacks leadership.	prescriptive	intended	Present	harmony	on research focus	IV
Luftman, J. N., P. R. Lewis, et al. (1993). "Transforming the enterprise: The alignment of business and information technology strategies." IBM Systems Journal 32(1): 198-221.	conceptual	Too much attention is placed on technology, rather than business, management, and organizational issues. How can IT enable the achievement of competitive and strategic advantage?	prescriptive	intended	Present	harmony	n/a	n/a
Luftman, J. N., R. Papp, et al. (1999). "Enablers and inhibators of business-IT alignment." Communications of the Association for Information Systems 1(11): 1-32.	survey from multiple years N = 1051 executives from 500+ firms	Achieving alignment is evolutionary and dynamic. It requires strong support from senior management, good working relationships, strong leadership, appropriate prioritization, trust, and effective communication, as well as a thorough understanding of the business environment. Achieving alignment demands focusing on maximizing the enablers and minimizing the inhibitors. The data show these factors to be constant over time and to be nearly identical for business executives and for IT executives.	prescriptive	intended	Present	harmony	on research focus	IV

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Ma, L. C. K., J. M. Burn, et al. (1998). Successful Management of Information Technology: A Strategic Alignment Perspective. Thirty-First Annual Hawaii International Conference on System Sciences, Kohala Coast, Hawaii, IEEE Computer Society.	survey N = 74 (matched pairs of CIOs and User Managers)	A major objective for this paper is to justify an alternative view on the contingency nature of IS strategic alignment through the development of a configurational (two-dimensional) model, which is more reliable than linear (one-dimensional) models adopted by most alignment studies.	prescriptive	intended	Defined	gestalt	n/a	n/a
Madapusi, A. and D. D'Souza (2005). "Aligning ERP Systems with International Strategies " Information Systems Management 22(1): 7-17.	conceptual	Misalignments between the firm's ERP system and its international strategy can often result in unsuccessful ERP implementations and sub-optimal business performance. Building on prior research, this article presents a systematic logic that can be used by business executives to address the alignment challenges. In particular, it provides details on three ERP systems issues that should be addressed: (1) systems configuration, (2) information architecture, and (3) systems rollout to reap the benefits of ERP system alignment.	prescriptive	intended	Present	configurated	n/a	n/a
Maes, R. (1999). A Generic Framework for Information Management. PrimaVera Working Paper 99-03, Universiteit van Amsterdam.	conceptual	A generic framework for investigating and interrelating the different components of information management is proposed: developed as a re-interpretation of and an extension to the widely propagated model for strategic alignment by Henderson and Venkatraman, it deals with business, information/communication, and technology at the strategic, (infra)structural, and operations level.	descriptive	a mix	Present	instrument	indirectly present	IV
Maes, R., D. Rijsenbrij, et al. (2000). Redefining business – IT alignment through a unified framework. PrimaVera Working Paper Series. Amsterdam, Universiteit van Amsterdam: 25.	conceptual	This papers redefines the concept by positioning it in a unified framework. This framework is derived form the generic framework for information management and the integrated architecture framework. This paper aims at providing for the foundation for further research into the concept of alignment as a real tool for management and design.	descriptive	a mix	Present	process	indirectly present	IV

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Martin, N., S. Gregor, et al. (2005). "The Social Dimension of Business and IS/IT Alignment: Case Studies of Six Public-Sector Organisations." Australian Accounting Review 15(3): 28-38.	case study N = 6 (interviews; 20 executives and 48 managers)	The results show that the social dimension including mechanisms such as business planning style and business planning communication is significant for alignment.	descriptive	a mix	Present	mutual support	indirectly present	IV
McFarlan, F. W. (1984). "Information technology changes the way you compete." Harvard Business Review 62(3): 98-103.	conceptual	Some companies have seized the advantage, while others have ended up playing the difficult and expensive game of catch-up ball. It is important for executives to make this competitive analysis in assessing where IS fits in their companies, since in some cases it appropriately plays a support role and can add only modestly to the value of a company's products, while in other settings it is at the core of their competitive survival. Understanding where a company fits on this spectrum can help the CEO determine both the proper level of expenditures and the proper management structure for IS.	prescriptive	intended	Not relevant	n/a	indirectly present	IV
Mehta, M. and R. Hirschheim (2007). "Strategic Alignment In Mergers And Acquisitions: Theorizing IS Integration Decision Making." Journal of the Association for Information Systems 8(3): 143-174.	case study N = 3 (36 interviews)	Our contributions are threefold. We show that firms are somewhat misaligned in the early post-merger period, and come into alignment only two to three years after the merger. We find that business-IS alignment was a minor concern for the new organizations in pre-merger and early post-merger phases. Other factors such as acquirer-target power struggles, prior merger experience, and overarching synergy goals drove much of the initial integration decision making. Only late in the post-merger do the merged organizations revisit their systems to bring them into alignment with the business needs.	prescriptive	intended	Present	support	n/a	n/a
Miller, J. (1993). "Measuring and aligning information systems with the organization." Information & Management 25(4): 217-229.	case study	Effectiveness criteria must recognize the dynamic nature of organizations, adapt to continually changing organizational effectiveness criteria, and be influential in shaping management action. The article describes a measurement instrument for IS performance.	prescriptive	intended	Present	linkage	n/a	n/a

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Mirani, R. and A. L. Lederer (1998). "An instrument for assessing the organizational benefits of IS projects." Decision Sciences 29(4): 803-838.	instrument development; cross-sectional study of 178 IS projects	A report on the development of an instrument to measure organizational benefits of IS projects. Benefits are categorized into three: strategic, informational, and transactional. Strategic benefits are divided into three sub-groups: competitive advantage, alignment, and customer relations. Informational benefits comprise information access, information quality, and information flexibility. Transactional benefits are communications efficiency, systems development efficiency, and business efficiency.	prescriptive	intended	Not relevant	n/a	n/a	n/a
Moody, K. W. (2003). "New meaning to IT alignment." Information Systems Management 20(4): 30-35.	conceptual paper	Enterprises that have developed collaborative management processes between the business and information services organizations get their projects and initiatives in line with the near-term objectives of the overall business better than others.	prescriptive	intended	Present	consistency	indirectly present	IV
Ndede-Amadi, A. A. (2004). "What strategic alignment, process redesign, enterprise resource planning, and e-commerce have in common: enterprise-wide computing." Business Process Management Journal 10(2): 184-199.	literature review and conceptual paper	The transition from strategic alignment as the basis for IT investment, to redesigned business processes as the critical elements of organizational strategic planning to which IT investments must be targeted, to the integration of these processes into enterprise-wide systems, to e-commerce is examined.	prescriptive	intended	Present	support	n/a	n/a
Newkirk, H. E. and A. L. Lederer (2006). "The effectiveness of strategic information systems planning under environmental uncertainty." Information & Management 43(4): 481-501.	survey N = 161	This study tested the effect of SISP phases on planning success in more and less uncertain environments. More extensive strategy formulation uniformly predicted successful planning in more uncertain environments, whereas strategic awareness generally predicted it in less uncertain ones. Strategy conception predicted it in neither more nor less uncertain environments. More extensive planning is thus not uniformly successful in either environment but depends on the nature of the uncertainty.	prescriptive	intended	Present	tie	indirectly present	IV

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Niederman, F., J. C. Brancheau, et al. (1991). "Information Systems Management Issues for the 1990s." MIS Quarterly 15(4): 475-500.	Delphi survey with three rounds where N1 = 114, N2 = 126, N3 = 104	This study reveals two important trends as the field enters the 1990s. First is the rising importance of technology infrastructure issues. Technology infrastructure issues now occupy three of the top 10 slots including the highest position. Second, it appears that internal effectiveness issues have made a strong comeback after being virtually ignored in 1986.	prescriptive	intended	Not relevant	n/a	n/a	n/a
Oh, W. and A. Pinsonneault (2007). "On the Assessment of the Strategic Value of Information Technologies: Conceptual and Analytical Approaches." MIS Quarterly 31(2): 239-265.	survey N = 110 Canadian manufacturing SMEs (matched pairs of CEOs and CIOs)	This study compares two conceptual (resource-centered and contingency-based) and two analytical (linear and nonlinear) approaches that can be used to assess the strategic value of IT. The results indicate that the resource-centered and contingency-based approaches provide complementary understanding of the strategic value of IT. On the one hand, the contingency-based approach is better at explaining the impact of cost related IT applications on firm performance. On the other hand, the resource-centered perspective has a stronger predictive ability of IT impact on firm revenue and profitability.	prescriptive	intended	Present	consistency	n/a	n/a
Orlikowski, W. J. (1996). "Improvising Organizational Transformation Over Time: A Situated Change Perspective." Information Systems Research 7(1): 63-92.	case study N = 1	This article outlines a perspective on organizational transformation which proposes changes as endemic to the practice of organizing and hence as enacted through the situated practices of organizational actors as they improvise, innovate, and adjust their work routines over time.	descriptive	realized	Not relevant	n/a	indirectly present	IV
Palmer, J. W. and M. L. Markus (2000). "The Performance Impacts of Quick Response and Strategic Alignment in Specialty Retailing." Information Systems Research 11(3): 241-259.	survey N = 80 based on the cross-sectional survey of specialty retailers	Adoption of the QR (Quick Response) program at a minimal level was associated with higher performance, although there was no performance impact due to higher levels of QR use. Firms did appear to match their IT usage to their business strategies, but there was no linkage between strategic alignment and firm performance, and there was surprisingly little variation in business or IT strategy.	prescriptive	intended	Defined	moderation	indirectly present	IV

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Papke-Shields, K. E. and M. K. Malhotra (2001). "Assessing the Impact of the Manufacturing Executive's Role on Business Performance through Strategic Alignment." Journal of Operations Management 19: 5-22.	survey N = 202 with follow-up interviews	This study jointly examines the role of both influence and involvement in achieving better business performance. The results indicate that involvement and influence are indeed two different, but highly related, aspects of the manufacturing executive's role. The interviews revealed numerous differences between the two with respect to achieving each and individual benefits derived from them.Both involvement and influence are important determinants of strategy alignment with influence appearing to play a more substantive role. More importantly, it is this alignment that affects business performance.	prescriptive	intended	Present	support	indirectly present	IV
Papp, R. (1999). "Business-IT alignment: productivity paradox payoff?" Industrial Management + Data Systems 99(8): 367-373.	longitudial study (5 years, N = 500 firms)	This paper explores the financial performance and alignment of over 500 firms over the past five years. From these data, a regression equation to measure performance controlling for alignment perspective and industry classification is proposed.	prescriptive	intended	Defined	moderation	n/a	n/a
Peak, D. and C. S. Guynes (2003). "The IT Alignment Planning Process." Journal of Computer Information Systems 44(1): 9-15.	a case study within one company: 58 of 75 senior and upper-middle managers participated in the pilot process	The IT Alignment Planning Model helps to identify areas of information concern, results in the prioritized development of IT strategies, and serves as a pilot for the corporate-wide implementation of the IT Alignment Planning process. The process provides input into strategic and tactical planning processes.	prescriptive	intended	Present	process	n/a	n/a
Peak, D., C. S. Guynes, et al. (2005). "Information Technology Alignment Planning - a case study." Information & Management 42(5): 635-649.	a case study within one company: 58 of 75 senior and upper-middle managers participated in the pilot process	This paper describes the Information Technology (IT) Alignment Planning process. The process is intended to aid in making the best possible use of IT resources in meeting the corporation's business objectives. We found that the process helped align IT with business strategies and improved and facilitated communication on IT project management and development.	prescriptive	intended	Present	process	n/a	n/a
Peppard, J. and J. Ward (2004). "Beyond strategic information systems: towards an IS capability." Journal of Strategic Information Systems 13(2): 167-194.	conceptual	Drawing on resource-based theory, this paper proposes a perspective on the management of IT in organizations that specifically considers how organizations can continuously derive and leverage value through IT. The analysis moves beyond a focus on identifying 'strategic systems' and develops the concept of an IS capability, suggesting that it heralds the arrival of a new era. The paper presents a model of an IS capability, outlines its core components and illustrates its application.	descriptive	a mix	Present	utilization	indirectly present	IV

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Peppard, J. and K. Breu (2003). Beyond Alignment: A Coevolutionary View of the Information Systems Strategy Process. ICIS 2003 Proceedings, Paper 61, Association for Information Systems.	conceptual	How do organizations achieve and sustain the process of continuous adaptation and change that is necessary to realize strategic information systems alignment? Coevolution theory offers the opportunity to explore coevolving interactions, interrelationships, and effects as both IS and business strategies evolve. An initial model of this coevolution is presented that applies the key attributes and concepts of coevolution theory to strategic IS alignment.	prescriptive	intended	Present	process	indirectly present	IV
Pollalis, Y. A. (2003). "Patterns of Co-alignment in Information-Intensive Organizations: Business Performance through Integration Strategies." International Journal of Information Management 23(6): 469-492.	survey N = 183	This research suggests, develops and tests a strategic co-alignment model by examining three types of integration that impact the planning process and the overall performance of information-intensive organizations: technological integration (TI), functional integration and strategic integration (SI).	prescriptive	intended	Defined	gestalt	n/a	n/a
Powell, T. C. (1992). "Organizational Alignment as Competitive Advantage." Strategic Management Journal 13(2): 119-134.	survey N = 113	This study integrates the two perspectives (industry factors and alignment between structures and environment) testing the financial performance consequences of organizational alignments, in context with the effects of industry, market share, and strategy. In an empirical study in two manufacturing industries, it is shown that some organizational alignments do produce supernormal profits, independent of the profits produced by traditional industry and strategy variables	prescriptive	intended	Defined	matching	n/a	n/a
Preston, D. S. and E. Karahanna (2004). Mechanisms for the Development of Shared Mental Models between the CIO and the Top Management Team. International Conference on Information Systems (ICIS), Washington, D.C., USA.	survey N = 382 CIOs	The study posits that knowledge exchange mechanisms and relational similarity between the CIO and TMT are key antecedents to the development of shared mental models.	prescriptive	intended	Not relevant	n/a	on research focus	IV

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Preston, D. S. and E. Karahanna (2009). "How to Develop a Shared Vision: The Key to IS Strategic Alignment." MIS Quarterly Executive 8(1): 1-8.	survey N = 243 (matched pairs of IT and TMT member) + semi-structured interviews with a small set of CIOs	Shared vision is facilitated by six visioning mechanisms; five distinct configurations of visioning mechanisms being used by firms: (1) Star, (2) Executive, (3) Confidante, (4) Educator, and (5) Underperformer. CIOs can use these configuration profiles to make tradeoff decisions about which visioning mechanisms to focus on and sustain for a shared CIO-TMT vision for IS strategic alignment. These tradeoffs will take account of CIOs' personal strengths and their organizational contexts.	prescriptive	intended	Present	congruence	on research focus	DV
Rathnam, R. G., J. Johnsen, et al. (2004). "Alignment of Business Strategy and IT Strategy: A Case Study of a Fortune 50 Financial Services Company." Journal of Computer Information Systems 45(2): 1-8.	case study N = 1 (interviews with 10 senior executives, of which three have IT perspective)	Improving the business strategy and vision, and communication of the business strategy and vision has the greatest potential for improving the alignment of business strategy and IT strategy. Two effective methods of aligning IT strategy and business strategy were identified: (i) developing a robust, business architecture, and, (ii) establishing a separate, centralized IT department.	prescriptive	intended	Present	alignment	n/a	n/a
Reich, B. H. and I. Benbasat (1996). "Measuring the linkage between business and information technology objectives." MIS Quarterly 20(1): 55-81.	case study N = 10 business units in life insurance companies with unstructured interviews N = 57 from 45 informants	Linkage construct has two dimensions: intellectual and social. This study is on measurement issues associated with the social dimension: cross-references between IS and business plans, mutual understanding, congruence between IS and business executives visions, and self-reported rating of linkage.	descriptive	a mix	Present	linkage	on research focus	DV
Reich, B. H. and I. Benbasat (2000). "Factors That Influence the Social Dimension of Alignment Between Business and Information Technology Objectives." MIS Quarterly 24(1): 81-113.	case study N = 10 business units in three major life insurance companies	Shared domain knowledge, IT implementation success, communication between business and IT executives, and connections between business and IT planning influenced short-term alignment; only shared domain knowledge influenced long-term alignment; strategic business plans were found to have influence on both.	prescriptive	intended	Present	alignment	on research focus	DV
Reich, B. H. and M. L. Kaarst-Brown (2003). "Creating social and intellectual capital through IT career transitions." Journal of Strategic Information Systems 12(2): 91-109.	longitudinal case study (3 years in one life insurance company with 70 informants)	The authors show how social capital led to an increase in intellectual capital and the organizational advantage that was achieved by using data from one case company.	prescriptive	intended	Not relevant	n/a	on research focus	DV

APPENDIX 1: Summary of the literature review

Article	Research method(s)	Message	Prescriptive or descriptive	Strategy as...	Concept of fit	Called as...	Presence of the concept of knowledge	IV/DV
Roepke, R., R. Agarwal, et al. (2000). "Aligning the IT Human Resource with Business Vision: The Leadership Initiative at 3M." MIS Quarterly 24(2): 327-353.	case study N = 1 firm (3M)	The transformation of IT from a backoffice support role to a strategic business partner requires new roles and competencies for IT leaders and professionals. Key challenges for IT leaders are to envision these roles and competencies and to develop and implement programs to translate this vision to reality. This paper describes the IT human resource vision that is guiding such a transformation at 3M and focuses on the implementation of its leadership initiative.	prescriptive	intended	Present	alignment	on research focus	DV
Rondinelli, D., B. Rosen, et al. (2001). "The Struggle for Strategic Alignment in Multinational Corporations: Managing Readjustment During Global Expansion." European Management Journal 19(4): 404-416.	case study N = 1 firm (MNC) using interviews and archival data	As corporations expand internationally, their ability to align their internal business strategies and management practices to conditions in external marketplaces becomes critical for sustaining growth and expanding market share.	prescriptive	intended	Present	complementing	indirectly present	IV
Ross, J. W., C. M. Beath, et al. (1996). "Develop Long-Term Competitiveness through IT Assets." Sloan Management Review 37(Fall 1996): 31-42.	conceptual	Firms can apply IT to enhance competitiveness by developing an especially effective IT capability: the ability to control IT-related costs, deliver systems when needed, and effect business objectives through IT implementations.This capability derives from careful management of three key IT assets: (1) a highly competent IT human resource, (2) a reusable technology base, and (3) a strong partnering relationship between IT and business management.	prescriptive	intended	Present	alignment	indirectly present	IV
Sabherwal, R. and P. Kirs (1994). "The Aligment Between Organizational Critical Success Factors and Information Technology Capability in Academic Institutions." Decision Sciences 25(2): 301-330.	case study N = 244 large academic institutions in the US	This study examines the performance implications of alignment between CSFs and one source of competence, the organizations' IT capability. The effects of environmental uncertainty, integration, and IT management sophistication are studied. Alignment facilitates both perceived IT success and organizational performance.	prescriptive	intended	Defined	profile deviation	n/a	n/a
Sabherwal, R. and Y. E. Chan (2001). "Alignment Between Business and IS Strategies: A Study of Prospectors, Analyzers, and Defenders." Information Systems Research 12(1): 11-33.	longitudial study based on two surveys (N1 = 164 companies, N2 = 62)	This paper examines the impact of alignment on perceived business performance using Miles and Snow's classification of business strategies. Alignment seems to influence the overall business success in Prospectors and Analyzers but not in Defenders.	prescriptive	intended	Defined	profile deviation	n/a	n/a

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Article	Research method(s)	Message	Prescriptive or descriptive	Strategy as...	Concept of fit	Called as...	Presence of the concept of knowledge	IV/DV
Sabherwal, R., R. Hirschheim, et al. (2001). "The Dynamics of Alignment: Insights from a Punctuated Equilibrium Model." Organization Science 12(2): 179-197.	case study N = 3 organizations	Analysis highlights the value of the punctuated equilibrium model and shows how various theories of organization design, strategy, and information technology management can be integrated to yield insights into alignment processes.	prescriptive	intended	Defined	profile deviation	n/a	n/a
Segars, A. H. and V. Grover (1998). "Strategic Information Systems Planning Success: An Investigation of the Construct and Its Measurement." MIS Quarterly 22(2): 139-163.	survey N = 253 IT executives	This study develops and tests a measurement model of SISP success. Constructs are alignment, analysis, cooperation, and improvement in capabilities.	prescriptive	intended	Present	linkage	indirectly present	IV
Segars, A. H., V. Grover, et al. (1998). "Strategic information systems planning: Planning system dimensions, internal coalignment, and implications for planning effectiveness." Decision Sciences 29(2): 303-345.	survey N = 253	SISP can be operationalized along distinct dimensions of comprehensiveness, formalization, focus, flow, participation, and consistency.	prescriptive	intended	Present	collaborative process	indirectly present	IV
Shpilberg, D., S. Berez, et al. (2007). "Avoiding the Alignment Trap in Information Technology." MIT Sloan Management Review 49(1): 51-58.	survey N = 504 (from 452 firms) + interviews	A narrow focus on alignment reflects a fundamental misconception about the nature of IT. An effective IT organization needs a wide variety of capabilities, ranging from staffing the help desk to creating and integrating innovative business applications.	prescriptive	intended	Present	matching	n/a	n/a
Slaughter, S. A., L. Levine, et al. (2006). "Aligning Software Processes with Strategy." MIS Quarterly 30(4): 891-918.	case study N = 9; semi-structured interviews	This study examines how firms align their software processes, products, and strategies in Internet application development. We identified four dimensions that influence alignment: the business unit strategy, the level of product customization, the level of process customization, and the volume of customers.	prescriptive	intended	Defined	match	n/a	n/a
Sledgianowski, D. and J. Luftman (2005). "IT-Business Strategic Alignment Maturity: A Case Study." Journal of Cases on Information Technology 7(2): 102-120.	case study N = 1 organization (specialty chemical manufacturer)	This case study describes the use of a management process and assessment tool that can help to promote long-term IT business strategic alignment.	prescriptive	intended	Present	harmony	indirectly present	IV

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Article	Research method(s)	Message	Prescriptive or descriptive	Strategy as...	Concept of fit	Called as...	Presence of the concept of knowledge	IV/DV
Sledgianowski, D. and J. N. Luftman (2006). "Development and Validation of an Instrument to Measure Maturity of IT Business Strategic Alignment Mechanisms." Information Resources Management Journal 19(3): 18-33.	survey N = 150 (8 companies)	A theoretical framework of the maturity levels of management practices and strategic IT choices that facilitate alignment was empirically tested and validated.Findings show promise for the assessment instrument to be used as a diagnostic tool for organizations to improve their IT-business alignment maturity levels.	prescriptive	intended	Present	process	indirectly present	IV
Smaczny, T. (2001). "Is an Alignment Between Business and Information Technology the Appropriate Paradigm to Manage IT in Today's Organizations?" Management Decision 39(10): 797-802.	conceptual	IT strategy should not be developed separately to business strategy but at the same time: there should be only one strategy. Synchronizing between separate business and IT strategies is not an option in a turbulent environment.	descriptive	a mix	Present	fusion	n/a	n/a
Tallon, P. P. (2007). "A Process-Oriented Perspective on the Alignment of Information Technology and Business Strategy." Journal of Management Information Systems 24(3): 227-268.	survey N = 241 (matched pairs of IT and business)	By bringing a process-level view to the study of alignment and its impacts, we go beyond a discussion on the extent of fit—a cornerstone of the literature—to whether firms are pursuing the right type of fit for the particular mix of processes underlying their strategy.	prescriptive	a mix	Multiple definitions	profile deviation and moderation	n/a	n/a
Tallon, P. P., K. L. Kraemer, et al. (2000). "Executives' Perceptions of the Business Value of Information Technology: A Process-Oriented Approach." Journal of Management Information Systems 16(4): 145-173.	survey N = 304 executives	We develop a process-oriented model to assess impacts of IT on critical business activities in the value chain. Corporate goals for IT can be classified into unfocused, operations focus, market focus, and dual focus. Management practices, such as alignment, contribute to higher perceived levels of IT business value.	prescriptive	a mix	Present	support	n/a	n/a
Tan, F. B. (1995). "The responsiveness of information technology to business strategy formulation: An empirical study." Journal of Information Technology 10(3): 171-178.	survey N = 88	The linkage between business strategy and IT responsiveness was examined. Variations in IT responsiveness are linked to the type of business strategy being pursued by an organization. Companies with an aggressive business strategy are more likely to use IT as a strategic resource in formulating business strategy.	prescriptive	intended	Present	linkage	n/a	n/a

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Article	Research method(s)	Message	Prescriptive or descriptive	Strategy as...	Concept of fit	Called as...	Presence of the concept of knowledge	IV/DV
Tan, F. B. and R. B. Gallupe (2006). "Aligning business and information systems thinking: a cognitive approach." IEEE Transactions on Engineering Management 53(2): 223-237.	case N = 6 companies (interviews with 80 people + questionnaire)	This paper describes a study that examines the cognitive basis of shared understanding between business and IS executives. Using Personal Construct Theory (Kelly [36]), this study uses cognitive mapping techniques to explore the commonalities and individualities in the cognition between these executives. The results indicate that a higher level of cognitive commonality is positively related to a higher level of business-IS alignment.	descriptive	a mix	Present	support	on research focus	DV
Tarafdar, M. and S. Qrunfleh (2010). "IT-Business Alignment: A Two-Level Analysis." Information Systems Management 26: 338-349.	Case study N = 4 firms Interviews with 30 individuals (both IT and business)	Four types of alignment states resulting from “strategic” and “tactical” alignment levels, and alignment-related managerial actions appropriate for each type	prescriptive	intended	Present	linkage	indirectly present	IV
Tavakolian, H. (1989). "Linking the Information Technology Structure with Organizational Competitive Strategy: A Survey." MIS Quarterly 13(3): 309-317.	survey N = 52 matched pairs from computer components industry	The IT structure, as measured by the locus of responsibilities for information systems, is strongly related to competitive strategy. Findings provide additional support for the organizational fit concept - that the conformity between IT structure and overall organizational context variables, including competitive strategy, is instrumental to the successful implementation of IT systems.	prescriptive	intended	Present	covariation	n/a	n/a
Teo, T. S. H. and J. S. K. Ang (1999). "Critical success factors in the alignment of IS plans with business plans." International Journal of Information Management 19(2): 173-185.	survey N = 136 senior IS executives	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 CSFs.	prescriptive	intended	Present	alignment	on research focus	IV
Teo, T. S. H. and W. R. King (1996). "Assessing the impact of integrating business planning and IS planning." Information & Management 30(6): 309-321.	survey N = 156 (matched pairs)	BP-ISP integration is considered in four ways (administrative, sequential, reciprocal, and full integration), reflecting various degrees of BP-ISP integration. The relationships between these and organizational impact (measured in terms of the extent of ISP problems and the extent of IS contributions to organizational performance) are investigated through the analysis of data gathered in a "matched pair" field survey of business planners and IS executives. The results empirically validate the importance of BP-ISP integration.	prescriptive	intended	Present	integration	n/a	n/a

Article	Research method(s)	Message	Prescriptive or descriptive	Strategy as...	Concept of fit	Called as...	Presence of the concept of knowledge	IV/DV
Teo, T. S. H. and W. R. King (1997). "An assessment of perceptual differences between informants in information systems research " Omega 25(5): 557-566.	survey N = 157 (matched pairs)	Perceptual differences may be caused by inherent differences in the roles and responsibilities, by the 'education gap', 'communication gap' and]or 'culture gap' between Business Planners and IS Executives, by the dynamic nature of the evolutionary process of BP-ISP integration, and by the natural tendency of IS Executives to perceive IS processes to be more sophisticated than others perceive them to be.	prescriptive	intended	Present	integration	on research focus	DV
Teo, T. S. H. and W. R. King (2000). "Assessing the impact of proactive versus reactive modes of strategic information systems planning " Omega 28(6): 667-679.	survey N = 157 (matched pairs)	This study examines two modes of ISP (reactive and proactive) as defined by the extent of BP-ISP integration. Firms operating in a proactive mode had significantly higher status for IS executive, significantly greater perceived IS contributions to organizational performance and significantly fewer ISP problems than did those operating in a reactive planning mode.	prescriptive	intended	Present	integration	n/a	n/a
van der Zee, J. T. M. and B. De Jong (1999). "Alignment Is Not Enough: Integrating Business and Information Technology Management with the Balanced Business Scorecards." Journal of Management Information Systems 16(2): 137-156.	case study N = 2 organizations	Multilevel, integrated business and IT management are aimed at fully integrating the capabilities of IT with business strategies and management's expectations, and vice versa. The framework includes the planning of and setting goals for IT, and the evaluation of results, integrated with the business context.	prescriptive	intended	Present	integration	n/a	n/a
Venkatraman, N., J. C. Henderson, et al. (1993). "Continuous strategic alignment: Exploiting information technology capabilities for competitive success." European Management Journal 11(2): 139-149.	conceptual	Authors discuss the analytical approach through their Strategic Alignment Model — defined in terms of four basic domains of strategic choice: business strategy, information technology strategy; organization infrastructure and processes, and information technology infrastructure and processes. Subsequently, the administrative approach for achieving strategic alignment is discussed in terms of a set of alignment mechanisms: governance process, technology capabilities, human resource capabilities and value management.	prescriptive	intended	Present	consistency	indirectly present	IV
Wang, E. T. G. and J. C. F. Tai (2003). "Factors affecting information systems planning effectiveness: organizational contexts and planning systems dimensions." Information & Management 40(4): 287-303.	survey N = 156	This study integrates three domains to investigate the effects of organizational contexts and planning system dimensions on the effectiveness of IS planning from a contingency perspective.	prescriptive	intended	Present	integration	n/a	n/a

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Weiss, J. W., A. Thorogood, et al. (2006). "Three IT-Business Alignment Profiles: Technical Resource, Business Enabler, and Strategic Weapon." Communications of the Association for Information Systems 18: 676-691.	conceptual (with examples)	Three profiles linking IT to different business objectives. Two dimensions define the three alignment profiles: internal IT-business integration and external market engagement. The technical resource profile calls for low levels of IT-business integration and IT-market engagement. The business enabler profile deploys IT in some business processes and begins engaging IT with customers and suppliers. The strategic weapon profile uses IT to mobilize and extend the enterprise, which requires extensive IT deployment, both internally and externally. Each profile differs in strategies, criteria, capabilities, and mental models.	prescriptive	intended	Present	integration	indirectly present	IV
Wijnhoven, F., T. Spil, et al. (2006). "Post-merger IT integration strategies: An IT alignment perspective." Journal of Strategic Information Systems 15(1): 5-28.	case study N = 3 hospitals	When a company decides to merge with or to acquire another company, a major question is to what extent to integrate the information technologies and the organization. We developed a variant of the IT alignment model. In this model, we identify three ambition levels of mergers and IT integration from the literature.	prescriptive	intended	Present	integration	n/a	n/a
Willcoxson, L. and R. Chatham (2004). "Progress in the IT/Business Relationship: A Longitudial Assessment." Journal of Information Technology 19(1): 71-80.	survey N = 1156; not matched pairs however	The data reveal significant differences in the perceptions of business managers and those of IT professionals, especially with respect to issues of IT system efficacy and communication efficacy	prescriptive	intended	Not relevant	n/a	on research focus	DV
Yetton, P. W., K. D. Johnston, et al. (1994). "Computer-Aided Architects: A Case Study of IT and Strategic Change." Sloan Management Review 35(4): 57-67.	case study N = 1	The authors describe and analyze a case in which business transformation occurred along a different, almost reverse, path to fit, through the incremental adoption of IT.	descriptive	realized	Defined	gestalt	n/a	n/a
Yetton, P., J. F. Craig, et al. (1995). Fit, Simplicity and Risk: Multiple Paths to Strategic IT Change. ICIS 1995 Proceedings. Paper 1.	case study N = 3 organizations	The dominant rational approach to IT-centered strategic change derives from the positioning literature in business strategy. It assumes a single best path to successful organizational transformation. Three cases are used to show that, in practice, there are multiple alternative paths. The strategic IT and business strategy literatures are critiqued in terms of the process of fit so as to explain why these alternative paths are successful.	descriptive	realized	Defined	gestalt	n/a	n/a
Zviran, M. (1990). "Relationships between organisational and information systems objectives: Some empirical evidence." Journal of Management Information Systems 7(1): 65-84.	survey N = 131	IS objectives are associated with organizational objectives and there is a correspondence between each organizational objective and specific is objectives. These relationships support normative approaches to linking is objectives to those of the organization.	prescriptive	intended	Present	link	n/a	n/a

SAATEKIRJE

Helsingin kauppakorkeakoulu
Tietojärjestelmätiede / Pirkko Lahdelma

Arvoisa vastaanottaja,

ZETA OY on päättänyt osallistua Helsingin kauppakorkeakoulussa tehtävään tutkimukseen IT -asioihin liittyvästä päätöksenteosta. Tutkimuksella haetaan vastauksia mm seuraaviin tutkimuskysymyksiin:

- Ketkä osallistuvat ja millä tavalla koko yritystä koskeviin IT-päätöksiin sen eri vaiheissa?
- Ketkä muodostavat yrityksen IT-asioiden vaikuttajaverkoston?
- Mikä vaikutus näillä edellisillä asioilla on siihen, miten IT:n ja liiketoiminnan yhteensovittamisessa koetaan onnistuvan?

Tulokset tulevat auttamaan ZETA OY:ta kehittämään IT-asioihin liittyvää päätöksentekoaan. Tutkimus toteutetaan organisaatiossanne laajana tutkimuksena, jossa tietoa kerätään useilta eri henkilöiltä. Sinut on valittu vastaajaksi tehtäviesi ja asemasi vuoksi.

Pyydän Sinua vastaamaan web-kyselynä toteutettuun kyselyyn. Vastaaminen kestää noin 15 – 30 minuuttia. Vastausaikaa on x.x.2009 saakka. Vastauksesi on tärkeä tutkimuksen onnistumisen kannalta.

Kaikki kysymyslomakkeessa esiintyvät kysymykset on otettu mukaan tarkoituksella ja ne ovat tärkeitä tutkimuskysymyksiin vastaamisen kannalta. Toivon, että vastaat mahdollisimman tarkasti kaikkiin kysymyksiin. Annettuja vastauksia käsitellään luottamuksellisesti ja siten, että vastaajien henkilöllisyyttä ei yhdistetä annettuihin tietoihin. Tutkimusaineistoa tai sen osia ei luovuteta tai kopioida kenellekään ulkopuoliselle, vaan se jää tutkijan ja Helsingin kauppakorkeakoulun tutkimuskäyttöön.

On mahdollista, että kyselyn lisäksi joitakin vastaajia myös haastatellaan henkilökohtaisesti.

Lisätietoja oman organisaationne puolelta antaa ETUNIMI SUKUNIMI. Mikäli Sinulla on yksittäisten kysymysten tulkintaa koskevia kysymyksiä tai jos kyselylomakkeelle johtava linkki ei toimi, niin voit olla yhteydessä Helsingin kauppakorkeakoulun tutkija Pirkko Lahdelmaan (pirkko.lahdelma@hse.fi).

Vaivannäöstänne jo etukäteen kiittäen,

Pirkko Lahdelma, tutkija
Helsingin kauppakorkeakoulu

COVERING LETTER

Helsinki School of Economics
Information systems science / Pirkko Lahdelma

To whom it may concern,

ZETA Inc. has decided to participate in a study on IT-related decision-making. This study is conducted in Helsinki School of Economics. The study focuses on the following research questions:

- Who participate and in what way in an enterprise-wide IT-decisions in the different phases of the decision-making process?
- Who comprise the influential network in IT-related matters?
- What kind of effect do these matters have on the perceived strategic alignment between IT and business?

The results will help ZETA Inc. to improve the IT-related decision-making. We will conduct a large-scale study, in which we collect data from several people. You have been chosen as a respondent due to your duties and position.

I ask you to respond to a web-based questionnaire, which will take about from 15 to 20 minutes.

I ask you to respond to a web-based questionnaire. It will take about 15 – 30 minutes to respond. The deadline is x.x.2009. Your response is of significant value for the success of this study.

All the questions in the questionnaire are purposeful and important for finding answers for the research questions. I hope that you answer as accurately and truthfully as possible to all the questions. All the responses will be processed confidentially and in a way that the identity of a respondent cannot be connected to the data. This data or parts of it will not be given or copied to any third party but it will be left for the researcher and Helsinki School of Economics to be used in research.

It is possible that some of the respondents will be interviewed, too.

More information in Zeta is available from FIRSTNAME SURNAME. If you have any problems in interpreting questions or if the link with an access to the questionnaire does not work, you can contact Pirkko Lahdelma, a researcher in Helsinki School of Economics (pirkko.lahdelma@hse.fi).

Thank you for your trouble!

Pirkko Lahdelma,
Researcher
Helsinki School of Economics

The contents of the Webropol questionnaire both in Finnish (the original questionnaire) and English (a translation):

Kyselyn aluksi pyydän Sinua kertomaan omasta asemastasi yrityksessänne.	**To begin with, I ask you to tell about your position in your organization.**
1) Mikä on organisaatioyksikkösi? (VALITSE LUETTELOSTA)	1) What is your organizational department or unit? (SELECT FROM THE LIST)
2) Missä toimipisteessä työskentelet? (VALITSE LUETTELOSTA)	2) In which office do you work? (SELECT FROM THE LIST)
3) Mikä on nimikkeesi tai tehtäväsi yrityksessä?	3) What is your title or what are your tasks in your organization?
4) Mikä on asemasi yrityksessä? • Ylin johto • Johto • Keskijohto • Asiantuntija • Toimihenkilö • Muu, mikä?	4) Which is your position in your organization? • Executive • Management • Middle management • Expert • Employee • Other, which?
5) Kuinka monta raportointitasoa toimitusjohtajan ja sinun välissäsi on? • Ei yhtään (raportoit suoraan toimitusjohtajalle) • 1 (esimiehesi raportoi suoraan toimitusjohtajalle) • 2 • 3 • 4 tai enemmän	5) How many reporting levels are there between you and the CEO? • None (you report directly to the CEO) • 1 (your supervisor reports directly to the CEO) • 2 • 3 • 4 or more
6) Kenelle raportoit? *Kirjoita etunimi ja sukunimi*	6) To whom do you report? *Give the first name and the surname*
7) Mihin yrityksenne päätöksenteko- tai asiantuntijaryhmistä kuulut? *Valitse kaikki ryhmät, joihin kuulut. Jos kuulut ryhmiin, jotka eivät ole valmiissa luettelossa (esimerkiksi projektiryhmät, projektien ohjausryhmät), niin merkitse ne kohtiin "Muu, mikä?" rastimalla kyseinen vaihtoehto ja kirjoittamalla ryhmien nimet vastausriveille.* • Hallitus • Johtoryhmä • IT-johtoryhmä • Riskienhallinnan johtoryhmä • Muu, mikä? _____	7) To which cross-functional groups or committees do you belong? *Select all the groups to which you belong. If you belong to the groups which are not in the pre-completed list (e.g. project teams, steering groups), please, select the option "Other, which?" and give the name of the group.* • Board • Top Management Group • IT Steering Group • Risk Management Steering Group • Other, which? _____
8) Mihin muihin yrityksenne ryhmiin kuulut? *Esimerkiksi henkilöstöyhdistykset, harrastusryhmät tai -kerhot, virkistystoiminta.* Arvioi, kuinka aktiivinen tai passiivinen olet kunkin ryhmän toiminnassa. Käytä asteikkoa 1...5, jossa 1 = erittäin passiivinen ja 5 = erittäin aktiivinen	8) To which other groups within your company do you belong? *For instance, staff associations, clubs, recreational services* How active or passive are you in each group? Use a scale from 1 to 5 where 1 = very passive and 5 = very active

Tässä osiossa selvitetään yrityksenne epä-virallisia verkostoja. Pyydän Sinua valitsemaan 1 - 5 yrityksenne henkilöä kunkin kysymyksen kohdalla.	**In this part, I examine informal networks in your organization. I ask you to select from 1 to 5 people in your organization for each question.**
9) Valitse luettelosta ne henkilöt, joiden kanssa useimmin keskustelet siitä, mitä yrityksessänne tapahtuu. joiden puoleen mieluiten käännyt kaivatessasi neuvoja työhösi liittyvissä kysymyksissä. jotka kääntyvät helposti sinun puoleesi kaivatessaan neuvoja työhönsä liittyvissä kysymyksissä. joiden kanssa olet myös ystävä. jotka tietävät eniten oman yrityksenne IT:stä.	9) Select from the list those people... with whom you most often discuss what is going on in your company. whom you tend to contact when you need work-related advice. who tends to contact you when he or she needs work-related advice. with whom you are a friend who know the most about the IT in your company
10) Puuttuuko listalta henkilöitä? Lisää puuttuvan henkilön nimi (etu- ja sukunimi) ja valitse merkitsemällä rastilla, mihin ryhmään tai ryhmiin hän kuuluu.	10) Is anyone missing in the list? If, please, add the first name and surname of that person and tick to which group(s) he or she belongs.
Kyselyn tässä osiossa pyydän Sinua kertomaan näkemyksesi siitä, miten hyvin IT:n ja liiketoiminnan yhteen-sovittamisessa on onnistuttu niin suunnitelmien tasolla kuin käytännössäkin.	**In this part of the questionnaire, I ask you to tell about your views on how well your company has succeeded in the alignment between IT and business both in planning and implementation.**
Yrityksen strategia voi painottua kustannus-tehokkuuteen, asiakaskeskeisyyteen ja/tai tuote- ja palveluinnovaatioihin. <u>Kustannustehokkuus</u> voi näkyä esimerkiksi tehokkuuden ja luotettavuuden tai alhaisten kustannusten painottumisena. <u>Asiakaskeskeisyys</u> voi näkyä esimerkiksi joustavuuden ja palvelun laadun korostumisena tai markkinoiden hallinnan painottumisena. <u>Tuote- ja/tai palveluinnovaatiot</u> voivat näkyä esimerkiksi luovuuden ja tuotekehityksen painottumisena tai tuotekehitykseen käytetyn ajan korostumisena.	A business strategy can focus on operational excellence, customer intimacy, and/or product and service innovations. <u>Operational excellence</u> is dominant if the focus is on the efficient processes, reliability, or low costs. <u>Customer intimacy</u> is dominant if the focus is on the flexibility, the service quality, and market orientation. <u>Product / service leadership</u> dominate if the focus is on the creativity, product development, and/or time-to-market.
Käytä seuraavissa vastauksissasi asteikkoa 1...5, jossa 1 = ei lainkaan, 2 = hieman, 3 = jonkin verran, 4 = selvästi ja 5 = erittäin selvästi. Jos et tiedä, valitse vaihtoehto "En tiedä" 11) Arvioi, millä tavalla yrityksenne strategiassa näkyy... kustannustehokkuus? asiakaskeskeisyys? tuote- ja/tai palveluinnovaatiot?	*Use a scale from 1 to 5 where 1 = not at all, 2 = little, 3 = some, 4 = much, and 5 = very much. If you don't know, choose "I don't know".* 11) In your opinion, how much weight does the value discipline of… operational excellence get in your business? customer intimacy get in your business? product / service leadership get in your business?
12) Millä tavalla nykyiset IT-ratkaisunne mielestäsi auttavat saavuttamaan yrityksenne... kustannustehokkuuteen liittyviä tavoitteita? asiakaskeskeisyyteen liittyviä tavoitteita? tuote- ja/tai palveluinnovaatioihin liittyviä tavoitteita?	12) How much do your current IT systems help to achieve your company's goals related to... the operational excellence? the customer intimacy? the product / service leadership?

13) Millä tavalla uudet vireillä olevat IT-ratkaisunne mielestäsi auttavat tulevaisuudessa saavuttamaan yrityksenne... kustannustehokkuuteen liittyviä tavoitteita? asiakaskeskeisyyteen liittyviä tavoitteita? tuote- ja/tai palveluinnovaatioihin liittyviä tavoitteita?	13) In future, how will the new but still pending IT solutions help to achieve your company's goals related to… operational excellence? customer intimacy? product / service leadership?
14) Arvioi seuraavia väitteitä. *Käytä seuraavissa vastauksissasi asteikkoa 1...5, jossa 1 = täysin eri mieltä, 2 = eri mieltä, 3 = ei eri mieltä, mutta ei samaakaan, 4 = samaa mieltä, 5 = täysin samaa mieltä:* Informaatioteknologia tarjoaa paljon strategisia mahdollisuuksia yrityksemme liiketoiminnalle. Osaamme hyödyntää mahdollisuuksia, joita informaatioteknologia tarjoaa yrityksemme liiketoiminnalle. Tietojärjestelmämme ovat kriittisiä yrityksemme menestymisen kannalta. Yrityksemme IT-suunnitelmat ovat realistisia. Yrityksemme IT-suunnitelmat heijastavat liiketoimintasuunnitelmia. Yrityksessämme IT:lle asetutut tavoitteet heijastavat hyvin liiketoimintatavoitteita. Yrityksemme IT-suunnitelmat tukevat hyvin liiketoimintastrategioita. Yrityksemme liiketoimintasuunnitelmaan sisältyy IT-suunnitelma tai siinä viitataan IT-suunnitelmaan. Yrityksemme liiketoimintasuunnitelmassa viitataan tiettyihin IT-sovelluksiin ja/tai informaatioteknologioihin. Yrityksemme liiketoimintasuunnitelmassa hyödynnetään yrityksemme omaa IT:n erityisosaamista. Yrityksemme liiketoimintasuunnitelma sisältää realistisia odotuksia IT:n osalta.	14) Consider the following statements. *Use a scale from 1 to 5 where 1 = highly disagree, 2 = disagree, 3 = not disagree but not agree either, 4 = agree, and 5 = highly agree. If you don't know, choose "I don't know".* Information technology offers a plenty of strategic opportunities for our business. We can take an advantage of the opportunities that information technology offers for our business. Our IT systems are critical for the success of our company. Our IT plans are realistic. Our IT plans reflect the business plans. Our IT goals reflect the business goals. Our IT plans support the business strategies. Our business plans include an IT plan or they refer to an IT plan. Our business plans refer to specific applications and/or information technologies. Our business plans utilize our IT capabilities. Our business plans include realistic expectations for IT.
Tässä osiossa pyydän Sinua kertomaan näkemyksesi yrityksenne liiketoiminta- ja IT-tietämyksestä.	**In this part, I ask you to tell your views about the business and IT knowledge in your company.**
Käytä seuraavassa vastauksessasi asteikkoa 1...5, jossa 1 = erittäin tyytymätön, 2 = melko tyytymätön, 3 = en tyytymätön, mutta en tyytyväinenkään, 4 = melko tyytyväinen, 5 = erittäin tyytyväinen: 15) Kuinka tyytyväinen tai tyytymätön olet nykyisiin IT-ratkaisuihinne? uusiin vireillä oleviin IT-ratkaisuihinne?	*Answer with the scale from 1 to 5 where 1 = very unsatisfied, 2 = unsatisfied, 3 = not unsatisfied neither satisfied, 4 = satisfied, 5 = very satisfied:* 15) How satisfied or unsatisfied are you on the current IT solutions in your company? the future, pending IT solutions in your company?
Käytä seuraavissa vastauksissasi asteikkoa 1...5, jossa 1 = erittäin huonosti, 2 = huonosti, 3 = ei huonosti mutta ei hyvinkään, 4 = hyvin, 5 = erittäin hyvin: 16) Vastaa seuraaviin kysymyksiin: Millä tavalla tunnet nykyiset IT-ratkaisunne? Millä tavalla tunnet mitä tärkeimpien kilpailijoidenne IT-ratkaisut ovat? Millä tavalla mielestäsi liiketoiminnasta vastuussa olevat henkilöt tuntevat nykyiset IT-ratkaisunne? Millä tavalla mielestäsi liiketoiminnasta	*In next questions, use the scale from 1 to 5, where 1 = very poorly, 2 = poorly, 3 = to some extent, 4 = well, 5 = very well:* 16) Answer the following questions: How well do you know the current IT solutions in your company? How well do you know the IT solutions of your major competitors? In your opinion, how well do those who are responsible for business know the current IT solutions in your company? In your opinion, how well do those who are responsible for business know what

vastuussa olevat henkilöt tuntevat mitä tärkeimpien kilpailijoidenne IT-ratkaisut ovat? Millä tavalla mielestäsi yrityksenne IT:sta vastuussa olevat henkilöt tuntevat omaa liiketoimintaanne? Millä tavalla mielestäsi yrityksenne IT:sta vastuussa olevat henkilöt tuntevat nykyiset IT-ratkaisunne? Millä tavalla mielestäsi yrityksenne IT:sta vastuussa olevat henkilöt tuntevat mitä tärkeimpien kilpailijoidenne IT-ratkaisut ovat?	IT solutions your major competitors have? In your opinion, how well do those who are responsible for IT know your company's business? In your opinion, how well do those who are responsible for IT in your company know your current IT solutions? In your opinion, how well do those who are responsible for IT in your company know what IT solutions your major competitors have?
Käytä seuraavissa vastauksissasi asteikkoa 1...5, jossa 1 = eivät lainkaan, 2 = hyvin harvoin, 3 = joskus, 4 = melko usein, 5 = erittäin usein: 17) Vastaa seuraaviin kysymyksiin: Kuinka usein mielestäsi yrityksenne liiketoiminnasta vastuussa olevat henkilöt ottavat itse keskusteluissa esille nykyisten IT-ratkaisujenne tarjoamia uusia mahdollisuuksia? Kuinka usein mielestäsi yrityksenne liiketoiminnasta vastuussa olevat henkilöt ottavat itse keskusteluissa esille uusien informaatioteknologioiden tarjoamia mahdollisuuksia? Kuinka usein mielestäsi yrityksenne IT:sta vastuussa olevat henkilöt tuovat keskusteluissa esille nykyisten IT-ratkaisujenne tarjoamia uusia mahdollisuuksia? Kuinka usein mielestäsi yrityksenne IT:sta vastuussa olevat henkilöt tuovat keskusteluissa esille uusien informaatioteknologioiden tarjoamia mahdollisuuksia?	*In next questions, use the scale from 1 to 5, where 1 = not at all, 2 = seldom, 3 = sometimes, 4 = often, 5 = very often:* 17) Answer the following questions: In your opinion, how often do those who are responsible for business in your company proactively discuss the opportunities that the current IT solutions can provide? In your opinion, how often do those who are responsible for business in your company proactively discuss the opportunities that new information technologies can provide? In your opinion, how often do those who are responsible for the IT in your company proactively discuss the opportunities that the current IT solutions can provide? In your opinion, how often do those who are responsible for the IT in your company proactively discuss the opportunities that new information technologies can provide?
Käytä seuraavissa vastauksissasi asteikkoa 1...5, jossa 1 = täysin eri mieltä, 2 = eri mieltä, 3 = ei eri mieltä, mutta ei samaakaan, 4 = samaa mieltä, 5 = täysin samaa mieltä: 18) Arvioi seuraavia väitteitä Liiketoimintaamme tai toimialaamme liittyy paljon erikoissanastoa ja omia termejä. Hallitsen hyvin liiketoimintaamme tai toimialaamme liittyvät erikoissanastot ja omat termit. Yrityksessämme puhutaan informaatioteknologiasta käyttäen paljon IT-alan omia termejä, erikoissanastoa tai lyhenteitä. Hallitsen hyvin informaatioteknologiaan liittyviä termejä, erikoissanastoa tai lyhenteitä. Yrityksemme informaatioteknologia on kuvattu helposti ymmärrettävällä tavalla. Yrityksemme informaatioteknologia on kuvattu siten, että siitä on helppo saada kokonaiskuva. Yrityksemme informaatioteknologia on kuvattu siten, että sitä on helppo pitää ajan tasalla.	*In next questions, use the scale from 1 to 5, where 1 = highly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = highly agree:* 18) Consider the following statements: Our business and industry involve a lot of special vocabulary and terms. I am knowledgeable with business related terms, special vocabulary and terms. In our company, people discuss IT by using a lot of IT-specific special vocabulary and terms, or abbreviations. I am knowledgeable with IT related terms, special vocabulary and terms, or abbreviations. The descriptions on our company's IT are easy to understand. The descriptions on our company's IT give easily an overview on it. The descriptions on our company's IT are easy to keep up-to-date.

Tässä osiossa pyydän Sinua kertomaan yrityksessänne tehdystä IT-päätöksestä ja siitä, miten se syntyi.	**In this part of the questionnaire, please tell about your views about an IT decision made in your company and about how it started.**
Yrityksessänne on otettu maaliskuussa 2009 käyttöön uusi sisäinen intranet-järjestelmä, ZETNET 2.0. Uusi järjestelmä tuo mukanaan mm. sen, että sisällöntuottajat huolehtivat tiedon viemisestä järjestelmään ja näin säästytään turhilta välivaiheilta. Tavoitteena on ajantasainen, parempi tieto, joka on kaikkien ulottuvilla. Tässä seuraavassa osiossa kysyn, miten päätös kehittää ja ottaa käyttöön ZETNET 2.0 on syntynyt ja keitä päätöksentekoon on osallistunut.	Your company released a new internal Intranet system ZETNET 2.0 in March 2009. This new system requires the content providers to enter the data into the system without any intermediaries. The objective is to provide better, real time information available for everyone. In this next part, I ask you how the decision to develop and implement ZETNET 2.0 was made and who were involved in the decision-making.
19) Mikä on ollut oma roolisi päätöksenteossa? päätöksentekijä päätöksen vastuullinen valmistelija valmistelutyöhön osallistuja tai valmistelutyössä avustaja neuvonantaja muu rooli, mikä? en ole ollut mukana millään tavalla	19) What was your own role in the decision-making? Decision-maker Responsible for preparing the decision Participating or assisting in preparing the decision adviser Another role; which? I was not involved at all
20) Millainen oma panoksesi on ollut päätöstä koskevan tämänhetkisen lopputuloksen kannalta? Erittäin vähäinen Vähäinen Ei vähäinen, mutta ei merkittäväkään Merkittävä Erittäin merkittävä	20) If you regard the current results, what kind of input to the decision have you had? Very small Small Not small neither great Great Very great
21) Miten tyytyväinen tai tyytymätön olet päätöstä koskevaan tämänhetkiseen lopputulokseen? Erittäin tyytymätön Tyytymätön En tyytymätön, mutta en tyytyväinenkään Tyytyväinen Erittäin tyytyväinen	21) How satisfied or unsatisfied are you with the current results concerning the decision? Very unsatisfied Unsatisfied Not unsatisfied, but not satisfied either Satisfied Very satisfied
22) Miten hyvin päätöksestä on mielestäsi tiedotettu? Erittäin huonosti Huonosti Ei huonosti, mutta ei erityisen näkyvästikään Näkyvästi Erittäin näkyvästi	22) How well has the decision been communicated? Very poorly Poorly Not poorly neither well Well Very well
23) Minkä verran olet saanut päätöksestä tietoa? Liian vähän Vähän Jonkin verran Melko riittävästi Täysin riittävästi	23) How much information have you received on the decision? Too little Little To some extent Sufficiently Very sufficiently
24) Mistä IT-päätös sai mielestäsi alkunsa? Pääsääntöisesti liiketoiminnan tarpeista (liiketoiminnan kehittäminen, jne) Pääsääntöisesti IT:n tarpeista (teknologian	24) In your opinion, where did the decision originate? Mainly from business Mainly from IT (e.g. new technology,

uudistaminen, vanhenevan järjestelmän uusiminen, jne) Yhtä paljon liiketoiminnan kuin IT:n tarpeista Muusta, mistä? En tiedä	renewal of old systems, etc.) As much from business as from IT Somewhere else; where? I don't know
25) Miten liiketoiminnan tarpeet on mielestäsi huomioitu päätöksenteossa? Erittäin huonosti Huonosti Ei huonosti, mutta ei erityisen hyvinkään Hyvin Erittäin hyvin	25) How well are the business needs taken into account in this decision? Very poorly Poorly Not poorly neither well Well Very well
26) Millä tavalla päätös tukee liiketoiminnan tavoitteiden saavuttamista? Erittäin huonosti Huonosti Ei huonosti, mutta ei erityisen hyvinkään Hyvin Erittäin hyvin	26) How well does this decision support achieving the business goals? Very poorly Poorly Not poorly neither well Well Very well
27) Miten paljon päätös vaikuttaa liiketoimintaan? Ei juuri ollenkaan Vähän Jonkin verran Paljon Erittäin paljon	27) How much effect does this decision have on business? Not at all Some Slightly Much Very much
28) Millainen tämän päätöksen päätöksentekoprosessi on ollut verrattuna muihin koko yritystä koskeviin päätöksiin? Erittäin epätyypillinen Epätyypillinen Ei epätyypillinen, mutta ei tyypillinenkään Tyypillinen Erittäin tyypillinen	28) If you compare to other company-level decisions, how has the decision process for this decision been? Very untypical Untypical Not untypical neither typical Typical Very typical
29) Kuinka yksimielisiä tai erimielisiä asioista yleensä oltiin päätöksen valmisteluvaiheen aikana? Täysin erimielisiä Melko erimielisiä Ei erimielisiä, mutta ei yksimielisiäkään Melko yksimielisiä Täysin yksimielisiä	29) How agreeing or disagreeing were the views in general during the phase in which the decision was prepared? Highly disagreeing Disagreeing Not disagreeing neither agreeing Agreeing Highly agreeing
30) Miten paljon asiantuntemusta oli käytössä päätöksen valmisteluvaiheen aikana? Ei lainkaan riittävästi Ei riittävästi Melko riittävästi Riittävästi Täysin riittävästi	30) How much expertise was available during the decision preparation phase? Not enough at all Not enough Slightly enough Enough Highly enough
31) Kuinka kauan koko päätöksentekoprosessi käsityksesi mukaan kesti? Alle 3 kk 3 - 6 kk 6 - 12 kk 12 - 24 kk 24 - 36 kk	31) In your opinion, how long did the decision-making process take as a whole? Less than 3 months 3 - 6 months 6 - 12 months 12 - 24 months 24 - 36 months More than 36 months

Yli 36 kk En tiedä	I don't know
32) Kuka oli päätöksentekijä? (etunimi, sukunimi)	32) Who was the decision-maker? (first name, surname)
33) Ketkä ovat osallistuneet tai keiden olisi pitänyt osallistua päätöksentekoon sen eri vaiheissa? Seuraavassa luettelossa on joukko yrityksenne henkilöitä. Pyydän Sinua valitsemaan, ketkä henkilöistä ovat vaikuttaneet eniten päätöstä koskevaan lopputulokseen, ketkä ovat olleet aloitteentekijöitä ja ketkä osallistuivat päätöksen valmisteluun. Vaihtoehdot eivät ole toisiaan poissulkevia, vaan yksi ja sama henkilö on voinut olla esimerkiksi sekä aloitteentekijä että osallistua valmisteluun. Jos henkilö ei ole ollut mukana päätöksenteossa, mutta mielestäsi hänen olisi pitänyt olla, niin merkitse myös tällaiset henkilöt. Jos luettelosta puuttuu nimiä, niin voit täydentää listaa seuraavassa kysymyksessä (nro 34). Silloin voit lisätä myös henkilöitä, jotka eivät välttämättä ole oman yrityksenne palveluksessa. Mielestäsi vaikuttaneet eniten päätöstä koskevaan tämänhetkiseen lopputulokseen Aloitteentekijöitä päätöksen suhteen Osallistuivat päätöksen valmisteluun Mielestäsi olisi pitänyt olla mukana päätöksentekoprosessissa, mutta ei jostain syystä ollut	33) Who were or should have been involved in the decision-making during the different phases? In the following list, there are some names from your company. Please pick up those who have been the most influential on the outcomes, who have been initiators, and who have participated in the decision-making process. The alternatives do not exclude each other but for instance, the same individual might have been an initiator and participated in the decision-making process. Select also those individuals not involved in the decision-making but should have been in your opinion. If some names are missing in the list, you can add the names in the next question (# 34). You can also add individuals who do not have to be employees in your company. The most influential regarding the current outcomes The initiator Participated in the decision-making Should have been involved in the decision-making but was not
34) Ketkä muut oman yrityksenne tai sen ulkopuoliset henkilöt ovat olleet mukana päätöksenteossa ja/tai vaikuttamassa päätöksen lopputulokseen? Keiden olisi pitänyt osallistua, mutta eivät jostain syystä osallistuneet? Kirjoita ensimmäisen henkilön etu- ja sukunimi ensimmäiseen kenttään, seuraavan toiseen jne. Jos et muista esimerkiksi etunimeä, niin merkitse silloin etunimi X:llä (esim. X Mäkinen). Jos nimi näyttää pitemmältä kuin sille varattu kenttä, niin se ei haittaa, sillä teksti vierittyy automaattisesti. Jos henkilö ei ole oman organisaatiosi palveluksessa, niin kerro, minkä yrityksen tai organisaation edustaja hän on. Jos et tiedä yrityksen nimeä, niin kirjoita kenttään, minkä tyyppinen yritys on (esim. konsultti, laitetoimittaja, jne.). Merkitse myös, jos hän oli päätöksenteon aikaan yrityksenne palveluksessa (ts. hän on yrityksenne entinen työntekijä). Etunimi ja sukunimi Organisaatio Vaikutti merkittävästi päätöstä koskevaan lopputulokseen Oli yksi aloitteentekijöistä päätöksen suhteen Oli yksi päätöksen valmistelijoista.	34) Who else from your company or outsiders were involved in the decision-making and thus, influencing the outcomes? Who should have been involved but was not? In the first field, fill out the first name and the last name of the first individual. In the second field, fill out the first name and the last name of the second individual. Please continue in the similar way. If you do not remember for instance the first name, replace the missing name with "X" (e.g. X Mäkinen). It does not matter if the name is longer than the field, since the text rolls automatically. If the person is not an employee in your company, please specify where he or she works. If you do not know the name of the company, specify its type (e.g. consultant company, vendor). Mark if the person was an employee in your company during the time of the decision-making (i.e. he or she is a former employee). First name and last name Organization Influenced significantly the outcomes One of the initiators Participated in the decision-making

Olisi pitänyt olla mukana päätöksenteossa, mutta ei ollut. Oli yrityksenne palveluksessa päätöksenteon aikana	Should have participated in the decision-making but did not Was an employee of the company during the decision-making
35) Mitä muuta haluaisit kertoa tästä IT-päätöksestä? (Esimerkiksi perusteluja aiemmille vastauksillesi?)	35) What else would you like to tell about this IT-related decision? (For instance, arguments for your responses)
Tässä osiossa pyydän Sinua kertomaan hieman taustatietoja itsestäsi.	**In this part of the questionnaire, please tell about your background.**
36) Sukupuolesi? Mies Nainen	36) Your gender? Male Female
37) Ikäsi? (vuosina) Alle 20 20 - 29 30 - 39 40 - 49 50 - 59 60 tai enemmän	37) Your age? (in years) Less than 20 20 - 29 30 - 39 40 - 49 50 - 59 60 or over
38) Minä vuonna olet tullut tämän yrityksen palvelukseen? (valitse aikaväli, jolle vuosi ajoittuu) 2008 - 2009, sitä ennen työnantajani oli: 2003 - 2007, sitä ennen työnantajani oli: 1998 - 2002 1993 - 1997 1988 - 1992 1987 tai aikaisemmin	38) When did you start working in this company? (choose the range in which the starting year falls) 2008 - 2009, my previous employer was: 2003 - 2007, my previous employer was: 1998 - 2002 1993 - 1997 1988 - 1992 1987 or earlier
39) Mistä vuodesta alkaen olet toiminut nykyisessä tehtävässäsi? (valitse aikaväli, jolle vuosi ajoittuu) 2008 - 2009, sitä ennen tehtäväni oli: 2005 - 2007, sitä ennen tehtäväni oli: 2002 - 2004 1998 - 2001 1997 tai aikaisemmin	39) When did you start in your current position? (choose the range in which the starting year falls) 2008 - 2009, before that my duties were: 2005 - 2007, before that my duties were: 2002 - 2004 1998 - 2001 1997 or earlier
40) Mikä on korkein koulutusasteesi? Perusaste Keskiaste Alin korkea-aste Alempi korkeakouluaste Ylempi korkeakouluaste Tutkijakoulutus Muu	40) Which is your highest degree of education? Basic level education Upper secondary level education Lowest level tertiary education Lower-level tertiary education Higher-level tertiary education Highest-level tertiary education (doctoral) Level unspecified or unknown
41) Mikä on korkeimman tutkintosi koulutusala? (Jos Sinulla on useita tutkintoja, niin valitse se mitä pidät ensisijaisena.) Yleissivistävä koulutus Kasvatustieteellinen ja opettajankoulutus Humanistinen ja taidealan koulutus Kaupallinen ja yhteiskuntatieteellinen koulutus Luonnontieteellinen koulutus	41) What is the field of education for your highest degree? (If you have several degrees, choose the one you consider the primary one.) General education Teacher education and educational science Humanities and arts Social sciences and business

Tekniikan koulutus Maa- ja metsätalousalan koulutus Terveys- ja sosiaalialan koulutus Palvelualojen koulutus Muu tai tuntematon koulutusala	Natural sciences Technology Agriculture and forestry Health and welfare Services Other or unknown field
42) Minä vuonna olet suorittanut korkeimman koulutusasteesi tutkinnon? (valitse aikaväli, jolle vuosi ajoittuu) 2008 - 2009 2003 - 2007 1998 - 2002 1993 - 1997 1988 - 1992 1987 tai aikaisemmin	42) In which year have you reached your highest degree? (choose the range where the year falls) 2008 - 2009 2003 - 2007 1998 - 2002 1993 - 1997 1988 - 1992 1987 or earlier
Käytä seuraavissa arvioinneissa asteikkoa 1...5, jossa 1 = täysin eri mieltä, 2 = eri mieltä, 3 = ei eri mieltä, mutta ei samaakaan, 4 = samaa mieltä, 5 = täysin samaa mieltä: 43) Arvioi seuraavia väitteitä Olen kiinnostunut informaatioteknologiasta. Keskustelen mielelläni informaatioteknologiasta. Seuraan aktiivisesti informaatioteknologian kehitystä.	*Use a scale from 1 to 5 where 1 = highly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = highly agree. If you do not know, choose "I don't know".* 43) Consider the following statements. I am interested in information technology. I enjoy discussing information technology. I follow actively the development and trends of information technology.
44) Hankin informaatioteknologiaa koskevat tietoni seuraavista tietolähteistä. Valitse rastimalla, mitä tietolähteitä käytät. Oman organisaation IT-ammattilaiset Konsultit Laitetoimittajat (uutislehdet, raportit, keskustelut) Ohjelmistotoimittajat (uutislehdet, raportit, keskustelut) Ulkoistuskumppanit (uutislehdet, raportit, keskustelut) Oman organisaation järjestämät koulutustilaisuudet Yliopistojen ja korkeakoulujen järjestämät seminaarit ja/tai kurssit IT-alan seminaarit, kurssit ja konferenssit Oman toimialan seminaarit, kurssit ja konferenssit IT-alan kaupalliset tutkimusraportit (esim Gartner) IT-alan sanomalehdet (esim Tietoviikko) Talousalan lehdet (esim Kauppalehti, Talouselämä) Sanomalehdet (esim Helsingin Sanomat) Internet, blogit, wikit, sähköiset keskustelufoorumit Kirjat Tieteelliset aikakausilehdet ja julkaisut Yritysvierailut Jokin muu, mikä?	44) My main sources of information regarding IT is the following (please mark the sources from the following list): IT professionals of your company Consultants Hardware vendors (newsletters, reports, discussions) Software vendors (newsletters, reports, discussions) Outsourcing partners (newsletters, reports, discussions) Internal training sessions Seminars and/or courses at a university or college Seminars, courses, and conferences in IT industry Seminars, courses, and conferences in company's core industry Commercial research reports on IT (e.g. Gartner) IT newspapers (e.g.Tietoviikko) Business newspapers and magazines (e.g. Kauppalehti, Talouselämä) Newspapers (e.g. Helsingin Sanomat) Internet, blogs, wikis, electronic discussion forums Books Academic journals and publications Visiting other organizations Other; which?
Käytä seuraavissa arvioinneissasi asteikkoa 1...5, jossa 1 = ei lainkaan hyödyllinen, 2 = ei hyödyllinen, 3 = melko hyödyllinen, 4 = hyödyllinen, 5 = erittäin hyödyllinen:	*In the next question, use the scale from 1 to 5, where 1 = not at all useful, 2 = not useful, 3 = slightly useful, 4 = useful, 5 = very useful:* 45) How useful do you consider the source

45) Kuinka hyödyllinen käyttämäsi tietolähde on?	of information that you use?
Käytä seuraavissa arvioinneissasi asteikkoa 1...5, jossa 1 = täysin eri mieltä, 2 = eri mieltä, 3 = ei eri mieltä, mutta ei samaakaan, 4 = samaa mieltä, 5 = täysin samaa mieltä:	*In the next questions, use the scale from 1 to 5, where 1 = highly disagree, 2 = disagree, 3 = not disagree neither agree, 4 = agree, 5 =highly agree:*
46) Lopuksi pyydämme sinua kertomaan näkemyksesi yrityksestä, jossa työskentelet.	46) Finally, I ask your views on the company where you work.
Yrityksemme on hyvin kotoisa paikka, jossa ollaan yhtä suurta perhettä.	The company I work in is a very personal place. It is like an extended family.
Yrityksemme on dynaaminen paikka, jossa kannustetaan yrittäjyyteen ja riskinottoon. Siellä työskentelevät ihmiset ovat valmiita pistämään itsensä likoon.	The company I work in is a very dynamic and entrepreneurial place. People are willing to stick their necks out and take risks.
Yrityksessämme on selkeästi määritellyt vastuut ja raportointisuhteet. Yrityksessämme on tärkeää toimia ohjeiden mukaan.	The company I work in is a very formal and structured place. People pay attention to procedures and rules to get things done.
Yrityksessämme keskitytään saamaan työt tehdyiksi. Ihmiset eivät tuo henkilökohtaisia asioitaan työpaikalleen.	The company I work in is a very production-oriented place. People are concerned with getting the job done and are not very personally involved.
Yrityksessämme työskentelevät ihmiset ovat hyvin sitoutuneita yritykseemme ja kunnioittavat siellä vallitsevia tapoja ja perinteitä.	In the company I work in, people are very committed, loyal and value traditions.
Yrityksessämme työskenteleviä ihmisiä kannustetaan innovaatioihin ja kehittämään yrityksen toimintaa. Yrityksellemme on tärkeää olla ensimmäisten joukossa tarjoamassa uusia tuotteita ja palveluja.	In the company I work in, people are encouraged for innovation and development. There is an emphasis on being first with products and services.
Yrityksessämme on tärkeää noudattaa sääntöjä ja toimia sovittujen periaatteiden mukaisesti.	In the company I work in people are committed with formal rules and policies. Following rules and maintaining a smooth-running institution are important.
Yrityksessämme on tärkeää, että tehtävät tulevat suoritetuiksi ja tavoitteet saavutetuiksi.	The company I work in emphasizes tasks and goal accomplishment.
Yrityksellemme ovat siellä työskentelevät ihmiset hyvin arvokkaita ja tärkeitä. Ihmisiä kohdellaan yksilöinä.	The company I work in emphasizes human resources. People are treated as individuals.
Yrityksemme on hyvin kasvuhakuinen. Kasvua tavoitellaan hankkimalla uusia tuotteita ja/tai palveluita ratkaisuiksi uusiin haasteisiin.	The company I work in emphasizes growth through acquiring new products/services to meet new challenges.
Yrityksessämme on tärkeää, että toiminnot eivät keskeydy, vaan ne jatkuvat tehokkaina ja vakaina.	The company I work in emphasizes permanence and stability. Efficient, smooth operations are important.
Yrityksessämme korostuvat kilpailu, tulosten tuottaminen ja mitattavissa olevien tavoitteiden saavuttaminen.	The company I work in emphasizes competitive actions, outcomes and achievement. Accomplishing measurable goals is important.
Kiitos vastauksistasi!	Thank you for your responses!

The interview protocol for the key informants

Your role and tasks in Zeta

ZetNet

- When and why did Zeta start to develop the ZetNet?
- What has been your role in the development of the ZetNet?
- What kinds of objectives or goals were set for the ZetNet?
- How do you control the achievement of the goals?
- How was the ZetNet project carried out in practice?
- Which was successful in the ZetNet project? Why?
- Which was challenging in the ZetNet project? Why?

IT steering committee

- How familiarized are you with the IT steering committee?
- When and why was the IT steering committee established?
- What is the role of the IT steering committee?
- How does the IT steering committee operate in practice?

Other issues

- How would you characterize the knowledge exchange within your organization unit?
- How would you characterize the knowledge exchange between different organization units in Zeta?

DESCRIPTIVE STATISTICS for items measured with Likert-type scales

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Cronbach's alpha α	$\alpha^{1/2}$
AL_IT_CURR	37	1.667	4.500	2.984	.687	n/a	n/a
AL_ITP	37	1.750	4.750	3.299	.769	.910	.954
ITP1	37	1.000	5.000	3.182	.956		
ITP2	37	2.000	5.000	3.250	.816		
ITP3	37	2.000	5.000	3.441	.752		
ITP4	37	1.000	5.000	3.323	.935		
AL_BP	37	1.992	4.500	3.010	.599	.680	.825
BP1	37	1.000	5.000	2.900	1.010		
BP2	37	1.000	5.000	2.871	.905		
BP3	37	2.000	4.000	2.968	.763		
BP4	37	2.000	4.000	3.300	.630		
SK_BUSIT	37	1.000	5.000	2.972	.897	n/a	n/a
SK_ITBUS	37	2.000	5.000	3.306	.775	n/a	n/a
D_ALIGN	37	1.500	5.000	3.230	.787	.910	.954
D_BUSNEED	37	1.000	5.000	3.162	.866		
D_BUSGOAL	37	2.000	5.000	3.270	.769		
COMP_IT_INT	37	1.000	5.000	3.712	.854	.930	.964
IT_INT	37	1.000	5.000	3.946	.848		
IT_DISC	37	1.000	5.000	3.757	.863		
IT_FOLL	37	1.000	5.000	3.432	1.015		
COMP_IT_KNOW	37	1.500	5.000	3.419	.741	.730	.854
IT_LANG	37	1.000	5.000	3.135	.948		
IT_KNOW	37	2.000	5.000	3.703	.702		

APPENDIX 4: Descriptive statistics, factor loadings, and intercorrelations

Rotated Component Matrix[a]

	Raw				Rescaled			
	Component				Component			
	1	2	3	4	1	2	3	4
ITP1	.832	.179	.190	.103	.871	.187	.198	.108
ITP2	.704	.165	.052	-.065	.862	.202	.063	-.080
ITP3	.616	.116	.259	-.012	.819	.154	.344	-.016
ITP4	.753	.161	.154	.142	.806	.173	.165	.152
BP1	.428	.379	.176	.463	.424	.375	.175	.459
BP2	.187	.166	-.003	.776	.206	.183	-.004	.858
BP3	-.029	-.037	.213	.598	-.038	-.048	.279	.784
BP4	.365	.036	.028	.195	.580	.057	.044	.310
D_BUSNEED	.292	.103	.725	.190	.337	.119	.837	.219
D_BUSGOAL	.201	.224	.634	.100	.261	.291	.825	.129
IT_LANG	.110	.688	.353	.068	.116	.726	.372	.071
IT_KNOW	.044	.437	.264	.133	.063	.623	.376	.189
IT_INT	.136	.773	-.046	-.006	.160	.912	-.054	-.007
IT_DISC	.266	.751	-.026	.071	.308	.871	-.030	.082
IT_FOLL	.165	.916	.226	.069	.163	.902	.223	.068

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

Correlations

		SK_BUSIT	SK_ITBUS	D_ALIGN	COMP_IT_INT	COMP_IT_KNOW
Kendall's tau_b	SK_BUSIT	1.000				
	SK_ITBUS	.310*	1.000			
	D_ALIGN	.173	.301*	1.000		
	COMP_IT_INT	-.002	.160	.278*	1.000	
	COMP_IT_KNOW	-.014	.286*	.444**	.500**	1.000

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

The strategic alignment between IT and business has continued as one of the top concerns of IT executives for decades. One reason for alignment being such a persistent worry for IT executives can be the differing views on alignment level within companies. As the overall research question of the study is "What explains (dis-)similarities in the perceptions on strategic IT-business alignment within an organization", the study focuses on the social dimension of strategic IT-business alignment. The research methodology was to use quantitative methods designed for social network analysis in one empirical research setting. The results revealed that the functional department structure had a significant effect on the similarity in the perceived IT-business alignment between a pair of individuals. Ties in discussion and advice networks had an impact on the similarity in the perceived alignment but affection-based informal networks, such as friendship, or formal cross-functional structures, such as steering groups, did not produce significant results.

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