The Implications of Business-IT Alignment for Business Value of IT

An interpretive qualitative study on the impact of the business-IT alignment on the business value of IT in a SAP environment of a global financial institution

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MSc Information Management thesis

Abstract: has the degree of business-IT alignment a positive impact on the business value of IT? This is tested by using the Strategic Alignment Model (SAM) of Henderson and Venkatraman (1993) on the SAP environment of one of the larger operating financial institutions. The research model expands past literature by including IT alignment preconditions and IT alignment processes. Consistent with IS alignment literature I find that a strong business-IT alignment positively impacts the business value of IT. IT alignment preconditions and processes are indicators of the business-IT alignment and have an indirect positive impact on the business value of IT. Within this SAP environment, the business-IT alignment is based on two levels of alignment, which are the local business unit level and the central IT level. Furthermore, the findings correspond with the results of Chan (2002), where informal relationships between business and IT staff are found to be important indicators of the business-IT alignment. At last, the findings of this thesis contradict to Sabherwal and Jeyaraj (2015), where the business value of IT is considered to be greater when IT investments are not considered by the organization.

Keywords: Business-IT alignment, Business value of IT, preconditions of IT alignment, IT alignment processes, Strategic Alignment Model.

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Management Summary

As of today, there is yet no general consensus of how the business-IT alignment affects the business value of IT. Past literature differ in their views on the measurement of business-IT alignment and few focus on its impact on the business value of IT. It is difficult to assess this impact, when there is no good understanding of the business-IT alignment itself.

This thesis aims to provide a relevant contribution in the search of the implications of the business-IT alignment by conducting an in-depth case study on a SAP platform of a global operating financial organization. More specifically, the case study includes interviews with employees of the financial organization at the local business unit level and the central IT management level. Furthermore, a questionnaire was constructed and used to measure the satisfaction gaps on the four different constructs of this thesis: (1) IT alignment preconditions, (2) IT alignment processes, (3) business-IT alignment and (4) the business value of IT.

The main findings of this thesis include, but are not limited to (1) the business-IT alignment positively impacts the business value of IT in terms information sharing and productivity (local business unit level) and cost savings (central IT level) and is also indirectly positively impacted by IT alignment preconditions and processes, (2) strong IT alignment preconditions and strong IT alignment processes positively impacts the business-IT alignment, and (3) strong IT alignment preconditions positively strengthens the relationship between IT alignment processes and IT alignment.

The findings of this thesis propose a number of recommendations for business and IT managers. First, a clear distinction can be made between the informal relationship of business and IT staff and the formal communication structure. Second, managers should be aware of the importance of IT alignment preconditions and processes. Third, managers should be aware of the difference between business needs at the local level and business needs at the central level. At last, business and IT staff at the local level value the business value of IT more in terms of functionality, whereas the central unit uses cost saving measures to assess business value of IT.

At last, future research should focus on more new IT alignment processes and preconditions, and should expand the SAM model by including more alignment levels as suggested in this thesis.

Preface

This thesis was written to support my graduation in Information Management (Master of Science) at Tilburg University. The main reason why I started this MSc is to become an Information Manager, which is able to mitigate the 'gap' between the business side and the IT side of organizations. Hence, I am very interested which drivers are important for attaining a fit in business-IT alignment and how this alignment can ultimately add value to an organization. I consider this thesis as my final education project, where I put all my key learning points together, to produce a thesis which supports me in the transition from a student to a starting IT Analyst.

I am indebted to several people for their tremendous support in writhing my thesis. First, I would like to thank Mr. dr. Martin Smits, who is my graduation supervisor and has been very supportive from start to end. His enthusiasm on IS alignment and extensive research expertise have been invaluable for the structuring and course of my thesis.

Next, I would like to thank the local IT manager of the participating financial organization for the great support in welcoming me into the organization and by always willing to take the extra mile to support my thesis by connecting me to other employees in the organization and help me understand the company structure.

At last, I would like to thank all the interviewees which were dedicated to help me with my thesis by taking the time and responsibility to do the interview, fill in the questionnaire, and by giving me a better perspective on how business and IT staff works together in an international SAP environment.

Erik Jan Poelen

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1 Introduction

The business value of Information Technology (BVIT) systems has been, and will be one of the major research topics in the field of MIS. The publication of the production paradox of IT of Brynjolfsson (1993) was one of the first publications on BVIT. In short, it argues that IT has no business value due to:

- Mismeasurements of outputs and inputs;
- Lags due to learning and adjustments;
- Redistribution and dissipation of profits;
- Mismanagement of information and technology.

Almost one decade later, Nicholas Carr struck the field of IS research by claiming that IT has become ubiquitous in his "IT doesn't matter" (Carr, 2003). He states that the way in which technology is used by organizations is becoming standardized, as best practices are built into the infrastructure of organizations. The differentiating potential of IT for a company decreases when it becomes more accessible and affordable for the market. Lots of criticism from fellow researcher followed, indicating that Carr (2003) provided too less, or none evidence that included rigor and reliability. Furthermore, the examples he used in his study where not representing IT investments (Madewell, 2013); (Strassmann, 2003).

Despite these contradicting views, research has shown that IT is not solely a tool for automation processes, but it also provides productivity gains and enables organizational changes (Melville, 2007); (Mithas, 2012). Brynjolfsson (2000) reviewed the literature on the impact of IT at the firm level and concluded: "Concerns about an information technology "productivity paradox" were raised in the late 1980s. Over a decade of research since then has substantially improved our understanding of the relationship between information technology and economic performance. The firm-level studies in particular suggest that, rather than being paradoxically unproductive, computers have had an impact on economic growth that is disproportionately large compared to their share of capital stock or investment" (p. 45). At last, Dedrick (2003) finds that the productivity paradox also refuted at the country level. Instead, IT investment have a positive impact on productivity.

Prior research showed that IT investments alone do not have a direct impact on the business value of IT systems (Sabherwal and Jeyaraj, 2015). Instead, many factors play an intermediating and/ or moderating role between the relationship of IT investments and the business value of IT.

One of the key concepts to capture these intermediating and moderating effects is the business IT alignment fit, which is now being used for over two decades (Henderson and Venkatraman, 1993); (Chan, 2002); (Luftman, 2005). However, the way in which the business IT alignment is conceptualized by researchers often varies and is contradicting (Chan, 2002); (Chan, 2007); (Sabherwal and Jeyaraj, 2015).

1.1 Scientific relevance

This study tries to propose a research model that assesses the impact of the business-IT alignment on the business value of IT by including two constructs which measure the IT alignment preconditions and IT alignment processes. Furthermore, this thesis provides a response and aims to start the discussion on some remarkable findings in the current IS alignment literature.

First, Smits et al. (2009), find preliminary empirical results which support a postive relationship between IT governance and strategic alignment. They ask for further research which is able to confirm these findings. I will complement to the study of Smits et al. (2009) by providing a questionnaire that will focus on IT governance, i.e. IT alignment processes, and business process performance, i.e. business value of IT, by doing multiple interviews with business and IT staff, which will lead to a better understanding of these concepts.

Second, I argue that the preconditions for IT alignment proposed by Chan (2002) are intertwining with the core construct business-IT alignment described by Henderson and Venkatraman (1993). Some of the specific preconditions used by Chan (2002) belong to the business IT alignment construct as they are not the best indicators of IT alignment. Moreover, I complement this research by proposing different objects who serve as important preconditions of IT alignment.

Third, in a recent meta-analysis of Sabherwal and Jeyaraj (2015), which examines the influences of the business value of IT of 303 studies published between 1990 and 2013, the observed business value of IT is found to be greater when IT investments are not explicitly considered. This finding is rather contradicting when looking at past literature (Chan, 2007). Hence,

this finding is further analyzed in this thesis by investigating the selection methods used by an organization to select IT investments.

Fourth, according to Chan (2002) found that the information organization structures play a far more important role than expected in improving IS performance. Moreover, the formal communication structure did not always improve IS performance. This thesis will further analyze the impact of both constructs on the business-IT alignment and the business value of IT.

Fifth, Sabherwal and Jeyaraj (2015) find that the business value of IT increases when organizational studies are not used, indicating that the use of organizational studies would possible decrease the BVIT. Additionally, they highlight the importance of using richer primary data and demonstrate the merits of studies focussing on fewer IT-based independent variables to measure BVIT. This thesis answers both request made by Sabherwal and Jeyaraj (2015) by conducting a interpretive qualitative research on the organization of a large financial institution.

1.2 Practical relevance

This thesis conducts research on business-IT alignment within the SAP environment of a large global financial institution. The financial institution sector is chosen because of the high strategic importance of IT in dealing with competition and the international environment this company operates in. The implications of the research model will be tested by doing in-depth interviews with business and IT staff which work for organization. This thesis aims to provide practical consultation for both business and IT managers in multiple ways.

First, management will have a better understanding of different indicators of the business-IT alignment, by studying the preconditions of IT alignment and the processes of IT alignment. These indicators could be visualized and analyzed to inform managers on areas of improvement.

Second, this thesis addresses the impact of IT alignment on the business value of IT, which is a detailed indicator of the business performance of IT. A better understanding of the impact of IT alignment on the business value of IT supports managers to address the importance of IT alignment and makes it easier for IT management to show the business side of the organization the added value of a good business-IT alignment within the organization.

Third, this thesis investigates and compares the perception of business-IT alignment at the central managed level and the local operating level. Managers should be aware of the contrast

between these layers. For example, central business and IT managers might have a different view on performance indicators of IT, compared to local business and staff.

Fourth, the implications of this thesis are not only relevant for the studied organization, on the contrary. This thesis aims to provide all types of organizations new ways to measure their business-IT alignment and support them generating more business IT value.

1.3 Problem statement and research question

As of today, there is yet no general consensus of the way in which the business-IT alignment affects the business value of IT. Past literature differ in view on the measurement of business-IT alignment itself and few focus on the impact on the business value of IT. It is difficult to assess the impact of the business-IT alignment on the business value of IT, when there is no good understanding of the business-IT alignment itself. Within an organization, there are multiple levels of alignment between different organizational layers, which contribute to the complexity of this research area. Based on this problem statement, the following *research question* can be derived:

- **How does the business-IT alignment affect the business value of Information Technology?**

A strong understanding of the business-IT alignment needs to be developed first before the research question can be rightfully answered. Therefore, the following sub questions must also be investigated throughout this thesis:

- How do IT alignment preconditions impact the business-IT alignment?
- How do IT alignment processes impact the business-IT alignment?
- Do IT alignment preconditions strengthen the relationship between IT align processes and the business-IT alignment?

The research question, accompanied with the sub questions, where developed to establish a structured approach to study the theoretical implications of past literature explained in the theoretical relevance section described above.

First, the initial findings of the impact of IT governance on alignment of Smits et al. (2009) are tested with the second sub question. The IT governance construct is a key part of the IT alignment processes in this thesis. Furthermore, their ‘alignment’ is presented in the business-IT

alignment construct in this thesis. Moreover, this thesis further investigates their initial findings which suggest that alignment positively impacts business process performance with the research question. In the research question of this thesis, the alignment construct is represented as the business-IT alignment and the business process performance of Smits et al. (2009) is part of the business value of IT construct.

Second, the preconditions of Chan (2002) are tested in this study by the first sub question. Moreover, throughout this thesis, multiple preconditions will be tested with a questionnaire and interviews with business and IT staff. An important focus will be put on what business and IT staff consider important IT alignment preconditions. Moreover, the impact of these IT alignment preconditions is further analyzed in the third sub question by also looking at their impact on the relationship between IT alignment processes and the business-IT alignment.

Third, the second research question will further analyze the findings of Sabherwal and Jeyaraj (2015). Within the construct of IT alignment processes, the 'consideration' of IT investments are represented by IT investment selection criteria. These selection criteria are extensively tested in the questionnaire and interviews.

Fourth, the first and second sub questions investigate the importance of the formal communication structure and informal relationships between business and IT staff. The formal communication structure is tested by sub questions two, as it is a part of the IT alignment processes. Moreover, informal relationships are tested with the first sub question, as they are considered as a IT alignment precondition.

1.4 Research method

The research method is based on the interpretive qualitative research method. First, a questionnaire is constructed based on the research question, sub questions and research model. This quantitative input can be used to calculate the satisfaction gaps of the participating business and IT personnel. Moreover, this questionnaire can later be used as a quick scan by the organizations to test their satisfaction of the different constructs of the research model. The questionnaire is primarily based on past literature. Next, the research model of this thesis is then further analyzed with in-depth interviews with business and IT staff of the participating financial organization.

1.5 Structure of the thesis

This paper is structured as follows. Section 2 discusses the past literature on business-IT alignment and the business value of IT. Moreover, in this section the variables of the research model will be explained and ending with the hypothesis and an overview of the questions which are dedicated to measure the variables in the questionnaire. Section 3 covers the research method which was used to conduct Research. Important rules and guidelines to conduct an interpretive case study are covered in this section. Moreover, the SAP environment and the interviewees are described in this section. At last, this section ends with an overview of the questionnaire. Section 4 illustrates the findings of the interview and questionnaire. Section 5 analyzes and discusses the findings of this thesis. First, the research question and hypotheses are being answered and compared with past literature. Next, the alignment levels of business-IT alignment are discussed. At last, the limitations of this thesis are explained. Section 6 provides a conclusion of the thesis, together with the recommendations for further research and the recommendations for practice.

2 Literature exploration and research model

2.1 Business-IT alignment

The alignment between business and IT has been an important topic in IS literature for many years. In early studies, this alignment was often seen as the fit between the business plan and the IT plan. Going forward, IS projects were becoming more complex and expensive, and where affecting more aspects of the business, making effective planning of uttermost important (Mclean, 1977).

Throughout the years, academic literature often defined the business-IT alignment as the degree of coherence between realized IT strategy and business strategy (Chan, 1991); (Henderson and Venkatraman, 1993); (Reich, 1996). Henderson and Venkatraman (1993) defined the fit in terms of the relationships between external business strategy and internal infrastructure and processes. Reich (1996) defined fit as the relationship between the business domain and IT domain. Moreover, other terms were used to name alignment, amongst others, bridge, harmony and fusion (Ciborra, 1997); (Luftman, 1999); (Smaczny, 2001). All these terms used a synonym for the business-IT alignment although subtle differences among them exists.

In this thesis, the business-IT alignment can be seen as the "*degree of fit and integration among business strategy, IT strategy, business infrastructure and IT structure"* (Henderson and Venkatraman, 1993). In the beginning years, IT was mainly serving the 'back office' of organizations, but as technology developed at a fast pace, the strategic function of IT was starting to lift. The first attempt which lead to an influential model to capture the strategic power of IT is the MIT model of Scott Morton (1991). The assumption of the model is that revolutionary change actuated by IT investments can lead to significant rewards, but only when strategy, structure, technology, management processes, individuals and roles are being kept in alignment (Scott Morson, 1991).

The MIT model lead Henderson and Venkatraman (1991) to their creation of the Strategic Alignment Model (SAM), see figure 1 (p. 13). The SAM model is often seen as the most influencing alignment model in MIS literature. The SAM model distinguishes between the business domain (strategy and processes) and the technology domain (strategy and processes). Alignment between these two domains is achieved by strategic fit (between strategies and internal processes) and functional integration (between the business and technology domain). In order for a business-IT alignment to occur all four constructs needs to be in balance.

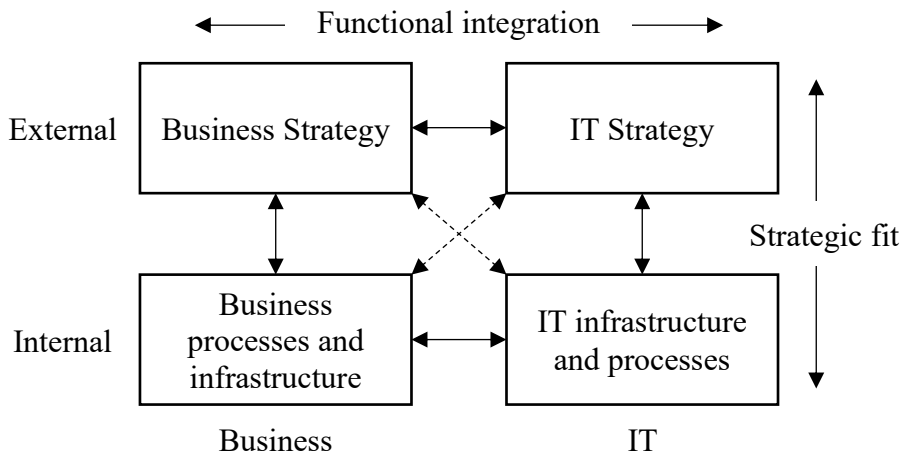


Figure 1: The Henderson and Venkatraman Strategic Alignment Model (1993). The model implies that a strategic fit and functional fit is need for a business-IT alignment. This can only be achieved when there is a fit between the business, strategy, IT strategy, business processes and infrastructure and the IT infrastructure and processes.

Baets (1992) developed an alignment model which is similar to the SAM model, but also recognizes that that alignment takes place in a broader context, where competition, organizational change, human resources, the global IT platform and information system implementation processes are incorporated. He challenges the SAM assumption of the awareness of the corporate strategy and the economic environment of the participants in the SAM model.

Reich (1996) defines the business-IT alignment as the degree to which mission, objectives, and plans are shared and supported by the IT strategy. McKeen (2003) argues that there is only a strategic alignment of IT when the business goals and activities and the information systems are in harmony. Moreover, good alignment means that the company is using the right IT in given situations at the right time (Luftman, 1999).

Studies have demonstrated the existence of a correlation between business-IT alignment and business performance (Chan, 2002); (Smits et al. 2009). However, due to the complex nature of business-IT alignment, it is perhaps more by also considering specific components of this alignment, rather than aiming for the unreachable overall alignment (Chan, 2002). This does not mean we should drop the holistic view of the business-IT alignment, but that more feasible business-IT alignment can be achieved by incorporating individual components. In this thesis, “preconditions for IT alignment” and “IT alignment processes” are considered as individual components that affect the current business-IT alignment of the organization.

2.1.1 Challenges within the business-IT alignment

Many researchers argue that alignment literature often fails to capture the important phenomena leading to a business-IT alignment. Furthermore, a business-IT alignment fit is not always desirable. According to Ciborra (1997), the alignment literature is too theoretical and fails to mimic real life situations. He therefore recommends a research approach where researchers go to the field to obtain information.

Moreover, critics argue that business-IT alignment is difficult to capture if the business strategy of an organization is unknown. Managers often have no clear concept of their own business strategy due to many unpredictable events (Vitale, 1986). When the business environment suddenly changes and the business-IT alignment is too tight, the business may struggle to adjusts to their new environment. This argument raises the attention on the importance of knowing the business strategy to obtain a business-IT alignment fit. This point of criticism stresses the importance of the autonomous functionality of business/IT strategies and plans in order to minimize the change on a 'domino effect'.

Ciborra (1996) argues technology is based on improvisations and unexpected outcomes. Alignment therefore is not a desirable end stage as the business must always change. In the end, businesses change because it is the only way to maintain a long-term relation with their stakeholders, which ultimately will enable them to be prosperous themselves. The vision to have the same alignment is not desirable or maintainable. Instead we should focus on the processes which enable the company to recover its alignment right when it is gone.

Next, there are several challenges for assessing the Business-IT alignment related to the following subjects:

- Knowledge;
- Locus of control;
- Organizational change.

Challenges related to knowledge refer to IT managers who do not understand the business strategy and the other way around for business managers (Reich, 2000). Even when the business strategy is known, the adaption process is unclear for the manager (Baets, 1992). As a consequence, managers face ambiguity around the differences between the planned strategy, strategy in place and their managerial actions. The next challenge is the lack in belief in the importance of alignment.

In a study of European banks of Beats (1996), the influence of mindsets on IT alignment awareness was significant. A trend in the belief that IT issues have great impact on the banking industry was found, but the belief that IT could also solve banking problems was weak. Moreover, it was found that managers which were still able to see ways to solve banking problems with IT, had a more positive attitude towards the importance of IT strategy and planning. In a study of Reich and Benbasat (2000) on insurance business units, they showed that the shared knowledge between IT and business managers was the strongest predictor of the social dimension of alignment. When this shared knowledge was higher, the communication between the different managers was also stronger, i.e. more strategic and frequent, which ultimately lead to higher level of alignment. Moreover, in the study on alignment in European banks, Beats (1996) found that IT alignment was not only negatively impacted by the lack of IT skills of bankers, but also by their knowledge of the banking industry itself. The IT alignment was found to decrease when managers had less awareness of the banking industry. Hence, managers can only use IT solutions to support solving their banking related problems when they have enough knowledge of the banking industry.

The next significant challenge to attain a fit in business-IT alignment is the locus of control. According to Campbell et al. (2005), managers make business decisions based on the level of authority and locus of understanding. For instance, when IT managers have the knowledge but not the authority to make specific IT related decisions they are bounded in the level of added value they can contribute.

At last there are the challenges related to organizational change. The business environment is constantly changing which requires organizations to continuously adapt to attain a business-IT alignment. The business environment changes so quickly, that once an IT plan is initiated, the business environment is already changed and requires new IT solutions. Van der Zee and de Jong (1999) appoint this issue by arguing that there is a time lag between the business planning processes and IT planning processes. Based on these arguments, should we stop the study of business-IT alignment fit? From the author's perspective, these counter arguments are rather challenges than show stoppers.

Summarizing, the business-IT alignment is shown to have the ability to positively affect the business value of IT. However, the business-IT alignment is a complex construct to measure, where many challenges have to be faced. These challenges are related to knowledge, locus of control and organizational change.

2.1.2 The level of business-IT alignment

When the business-IT alignment is studied within an organization, the level of alignment can vary depending on the type of (case) study. For example, one can study the higher organizational layers of an organization which focusses more on the degree of alignment between business strategy and IT strategy. Next, a specific local business unit of a large organization generally involves more interaction between local business and IT staff, thus focusing more on alignment on the operational level. However, in both situations exceptions exist.

In this thesis, the business-IT alignment is studied at both the business unit level (i.e. operational/local level) and the central IT level (IT strategy level). The main reason is, that the investigated SAP platform of the participating financial organization exists for the most part of communication linkages between the central IT unit and the local IT and business units of the participating financial organization. Hence, these business-IT alignment levels have the focus in this thesis.

2.1.3 Business-IT alignment questions

Questions which measure the business-IT alignment are based on the different linkages of the SAM model of Henderson and Venkatraman (1993). More specifically, the questions aim to measure IT alignment fit based on the functional integration and strategic fit linkages of the model. Table 1 (p. 17) provides an overview of the questions that capture the business-IT alignment in the questionnaire.

2.2 IT alignment preconditions

Due to business-IT alignment's complex nature it can be beneficial to emphasize the managers on the preconditions. In this thesis, the preconditions of IT alignment fit are defined as: "*the required preconditions which enable an organization to attain a business-IT alignment*". The consideration of these preconditions is not to derogate the importance of business-IT itself, but suggests that managers will develop a better understanding of the business-IT alignment when the preconditions are proposed. Chan (2002) summarizes four preconditions of the business-IT alignment:

- Communication and understanding between business and IT managers (Enns, 1997);
- Linked business and IT missions, priorities and strategies (Reich and Benbasat, 1996);

Interview question on the business-IT alignment	Source
1. The IT plan reflects the business plan mission, goals and strategies	*(King, 1978); (Tallon et al., 2000)*
2. The business really uses well the capabilities of IT	*(Goldsmith, 1991); (Burns & Szeto, 2000)*
3. IT services are aligned with the business needs in all organizational layers	*(Smits et al. 2009)*
4. There is a good system in my department to share information with other departments	*(Bergeron, 2004)*
5. There is a fit between our long-term IT plans and our current IT projects and IT operations	*(Smits et al. 2009)*
6. There is a fit between our long-term business strategy and our current business processes and infrastructure	*(Poelen, 2017)*

Table 1: questionnaire questions measuring the business-IT alignment. These questions are dedicated to measure the business-IT alignment by addressing all the linkages in the SAM model of Henderson and Venkatraman (1993) which should be aligned. Sourcing is provided behind every question. The questions all relate to the SAM model: question 1: functional integration of business and IT strategy; question 2: functional integration of business and IT processes and infrastructure; question 3: cross-sectional integration of IT infrastructure and processes and the business strategy; question 4: cross-sectional integration of business infrastructure and processes and the IT strategy; question 5: strategic fit between IT strategy and processes and infrastructure; and question 6: strategic fit between business strategy and processes and infrastructure. The complete sources can be found in section 6 (references).

- Interconnected business and IS planning processes (Broadbent, 1991);
- Business executive commitment to IT issues and initiatives (Lederer, 1987).

The communication and understanding between business and IT managers is a vital precondition of IT alignment fit. After all, if business and IT managers communicate ineffectively and do not understand each other, it will be very difficult to align business/IT strategies and processes. Moreover, when business executives have no commitment to the IT part of their organization, they will likely not incorporate IT strategies in their business planning.

The categorization of the linked business and IT missions, priorities and strategies and business executive commitment to IT issues and initiatives, made by Chan (2002), is remarkable. When we consider the SAM model of Henderson and Venkatraman (1993) these two arguments are not preconditions, but primary conditions of the business-IT alignment. Furthermore, Chan (2002) states that Henderson and Venkatraman (1993) and Reich and Benbasat (2000) are two well received reviews of IT alignment. The definition of the business-IT alignment in Chan (2002) is:

> *"the bringing in line of the IS function's strategy, structure, technology, and processes with those of the business unit so that IS personnel and their business partners are working toward the same goals while using their respective competencies (p. 101)."*

This definition is merely an extensive definition of Henderson and Venkatraman (1993). Hence, throughout this thesis these two preconditions will be considered as conditions for IT alignment fit itself. Chan (2002) states five more preconditions of the business-IT alignment based on the structural dimension of IT alignment fit, which is the degree of fit in organizational structure between IT and the business:

- IS skills on the part of line personnel and business skills for IS personnel (Armstrong, 1996);
- Informal networks and relationships (Rockart, 1991);
- Career paths and cross functional linkages (Rockart, 1991);
- Incentive and rewards (Rockart, 1991);
- Performance and evaluation (Rockart, 1991);
- Informal organizational structure (Chan, 2002);
- (De)centralized reporting relationships and committees (Sambamurthy, 1993).

Interesting to see in Chan (2002) is that the informal organizational structure is more important to IT alignment fit than commonly recognized. During the study, interviewees consistently argued that the informal organization structure was important for the business-IT alignment:

> *"This informal organizational structure compromises all the informal connections and procedures that are used by the employees to get the work done, such as social networks, communities of practice, cross department relationships, unofficial agreed-on processes, flexible division of work, and such (p. 109)."*

Hence, she argues that the relative on formal IS structures may be exaggerated and that future management practice should focus more on information IS structures. The (de)centralized reporting relationships and committees will be categorized under IT alignment processes in the thesis, as this is a process set-up by the organization which should affect the IT alignment fit. At last, Chan (2002) concludes that the preconditions based on the strategic component of IT alignment are probably more important than the preconditions of the structural component. The strategic preconditions were marked important by all of the eight companies in the study, whereas the structural preconditions only existed in several of the companies. Taking into consideration

that business-IT alignment could be achieved in more ways than past research has uncovered, it remains difficult to rank strategic and structural based preconditions. The fact that companies all use the same strategic preconditions, but use different structural preconditions is not a valid argument to efface the relative importance of structural preconditions. As a matter of fact, it tells us that we should spend more effort on unravelling the structural preconditions which enable the IT alignment fit.

Summarizing, there are multiple preconditions which affect the business-IT alignment of an organization. Based on the findings and discussions of past literature I hypothesize:

- **Hypothesis 1**: strong IT alignment preconditions positively impact the business-IT alignment.

2.2.1 IT alignment interview questions

Questions which measure the IT alignment preconditions (table 2) are based on important indicators of IT alignment preconditions indicators found by the existing literature.

Interview questions on the preconditions of business-IT alignment	Source
1. Business and IT managers have a strong working relationship	*(Enns, 1997)*
2. Business managers are committed to IT issues and initiatives	*(Lederer, 1987)*
3. Business personnel have strong Information System skills	*(Armstrong, 1996)*
4. IT personnel have strong business skills	*(Armstrong, 1996)*
5. Business and IT managers have strong informal relationships	*(Rockart, 1991); (Chan, 2002)*
6. IT personnel regularly move to a business function in our organization	*(Chan, 2002)*
7. Bonus schemes for business and IT personnel exist	*(Chan, 2002); (Rockart, 1991)*

Table 2: interview questions of IT alignment preconditions. These questions represent the IT alignment preconditions variable in the questionnaire. Questions are based on existing literature. References of every precondition is in brackets.

2.3 IT alignment processes

IT alignment processes is the second construct which is tested in thesis and can be best described as '*the (decision making) processes dedicated to match the strategic orientation of IT and business'*. There is an evident separation between IT alignment preconditions and IT alignment

processes. First, IT alignment preconditions mainly represent preconditions evolving around the business and staff of an organization (e.g. capabilities, relationships and interests), whereas IT alignment processes represent the actual processes in place within the organization which affect the business-IT alignment.

Smits et al. (2009) were one of the first to add the decision-making processes to the strategic alignment framework. In their case study of nine organizations in the Netherlands they find that business and IT managers are relatively satisfied with IT governance (processor of IT alignment processes). Originally, there are three different configurations of IT governance (Sambamurthy and Zmud, 1999):

- *Centralized configuration*: corporate IT management has the authority for infrastructure, applications and development decision making;
- *Decentralized configuration*: divisional IT management and business unit management have the authority for the decisions made for the IT infrastructure, applications and development;
- *Federal configuration*: a hybrid form of centralized and decentralized configurations, where corporate IT has the authority over infrastructure decision making, and the divisional IT and business unit management have authority over the applications and development.

It is argued that centralization provides greater efficiency and standardization, whereas decentralization improves business ownership and responsiveness (Brown, 1997). The federal configuration, i.e. the hybrid form of IT governance, is often used when organization undergo increased uncertainty and complexity and adopt multi-focused strategies (Peterson, 2001).

The finding of Smits et al. (2009) that bad scores on the satisfaction of business process performance may occur even when IT governance scores highly suggest that there are more important processes which are influential for the business-IT alignment and business process performance.

An approach to study IT investments is the driver-lever-impact theory of Hsiao (1998). He analyzes alignment processes by making a distinction between a driver of a decision process, levers of intermediate results of decisions and the impact of the decisions. He argues that alignment is a process that has a typical sequence of activities involving drivers, levers and impacts. For example, the IT strategy is the driver for IT processes or business strategy (levels), which ultimately affect

business processes (impact). In the specific situation of this thesis, IT investment is the driver for IT or business processes (levels), which ultimately affect business process performance (impact).

A better understanding of the impact of IT investments can be developed when a more detailed explanation of the concept is used. Weill (2004) constructs four IT asset classes based on four different management objectives business leaders have for investing in IT (figure 2):

- *Transactional* IT: cut costs or increase throughput for the same cost (e.g., a trade processing system for a brokerage firm);
- *Informational* IT: provide information for any purpose including to account, manage, control, report, communicate, collaborate or analyze (e.g., sales analysis or reporting);
- *Strategic* IT: gain competitive advantage or position in market place. Often new in time and a high risk/return;
- *Infrastructure* IT: base foundation of shared IT services used by multiple applications (e.g., servers, networks, laptops). Focus on cost reduction by consolidation.

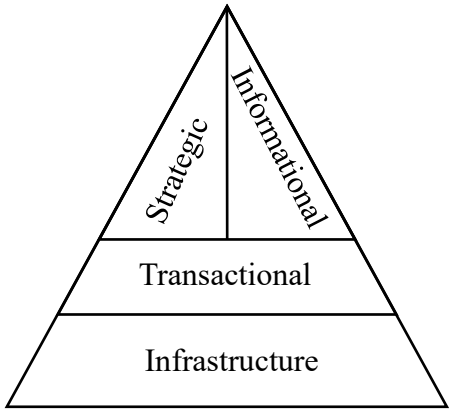


Figure 2: rethinking IT as an Investment Portfolio (Weill, 2004). IT resources are classified in four different asset classes.

Any IT project or system can be categorized within multiple IT asset classes, based on the strategy and the current installed IT of the organization. For example, one firm investing in an ERP system could have a breakdown that has greater relative weights on infrastructure, whereas a different organization already has a part of the infrastructure ready. Another argument for allocating IT resources is that the IT portfolio and systems of an organization change over time. For example, ATM investments were categorized under a strategic advantage, back in 1984. During the years,

it moved from the strategic to the transactional class, reducing processing costs. Today ATMs are considered to be part of the infrastructural class, with some banks specializing in ATM networks and charging fees to competitors to make use of the network. Hence, an organization's asset class percentages in their IT portfolio today will be different than five years ago, even if the systems of the organization remain the same. IT portfolios are often used by executive management and IT investment committees to analyze to proposed IT investments. The costs of the proposed IT project are allocated to the four different asset classes and later consolidated to the organization or a business unit.

IT portfolios vary across industry, but also within industry as firms tend to have different strategic objectives (Weill, 2004). This IT investment portfolio shows that it is not only important how much a company is investing in IT, but also by making the right investments that belong to your business strategy. Top industry performers spend on average 4% more on IT and their allocating is similar to the industry average (Weill, 2004). However, IT portfolios vary across industry, e.g. top performers in the financial services and insurance industry spend on average 10% less than the industry average and have a portfolio more focused towards infrastructural IT (Weill, 2004). Furthermore, an IT investment portfolio should be aligned with the business strategy based on balanced risks and returns. Setting an IT investment portfolio gives organizations a good overview on how their IT assets are distributed, and how the performance of individual IT assets can be assessed at any time.

Summarizing, alignment processes in an organization affect the decision-making processes on IT and business, and the communication and coordination processes among the business and IT side of the organization. A company should be aware of their driver, lever(s) and impact(s) which can positively impact the business-IT alignment, and ultimately the business value of IT. An IT strategy can be developed by considering multiple IT asset classes, each class stating how it will affect the business by considering productivity and profitability measures. Based on alignment process literature I hypothesize:

- **Hypothesis 2**: strong IT alignment processes positively impact the business-IT alignment.

Furthermore, it is expected that hypothesis 2 is affected by the IT alignment preconditions. IT alignment greatly refers to capabilities of business and IT staff, which are also determining IT alignment processes. Based on this assumption I hypothesize:

- **Hypothesis 3**: IT alignment preconditions strengthen the impact of strong IT alignment processes on the business-IT alignment.

2.3.1 IT alignment processes interview questions

Table 3 provides an overview of the IT alignment processes questions which are used in the questionnaire. These questions are derived from the IT governance process of Smits et al. (2009) and IT assets of Weill (2004). The four IT assets, derived from management objectives, are used to discover potential selection criteria which the investigated organization might use.

Interview questions on the business-IT alignment processes	Source
1. There is a formal communication structure between business and IT functions	*(Smits et al., 2009)*
2. We use cost saving metrics for the selection of the needed information systems	*(Weill, 2004)*
3. We use information sharing metrics for the selection of the needed information systems	*(Weill, 2004)*
4. We use competitive advantage metrics for the selection of the needed information systems	*(Weill, 2004)*
5. We use infrastructure based metrics for the selection of the needed information systems	*(Weill, 2004)*
6. We have defined strong methods to learn new IT	*(Smits et al., 2009)*
7. We have a set of clear learning programs for cross domain knowledge sharing on business and IT	*(Smits et al., 2009)*
8. We ensure the implemented IT follows the evolutions of our business environment	*(Bergeron et al., 2004)*

Table 3: interview questions of IT alignment processes. These questions represent the IT alignment processes variable in the questionnaire. Questions are based on existing literature. References of every IT alignment process are in brackets.

2.4 Business value of Information Technology

Melville (2007) defines business value of IT as "*the organizational performance impacts of information technology at both the intermediate process level and the organizational-wide level, and compromising both efficiency impacts and competitive impacts (p. 287)"*. Similar to prior research, Kohli (2003) suggests that there are various types of indicators of the business value of IT, including:

- Productivity measures (e.g. beer production, management output);
- Expense-based measures (e.g. labor hours, labor costs and inventory turnover);

- Financial measures (e.g. return of investments and return on assets).

Financial measures represent the company's overall measurement of efficiency, but are not the only indicators of IT performance. Devaraj (2003) argues that "*productivity-based variables also tend to be closer to the process and, therefore, less likely to be confounded by external variables (p. 136)".* Kohli (2008) suggests that IT adds value to the business in several ways, including: productivity gains, process improvements, profitability enhancement, increased consumer surplus or improvements in supply chains, or innovation at the interorganizational level.

Nevertheless, increased efficiency in productivity or reducing costs are important roles of IT, but is not the only role of IT. Moreover, IT is able to provide flexibility, structure and scope to the firm. These factors hold significant competitive advantages for the firm when looking at competitive priorities such as innovation, speed and quality (Melville, 2007).

In summary, there are several ways to measure the value of IT. These are productivity, expense-based and financial measures. Moreover, IT can also provide competitive priorities to the organization. Based on the findings of existing literature, I hypothesize:

- **Hypothesis 4**: a strong business-IT alignment positively impacts the business value of IT.

2.4.1 Business value of IT interview questions

Table 4 provides an overview of the interview questions on the business value of IT. The questions are based on the measures provided by Kohli (2003) and Melville (2007).

Interview questions on the business value of IT	Source
1. IT improves the productivity of our organization	*(Gregor et al., 2006)*
2. IT decreases the total expenses of our organization	*(Gregor et al., 2006)*
3. IT improves the infrastructure of our organization	*(Gregor et al., 2006)*
4. IT improves information sharing within the organization	*(Gregor et al., 2006)*
5. IT improves the financial performance of our organization	*(Poelen, 2017)*

Table 4: interview questions of the business value of IT. These questions represent the business value of IT variable in the questionnaire. Questions are based on existing literature. References of every IT alignment process are in brackets.

2.5 The research model

The research model (figure 3, p. 25) is based on the four different variables:

- Business-IT alignment (see section 2.1);
- IT alignment preconditions (see section 2.2);
- IT alignment processes (see section 2.3);
- Business value of IT (see section 2.4).

Moreover, the research question and sub questions are represented by the four hypotheses in the research model:

- **H1**: strong IT alignment preconditions positively impact the business-IT alignment.
- **H2**: strong IT alignment processes positively impact the business-IT alignment.
- **H3**: IT alignment preconditions strengthen the impact of strong IT alignment processes on the business-IT alignment.
- **H4**: a strong business-IT alignment positively impacts the business value of IT.

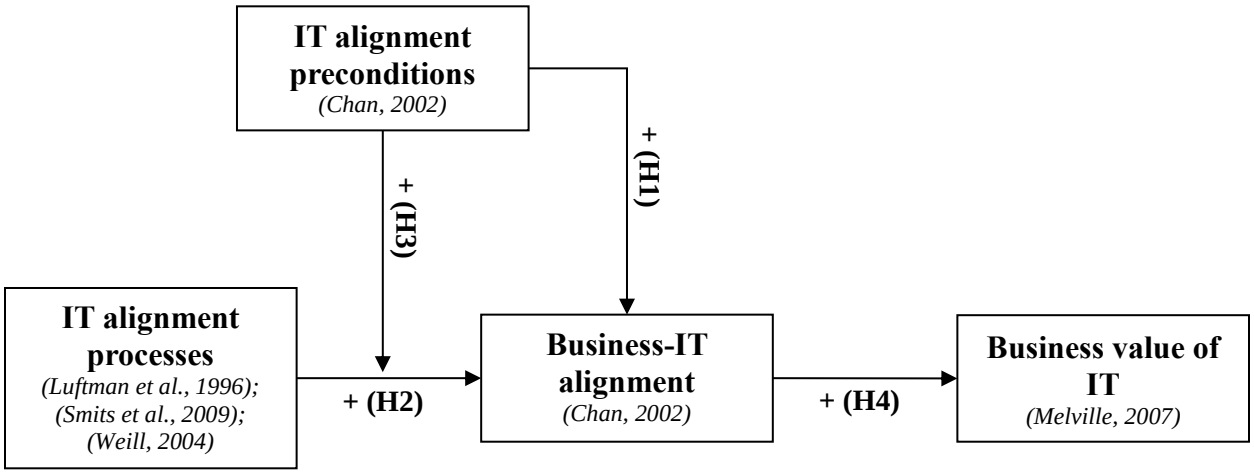


Figure 3*:* the business-IT alignment research model. The research model is based on four constructs: (1) IT alignment preconditions (as defined in section 2.1), (2) IT alignment processes (section 2.2), (3) business-IT alignment (section 2.3), and (4) the business value of IT (section 2.4). After every variable, core past literature (in brackets) is shown. The four hypotheses are shown as: (H1), (H2), (H3) and (H4). The coefficients of all these hypotheses are expected to be positive (+). The variables will be measured using a questionnaire which is based on the existing literature of every variable.

3 Method

3.1 Interpretive qualitative research

The empirical work in this thesis was done using an interpretive qualitative research. This thesis was conducted by carefully looking at the three topics of Walsham (1995), which are the role of the researcher, interviewing techniques and reporting methods.

3.1.1 Role of the researcher

The interpretive researcher should have a good understanding of its role, as it is a difficult task of interpreting other's interpretations. Interpretive research consists mainly of two roles, which are the outside observer and the involved researcher. This research is conducted by fulfilling the role of an outside observer. The outside observer usually preserves more distance from personnel in the field and therefore the researcher does not have a direct personal stake in various interpretations of the case-study. Accordingly, personnel are more willing to provide information, especially when a Non-Disclosure-Agreement (NDA) is signed between both parties[1]. The disadvantage of this role is that the researcher will not be present on many occasions and will not have a good sense of the field of the organization. Despite, the interviewer visited a local headquarters of the financial institution, where the interviewer was received an explanation of the organization structure and the SAP platform of the financial institution.

3.1.2 Interview style

Next, interviews where used as the primary tool to collect information. By doing interviews, the researcher has the ability to take a step back and examine the interpretations of the interviewees. During the interview, the interviewer will not set a strict direction, to allow the interviewees to share their own views. However, the interviewer does follow up when interviewees share their own story. Interviewees who feel the interviewer has no personal interest in the stories they are sharing, will doubt the professionalism of the researcher and will share less information accordingly. Moreover, the interviews are taped to capture the interpretations of the interviewees as accurately as possible. The interviewer also had the option to make personal notes, but chose

[1] A NDA has been signed between both the Tilburg University under dr. prof. Martin Smits and Erik Jan Poelen and the participating financial institution organization not to share personal information and maintain anonymization.

not to, in order to save time to come up with follow up questions to get a better understanding of the interviewees' interpretation. At the end of every interview, the interviewer judges his own performance during the interviews.

3.1.3 Reporting the results

The reporting method of case studies is always of crucial importance, especially in interpretive case studies. An interpretive researcher should not present his results as facts, as they are ultimately their interpretations of other people's interpretations. The rationale of coming to the results should therefore carefully be explained to receive credibility of the reader.

3.2 A global financial institution

The case study of this thesis was done at one of world's top financial institutions, based total revenue[2] . In order to provide anonymization for the organization and participating interviewees, no further detailed company information will be described. Throughout this thesis, the investigated organization will be named: the *participating financial organization*.

Within economics, a financial institution is an organization which provides financial services to its customers. Broadly speaking, financial institutions provide intermediary services in the financial markets. In general, there are three types of financial institutions:

- Depository institutions: manage deposits and provide loans;
- Contractual institutions: insurance and pension services;
- Investment institutions: asset management, underwriters and corporate finance.

3.3 The SAP platform: process overview and participants

The interviews are based on experiences and feelings of business and IT staff, working with the SAP platform on a continuous basis. This platform is based on Enterprise Resource Planning (ERP), which is the integrated management of core business processes mediated by IT. ERP systems run on a variety of computer hardware, where a database is often used to store the information. ERP systems typically consist of the following modules:

[2] Based on a list of the largest publicly traded financial services companies. Retrieved from: https://en.wikipedia.org/wiki/List_of_largest_financial_services_companies_by_revenue

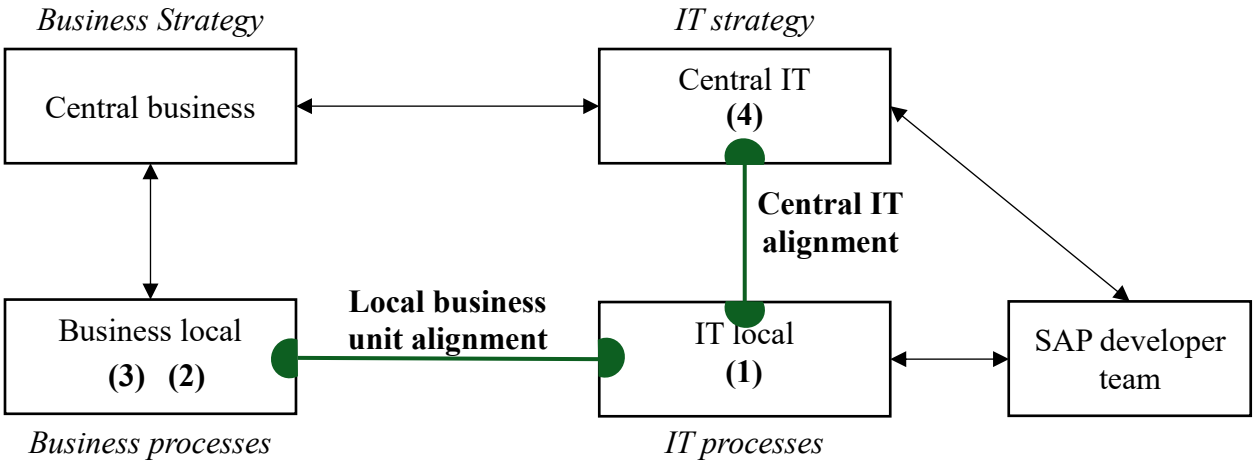
- Finance;
- Inventory and materials management;
- Manufacturing;
- Marketing and sales;
- Payment;
- Product planning;
- Production planning.

The main purpose of this SAP platform is to connect different countries. The different countries will then have easier access to information and one unified approach will make it easier to share information cross country. For instance, think about multiple divisions (countries) which all had their own ways to report financial statements. Now there is one unified method come to come up with the financial statements, which makes it more convenient to compare financial statements of different countries.

During the implementation and maintenance of this SAP platform, there is a continuous interaction between IT and business staff. The following steps illustrate the key process of generating a new report in the SAP platform:

1. There is a demand for a new marketing report from the local business unit. This is communicated to the local IT unit by opening a request.
2. The local IT unit receives the request and responds to the local business unit by asking why they want to have the new report. The local IT unit then investigates whether there are more local units interested in the request. Next, the local IT unit contacts the central IT team to discuss the new request.
3. If the request is accepted by the central team, the SAP development team is informed about the request. This unit has the sufficient SAP programming knowledge and is able to process the request in the SAP platform.
4. There is an ongoing communication process between the different business units, where the local IT unit functions as an intermediary. Ultimately, the SAP development team has the right information to make the requested change in the SAP platform.
5. The request is treated and the local business unit is now able to retrieve the new report from the SAP platform.

Figure 4 illustrates the alignment of the business and IT staff within the context of the SAM model of Henderson and Venkatraman (1993).



Interviewees	Position in the organization	Function within the SAP environment
(1) Local IT manager	Local IT department	Implementing and monitoring of the SAP platform at the local level
(2) Local business staff #1	Accounting department	Working with SAP for accessing information and requesting updated reports
(3) Local business staff #2	Controlling department	Working with SAP for accessing information and requesting updated reports
(4) Central IT manager	Central IT department	Coordination of the implementation and maintenance of the company wide SAP platform

Figure 4: the SAP platform with participants. This overview is configured in the same style as the SAM model of Henderson and Venkatraman (1993). The four interviewees are illustrated by the numbers, where (1) is IT manager; (2) local business staff #1; (3) local business staff #2 and (4) the central IT manager. The direct communication between the interviewees are illustrated by the green linkages. Within the context on the SAM model, the case study of this thesis focusses on the local business unit alignment and the central IT alignment.

The Strategic Alignment Model of Henderson and Venkatraman (1993) clearly show how the communication between the central team, the local business and IT team, and the developer team represent the core of the business-IT alignment. The central IT team outlines the strategy for the SAP platform, whereas the processes and infrastructure are implemented and maintained by the local IT group. The local business demands a report which required based on the strategy which is

set by the central business unit. Of course, diagonal communication between the different teams do exists, e.g. in a yearly meeting with all the teams, but most communication is done by the direct linkages. The SAP developer team is an important element on this group, but does not necessarily fit in the SAM model, as it serves as a group within IT processes and infrastructure, but does not belong to one local IT group as this group is managed by the central IT group.

Within the context of the SAM model of Henderson and Venkatraman (1993) the setting of this case study investigates the local business unit alignment and the central IT alignment. The interviewees in this thesis all play part in attaining a business-IT alignment. The upper part of Figure 4 illustrates the position of the interviewee (lower part figure 4) in the SAP environment. The interviews consist of four business and staff with all a different position in the SAP decision making process:

1. *Local IT manager*: part of the international SAP team which implements and maintains the SAP system at the local level, but is still part of an international unit led by the central decision making team. This person works closely together with other local IT staff and has direct communications with the local business and SAP developer team. The personal objective of this person is to implement and maintain the SAP module in a way, where the platform responds to the business needs in a timely and accurate matter. Hence, the local IT group works closely together with the local business group.
2. *Local business staff #1*: this person is part of the local business unit and works closely together with the local IT staff. This local business staff uses the SAP platform on a daily basis to receive and transmit information. This business employee is part of a group which relies on accurate information and desires that the IT group is able to quickly respond whenever they request a new report.
3. *Local business staff #2*: this person works at a different local business unit. This local business unit requires different needs from the local IT department, which is more complex to deliver. Hence, it is more difficult for the local IT department to fulfil the business needs of this local business department.
4. *Central team IT manager*: this person is part of the central IT team which coordinates and plans IT throughout the different countries. This department communicates mostly with the local IT group. The main mission of this group is to build one uniform SAP platform

which can be used by all the different countries, where company information can easily be shared and accessed.

3.4 Questionnaire and interview

For each construct in the research model, interviewees are asked to answers a set of different questions. First, interviewees are asked to rank the current satisfaction of the variables (As Is). Next, similar questions are answered by the interviewees about the desired state of the variables (To Be). The gap between the desired situation (To Be) and the current situation (As Is) can be used for testing the manager's satisfaction of every construct (Hoffman, 1996).

The questionnaire (appendix A) aims to get a clear vision of every construct by a collection of questions as described in section 2 of this thesis. Each of the four interviews will take around one hour, where the interviewees first complete the questionnaire. Afterwards, the interviewee is asked to comment on the four hypotheses of this thesis through the following questions. The following four open question are provided to the interviewee as guidance:

- Open question 1: how do you think IT alignment preconditions (A) impact the business-IT alignment fit (B)? Please elaborate on your answer.
- Open question 2: how do you think IT alignment processes (C) impact the business-IT alignment fit (B)? Please elaborate on your answer.
- Open question 3: how do you think IT alignment preconditions (A) affect the relationship between IT alignment processes (C) and the business-IT alignment fit (B)? Please elaborate on your answer.
- Open question 4: how do you think the IT-business alignment fit (B) impacts the business value of IT (D)? Please elaborate on your answer.

Moreover, a handout with additional information on the open questions and the research model is provided to the interviewees (see appendix F and appendix G).

3.5 Working method

The questionnaire will be answered on a 5-point Likert scale for the planned (To Be) and the current situation (As Is). The questionnaire will be answered by both business and IT staff. This is needed to measure the following two distinct measures:

1. *Satisfaction of the business/ IT staff*: this measure is calculated as the gap between the planned (To Be) situation and the existing (As Is) situation. For example, a planned satisfaction of 5 and an existing satisfaction of 1 will lead to the maximum gap of 4, indicating that the business/ IT employee is not content with the existing situation. On the other hand, a gap of 1 will indicate that the business/ IT employee is satisfied. In this thesis, the business and IT satisfaction are defined as:

   (1) $Business\ satisfaction = \frac{\sum(Qist_n - Qsoll_n)}{q}$

   (2) $IT\ satisfaction = \frac{\sum(Qist_n - Qsoll_n)}{q}$

   where *n* refers to the specific question of the questionnaire and *q* is the total amount of questions of the specific questionnaire.

2. *Agreement between business and IT manager:* the agreement of the current situation (As Is) is calculated as the gap between the answers on the current situation given by business managers and IT staff. Moreover, the agreement on the desired situation (To Be) is calculated as the gap between the answers on the desired situation of business and IT staff. For example, a gap of 4 (To Be) means that managers disagree on the desired situation. Within this thesis, agreed between business and IT staff is defined as:

   (1) $Business - IT\ agreement\ on\ the\ current\ situation = \frac{\sum(Qist_n - Qist_n)}{q}$

   (2) $Business - IT\ agreement\ on\ the\ desired\ (planned)\ situation = \frac{\sum(Qsoll_n - Qsoll_n)}{q}$

   where *n* refers to the specific question of the questionnaire and *q* is the total amount of questions of the specific questionnaire.

The different constructs are analyzed in the organization by using the questionnaire. Analysis of the different hypotheses are based on the interviews with business and IT staff of the organization. Each interview will take around one hour, where a total of 52 questionnaire questions will be answered. Next, the interviewee will respond to the four opens questions. Three interviews are done through audio conferencing, whereas one interview was done face to face at a local headquarters of the participating financial organization.

4 Findings

4.1 Descriptive statistics questionnaire

The questionnaires of the respondents can be found in appendix B, appendix C, appendix D and appendix E. Figure 5 provides an overview of the descriptive statistics of the questionnaire. The upper part of figure 5 provides an overview of the degree of satisfaction of business and IT staff. The lower part of figure 5 shows the agreement between business and IT staff on the current and desired state.

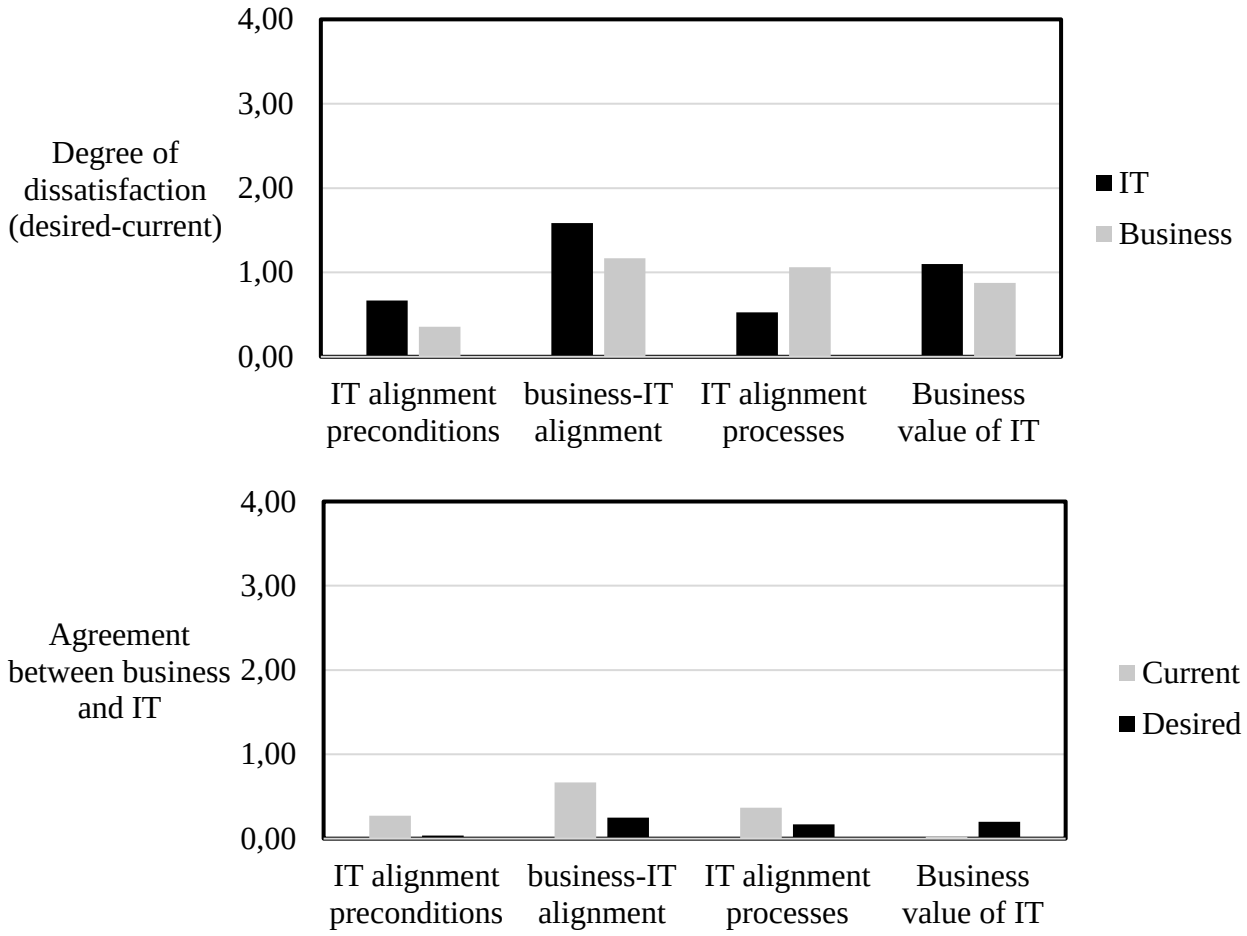


Figure 5: satisfaction of business and IT staff on the four building blocks of on the business-IT satisfaction gap (upper part) and the current and desired state gaps between business and IT (lower part).

The upper part of figure 5 indicates that business and IT staff are mostly dissatisfied with the business-IT alignment (1.58 for IT and 1.17 for business). Other variables have a satisfaction gap below 1.0, except for IT alignment processes of IT staff (1.06) and the business value of IT for

business staff (1.10). The lower part of figure 5 shows that business and IT staff agree with the current and desired state of the four variables, as all the variables are far below a gap of 1.

4.2 Findings on hypothesis 1

Summaries of the interviews are attached in appendix H, appendix I, appendix J and appendix K. In this section, the findings of the interviews are described for all four hypotheses.

The process of implementing and integrating an international operating SAP platform is complex. Business needs differ across country and often change over time. In this specific project, it is of major importance that the dedicated IT and business staff have a certain level of mutual recognition. For example, when a business manager wants a specific change in the SAP platform to obtain new of adapted financial reports, he or she must have a general understanding whether the IT capabilities are available to complete his request. The other way around, IT staff should understand why the business wants the request in order to make the right valuation. In this setting the interviewees commented on the implications of the business-IT alignment.

Finding a. The informal relationships are important indicators of the business-IT alignment.

During the interviews, the interviewees constantly stressed the importance of a good informal and working relationship between business and IT staff to improve the business-IT alignment. When looking at the quote of the local IT manager, the following relationships can be seen using the research model of the thesis:

> *"We have strong informal relationships in the local business, which in general improves the business-IT alignment. This makes things a lot easier, as you can clarify yourself in emergency topics. Also, you can discuss formal topics informally with the team and that helps a lot to speed up in the end."*

The first highlight mentions the strong informal relationship within the local business, which is one of the preconditions of business-IT alignment. In the second highlight, the interviewee describes the impact of this precondition on the business-IT alignment, which is that people can clarify themselves in emergency topics and discuss formal topics in an informal way. At last, in the third highlight, the interviewee states that the improved business-IT alignment, resulting from

the strong precondition, will speed up the communication process. A better communication is an important functional capability of the SAP platform, and thus this precondition also has an indirect positive effect on the business value of IT.

Finding b. The formal communication structure decreases the communication lag between business and IT, which provides a competitive advantage for the organization.

Although the interviewees mentioned the informal relationships to be an important indication of the business-IT alignment, it is not a replacement of the formal communication structure. The formal communication structure is needed to keep IT aligned with the business. Based on the research model, the following relationships can be seen in this quote of a local business manager:

> *"This communication lag (read between business and IT) is not always possible to solve with informal communications, as we are a big company where business and IT staff is geographically dispersed. I think the communication structure between business and IT can be more formal, so we can respond faster on our business needs, which is an important factor of achieving a competitive advantage."*

According to the local business employee in the second and third highlight, when the formal communication structure (IT alignment process) increases, the communication lag decreases (business-IT alignment). In highlight four, the interviewee states that this increase in business-IT alignment will ultimately result to a competitive advantage (increase in business value of IT). Hence, this IT alignment process has a positive impact on the business-IT alignment, which ultimately has a positive impact on the business value of IT. In the first highlight, the interviewee mentions that this communication gap cannot always be solved by strong informal relationships. Hence, both a strong formal communication structure and a strong informal relationship should be in place.

Finding c. Shared business-IT skills matter for the business-IT alignment, but differ within the organization.

All of the interviewees mentioned the importance of shared business-IT skills, but disagreed on the degree of these shared business-IT skills. The central IT manager argued that the central business unit should have some IT skills, and central IT should have some understanding of the

business. However, at the local units, business and IT staff believe shared business-IT skills should be more developed. An explanation for this could be that local business and IT staff work very closely together with the SAP platform. IT staff continuously needs to evaluate what the business needs, and the business needs to know whether IT is able to fulfil their demands.

However, the situation at the central business and IT team is quite different. Here, the IT central team sets out a strategy for the SAP platform, where the business team is not really involved on a continuous level. The central business team only gets involved when things go in the wrong direction. Thus, in attaining a business-IT alignment, central and local business/IT demand a different business-IT skillset.

In summary, informal relationships and the formal communication structure are important indicators of the business-IT alignment. Moreover, shared business-IT skills matter for the business-IT alignment. Shared business-IT skills need to be stronger at the local business unit as business and IT staff work more closely together. At the central level, business and IT staff only need some general understanding of what the other department is doing, as they work together less frequently. Based on the findings of the interviews, I reject the null and accept hypothesis 1:
Hypothesis 1 accepted: strong IT alignment preconditions positively impacts the business-IT alignment.

4.3 Findings on hypothesis 2

Finding d. Metrics for the selection process of IT is important to the business-IT alignment.
During the interviews, business and IT staff all mentioned the importance of selection metrics of IT investments. According to every interviewee, there is a selection process in place in the organization, both at the central team and the local teams. A local business manager addresses the benefits of these selection criteria for the business-IT alignment:

> *"I do believe that these metrics are important, as we cover every aspect in great detail, therefore this fit in business and IT plan is already checked before the investment."*

Using the research model of the thesis, we see the following relationship: making use of the selection metrics (IT alignment processes) leads to a better business-IT alignment, as IT is a check

to match the business and IT plan before the investment is done. Hence, it is likely that using these selection metrics mitigate the change of selecting IT investments which do not fit with the business and IT plan, thus not lead to a business-IT alignment.

In summary, IT alignment processes have a positive impact on the business-IT alignment. Selection metrics for IT investments are used throughout the organization, both at the local and the central team. Based on the interview findings I reject the null and accept hypothesis 2:
Hypothesis 2 accepted: strong IT alignment processes lead to a better IT alignment fit.

4.4 Findings on hypothesis 3

Finding e. Better IT alignment preconditions positively impact the relationship between IT alignment processes and the business-IT alignment.

The interviewees explained that the IT alignment processes where set by the central IT team, and in many cases these processes cannot be significantly influenced by the local teams. For example, the organization has a strong formal communication structure and does not a have clear set of learning programs for cross domain knowledge sharing between business and IT staff. These processes are set by the central IT team and the local business have less to no impact on these decisions. However, in this example the local team does enhance the usage of the learning programs: company staff is likely to make better use of domain knowledge sharing program when they have knowledge in what the other department is doing and are more befriended with the other department.

In summary, it is difficult to impact IT alignment processes with IT alignment preconditions, as they often set for a fixed amount of time by the central IT team. Nevertheless, preconditions for IT alignment does have a positive impact on the relationship between IT alignment processes and the business-IT alignment. Based on the findings of the interview I reject null, and accept hypothesis 3:
Hypothesis 3 accepted: strong IT alignment preconditions positively strengthens the relationship between IT alignment processes and IT alignment.

4.5 Findings on hypothesis 4

Finding f. Business-IT alignment positively impacts the productivity of the organization.

All of the interviewees argued that a strong business-IT alignment within the SAP environment results in an added value for the organization, i.e. the business value of IT. However, both the central team and the local team expressed different business values of the SAP platform, which characterizes the more local 'operating' view against the 'helicopter view' of a central team. First, a local IT manager explains the increase in productivity for the local business/IT teams:

> *"a great value for the business is the faster running of the reports in the SAP platform, i.e. running reports to get data for creating a balance sheet. Previously, the report needed to run for three to four minutes, depending on the report complexity. We implemented an SAP update and now the reports run in just thirty seconds. And that's really an improvement that we made three years ago, and really helps the productivity of the business itself."*

The interviewee shared a practical example of the increased productivity due to an improvement (update) of the SAP platform, which helps the business staff to access reports faster from the SAP platform. Using the research model of the thesis we see the following relationship: the improvement of the SAP platform (business-IT alignment) has a positive impact on the business value of IT, by running reports at a faster rate.

Another example of the benefits of the new SAP platform is the improved communication structure of the company, enabling different countries to easier share and compare all kinds of data (e.g. Key Performance Indicators and financial statements). The local IT manager describes this observation:

> *"Another big improvement of the platform is that the local business units of the company are now more involved at the international level. That is definitely an advantage, to have a form of transparency between the different countries. Before, you had a kind of silo's. Everyone did their own thing, but now you are forced to talk to each other: how does country A calculate its numbers? We can now easier share our numbers. When we have a problem in country A, we can now ask country B: do you have the same problem? How have you dealt with it?"*

In this fragment, the interviewee describes that the new SAP platform created a form of transparency between the different countries, which makes it easier to share and compare data.

Using the research model of this thesis, the following relationship is seen: the increased transparency between the countries (increase in business-IT alignment) leads to better information sharing between the different countries (increase in business value of IT). Business and IT staff at the local departments were able to show the benefits of the new SAP platform in a functional point of view, i.e. increased information sharing and productivity. However, when asked to give an assessment on the impact of the SAP platform on measures as financial performance or the total expenses of the organization, these interviewees could not provide a sufficient answer. The business and IT staff at the local level found it difficult to quantify the benefits of the SAP platform in terms of money value. A local business employee did mention they were not saving money with the SAP platform at the local level, but was not informed on the company wide SAP expenses.

However, the central IT manager did look in a different way at the impact of the business-IT alignment on the business value of IT:

> *"I do believe we can quantify the benefits of IT. For example, we see the number of FTE's decreasing thanks due the new IT investments, which results in significant cost savings. Moreover, we now have more standardized processes which makes it easier to share and compare KPIs between the different countries our organization is operating in, but we mostly look at cost savings."*

Opposing the view of the local business and IT staff, this interviewee quantifies the benefits of the SAP platform. Following the research model of the thesis, the following relationship can be seen: the improved SAP platform (increase in business-IT alignment) leads to a decrease in FTE's needed, which resulted in significant cost savings (increase in business value of IT).

In summary, both at the local and central level, an increased business-IT alignment results to an increase of business value of IT. However, the local business units look more at the impact on functionality (information sharing and productivity), whereas central IT described the positive impact on cost savings. This shows that the central IT team looks from a different perspective at the impact of SAP platform on the organization than the local business units. Based on the findings of the interviews I reject the null and accept the hypothesis:

Hypothesis 4 accepted: a strong business-IT alignment positively impacts the business value of IT.

4.6 Implications for the research question

So, how does the business-IT alignment affect the business value of Information Technology?

Looking back at the findings of this thesis it is clearly visible that much work was devoted to study the business-IT alignment itself. One could argue that it would be more efficient to just skip the first three hypotheses to fully focus on the last hypothesis as it is basically the research question written down as an observable variable, is it not?

When looking at *how* the business-IT alignment affects the business value of IT, a good understanding of the foundation is needed. What is left of our findings if we do not know about the main drivers of the business-IT alignment? No, we should not work on quicksand.

Hence, by not including the first three hypotheses, important assessors of the business value of IT would be ignored. In finding a., the strong informal relationships between business and IT staff led to a stronger business-IT alignment, which ultimately resulted in an increased productivity, i.e. an increase in business value of IT. Moreover, a IT alignment process was found to have an indirect impact on the business value of IT. A stronger formal communication structure would positively impact the business-IT alignment, it would ultimately become a competitive advantage for the participating financial organization. Thus, if the preconditions and processes of the business-IT alignment where not investigated, these relationships would not have been detected resulting in a possible omitted variable bias.

In conclusion, the business-IT alignment positively impacts the business value of IT in terms information sharing and productivity (local business unit level) and cost savings (central IT level) and is also indirectly positively impacted by IT alignment preconditions and processes. Sometimes you have got to back to actually move forward.

5 Discussion

5.1 Findings versus existing literature

The mainspring of writing this thesis aroused from findings of past literature, as some of them where more than remarkable. I will respond to them accordingly.

First, based on an analysis on alignment literature I argue that some preconditions described by Chan (2002) cannot be used as IT alignment preconditions, as they measure the business-IT alignment itself. Moreover, research on IT alignment preconditions was enriched by adding new objects which aim to measure IT alignment preconditions in the case study. Moreover, the findings of this thesis correspond with the findings of Chan (2002), where informal relationships where found to be an important indicator of strategic alignment.

Second, my findings are contrary to the findings of Sabherwal and Jeyaraj (2015) arguing that the business value of IT is greater when IT investments are not explicitly considered. Four different selection metrics for IT investments were considered during the case study of this thesis. These metrics were all found important by both the central IT team and the local business and IT team. Moreover, inclusion of these selection methods resulting in a better business-IT alignment.

Third, the second finding of Sabherwal and Jeyaraj (2015) which implies that studies that not consider profitability measures would find a higher business value of IT is a more complicated discussion. Based on the findings of this thesis, this would really depend on which organizational level the research is conducted. Business and IT personnel at the local level where not really considering profitability measures as an indicator of the business value of IT, whereas at the central team cost sharing was an important indicator of business value of IT. Therefore, studies can find a higher business value of IT when not using profitability indicators, as business and IT personnel at the local level are often not familiarized with the use of profitability indicators.

Fourth, this thesis dos not provide enough evidence to disprove the finding of Sabherwal and Jeyaraj (2015) that the business value of IT increases when organizational studies are not used. Nevertheless, this thesis shows that an organizational study is a good setting to assess business-IT alignment and the business value of IT. Hence, doubts on this finding have remained strong.

Fifth, this thesis tried to answer the call for further research of Smits et al. (2009) to further investigate their preliminary empirical results which support a positive relationship between IT Governance and Strategic Alignment. The IT alignment processes are basically an extension of IT

Governance. Based on this case study, IT alignment processes are found to have a significant positive impact on the business-IT alignment.

5.2 The level of alignment

This thesis illustrates the complexity of alignment within a large organization. In the very specific case study of this thesis, where a SAP platform was investigated, it shows that a business-IT alignment of the SAP platform is achieved when there is an alignment at both the local business unit level and the central IT level. Furthermore, the interviewees behind these two levels of alignment had a different perspective of how their respective alignment impacted the business value of the SAP platform. Ultimately, the incorporation of both levels of alignment resulted in a better understanding of the implications of business-IT alignment on the business value of IT. Hence, the Strategic Alignment Model of Henderson and Venkatraman (1993) is a helpful framework to capture the alignment of an organization or its business units/ key processes. However, some of its conditions are still there to be challenged. Henderson and Venkatraman (1993) argue that an alignment between business and IT is only achievable when there is an alignment between all the six linkages in the SAM model. In the context of assessing the business-IT alignment by doing case study research I argue that this statement is neither wrong, but I do believe when researching business-IT alignment in a specific case study, like this thesis, focus has to be set on the levels of alignment which are applicable to the investigated topic. Being conscious of time, resources and the organizational complexity it was more valuable to study the different alignment levels between local business and IT staff and local IT staff and central IT staff. Furthermore, within the SAP platform of the participating financial organization, central business strategy staff were merely involved. Hence, thoroughly studying them in this thesis would not have increased our knowledge of the business-IT alignment and its impact on the business value of IT in this scenario.

At the contrary, the inclusion of the SAP developer team in the case study of this thesis could have increased our understanding in the business-IT alignment of the SAP platform and its impact on the business value of IT. Moreover, this could reveal a new additional layer of the SAM model by also looking within IT operations and infrastructure at different groups. These groups do not necessarily have the same objectives and are often remotely dispersed, thus alignment between these two groups are not a prerequisite.

In conclusion, within field research of business-IT alignment, more focus should be set on the different levels of business-IT alignment relevant to the specific scenario. Henderson and Venkatraman (1993) argue that all the six linkages of the SAM model should be aligned in order to attain a full business-IT alignment, but following up these set requirements is not always conductive to a better understanding of the business-IT alignment being investigated.

5.3 Limitations

This thesis is subject to some important limitation. First, the case study was done at one organization. Organizations differ in organizational structure, business model and culture amongst others. First, organizations with a flat organization structure would have resulted in a whole different scenario than an organization with hierarchical organizational structure. Within a flat organizational structure, generally more employees have decision making power. Hence, emphasis should be put on all the participating employees, whereas in a hierarchical organizational structure there is generally more emphasis on one group of employees, which are the decision makers. Next, business models of organization often vary, also within the same industry. For example, the business model of commercial banks is entirely different than the hotel industry. Furthermore, within the hotel industry there are companies which are also the owners of the hotels, but there are also companies which solely act as a middleman. At the last, a different company culture might impact the business-IT alignment. The way in which business and IT staff, at different organizational layers, relate to each varies across organizations. At some organizations, there is a 'Chinese wall' between different departments, which makes mutual understanding very difficult. It is therefore not ruled out that a similar case study at a different company would lead to different findings.

Second, the SAP platform in this thesis is tailored to the company's structure and needs. Hence, the implications of this thesis cannot be seen as a blue print for different SAP platform. Moreover, the implications of this thesis should not exceed the SAP environment of this organization, as it is merely a component of the larger and complex organization. Hence, the thesis findings should not be used to make an assessment of the organization wide business-IT alignment.

Third, the results of the questionnaire depend on the interpretation of the interviewee. Different interpretations between interviewees can lead to misguided questionnaire results. This

impact is mitigated by the interviewer and the second reader of the participating financial organization by always providing explanation to the interviewee when needed.

Fourth, taking the role of the outside observer in the case study also has its drawbacks. The researcher is fully depended on the interview results of the four employees of the participating financial organization. There is no guarantee that these interview findings will correspond with the global view on the business-IT alignment and business value of IT in the participating financial organization.

At last, one should be careful for using the descriptive statistics of the questionnaire as statistical evidence for different hypotheses in the research model. They are an indication of the satisfaction gaps of business and IT staff, but by no means provide strong evidence for the four hypotheses in the research model.

6 Conclusion

This thesis has answered the research question “how does the business-IT alignment affect the business value of Information Technology?” by doing literature analysis and one in depth case analysis. First, I found that the business-IT alignment positively impacts the business value of IT in terms information sharing and productivity (local business unit level) and cost savings (central IT level) and is also indirectly positively impacted by IT alignment preconditions and processes. Next, I found that strong IT alignment preconditions and strong IT alignment processes positively impacts the business-IT alignment. Moreover, I found that strong IT alignment preconditions positively strengthens the relationship between IT alignment processes and IT alignment.

6.1 Recommendations for further research

Some of the findings require additional research. First, besides the IT alignment preconditions and processes being investigated in this thesis, there are more indicators of these two variables which might impact the business-IT alignment. These indicators can be found in existing literature, but could not be used due the bounded capacity of the questionnaire.

Second, future research could be devoted to include more stakeholders of the SAP platform. The inclusion of the SAP developer team would lead to a more detailed case study with more different alignment levels. Furthermore, these new alignment levels would be within IT operations and infrastructure and further expand the SAM model of Henderson and Venkatraman (1993).

Third, instead of focusing on the difference between business and IT staff, more emphasis should be put on the different levels of alignment going forward. For example, the questionnaire can also be used to measure the differences between different levels of alignment instead of distinguishing between business and IT. Within the setting of this thesis this was difficult, as the local IT staff was involved at both levels of alignment and could not be allocated to one alignment level.

Fourth, this case study should be tested at different sectors than the financial institution sector, as it would be interesting to see how the business-IT alignment is managed at companies with a different revenue model.

Fifth, the implications of IT selection criteria on the business-IT alignment should be further analyzed. These criteria were found to be important by business and IT staff, but more

understanding is needed of the different availabilities and their individual impact on the business-IT alignment.

At last, instead of analyzing the business-IT alignment of a SAP environment of a large organization, the general business-IT alignment could be analyzed, which provides more understanding of the total business-IT alignment of an organization. This research method will be a good option for SME companies, but remains very difficult for a large organizational, due to the large number of employees in the organization which are often geographically dispersed.

6.2 Recommendations for practice

The findings of the thesis propose a number of recommendations for business and IT managers of the participating financial organization and other managers interested in understanding the business-IT alignment and its impact on the business value of IT.

First, business and IT staff at the local level value the business value of IT more in terms of functionality, whereas the central unit uses cost saving measures to assess business value of IT. Hence, managers should be aware of the different views, as business and IT staff do not use cost saving measures, as they often do not see the global impact of improvements of a SAP platform.

Second, managers should be aware of the difference between business needs at the local level and business needs at the central level. Where, IT staff at the local level works very close with the local business, the business staff at the central level is more reactive and is not really committed to IT plans and initiatives.

Third, a clear distinction can be made between the informal relationship of business and IT staff and the formal communication structure. It looks like one excludes the other, but all the interviewees stressed the importance on both factors. A formal communication structure is essential for a complex SAP platform to set direction for all stakeholders, whereas strong informal relationships between business and IT staff enables personnel to clarify themselves, often around and in between meetings.

At last, managers should be aware of the importance of IT alignment preconditions and processes. These variables are found the be important indicators of the business-IT alignment, but also indirectly impact the business value of IT. Moreover, the satisfaction of these variables can easily be measured by creating a questionnaire which can be spread throughout the organization.

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Appendix A: The Business-IT alignment Questionnaire

Name interviewee: _____ Date: _____

Job Function: _____ Role: ❑ Business staff ❑ IT staff

This questionnaire aims to analyze the mutual relationships of the four building blocks of the business-IT alignment research model: (i) preconditions of IT alignment, (ii) IT alignment processes, (iii) business-IT alignment, and (iv) business value of IT. For a complete description of this model see the research model attached. Definitions for each building block are provided. Questions are based on a five-point Likert scale, **where (1) is completely untrue, and (5) is completely true**. The 'As Is' questions ask you about your opinion on the current state and the 'To Be' questions ask you about your opinion on the desired state. The questions are based on past research and do often refer to the organization. Please, when answering the questions in this questionnaire take your own work environment into consideration (e.g. the SAP platform) instead of the firm level. You are by no means obliged to answer a question when you feel you do not have the right insight to answer the questions. In this case, please leave the question open.

Building block A: the IT alignment preconditions

IT alignment preconditions	**Definition**: 'IT alignment preconditions are the required preconditions which enable the organization to attain an IT alignment fit'				
*Questions to assess " **As IS** " situation*	**1**	**2**	**3**	**4**	**5**
1. Business and IT managers have a strong working relationship					
2. Business managers are committed to IT issues and initiatives					
3. Business personnel have strong Information System skills					
4. IT personnel have strong business skills					
5. Business and IT managers have strong informal relationships					
6. IT personnel regularly move to a business function in our organization					
7. Bonus schemes for business and IT personnel exist					
*Questions to assess " **To Be** " situation*	**1**	**2**	**3**	**4**	**5**
1. Business and IT managers should have a strong working relationship					
2. Business managers should be committed to IT issues and initiatives					
3. Business personnel should have strong Information System skills					
4. IT personnel should have strong business skills					
5. Business and IT managers should have strong informal relationships					
6. IT personnel should regularly move to a business function in our organization					
7. Bonus schemes for business and IT personnel should exist					

Building block B: the business-IT alignment fit

Business-IT alignment fit	**Definition**: 'business-IT alignment fit is the degree of fit and integration among business strategy, IT strategy, business infrastructure and IT structure'				
*Questions to assess " **As IS** " situation*	**1**	**2**	**3**	**4**	**5**
1. The IT plan reflects the business plan mission, goals and strategies					
2. The business really uses well the capabilities of IT					
3. IT services are aligned with the business needs in all organizational layers					
4. There is a good system in my department to share information with other departments					
5. There is a fit between our long-term IT plans and our current IT projects and IT operations					
6. There is a fit between our long-term business strategy and our current business processes and infrastructure					
*Questions to assess " **To Be** " situation*	**1**	**2**	**3**	**4**	**5**
1. The IT plan should reflect the business plan mission, goals and strategies					
2. The business should really use well the capabilities of IT					
3. IT services should be aligned with the business needs in all organizational layers					
4. There should be a good system in my department to share information with other departments					
5. There should be a fit between our long-term IT plans and our current IT projects and IT operations					
6. There should be a fit between our long-term business strategy and our current business processes and infrastructure					

Open question 1: how do you think IT alignment preconditions (**A**) impact the business-IT alignment fit (**B**)? Please elaborate on your answer.

Building block C: the IT alignment processes

IT alignment processes	**Definition**: 'IT alignment processes are the decision making processes dedicated to match the strategic orientation of IT and the business'				
*Questions to assess " **As IS** " situation*	**1**	**2**	**3**	**4**	**5**
1. There is a formal communication structure between business and IT functions					
2. We use cost saving metrics for the selection of the needed information systems					
3. We use information sharing metrics for the selection of the needed information systems					
4. We use competitive advantage metrics for the selection of the needed information systems					
5. We use infrastructure based metrics for the selection of the needed information systems					
6. We have defined strong methods to learn new IT					
7. We have a set of clear learning programs for cross domain knowledge sharing on business and IT					
8. We ensure the implemented IT follows the evolutions of our business environment					
*Questions to assess " **To Be** " situation*	**1**	**2**	**3**	**4**	**5**
1. There should be a formal communication structure between business and IT functions					
2. We should use cost saving metrics for the selection of the needed information systems					
3. We should use information sharing metrics for the selection of the needed information systems					
4. We should use competitive advantage metrics for the selection of the needed information systems					
5. We should use infrastructure based metrics for the selection of the needed information systems					
6. We should define strong methods to learn new IT					
7. We should have a set of clear learning programs for cross domain knowledge sharing on business and IT					
8. We should ensure the implemented IT follows the evolutions of our business environment					

Open question 2: how do you think IT alignment processes (**C)** impact the business-IT alignment fit (**B**)? Please elaborate on your answer.

Open question 3: how do you think IT alignment preconditions (**A**) affect the relationship between IT alignment processes (**C**) and the business-IT alignment fit (**B**)? Please elaborate on your answer.

Building block D: the business value of IT

Business value of IT	**Definition**: 'the business value of IT is the organizational performance impacts of information technology at both the intermediate process level and the organizational-wide level, and compromising both efficiency impacts and competitive impacts'				
*Questions to assess " **As IS** " situation*	**1**	**2**	**3**	**4**	**5**
1. IT improves the productivity of our organization					
2. IT decreases the total expenses of our organization					
3. IT improves the infrastructure of our organization					
4. IT improves information sharing within the organization					
5. IT improves the financial performance of our organization					
*Questions to assess " **To Be** " situation*	**1**	**2**	**3**	**4**	**5**
1. IT should improve the productivity of our organization					
2. IT should decreases the total expenses of our organization					
3. IT should improve the infrastructure of our organization					
4. IT should improve information sharing within the organization					
5. IT should improve the financial performance of our organization					

Open question 4: how do you think the IT-business alignment fit (**B**) impacts the business value of IT (**D**)? Please elaborate on your answer.

Appendix B: The Business-IT alignment Questionnaire (local IT manager)

Name interviewee: Local IT manager Date: 22 February 2017

Job Function: _____ Role: IT staff

This questionnaire aims to analyze the mutual relationships of the four building blocks of the business-IT alignment research model: (i) preconditions of IT alignment, (ii) IT alignment processes, (iii) business-IT alignment, and (iv) business value of IT. For a complete description of this model see the research model attached. Definitions for each building block are provided. Questions are based on a five-point Likert scale, **where (1) is completely untrue, and (5) is completely true**. The 'As Is' questions ask you about your opinion on the current state and the 'To Be' questions ask you about your opinion on the desired state. The questions are based on past research and do often refer to the organization. Please, when answering the questions in this questionnaire take your own work environment into consideration (e.g. the SAP platform) instead of the firm level. You are by no means obliged to answer a question when you feel you do not have the right insight to answer the questions. In this case, please leave the question open.

Building block A: the IT alignment preconditions

IT alignment preconditions	**Definition**: 'IT alignment preconditions are the required preconditions which enable the organization to attain an IT alignment fit'				
*Questions to assess " **As IS** " situation*	**1**	**2**	**3**	**4**	**5**
1. Business and IT managers have a strong working relationship				x	
2. Business managers are committed to IT issues and initiatives				x	
3. Business personnel have strong Information System skills			x		
4. IT personnel have strong business skills			x		
5. Business and IT managers have strong informal relationships				x	
6. IT personnel regularly move to a business function in our organization		x			
7. Bonus schemes for business and IT personnel exist			x		
*Questions to assess " **To Be** " situation*	**1**	**2**	**3**	**4**	**5**
1. Business and IT managers should have a strong working relationship				x	
2. Business managers should be committed to IT issues and initiatives				x	
3. Business personnel should have strong Information System skills			x		
4. IT personnel should have strong business skills			x		
5. Business and IT managers should have strong informal relationships				x	
6. IT personnel should regularly move to a business function in our organization		x			
7. Bonus schemes for business and IT personnel should exist			x		

Building block B: the business-IT alignment fit

Business-IT alignment fit	**Definition**: 'business-IT alignment fit is the degree of fit and integration among business strategy, IT strategy, business infrastructure and IT structure'				
*Questions to assess " **As IS** " situation*	**1**	**2**	**3**	**4**	**5**
1. The IT plan reflects the business plan mission, goals and strategies		x			
2. The business really uses well the capabilities of IT			x		
3. IT services are aligned with the business needs in all organizational layers		x			
4. There is a good system in my department to share information with other departments		x			
5. There is a fit between our long-term IT plans and our current IT projects and IT operations		x			
6. There is a fit between our long-term business strategy and our current business processes and infrastructure			x		
*Questions to assess " **To Be** " situation*	**1**	**2**	**3**	**4**	**5**
1. The IT plan should reflect the business plan mission, goals and strategies				x	
2. The business should really use well the capabilities of IT			x		
3. IT services should be aligned with the business needs in all organizational layers				x	
4. There should be a good system in my department to share information with other departments			x		
5. There should be a fit between our long-term IT plans and our current IT projects and IT operations				x	
6. There should be a fit between our long-term business strategy and our current business processes and infrastructure			x		

Open question 1: how do you think IT alignment preconditions (**A**) impact the business-IT alignment fit (**B**)? Please elaborate on your answer.

Building block C: the IT alignment processes

IT alignment processes	**Definition**: 'IT alignment processes are the decision making processes dedicated to match the strategic orientation of IT and the business'				
*Questions to assess " **As IS** " situation*	**1**	**2**	**3**	**4**	**5**
1. There is a formal communication structure between business and IT functions				x	
2. We use cost saving metrics for the selection of the needed information systems				x	
3. We use information sharing metrics for the selection of the needed information systems			x		
4. We use competitive advantage metrics for the selection of the needed information systems				x	
5. We use infrastructure based metrics for the selection of the needed information systems			x		
6. We have defined strong methods to learn new IT		x			
7. We have a set of clear learning programs for cross domain knowledge sharing on business and IT			x		
8. We ensure the implemented IT follows the evolutions of our business environment			x		
*Questions to assess " **To Be** " situation*	**1**	**2**	**3**	**4**	**5**
1. There should be a formal communication structure between business and IT functions				x	
2. We should use cost saving metrics for the selection of the needed information systems				x	
3. We should use information sharing metrics for the selection of the needed information systems				x	
4. We should use competitive advantage metrics for the selection of the needed information systems				x	
5. We should use infrastructure based metrics for the selection of the needed information systems			x		
6. We should define strong methods to learn new IT				x	
7. We should have a set of clear learning programs for cross domain knowledge sharing on business and IT				x	
8. We should ensure the implemented IT follows the evolutions of our business environment				x	

Open question 2: how do you think IT alignment processes (**C)** impact the business-IT alignment fit (**B**)? Please elaborate on your answer.

Open question 3: how do you think IT alignment preconditions (**A**) affect the relationship between IT alignment processes (**C**) and the business-IT alignment fit (**B**)? Please elaborate on your answer.

Building block D: the business value of IT

Business value of IT	**Definition**: 'the business value of IT is the organizational performance impacts of information technology at both the intermediate process level and the organizational-wide level, and compromising both efficiency impacts and competitive impacts'				
*Questions to assess " **As IS** " situation*	**1**	**2**	**3**	**4**	**5**
1. IT improves the productivity of our organization			x		
2. IT decreases the total expenses of our organization		x			
3. IT improves the infrastructure of our organization			x		
4. IT improves information sharing within the organization				x	
5. IT improves the financial performance of our organization					
*Questions to assess " **To Be** " situation*	**1**	**2**	**3**	**4**	**5**
1. IT should improve the productivity of our organization				x	
2. IT should decreases the total expenses of our organization				x	
3. IT should improve the infrastructure of our organization				x	
4. IT should improve information sharing within the organization				x	
5. IT should improve the financial performance of our organization					

Open question 4: how do you think the IT-business alignment fit (**B**) impacts the business value of IT (**D**)? Please elaborate on your answer.

Appendix C: The Business-IT alignment Questionnaire (local business staff #1)

Name interviewee: local business staff Date: 8 March 2017

Job Function: Record to close Role: Business staff

This questionnaire aims to analyze the mutual relationships of the four building blocks of the business-IT alignment research model: (i) preconditions of IT alignment, (ii) IT alignment processes, (iii) business-IT alignment, and (iv) business value of IT. For a complete description of this model see the research model attached. Definitions for each building block are provided. Questions are based on a five-point Likert scale, **where (1) is completely untrue, and (5) is completely true**. The 'As Is' questions ask you about your opinion on the current state and the 'To Be' questions ask you about your opinion on the desired state. The questions are based on past research and do often refer to the organization. Please, when answering the questions in this questionnaire take your own work environment into consideration (e.g. the SAP platform) instead of the firm level. You are by no means obliged to answer a question when you feel you do not have the right insight to answer the questions. In this case, please leave the question open.

Building block A: the IT alignment preconditions

IT alignment preconditions	**Definition**: 'IT alignment preconditions are the required preconditions which enable the organization to attain an IT alignment fit'				
*Questions to assess " **As IS** " situation*	**1**	**2**	**3**	**4**	**5**
1. Business and IT managers have a strong working relationship					x
2. Business managers are committed to IT issues and initiatives					x
3. Business personnel have strong Information System skills					x
4. IT personnel have strong business skills				x	
5. Business and IT managers have strong informal relationships					x
6. IT personnel regularly move to a business function in our organization	x				
7. Bonus schemes for business and IT personnel exist					
*Questions to assess " **To Be** " situation*	**1**	**2**	**3**	**4**	**5**
1. Business and IT managers should have a strong working relationship					x
2. Business managers should be committed to IT issues and initiatives					x
3. Business personnel should have strong Information System skills					x
4. IT personnel should have strong business skills				x	
5. Business and IT managers should have strong informal relationships					x
6. IT personnel should regularly move to a business function in our organization	x				
7. Bonus schemes for business and IT personnel should exist					

Building block B: the business-IT alignment fit

Business-IT alignment fit	**Definition**: 'business-IT alignment fit is the degree of fit and integration among business strategy, IT strategy, business infrastructure and IT structure'				
*Questions to assess " **As IS** " situation*	**1**	**2**	**3**	**4**	**5**
1. The IT plan reflects the business plan mission, goals and strategies				x	
2. The business really uses well the capabilities of IT					x
3. IT services are aligned with the business needs in all organizational layers				x	
4. There is a good system in my department to share information with other departments			x		
5. There is a fit between our long-term IT plans and our current IT projects and IT operations				x	
6. There is a fit between our long-term business strategy and our current business processes and infrastructure				x	
*Questions to assess " **To Be** " situation*	**1**	**2**	**3**	**4**	**5**
1. The IT plan should reflect the business plan mission, goals and strategies					x
2. The business should really use well the capabilities of IT					x
3. IT services should be aligned with the business needs in all organizational layers					x
4. There should be a good system in my department to share information with other departments				x	
5. There should be a fit between our long-term IT plans and our current IT projects and IT operations				x	
6. There should be a fit between our long-term business strategy and our current business processes and infrastructure				x	

Open question 1: how do you think IT alignment preconditions (**A**) impact the business-IT alignment fit (**B**)? Please elaborate on your answer.

Building block C: the IT alignment processes

IT alignment processes	**Definition**: 'IT alignment processes are the decision making processes dedicated to match the strategic orientation of IT and the business'				
*Questions to assess " **As IS** " situation*	**1**	**2**	**3**	**4**	**5**
1. There is a formal communication structure between business and IT functions			x		
2. We use cost saving metrics for the selection of the needed information systems				x	
3. We use information sharing metrics for the selection of the needed information systems				x	
4. We use competitive advantage metrics for the selection of the needed information systems				x	
5. We use infrastructure based metrics for the selection of the needed information systems				x	
6. We have defined strong methods to learn new IT				x	
7. We have a set of clear learning programs for cross domain knowledge sharing on business and IT		x			
8. We ensure the implemented IT follows the evolutions of our business environment		x			
*Questions to assess " **To Be** " situation*	**1**	**2**	**3**	**4**	**5**
1. There should be a formal communication structure between business and IT functions			x		
2. We should use cost saving metrics for the selection of the needed information systems					x
3. We should use information sharing metrics for the selection of the needed information systems				x	
4. We should use competitive advantage metrics for the selection of the needed information systems					x
5. We should use infrastructure based metrics for the selection of the needed information systems				x	
6. We should define strong methods to learn new IT					x
7. We should have a set of clear learning programs for cross domain knowledge sharing on business and IT				x	
8. We should ensure the implemented IT follows the evolutions of our business environment				x	

Open question 2: how do you think IT alignment processes (**C)** impact the business-IT alignment fit (**B**)? Please elaborate on your answer.

Open question 3: how do you think IT alignment preconditions (**A**) affect the relationship between IT alignment processes (**C**) and the business-IT alignment fit (**B**)? Please elaborate on your answer.

Building block D: the business value of IT

Business value of IT	**Definition**: 'the business value of IT is the organizational performance impacts of information technology at both the intermediate process level and the organizational-wide level, and compromising both efficiency impacts and competitive impacts'				
*Questions to assess " **As IS** " situation*	**1**	**2**	**3**	**4**	**5**
1. IT improves the productivity of our organization			x		
2. IT decreases the total expenses of our organization			x		
3. IT improves the infrastructure of our organization			x		
4. IT improves information sharing within the organization				x	
5. IT improves the financial performance of our organization					
*Questions to assess " **To Be** " situation*	**1**	**2**	**3**	**4**	**5**
1. IT should improve the productivity of our organization				x	
2. IT should decreases the total expenses of our organization				x	
3. IT should improve the infrastructure of our organization				x	
4. IT should improve information sharing within the organization				x	
5. IT should improve the financial performance of our organization					

Open question 4: how do you think the IT-business alignment fit (**B**) impacts the business value of IT (**D**)? Please elaborate on your answer.

Appendix D: The Business-IT alignment Questionnaire (business staff #2)

Name interviewee: Local business employee #2 Date: 8 March 2017

Job Function: Finance Role: Business staff

This questionnaire aims to analyze the mutual relationships of the four building blocks of the business-IT alignment research model: (i) preconditions of IT alignment, (ii) IT alignment processes, (iii) business-IT alignment, and (iv) business value of IT. For a complete description of this model see the research model attached. Definitions for each building block are provided. Questions are based on a five-point Likert scale, **where (1) is completely untrue, and (5) is completely true**. The 'As Is' questions ask you about your opinion on the current state and the 'To Be' questions ask you about your opinion on the desired state. The questions are based on past research and do often refer to the organization. Please, when answering the questions in this questionnaire take your own work environment into consideration (e.g. the SAP platform) instead of the firm level. You are by no means obliged to answer a question when you feel you do not have the right insight to answer the questions. In this case, please leave the question open.

Building block A: the IT alignment preconditions

IT alignment preconditions	**Definition**: 'IT alignment preconditions are the required preconditions which enable the organization to attain an IT alignment fit'				
*Questions to assess " **As IS** " situation*	**1**	**2**	**3**	**4**	**5**
1. Business and IT managers have a strong working relationship		x			
2. Business managers are committed to IT issues and initiatives		x			
3. Business personnel have strong Information System skills				x	
4. IT personnel have strong business skills	x				
5. Business and IT managers have strong informal relationships				x	
6. IT personnel regularly move to a business function in our organization	x				
7. Bonus schemes for business and IT personnel exist					
*Questions to assess " **To Be** " situation*	**1**	**2**	**3**	**4**	**5**
1. Business and IT managers should have a strong working relationship			x		
2. Business managers should be committed to IT issues and initiatives			x		
3. Business personnel should have strong Information System skills				x	
4. IT personnel should have strong business skills				x	
5. Business and IT managers should have strong informal relationships				x	
6. IT personnel should regularly move to a business function in our organization	x				
7. Bonus schemes for business and IT personnel should exist					

Building block B: the business-IT alignment fit

Business-IT alignment fit	**Definition**: 'business-IT alignment fit is the degree of fit and integration among business strategy, IT strategy, business infrastructure and IT structure'				
*Questions to assess " **As IS** " situation*	**1**	**2**	**3**	**4**	**5**
1. The IT plan reflects the business plan mission, goals and strategies		x			
2. The business really uses well the capabilities of IT		x			
3. IT services are aligned with the business needs in all organizational layers		x			
4. There is a good system in my department to share information with other departments	x				
5. There is a fit between our long-term IT plans and our current IT projects and IT operations				x	
6. There is a fit between our long-term business strategy and our current business processes and infrastructure		x			
*Questions to assess " **To Be** " situation*	**1**	**2**	**3**	**4**	**5**
1. The IT plan should reflect the business plan mission, goals and strategies				x	
2. The business should really use well the capabilities of IT				x	
3. IT services should be aligned with the business needs in all organizational layers				x	
4. There should be a good system in my department to share information with other departments				x	
5. There should be a fit between our long-term IT plans and our current IT projects and IT operations				x	
6. There should be a fit between our long-term business strategy and our current business processes and infrastructure				x	

Open question 1: how do you think IT alignment preconditions (**A**) impact the business-IT alignment fit (**B**)? Please elaborate on your answer.

Building block C: the IT alignment processes

IT alignment processes	**Definition**: 'IT alignment processes are the decision making processes dedicated to match the strategic orientation of IT and the business'				
*Questions to assess " **As IS** " situation*	**1**	**2**	**3**	**4**	**5**
1. There is a formal communication structure between business and IT functions				x	
2. We use cost saving metrics for the selection of the needed information systems			x		
3. We use information sharing metrics for the selection of the needed information systems				x	
4. We use competitive advantage metrics for the selection of the needed information systems			x		
5. We use infrastructure based metrics for the selection of the needed information systems				x	
6. We have defined strong methods to learn new IT				x	
7. We have a set of clear learning programs for cross domain knowledge sharing on business and IT		x			
8. We ensure the implemented IT follows the evolutions of our business environment		x			
*Questions to assess " **To Be** " situation*	**1**	**2**	**3**	**4**	**5**
1. There should be a formal communication structure between business and IT functions				x	
2. We should use cost saving metrics for the selection of the needed information systems				x	
3. We should use information sharing metrics for the selection of the needed information systems				x	
4. We should use competitive advantage metrics for the selection of the needed information systems				x	
5. We should use infrastructure based metrics for the selection of the needed information systems				x	
6. We should define strong methods to learn new IT					x
7. We should have a set of clear learning programs for cross domain knowledge sharing on business and IT				x	
8. We should ensure the implemented IT follows the evolutions of our business environment					**x**

Open question 2: how do you think IT alignment processes (**C)** impact the business-IT alignment fit (**B**)? Please elaborate on your answer.

Open question 3: how do you think IT alignment preconditions (**A**) affect the relationship between IT alignment processes (**C**) and the business-IT alignment fit (**B**)? Please elaborate on your answer.

Building block D: the business value of IT

Business value of IT	**Definition**: 'the business value of IT is the organizational performance impacts of information technology at both the intermediate process level and the organizational-wide level, and compromising both efficiency impacts and competitive impacts'				
*Questions to assess " **As IS** " situation*	**1**	**2**	**3**	**4**	**5**
1. IT improves the productivity of our organization			x		
2. IT decreases the total expenses of our organization			x		
3. IT improves the infrastructure of our organization			x		
4. IT improves information sharing within the organization			x		
5. IT improves the financial performance of our organization			x		
*Questions to assess " **To Be** " situation*	**1**	**2**	**3**	**4**	**5**
1. IT should improve the productivity of our organization				x	
2. IT should decreases the total expenses of our organization				x	
3. IT should improve the infrastructure of our organization				x	
4. IT should improve information sharing within the organization				x	
5. IT should improve the financial performance of our organization				x	

Open question 4: how do you think the IT-business alignment fit (**B**) impacts the business value of IT (**D**)? Please elaborate on your answer.

Appendix E: The Business-IT alignment Questionnaire (central IT manager)

Name interviewee: Central IT manager Date: 20 March 2017

Job Function: Central IT function Role: Central IT staff

This questionnaire aims to analyze the mutual relationships of the four building blocks of the business-IT alignment research model: (i) preconditions of IT alignment, (ii) IT alignment processes, (iii) business-IT alignment, and (iv) business value of IT. For a complete description of this model see the research model attached. Definitions for each building block are provided. Questions are based on a five-point Likert scale, **where (1) is completely untrue, and (5) is completely true**. The 'As Is' questions ask you about your opinion on the current state and the 'To Be' questions ask you about your opinion on the desired state. The questions are based on past research and do often refer to the organization. Please, when answering the questions in this questionnaire take your own work environment into consideration (e.g. the SAP platform) instead of the firm level. You are by no means obliged to answer a question when you feel you do not have the right insight to answer the questions. In this case, please leave the question open.

Building block A: the IT alignment preconditions

IT alignment preconditions	**Definition**: 'IT alignment preconditions are the required preconditions which enable the organization to attain an IT alignment fit'				
*Questions to assess " **As IS** " situation*	**1**	**2**	**3**	**4**	**5**
1. Business and IT managers have a strong working relationship		x			
2. Business managers are committed to IT issues and initiatives		x			
3. Business personnel have strong Information System skills		x			
4. IT personnel have strong business skills			x		
5. Business and IT managers have strong informal relationships			x		
6. IT personnel regularly move to a business function in our organization		x			
7. Bonus schemes for business and IT personnel exist					
*Questions to assess " **To Be** " situation*	**1**	**2**	**3**	**4**	**5**
1. Business and IT managers should have a strong working relationship				x	
2. Business managers should be committed to IT issues and initiatives			x		
3. Business personnel should have strong Information System skills		x			
4. IT personnel should have strong business skills					x
5. Business and IT managers should have strong informal relationships				x	
6. IT personnel should regularly move to a business function in our organization				x	
7. Bonus schemes for business and IT personnel should exist					

Building block B: the business-IT alignment fit

Business-IT alignment fit	**Definition**: 'business-IT alignment fit is the degree of fit and integration among business strategy, IT strategy, business infrastructure and IT structure'				
*Questions to assess " **As IS** " situation*	**1**	**2**	**3**	**4**	**5**
1. The IT plan reflects the business plan mission, goals and strategies			x		
2. The business really uses well the capabilities of IT		x			
3. IT services are aligned with the business needs in all organizational layers		x			
4. There is a good system in my department to share information with other departments					
5. There is a fit between our long-term IT plans and our current IT projects and IT operations			x		
6. There is a fit between our long-term business strategy and our current business processes and infrastructure					
*Questions to assess " **To Be** " situation*	**1**	**2**	**3**	**4**	**5**
1. The IT plan should reflect the business plan mission, goals and strategies					x
2. The business should really use well the capabilities of IT				x	
3. IT services should be aligned with the business needs in all organizational layers				x	
4. There should be a good system in my department to share information with other departments					
5. There should be a fit between our long-term IT plans and our current IT projects and IT operations					x
6. There should be a fit between our long-term business strategy and our current business processes and infrastructure					

Open question 1: how do you think IT alignment preconditions (**A**) impact the business-IT alignment fit (**B**)? Please elaborate on your answer.

Building block C: the IT alignment processes

IT alignment processes	**Definition**: 'IT alignment processes are the decision making processes dedicated to match the strategic orientation of IT and the business'				
*Questions to assess " **As IS** " situation*	**1**	**2**	**3**	**4**	**5**
1. There is a formal communication structure between business and IT functions					x
2. We use cost saving metrics for the selection of the needed information systems				x	
3. We use information sharing metrics for the selection of the needed information systems				x	
4. We use competitive advantage metrics for the selection of the needed information systems					
5. We use infrastructure based metrics for the selection of the needed information systems				x	
6. We have defined strong methods to learn new IT				x	
7. We have a set of clear learning programs for cross domain knowledge sharing on business and IT		x			
8. We ensure the implemented IT follows the evolutions of our business environment				x	
*Questions to assess " **To Be** " situation*	**1**	**2**	**3**	**4**	**5**
1. There should be a formal communication structure between business and IT functions					x
2. We should use cost saving metrics for the selection of the needed information systems					x
3. We should use information sharing metrics for the selection of the needed information systems				x	
4. We should use competitive advantage metrics for the selection of the needed information systems					
5. We should use infrastructure based metrics for the selection of the needed information systems				x	
6. We should define strong methods to learn new IT				x	
7. We should have a set of clear learning programs for cross domain knowledge sharing on business and IT				x	
8. We should ensure the implemented IT follows the evolutions of our business environment				**x**	

Open question 2: how do you think IT alignment processes (**C)** impact the business-IT alignment fit (**B**)? Please elaborate on your answer.

Open question 3: how do you think IT alignment preconditions (**A**) affect the relationship between IT alignment processes (**C**) and the business-IT alignment fit (**B**)? Please elaborate on your answer.

Building block D: the business value of IT

Business value of IT	**Definition**: 'the business value of IT is the organizational performance impacts of information technology at both the intermediate process level and the organizational-wide level, and compromising both efficiency impacts and competitive impacts'				
*Questions to assess " **As IS** " situation*	**1**	**2**	**3**	**4**	**5**
1. IT improves the productivity of our organization			x		
2. IT decreases the total expenses of our organization			x		
3. IT improves the infrastructure of our organization				x	
4. IT improves information sharing within the organization			x		
5. IT improves the financial performance of our organization			x		
*Questions to assess " **To Be** " situation*	**1**	**2**	**3**	**4**	**5**
1. IT should improve the productivity of our organization					x
2. IT should decreases the total expenses of our organization				x	
3. IT should improve the infrastructure of our organization					x
4. IT should improve information sharing within the organization				x	
5. IT should improve the financial performance of our organization				x	

Open question 4: how do you think the IT-business alignment fit (**B**) impacts the business value of IT (**D**)? Please elaborate on your answer.

Appendix F: Interview sample handout questions

Open question 1: how do you think IT alignment preconditions (**A**) impact the business-IT alignment fit (**B**)? Please elaborate on your answer.

Examples:

- Business managers have strong informal relationships <> alignment of the business and IT operations and or strategy
- Strong IT skills of business personnel <> the business plan utilizes the strategic capability of IT
- Strong business skills of IT <> the IT plan reflects the business plan, mission, goals and strategies
- Business and IT managers have a strong working relationship <> there is a distributed system the share information within the organization

Open question 2: how do you think IT alignment processes (**C)** impact the business-IT alignment fit (**B**)? Please elaborate on your answer.

Examples:

- The formal/informal communication structure between business and IT <> the IT function is aligned with all other business functions
- The consideration of a certain metric for the selection of the needed IT systems <> there is a fit between our long-term business strategy and our current business processes and infrastructure
- Informal processes for cross domain knowledge sharing <> the business plan utilizes the strategic capability of IT

Open question 3: how do you think IT alignment preconditions (**A**) affect the relationship between IT alignment processes (**C**) and the business-IT alignment fit (**B**)? Please elaborate on your answer.

Examples:

- Business and IT managers have a strong working relationship <> there is a formal communication structure between business and IT functions
- Business managers are committed to IT issues and initiatives <> we have defined informal processes for cross domain knowledge sharing on business and IT

Open question 4: how do you think the IT-business alignment fit (**B**) impacts the business value of IT (**D**)? Please elaborate on your answer.

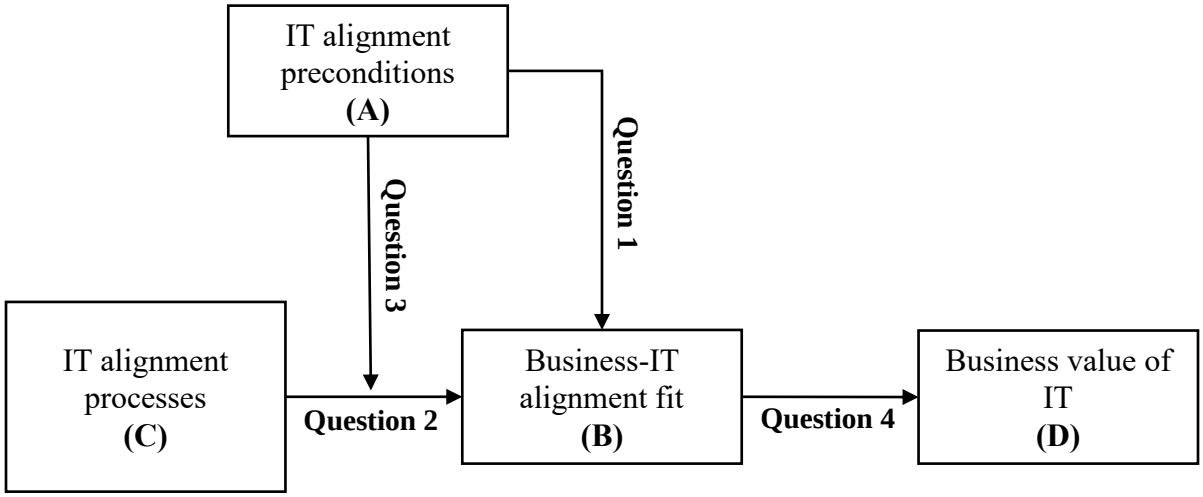
Examples:

- Think about how the SAP platform impacted your business
- What are the positives? How did you benefit from the platform?
- What needs to be improved?

Appendix G: background for the Business-IT Alignment Questionnaire

This document is created to give the interviewee additional information for the interview to answer all the question in the correct way. First, the research model is described, where the building blocks and the four questions are positioned. Next, all the building blocks are described with some additional definitions which are needed to answers all of the questions in a correct manner.

The business-IT alignment research model

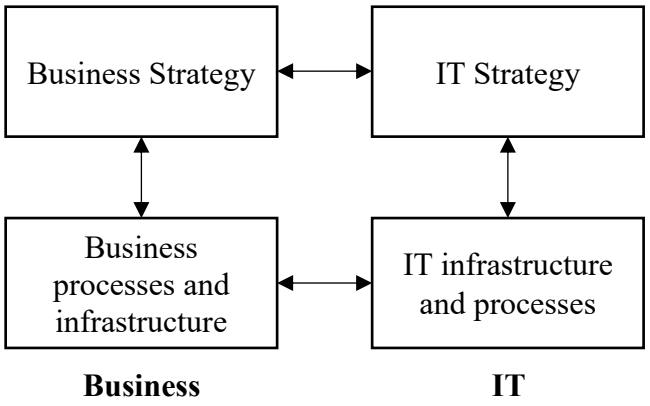


Preconditions of IT alignment (A)

These are the required preconditions which enable an organization to attain an IT alignment fit. The questions in the questionnaire are based on past literature who address important preconditions of IT alignment.

Business-IT alignment fit (B)

This is the business-IT alignment fit is the degree of fit and integration among business strategy, IT strategy, business infrastructure and IT structure. The questions in the questionnaire are based on the Strategic Alignment Model of Henderson and Venkatraman (1993) which describe the core linkages which should be aligned to attain a business-IT alignment fit. The arrows between the four different obstruct imagine the individual relationships and should be aligned in order to attain a full business-IT alignment fit.



IT alignment processes (C)

IT alignment processes are the decision-making processes dedicated to match the strategic orientation of IT and business. Please read these definitions carefully before answering questions 2, 3, 4, and 5:

- Transactional IT: cut costs or increase throughput for the same cost (e.g., a trade processing system for a brokerage firm).
- Informational IT: provide information for any purpose including to account, manage, control, report, communicate, collaborate or analyze (e.g., sales analysis or reporting).
- Strategic IT: gain competitive advantage or position in market place. Often new in time high risk/return.
- Infrastructure IT: base foundation of shared IT services used by multiple applications (e.g., servers, networks, laptops). Focus on cost reduction by consolidation

Business value of IT (D)

The business value of IT is the organizational performance impacts of information technology at both the intermediate process level and the organizational-wide level, and compromising both efficiency impacts and competitive impacts. When answering the questions in the questionnaire take into account that there are many different ways to measure *financial performance*, e.g. return on investments, net income and return on assets.

Appendix H: interview with local IT manager

Date: 22 February 2017
Place: local headquarters of the participating financial organization.
Attendants: local IT manager, Erik Jan Poelen

Interviewee: we have strong informal relationships in the team. That helps a lot to improve the business-IT alignment in general. We have strong working relationships in the local business, which in general improves the business-IT alignment. This makes things a lot easier because, you can clarify yourself in emergency topics or open topics out of these organizations. So, you can clarify open topics and you can discuss formal topics in an informal way with the team and that helps a lot to speed up in the end. Also, for your MSc thesis I could just send employee XYZ an e-mail of what we want to do, where a good informal relationship really helps to speed up the process.

Interviewer: that being said, do you think the formal relationship is more difficult at some times?

Interviewee: yes, it is. It is a slow process sometimes. However, you have to keep these processes alive to align everything accordingly.

Interviewer: I see that you marked the reflection of the IT plan with the business mission, goals and strategies marked a (2), but your desired state is a (4). Could you please elaborate on this?

Interviewee: IT serves the business. At some parts, we are quite good in doing this, but at some we can improve the SAP platform that it even better serves IT and processes. For example, running a report takes quite a lot of time, but it would be more efficient for the business to get the results of the reports faster.

Interviewer: I see the shared business-IT skills are alright? Do you need to understand each other better to build those strong informal relationships?

Interviewee: yes. For example, in country A, employee XYZ (business department) also has strong IT skills which really helps. And the other way around as well, when IT people have strong business knowledge you can really pickup fast what the business wants and needs. Maybe it is not for all the IT people at our organization, but this is the case for local department of our organization.

Interviewer: information sharing is marked a (3), but could be better (4)?

Interviewee: we have one communication tool, but still needs to be improved.

Interviewer: what do you think about the influence of the preconditions in the questionnaire you mentioned earlier? Do they influence IT alignment processes?

Interviewee: yes, definitely. The people, in general, have a huge impact on the actual processes, as they want to do as best as they can. Even when you have a clear formal way of how a project is going, the informal part is still very useful to keep each other noticed how things are going. It often makes it a lot easier than only following the formal processes.

Interviewer: now let us move to the business value of IT. I see some differences between the current and desired state. Could you elaborate on this?

Interviewee: The SAP system is not really that old. It usually takes some time to set-up well and is fully up and running. There are areas that really improved over the last years, but there are still some areas that needed to be improved. For example, we have all these interfaces in the SAP platform. When they are not running stable, it means that you miss lots of data in the finance environment. That's something that really got better over time but there is still room for improvement. These are things however that just need time to improve. I expect that the problems we have right now will still get improved in the following years.
Next a great value for the business is the running of the reports in the SAP platform, i.e. running reports to get data for creating a balance sheet. So earlier the report needed to run for three to four minutes, depending on the report complexity. We implemented an SAP update and now the reports run in just thirty seconds. And that's really an improvement that we made three years ago, and

really helps the productivity of the business itself. Another example, all the transfers of the local business and finance department now implemented a daily check for every interface whether it is running smoothly or there are no problems recognized. That was one step that really improved the overall productivity of the organization.

Interviewer: and what about the total expenses of the SAP platform?
Well, this is quite hard to say. Implementing a SAP platform is very expensive, but I have no clear idea of the cost figures. And I don't know what the break-even point is. Well, it remains hard to capture the benefits in numbers. How do you measure the benefits that up the revenue to compare it with the costs of the platform?

Interviewer: how do you measure the performance of the SAP platform?
Well, that one is also hard to answer directly. You can see having all the different countries on the same platform and have a way to compare results is a real benefit for us. To give you an example, every country where we were operating had a different way to present the revenue of a business unit, which made it hard to compare the results. The implementation of the SAP systems resulted in a transition where all the financial data could be shared and compared easier and faster. But how do you measure this in money value? I do not know. Normally, SAP systems are huge upfront investments, but you have to make these investments if you want to run a company our organization. But it then remains difficult to measure the investment costs itself.
Another big improvement of the platform is that the local business units of the company are now more involved at the international level. Before, you had a kind of silo's. You had country A, country B, country C, et cetera. Everyone did their own thing, but now you add up you are forced to talk to each other. How does country A calculate the numbers and compare your figures within country B? That is definitely an advantage, to have a form of transparency between the different countries. When we have a problem in country A, we can now ask country B: do you have the same problem? How have you dealt with it and how can we take over your solution and that is what happened with our SAP system as well. Maybe this is also something in terms of performance, so you cannot measure that collaboration between countries in term of money, that's hard. The communication in the finance areas really improved between the countries.

Interviewer: thanks for your time and considerations. This is the end of the interview.

Additional notes: the interviewee provided the tip to simplify the questions two, three, four and five of IT alignment processes. It would be hard for personnel to understand the questions and to come up with specific examples. Instead, it may be better to ask the interviewee if they use any selection criteria for the selection of their IT investments. In the next interviews, I will therefore provide some example questions which help the interviewee with the approach that should be used.

Appendix I: interview with local business employee #1

Date: 8 March 2017
Place: online conference call
Attendants: local IT manager, Erik Jan Poelen, business employee #1

Interviewer: could you give a quick introduction of yourself? And what is your current role within the organization?

Interviewee: I studied Finance, but created an interest for IT when I started to work. Within our organization I work as an accountant and I serve as a link between business and IT. I am working in the local business. I also had previous roles in IT at our organization. There was a time I did a lot of SAP customizing. I am not doing that anymore, but when we have certain change requests for IT I do have the knowledge. Therefore, I have a strong background in the SAP platform also. Customizing SAP modules is now moved to the SAP development team.

Interviewer: Could you elaborate on your feelings of the business-IT alignment of your organization?

Interviewee: I believe the SAP platform is aligned with our business plan. Every year we have a meeting to discuss the project plan for our country. In that meeting the flaws of the SAP platform are discussed and adjusted right after. I work close with IT and the SAP development team and I definitely believe we use all the capability of IT.
Sharing of information is something that could be still improved, as we basically share information country-wide, which not always runs as smoothly as we want. However, I do not think we could achieve a five rating as this remains a difficult process. Right now, we are in a digitalization process, where we try to automate a lot of services we previously out sourced to country D. We are now working with SOP (standard operation process), which is a document that describes processes and can be used by a machine, which is able to read it and perform the written action.

Interviewer: and what about the preconditions of the business-IT alignment?

Interviewee: I believe that both IT and business people have to have some knowledge of each other's focus otherwise it will be hard to understand each other. We have great informal relationships. We do a lot of coffee break together were we discuss formal topics as well. We never make moves to cross sectional moves, which I think is fine.

Interviewer: I would like to go to the first open question.

Interviewee: I definitely believe informal relationships are important. We you grab a coffee you can share information; by surprise… this is sometimes easier than these formal meetings. My strong IT skills are very important for us, as I know how to present what our business plan wants from IT, which made it easier to align the business plan with IT. Great technical cross-domain skills are not needed, but I do believe we need to have a decent sense of what the other is doing in order to get the right input from each other. We have to know how IT staff thinks to come up solutions, and that is more important than the technical skills.
We share information in an informal and formal way. Every week we have a meeting with the business and IT for the SAP platform and that is the time and place to share information but also a possibility to meet my international colleagues in an informal way.

Interviewer: Let us now move to the questions on IT alignment preconditions, i.e. open question two and three.

Interviewee: we use all metrics before we invest in IT as we doing that very detailed. In every case (decent investment) we have different focus points which we evaluate. I do see however, that saving costs is getting more important in the future, together with competitive advantage.
For learning new IT, we have programs which we use, but this will be increased in the future. We will then also use YouTube videos that are built to learn new IT in an easy way. Our current IT does follow the evolutions of our business environment, but not very quickly. In the future, we to adapt faster, because in order to become to competitive this needs to be better.

I do believe that these metrics are important, as we cover every aspect in great details, therefore this fit in business and IT plan is already checked before the investment. I think the structure between business and IT can be more formal, so we can respond faster on our business needs which is important for our competitive advantage. This communication is lag is not always possible to solve with informal communications, as we are a huge internationally operating company where business and IT staff is geographically dispersed.

Interviewer: now that we covered the business-IT alignment and its assessors. Let us move the business value of IT. Could you please try to answer the last open quest?

Interviewee: the SAP platform is a shared platform for more countries, but from a local point of view it is not savings costs to the previous one. The information sharing capabilities are now much more developed than the other 'metrics' as we can communicate and compare data with different countries much better and faster. The SAP platform is much more about accounting, so I do not see a direct link that it would improve our financial performance. It therefore cannot answer this question. I find this question hard to answer because it is hard to put the SAP platform in direct numbers, but of course it has many benefits like the faster information sharing. The SAP platform should be based on the requirements of all the different stakeholders. The sooner the market and partners get information, the better this is for our company. When this information sharing is faster than the competition, IT really provides the added value. We are currently working on the reporting capabilities of our organization, and this still needs improvement. Management relies not only on how fast we can share information but also data that is accurate.

Interviewer: thanks for your time and considerations. This is the end of the interview.

Appendix J: interview with local business employee #2

Date: 8 March 2017
Place: online conference call
Attendants: local IT manager, Erik Jan Poelen, local business employee #2

Interviewer: could you give a quick introduction of yourself? And what is your current role within the organization?

Interviewee: I am working at the local business in the controlling department. In the SAP environment, I am responsible for the cost accounting and allocation topics. I am fully involved in the organization and governance processes which involve the SAP project since the beginning. For cost accounting, we do budgeting and planning, cost allocation and reporting. We use many tools which also include the SAP system.

Interviewer: we begin with the business-IT alignment. Could you try to answer the first open question?

Interviewee: I think the SAP platform is not agile and fast enough. This is still in progress and will be attained in the long-run as it is our mission to become more flexible and agile. Right now, there are too many side applications alongside the SAP platform that have to be used, because the platform's core architecture does not yet deliver everything the business needs. We used to call this a zoo of applications. So, this is still something we work on. We try to enrich the core architecture with these applications. In the future, we will not only use SAP like platforms, but more a combination of more applications. Next, we have built a small business data warehouse for controlling needs to share information, because of the lag of existing data warehouses that cover finance KPIs is too large. The key issue however is, that we still have difficulties to share this information between different departments.
Moreover, I believe the fit of our short-term and long-term IT plan is good, but what I have seen from previous experience is that is difficult to keep that focus after some years passed by. Also,

you see when we you make time lines to align some projects in 3 years, this will usually become 5 years, and so on.

Interviewer: please elaborate on your decisions regarding the preconditions of the business-IT alignment.

Interviewee: I believe the current working relationship is not good enough between business and IT when looking at agility and flexibility. This is one of the reasons the local business tends to implement applications which are independent of the IT department. We try to use business solutions that are independent of our local IT which of course makes us less committed to issues and ideas from the IT side. For example, excel is often much easier than other IT initiatives as we are using it more. We have truly a strong impersonal relationship, but I do see there is personnel, both in business and IT, where this is relationship is not that strong as they also more focus on their own work focus which often deviates from each other. We tend to look for own solutions instead of going to IT right away. We have very good IT skills, which we also make use of when making our own solutions. We have a group of people in our finance department that deals with data innovation. There are data experts and artificial experts that try to increase our understanding of Big Data. You would think this is part of the IT department, but it is not.
Next, I find that IT should improve their business skills. They are far away of hearing the business and this is the most important reason for that. Focussing on my personal experience, the informal relationship between me and IT people is good, but I do not argue this is the same for everyone. This informal relationship is very important in order to better understand each other, as this not often happens during formal sessions. There are a lot of strict governance processes within the SAP platform, which makes it hard to find each other. Instead, we then collaborate in a more informal way where we do have the opportunity to understand each other. This will remain important as we keep making use of it.

Interviewer: thanks for your detailed response. Let us now go move to the IT alignment processes.

Interviewee: we have definitely a formal communication structure like meetings and solution committees et cetera, so the formal side is very strong, but it is not agile! We always do a proof of

concept and look at all the four metrics. We really give it a detailed selection process. Cost saving is not the strongest part as we more look at the functional view, which would be more the information sharing and infrastructure based metrics. Is it easy to use? And does it really fit in our environment? The time to market from IT side is always having a lag with what the business wants, I would want this to be a lot better as it is one of the important requirements IT should try to fulfil; only then it could give us a competitive advantage.

Interviewer: what is your view on the relationship between the business-IT alignment and the business value of IT, i.e. open question four?

*Interviewee: f*or the overall group, it improved the productivity, but at the local business we do not see direct benefits, but maybe this will get better. In the long-run, the SAP platform can decrease the costs even more than it does right now. Including major outsourcing, where IT is hugely involved. Infrastructure, from a local perspective not really, but globally yes. The central team benefits a lot from the merged structure, major KPIs of all countries are now in one system. So yes, there is a system that shares information, but still with too much manual effort. Therefore, information sharing capabilities are still there to be improved. Many countries were running behind, so they really benefitted from the new SAP system.

Interviewer: thanks for your time and considerations. This is the end of the interview.

Appendix K: Interview with central IT manager

Date: 21 March 2017
Place: online conference call
Attendants: local IT manager, Erik Jan Poelen, central IT manager

The business manager's issues and initiatives.
Interviewee: from a global perspective, business managers are always there when something goes wrong and we need to seek a resolution. I believe the business managers are the most satisfied when they do not have to anything and IT is running smoothly. They are more reactive then proactive in dealing with issues and initiatives of IT.

IT and business skills
Interviewee: from a global perspective, business people do not have strong IT skills, but do know what they want from IT and what is available for them. It will then be the task of IT to propose the right solutions. IT itself does need a good understanding of wat the business wants. In the end if these two groups do not understand each other this whole project will not work.

The formal communication structure
Interviewee: we have very structured communication processes for the SAP platform, especially concerning the strategy. For example, we have validation boards which we use to structure the process. For an organization with so many countries it is important to have structured communication process. There is no possible other way; it would be too difficult to manage.

The selection criteria for IT investments
Interviewee: we have an architectural review board in place, where we go through before we make a decision on an IT investment. It checks whether the investment fits in the global architecture, but also whether the investments fits in our future plans. Can the tool be implemented based on our security measures? And also is this tool able to bring cost savings? Cost savings is more important for us. At last, we also look at how we can place a tool in the market, but we do not have a clear benchmark to compare it with different companies.

The business value of IT

Interviewee: I do believe we can quantify the benefits of IT. For example, we see the number of FTE's decreasing thanks due the new IT investments, which results in significant cost savings. Moreover, we now have more standardized processes which makes it easier to share and compare KPIs between the different countries our organization is operating in, but we mostly look at cost savings.

Informal relationships and formal communication structure

Interviewee: we have a meeting with Local Business, Global IT and Global Business. This meeting is an official organized meeting with agenda, etc. but with a lot of room (e.g. dinner) for informal communication as well. The meeting takes place every 2 months in different locations with local representatives from every country. In this way, you have got "formalized meetings" with possibility to strengthen the informal communication in between (Coffee, Dinner). The meeting is the "what we call business meeting", in the same set-up you have got the meeting with all Local Flyers (3 meetings per year in different locations). Furthermore, you have some topic-related meetings, e.g. specific Controlling meetings where all CO-representatives meet each other.

Interviewer: thanks for your time and considerations. This is the end of the interview.