BUSINESS AND IT ALIGNMENT IN CONTEXT

ISBN: 978-90-393-5923-5

BUSINESS AND IT ALIGNMENT IN CONTEXT

Business en IT alignment in context
(met een samenvatting in het Nederlands)

Proefschrift

ter verkrijging van de graad van doctor aan de Universiteit Utrecht
op gezag van de rector magnificus, prof.dr. G.J. van der Zwaan,
ingevolge het besluit van het college voor promoties in het openbaar te verdedigen op
dinsdag 28 mei 2013 des middags te 2.30 uur
door

Adrianus Jan Gijsbert SILVIUS

geboren op 16 januari 1963
te Vlaardingen

Promotor: Prof. dr. S. Brinkkemper

Co-promotor: Dr. R.S. Batenburg

Dit proefschrift is mede mogelijk gemaakt door Hogeschool Utrecht en Van Aetsveld, verandermanagement,projectmanagement.

PREFACE

During my studies at the Dutch Military Academy, a guest lecture by an experienced business consultant sparked my interest in consultancy. The prospect of working on 'strategic' issues in different companies appealed to me and by the time I graduated from the academy, I had the firm ambition to continue my development in the direction of management consultancy, advising companies on the most efficient way to organize their businesses. My first job brought me to one of the logistics units of the army, as an internal auditor. It was 1986, and this particular unit was the first of its kind in the army, to be equipped with a state-of-the-art integrated information system to run its operations.

In my work I was confronted with the aftermath of this system implementation, and although I had little interest in information technology, I soon learned that the traditional work of a consultant, advising on effective and efficient organizations, had changed because of the development of information technology. Optimizing businesses without considering the potential applications of information technology and information systems, did not make any sense anymore. And when, a couple of years later, I landed a position as consultant, it was a consultant on 'organization and information'. For more than 15 years, I had the opportunity to work with organizations on business strategy, information technology strategy, business process optimization, information systems planning and project management. In those years I got both fascinated by the potential that information technology offers to optimize and innovate businesses, and worried by the struggle that most organizations experience when realizing this potential. And when I changed my profession to that of an educator and a researcher, the fascination never faded, nor did the worries.

With this dissertation I hope to share some of the insights I found when studying the alignment of business and information technology. Being an academic was never my big ambition, but finding answers was. And the two go hand in hand.

At the completion of this milestone, I would like to thank the co-authors of the publications that form this dissertation. I would also like to thank the team of the research group Business, IT and Innovation and the colleagues and students of our Master of Information and Master of Project Management programs. Doing research can sometimes be a lonely calling, so the cooperation with colleagues is an important stimulation.

I would especially like to thank my supervisors, Sjaak Brinkkemper and Ronald Batenburg, for offering me the opportunity to bring my ideas to a higher level. They were sometimes critical, but always constructive. Without their support this dissertation definitely would not have been possible.

I would also like to thank my examiners: Professors Rik Maes, Wim van Grembergen, Egon Berghout, Hans van der Heijden and Piet Ribbers, for their effort and time in examining my dissertation.

Last, but not least I would like to thank my parents, children, family and friends for their support of my job and work.

Gilbert Silvius, Utrecht, May 2013.

CONTENTS

1. INTRODUCTION

1.1 Motivation for this study

For already more than two decades, the necessity and desirability of aligning business needs and information technology (IT) capabilities is considered to be one of the key issues in IT management (Brancheau and Wetherbe, 1987; Reich and Benbasat, 1996; Chan et al., 1997; Sabherwal and Chan, 2001; Cumps et al., 2006a; Luftman et al., 2006; Luftman, 2009; Gallagher and Gallagher, 2010). IT is changing the way companies organize their business processes, communicate with customers and deliver their services (Avolio et al., 2000). And several studies (Chan et al., 1997; Irani, 2002; Kearns and Lederer, 2003; Alter, 2005; Byrd et al., 2006; Luftman et.al, 2008), provide support for the hypothesis that "organizations that successfully align their business strategy with their IT strategy will outperform those that do not" (Chan and Reich, 2007a).

However, studies (for example Rosa, 1998; Luftman et al., 1999) also report low scores when executives are asked if they have succeeded in achieving alignment. These 'success rates' vary from 8% (Rosa, 1998) to "less than half" (Luftman et al., 1999). Also, the annual survey of top management concerns of the Society for Information Management (www.simnet.org), ranked 'IT and business alignment' consistently as one of the top concerns for senior management, for the last eight years (Society of Information Management, 2003 - 2010). In five of these eight years it was even considered the 'top concern'.

After many years of research on business and IT alignment (BIA), Chan and Reich (2007b) list over 150 studies in their bibliography paper, the fact that alignment still remains one of the top concerns for IT and business executives, raises questions. Already in 2002, Chan posed the fundamental question "Why haven't we mastered alignment?" (Chan, 2002). This question remains valid today, both from an academic and from a practical perspective. It is this question that motivates the research of this dissertation: *Why haven't organizations mastered alignment?* This question is directly related to the question: *How can organizations master alignment?* In order to position the questions that set the stage for the studies in this dissertation, we will first provide a brief introduction into the research domain: business and IT alignment. This is followed by an analysis of the models and conceptualizations of BIA, and the challenges organizations face in mastering alignment. From the analysis of both theory and practical challenges, we will then identify the main research question of this dissertation and introduce the specific research questions that are addressed in the following chapters.

1.2 Research domain: Business and IT alignment

In this section we introduce the domain of the study. We will first describe the history and development of alignment, and provide the definition of BIA used in this dissertation. After this, we will provide an overview of the main conceptualizations and operationalizations of BIA, followed by an analysis of the reasons why alignment is so elusive, according to empirical studies. We will conclude this section with an analysis of the theoretical perspectives underpinning BIA, that preludes the research questions of our study.

1.2.1 A short history of business and IT alignment

Although Henderson and Venkatraman are often credited for coining 'alignment' as a new concept for the 'fit' between business and IT in their Strategic Alignment Model (Henderson and Venkatraman, 1992 and 1993), some early studies on alignment were published already in the late 70s and 80s (For example McLean and Soden, 1977; Benson and Parker, 1985; Mills, 1986; Brancheau and Wetherbe, 1987; Parker et al., 1988). In fact, BIA is one of the early research streams in information systems (IS) literature (King, 1978; McLean and Soden, 1977). Ever since the introduction of IT in organizations, the 'fitting' of IT solutions to business requirements proved to be a continuous challenge (Luftman et al., 1993). The alignment of business planning and IT planning was also the focus of the Information Systems Planning methods that arose in the early 1980s (Chan and Reich, 2007a). We therefore start this overview of the development of concepts, influences and ideas on BIA, with a brief introduction to these methods.

The era of Information Systems Planning

Together with the rise of IT and IS in organizations, the need for a structured planning and control cycle of IT/IS and IT/IS investments, arose. Information Systems Planning (ISP) is the term used for the early methods that aimed at implementing a structured planning process for IT/IS investments and projects. These methods, for example Business Systems Planning (International Business Machines Corporation, 1981), Information Engineering (Martin, 1982) and Information Systems Study (International Business Machines Corporation, 1986), can be regarded as early manifestations of BIA (Chan and Reich, 2007a). As these early methods were developed in the 1970s and 1980s, at a time when the use of IT/IS in organizations was relatively new, it is not surprising that they were designed for building foundations for the development of large bespoke information systems. The methods therefore focused heavily on the analysis and structure of the data of organizations.

Table 1-1 shows an overview of the topics covered by the three most influential ISP methods (Silvius, 2007a). This overview shows which topics (in our view and at that time) were addressed, and to what extent.

The methods of, and approaches to, ISP developed over the years in focus and scope (Bergin, 1993), for example with regards to their strategic orientation. Some studies (e.g. Lederer and Sethi, 1988; Earl, 1993; Segars et al., 1998) conclude that the methodological nature in the development of ISP, failed to identify the broader set of practices and factors that influenced the use and effectiveness of ISP. These factors include the level of participation of business management in the ISP process, the ownership of the ISP project and the focus of the planning exercise. And although intended as a tool for business management, Pols (2003) concluded, that the formalized methodological nature of ISP made it a procedure by IT professionals, for IT professionals.

From the conclusion that the methods of ISP failed to address the non-methodological aspects of realizing IS planning, Earl (1993) proposed the concept of Strategic Information Systems Planning, a combination of ISP methodology, the process of the planning exercise and the implementation of the plan, as a more complete way of realizing IT/IS planning.

		Business Systems Planning (International Business Machines Corporation, 1981)	Information Engineering Facility (Martin, 1982)	Information Systems Study (International Business Machines Corporation, 1986)
Business Strategy		---	+++	---
Business Processes		+++	+++	+++
Business Data		+++	+++	+++
Business Organization		+	+++	+
IT Applications	as-is	-/-	-/-	+++
	to-be	+++	+++	+++
IT Infrastructure	as-is	-/-	-/-	+++
	to-be	+	+	+
IT Organization	as-is	-/-	-/-	-/-
	to-be	+	+++	-/-
Projects	Existing portfolio	-/-	-/-	-/-
	Proposed portfolio	+++	+++	+++

Legenda +++ = Topic is given full attention
+ = Topic is given some attention
-/- = Topic is given no attention

Table 1-1. Coverage of topics in the main ISP methods.

A next era: from Information Systems Plannin to Strategic Information Systems Planning

The concept of Strategic Information Systems Planning (SISP) evolved during the 1980s (Lederer and Sethi, 1988). The significant difference between SISP and the methods of ISP, is the explicit emphasis on strategic alignment and competitive impact. Earl (1993) confirms that two key defining aspects of SISP are "aligning investment in IS with business goals" and "exploiting IT for competitive advantage" (Earl, 1993: p. 1). In ISP, the alignment of business and IT is one-sided: IT follows business. Lederer and Sethi (1988) adopt in SISP a broad, two-sided view of alignment. They define SISP as "the process of identifying a portfolio of computer-based applications that will assist an organization in executing its business plans and consequently realizing its business goals" (Lederer and Sethi, 1988: p. 446), but also state that SISP entails "searching for applications with a high impact and with the ability to create an advantage over competitors" (Lederer and Sethi, 1988: p.446).

The development of SISP, however, entails more than just a different technique, procedure or method (Earl, 1993). SISP comprises of a mix of procedures, techniques, user–IS interactions, special analyses and random discoveries. SISP is a more holistic approach to the planning of IT/IS investments, supporting companies to tailor the SISP focus, methodology, process and implementation to the needs and context of the organization. For example, the method used for developing an SISP can range from 'no method at all' to a formalized methodological approach (Earl, 1993). And the relation of the SISP to business strategy can range from 'loosely related' to 'jointly developed'.

Tailoring the SISP approach, implies that SISP should fit the organization's needs, conditions and circumstances. This contingency view on SISP, and subsequently on the resulting alignment of business and IT, differs from the earlier ISP methods. We will refer to this perspective later in this chapter.

The new era of Business and IT alignment

Initiated by concepts of strategic alignment developed by Benson and Parker (1985), MacDonald (1991), Baets (1992) and most notably Henderson and Venkatraman (1992, 1993), the second half of the 1990s saw the rise of business and IT alignment (BIA) as a more suitable, and also more contemporary, term for the mutual shaping of business plan and operations on the one hand, and IT/IS plans and operation on the other (Chan and Reich, 2007a). Typical of this era is that some researchers strongly suggest (for example Henderson and Venkatraman, 1993; Woolfe, 1993) that payoffs from IT investment are a function of strategic alignment. Hence, BIA quickly got embraced by organization and practitioners as a new solution to the challenge of fitting IT solutions to business requirements and opportunities (Bloem et al., 2005).

Since the 1990s, BIA has been well studied, as shown by the over 150 BIA studies that were found and analyzed by Chan and Reich (2007b). It is remarkable, however, that the term as such, has many wordings and definitions. Business and IT Alignment is widely used, but other notations that can be found include "Business/IT Alignment" (e.g. Van Grembergen and De Haes, 2010) and "Business – IT Alignment" (e.g. Maur et al., 2009; Maes et al., 2000). Some authors refer to "Strategic Business and IT Alignment", abbreviated as SBITA (e.g. Silva et al., 2006), whereas others simply address BIA as "alignment" (e.g. Chan and Reich, 2007a) or as "strategic alignment" (Henderson and Venkatraman, 1993).

Source	*Definition of BIA*
Henderson and Venkatraman (1993)	The degree of fit and integration between business strategy, information technology strategy, business infrastructure and information technology infrastructure.
Broadbent and Weill (1993)	The degree of congruence of an organization's IT strategy and IT infrastructure with the organization's strategic business objectives and infrastructure.
King and Teo (1996)	The method whereby the IT strategy is derived from the business strategy.
Luftman et al. (1999)	The extent to which IT and business liaise when formulating their mission statements, their objectives and their strategic plans and whether these are supported by the information technology strategy.
Reich and Benbasat (2000).	The degree to which the IT mission, objectives and plans support and are supported by the business mission, objectives and plans.
Campbell (2005)	The process where business and IT work together to achieve a common business goal.
Wieringa et al. (2005)	The problem of matching IT services with the requirements of the business.
Xiang et al. (2008)	The process that helps business organizations understand their goals according to the influence of technology on organizational strategy through the development of a reasonable IT strategy.

Table 1-2. Definitions of business and IT alignment.

Already at the end of 1990s, Maes et al. (2000) concluded that the majority of publications are rather vague in terms of how to define or practice alignment. In fact, there is no consensus on a precise definition of BIA (Kyobe, 2008). Table 1-2 provides a selection of definitions found on the concept of BIA.

When analyzing these definitions, it appears that different words are used to describe or define the word *'alignment'*. Expressions used in the definitions above are "fit" (Henderson and Venkatraman, 1993), "integration" (Henderson and Venkatraman, 1993), "congruence" (Broadbent and Weill, 1993), "derived" (King and Teo, 1996), "liaise" (Luftman et al., 1999), "support" (Reich and Benbasat, 2000), "work together" (Campbell, 2005) and "match" (Wieringa et al., 2005). Silva et al. (2006), found also words like "harmony" (Luftman et al., 1993), "linkage" (Reich, 1993), "bridge" (Ciborra, 1997) and "fusion" (Smaczny, 2001) as descriptions of alignment. It can be observed that terms as 'support' and 'derived' suggest a more hierarchical relationship between business and IT, with IT following business, than terms as 'liaise', 'match', 'fit' and 'integration'.

After considering the many different definitions of BIA, Chan (2002) distinguishes two prevailing conceptualizations of alignment. The first one focuses on planning and objectives integration. This conceptualization views alignment as the degree to which the business mission, objectives and plans are supported by the IT mission, objectives and plans. In other words, business is leading in the alignment process; IT is following, enabling or supporting. This view can be found for example in the work of Reich and Benbasat (1996), Hirschheim and Sabherwal (2001), Kearns and Lederer (2004), Wieringa et al. (2005), and is also recognizable in the earlier ISP methods. The second conceptualization of BIA implies a mutual influence of IT and business in the alignment process (Poels, 2006), and can be found in the seminal work of Henderson and Venkatraman (1993). Their widespread framework of alignment, known as the Strategic Alignment Model, positions IT visually at an equal level as business. This conceptualization of BIA will be described in more detail in the next section. The two-sided view on alignment prevails in today's thinking about BIA (Poels, 2006).

The definitions of BIA not only differ in their description or interpretation of the word alignment. Different views also appear on whether BIA is *a process*, as mentioned in the definitions of King and Teo (1996), Campbell (2005) and Xiang et al. (2008), or *a state*, as suggested by Henderson and Venkatraman (1993), Broadbent and Weill (1993), Luftman et al. (1999) and Reich and Benbasat (2000). Chan and Reich (2007a) observe that both interpretations can be found in literature.

In describing '*business*' in business and IT alignment, the definitions of BIA appear to agree that this covers the strategic mission, goals and plans of the business. Terms used to indicate this include "business strategy" (Henderson and Venkatraman, 1993; King and Teo, 1996), "business mission" (Reich and Benbasat, 2000), "business objectives" (Broadbent and Weill, 1993; Reich and Benbasat, 2000), "business goal" (Campbell, 2005; Xiang et al., 2008) and "strategic plans" (Luftman, 1999; Reich and Benbasat, 2000). The more operational aspects of business, however, only appear in some of the definitions in terms of "business infrastructure" (Henderson and Venkatraman, 1993; Broadbent and Weill, 1993) and "requirements of the business" (Wieringa et al., 2005).

Another relevant difference in the definitions is that some describe BIA as "the problem" (Wieringa et al., 2005), while others address BIA as more solution oriented. For example, King and Teo mention "the method" in their definition of BIS, while Xiang et al. (2008) describe BIA as "the process that helps".

Based upon this analysis of definitions of BIA, we agree with Kyobe's conclusion that there is no consensus on a precise definition (Kyobe, 2008). For our study, we therefore constructed a broad definition of BIA, that covers the main components found in the definitions of alignment in literature:

Business and IT alignment is the degree to which IT applications, infrastructure and organization enable and shape the business strategy and processes, as well as the process to develop this.

In this definition, BIA can express both a *state* or measurable construct, the degree of alignment, as a *process*, the activities or methodology to reach a certain state of alignment. In the definition 'business' is defined by business processes and business strategy and 'IT' is defined as IT applications, infrastructure and organization. This view finds support in the methods of ISP. The question whether IT aligns to business or the other way around is answered as 'enable and shape'. This defines alignment as a two-way process.

The definition also implies that BIA covers not just the alignment process aimed at developing, selecting or enhancing IT applications and infrastructure, but also the agreements regarding the management and maintenance of application and infrastructure services. In the Strategic Alignment Model of Henderson and Venkatraman (1993) this is shown in the different levels of alignment. The strategic level covers the alignment between business strategy and IT strategy, whereas the operational level covers the alignment between business processes & organization and IT infrastructure & organization.

1.2.2 Models of business and IT alignment

In order to clarify what alignment is and how it should be analyzed, several authors developed models or frameworks that conceptualize BIA. Over viewing these, as we will do below, imposes the observation that most of these models can be considered elaborations or extensions of existing models (Mekawy et al., 2009).

Henderson and Venkatraman's Strategic Alignment Model

As the conceptual starting point of alignment, many studies on alignment refer to the *Strategic Alignment Model of Henderson and Venkatraman* (Maur et al., 2009; Avison et al., 2004). The Strategic Alignment Model (Henderson and Venkatraman, 1993) describes BIA along two dimensions (Figure 1-1). The dimension of strategic fit differentiates between external focus, directed towards the business environment, and internal focus, directed towards administrative structures. The other dimension, functional integration, distinguishes the business and IT domains. Combining these two dimensions, the model defines four 'quadrants' of strategic choice: business strategy, IT strategy, organization infrastructure and processes, and IT infrastructure and processes. Each of these quadrants has its constituent components. On the strategic level: scope, competences and governance, and on the organization level: infrastructure, processes and skills.

In the Strategic Alignment Model, alignment is about creating fit between the domains, business and IT, and the perspectives, external on the strategic level, and internal on the organizational level. Henderson and Venkatraman (1993) suggest different potential approaches to achieve alignment: (1) strategy execution, (2) technology potential, (3) competitive potential, and (4) service level.

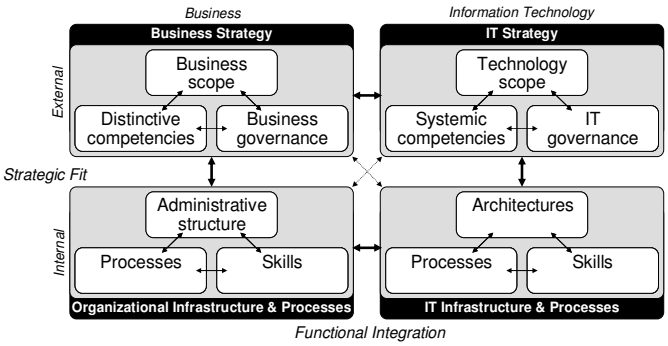

Figure 1-1. The Strategic Alignment Model (Henderson and Venkatraman, 1993).

Each approach has its own starting point (anchor quadrant), mean (pivot quadrant) and effect domain (target quadrant) (Coleman and Papp, 2006). The anchor quadrant represents the business area that will generally be the initiator of change and will provide the majority of requests for IT services. The pivot quadrant represents the functional area that will 'translate' the change initiated by the anchor quadrant into implementable plans, requirements and actions. The impact quadrant, finally, is impacted the greatest by the change initiated by the anchor quadrant. (Avison et al., 2004).

The significance of Henderson and Venkatraman's Strategic Alignment Model goes beyond the conceptualization of the constituting components of alignment. The different alignment approaches extended the 'IT follows business' approach that characterized the traditional approach to alignment and provided a more holistic conceptualization of BIA. Especially innovative were the IT driven approaches to alignment, competitive potential and service level, that suggested that IT could also lead the business, instead of follow it.

Despite being the foundation for many studies on alignment (Avison et al., 2004), the Strategic Alignment Model does not provide a construct or instrument on how to measure and evaluate alignment (Marques Pereira and Sousa, 2003). Empirical studies on alignment therefore mostly apply models that should be considered extensions of the Strategic Alignment Model (Mekawy, et al., 2009).

Conceptual elaborations on BIA and Henderson and Venkatraman's model

Several authors elaborated on Henderson and Venkatraman's Strategic Alignment Model in further conceptualizations of alignment.

One example is *Goedvolk et al.* (1997), that elaborated on the architecture perspective on alignment in, what is called, the Integrated Architecture Framework. The Integrated Architecture Framework advocates architecture as a catalyst of aligning business and IT (Mekawy et al., 2009), and expands the functional areas of the Strategic Alignment Framework into four 'Major Architecture Areas': Business, Information, Information Systems and Technology. The distinction in an external and an internal perspective, that was included in the Strategic Alignment Model, is abandoned. The Integrated Architecture Framework presents a three-layer design approach: conceptual, logical and physical. While Henderson and Venkatraman's model suggested different approached to alignment, with different anchor, pivot and anchor domains, the Integrated Architecture Framework advocates a top-down, design based, approach to alignment. The Integrated Architecture also does not consider the social or economical aspects of alignment (Luftman and Kempaiah, 2007).

Empirical applications of the framework therefore focused on structuring the relationships between enterprise architectures and IT architectures.

Maes et al. (2000) build upon the Integrated Architecture Framework in their 'unified framework for alignment'. In this '9-squares' unified model, that shows great similarity with the Integrated Architecture Framework, the functional 'columns' are limited to three: business, information/communication and technology. This unified framework is an attempt to modify the Strategic Alignment Model to reflect the fact that "IT and business strategies are moving closer together as technology evolves and becomes more integrated" (Avison et al, 2004: p. 232). By distinguishing information/communication and technology as separate domains, the authors emphasize that not the provision of information is a source of competitive advantage, but the use of it. Information sharing acts as a buffer between business and technology. Maes' unified model also distinguishes three levels: strategy, structure and operations (Mekawy et al., 2009). The model of Maes et al. (2000) was soon adopted by practitioners as an overview of the process areas in the business and IT alignment domain (Poels, 2006). However, it was also missing a measurable construct or instrument.

While the Integrated Architecture Framework model focuses on the architecture dimension of BIA, other authors presented other perspectives. For example, in their model of alignment, *Reich and Benbasat* (2000) focus on the social dimension. Their model identifies four factors to apprehend alignment: shared domain knowledge, IT implementation success, communication between business and IT executives and connections between business and IT planning. In their study, Reich and Benbasat, also developed measurement scales of their constructs and applied these constructs in an empirical study. A limitation of this model is that in its focus in the social dimension of alignment, it neglects the intellectual dimension (Makawy et al., 2009).

Another framework was developed by *Chan et al.* (1997). This model, called *STROIS* (Strategic Orientation of IS), focuses on the strategic dimension of alignment. STROIS is based on the earlier STROBE (Strategic Orientation of Business Enterprises) model of Venkatraman (1989). The Chan et al. (1997) study measured business strategic orientation, IS strategic orientation, and IS strategic alignment, and investigated their implications for perceived IS effectiveness and business performance. It found empirical support for modeling IT strategic alignment as a moderation or synergistic approach, rather than a simple matching or mirroring approach. Some later studies (for example Ma and Burn, 1998; Cragg et al., 2002) followed the approach of assessing alignment based on the combination of STROBE and STROIS.

Sabherwal and Chan (2001) also elaborated on the strategic dimension of alignment. In their study on the relationship between business strategy and IT strategy, they matched different IT strategies with the business strategy typology developed by Miles and Snow (1978). Their model of fit between business strategies and IT strategies has an emphasize on "realized strategies, rather than intended strategies, and IS strategy, rather than IT or information management (IM) strategies" (Mekawy, et al., 2009: p. 450). Sabberwal and Chan concluded that a 'defender' business strategy (following, aiming to reduce costs, maximizing efficiency and effectiveness of operations, while avoiding organizational change) is best served with a 'IT for efficiency' strategy, in which IT is oriented towards internal and inter-organizational efficiencies and improved decision making. A 'prospector' business strategy (leading, reacting first on changes in the market) is best served by 'IT for flexibility', which focuses on market flexibility, time-to-market and quick decision making. And lastly, an 'analyzer' business strategy (observing, closely watching competitor's activities and carefully evaluating

changes) is best matched by a 'IT for comprehensiveness' strategy, which allows for quick responses and comprehensive decision making, based on knowledge of market situations and other organizations.

Empirical elaborations on BIA and Henderson and Venkatraman's model

The previous section presents different models and frameworks, illustrating that BIA has been by conceptually elaborated from different perspectives. These models and frameworks extend the conceptual interpretation of what BIA is, and as such, these models have their values. However, most of them lack a practical or instrumental dimension. Avison et al. (2004) observe that "there is little in the literature at present that explains what a manager should do with these frameworks other than understand them conceptually" (p. 234). For this reason, the following section will present models that provide a practical operationalization of BIA, and overview the work of scholars that elaborated BIA by instruments for empirical research.

Probably one of the most cited and empirically applied (Mekawy et al, 2009) development models on BIA is the *Strategic Alignment Maturity (SAM) model* designed by *Luftman* (Luftman, 2000). This model presents BIA both in constituting factors and in levels of organizational maturity. The SAM model therefore provides not just a empirical conceptualization of alignment, but also a path of action, an operationalization, for organizations that aim to develop alignment maturity. Since its publication, the application of the SAM model has been reported in several scholarly publications (for example Ekstedt et al., 2005, Cumps et al., 2006b; De Haes and Van Grembergen, 2008; Luftman and Kempaiah, 2007; Chen, 2010). It has also been validated in several studies (Sledgianowski et al., 2006; Luftman et al., 2008; Chen, 2010).

BIA maturity variable	*Description*
Communication	How well does the technical and business staff understand each other? Do they connect easily and frequently? Does the company communicate effectively with consultants, vendors and partners? Does it disseminate organizational learning internally?
Value measurement	How well does the company measure its own performance and the value of its projects? After projects are completed, do they evaluate what went right and what went wrong? Do they improve the internal processes so that the next project will be better?
Governance	Do the projects that are undertaken flow from an understanding of the business strategy? Do they support that strategy? Does the organization have transparency and accountability for outcomes of IT projects.
Partnership	To what extend have business and IT departments forged true partnerships based on mutual trust and sharing risks and rewards?
Scope & Architecture	To what extend has technology evolved to become more than just business support? How has it helped the business to grow, compete and profit?
Skills	Does the staff have the skills needed to be effective? How well does the technical staff understand business drivers and speak the language of the business? How well does the business staff understand relevant technology concepts?

Table 1-3. The BIA maturity variables of Luftman's SAM model
(adapted from Luftman, 2000).

The SAM model recognizes six criteria (or variables) to measure the maturity of alignment (Table 1-3, adapted from Luftman, 2000). These variables can be assessed on a five-level maturity scale, ranking from an 'Ad Hoc Process' to an 'Optimized Process'.

The variables of the SAM model provide a comprehensive overview of the constituting elements of alignment, and a good insight into the characteristics of the different levels of maturity. With the SAM model, organizations can assess their level of alignment in order to derive a better understanding of their BIA capability. After this assessment, the description of the next highest maturity level of each variable provides a guiding insight for the actions required to develop to the higher level of maturity. In this way, the SAM model provides a prescriptive roadmap for the development of alignment in an organization. Assessment approaches in general are becoming an accepted way of measuring complex phenomena (Plazaola et al., 2006). The decomposition of the phenomenon into a set of underlying components makes it easier to find empirical data, compared to the original phenomenon as a whole. Luftman's SAM model can be preferred above the classic maturity models that are based on the Software Engineering Institute's Capability Maturity Model (Carnegie Mellon Software Engineering Institute, 2002), that limit their concepts of maturity to process maturity. Recent insights show that true organizational maturity also requires non-process factors, such as human factors (Pasian et al., 2012), making the holistic approach on maturity, that the SAM model represents, the preferable one.

In the Netherlands, *Scheper* (2002) was one of the scholars that criticized the concepts and relations in Henderson and Venkatraman's Strategic Alignment Model, with regard to the point that they are not operationalized, nor clearly defined. Hence, he concluded that the model it is not very useful for empirical research (Scheper, 2002). As an alternative, Scheper defines five relevant domains, drawing back on Turban et al. (1999), to construct his BIA maturity model. This model is based on five interrelated alignment dimensions that are critical for any type of organization: (1) strategy and policy, (2) monitoring and control, (3) organizational structure and processes, (4) information technology, and (5) people and culture. Scheper operationalizes the concept of alignment by defining maturity levels for each of the five dimensions, and subsequently measuring the imbalances between the maturity scores. This measurement of alignment is visualized by (5-dimensional) spider graphs, and formalized by metrics that measure (standardize) the level of multidimensional alignment. The model of Scheper has been applied and elaborated upon in further studies, for example by Batenburg and Versendaal (2004, 2008a, 2008b), Helms et al. (2006) and Wijngaert et al. (2008). Interesting in these studies is that the model of Scheper is tailored for specific applications in business functions, for example customer relationship management (Batenburg and Versendaal, 2004 and 2008a), e-procurement (Batenburg and Versendaal, 2008b), product lifecycle management (Helms et al., 2006) and logistics (Wijngaert et al., 2008). Van de Wetering et al. (2011) tailored Scheper's model to a specific industry and IT, by developing a BIA maturity model for picture archive communication systems in hospitals. In tailoring the maturity model of Scheper to specific application domains, these studies add a contingency perspective to alignment research.

Mekawy et al. (2009) provided an evaluation of BIA models, including most of the models described above. Based on evaluation of the models on 23 criteria, including conceptual completeness, flexibility, complexity, empirical applicability and effectiveness, they concluded that Luftman's SAM model is the most established and most comprehensive model of alignment.

Given the qualities of the SAM model as a measurable, yet holistic, conceptualization of alignment, the conclusion from the evaluation by Mekawy et al. (2009), and the fact that the SAM model is applied in over 20 studies on alignment[1], by academics in both North and South America, Europe and Asia, we adopted Luftman's SAM model as the operationalization of BIA in our studies.

1.2.3 The quest for mastering business and IT alignment and its added value

Now we have summarized what BIA includes, and how it is conceptually and empirically defined, a basic question remains: does BIA indeed add value to organizations. And if so, what do we know about the barriers and challenges of BIA?

Obviously, as the alignment of IT and business is aimed at enabling business strategy, the goal of alignment is to create value (Poels, 2006). Alignment should lead to business value resulting from the use of IT, in terms of increased business performance (Van Grembergen and De Haes, 2010). However, measuring IT benefits and value is frequently reported as one of the most important issues for senior IT management (Brancheau and Wetherbe, 1987; Niederman, Brancheau and Wetherbe, 1991; Whitling et al, 1996). And the relationship between IT investments and value has been well studied in the last decades. The empirical studies on this topic showed mixed results (Soh and Markus, 1995). Several studies showed that the relationship between IT investments and organizational performance could not be proven (Loveman, 1988; Kauffman and Weill, 1989; Salmela, 1997). This result became known as the 'IT productivity paradox' (Brynjolfsson, 1993).

Barua and Mukhopadhyay (2000) concluded that these studies into the value of IT ignored the synergistic effects of IT with other organizational factors. Also Brynjolfsson and Hitt (2000) suggested that research into the relationships between IT and other organizational factors and the resulting effects on performance is needed, in order to advance our understanding of the value of IT. A specific IT investment can have a positive return in organization A and a negative or no return in organization B, depending on when, how and why IT is used in an organization (Soh and Markus, 1995). This approach to the valuation of IT, not focusing on value as a function of IT investments, but focusing on the conditions and situational circumstances in which IT can create value in organizations, is known as the process approach to IT value (Mooney et al, 1995). With its focus on the why, how and when questions of IT value creation in organizations, the process approach links the value and valuation of IT to alignment. Also Henderson and Venkatraman (1993) and Woolfe (1993) suggest that payoffs from IT investment are a function of strategic alignment.

The seemingly 'logical' relation between alignment and value is, however, not reflected in the vast amount of research on IT valuation. The question remains therefore, how BIA effects, or should effect, the valuation of IT in organizations. The unexplored relationship between alignment and IT valuation, and hence, between alignment and IT value, may be one of the reasons, why BIA remains a prominent area of concern for IT and business executives. Despite the conceptualizations and operationalizations of alignment, presented in the previous paragraphs, aligning IT and business needs is still an important challenge for many organizations (Society of Information Management, 2003 - 2010). This observation also questions the applicability and/or validity of the models and frameworks that have been developed. In order to analyze the reasons why alignment has not been 'mastered' yet, we list below the (in our view) most important challenges with BIA that appear from empirical studies.

[1] An overview of these studies is provided in Table 5-1 in chapter 5.

Not a universally accepted framework or model

After many years of research into alignment, a single universally accepted and recognized framework or model still is lacking (Luftman and Kempaiah, 2007). A universal framework would provide a shared foundation for academics and practitioners to study or understand alignment, thereby improving the body of knowledge on the topic.

As mentioned earlier, Henderson and Venkatraman's Strategic Alignment Model should be considered the conceptual starting point of models and frameworks on BIA (Maur et al., 2009). However, it was also concluded that where this model helps us to understand the components that may determine alignment, it fails to provide a roadmap on how to achieve alignment (Marques Pereira and Sousa, 2003). The models of alignment presented in section 1.2.2. provide elaborations of the Strategic Alignment Model, all with specific qualities and limitations (Mekawy et al., 2009). None of these models can claim universal recognition, however, several authors (Poels, 2006; Mekawy et al., 2009; Chen, 2010) consider the SAM model provided by Luftman (2000), the most established and most comprehensive conceptualization of alignment.

Descriptive vs. prescriptive models of alignment

The conceptualizations of alignment, as presented in section 1.2.2. are mostly descriptive in nature. Henderson and Venkatraman's Strategic Alignment Model, Goedvolk et al.'s Integrated Architecture Framework, Maes et al.'s unified framework, etc. all provide a view or perspective on *what alignment is*, or which different components contribute to BIA. The application of these insights to business practice, however, requires a 'translation' from descriptive theory to more prescriptive theory. Prescriptive in the way of providing roadmaps or guidelines on *how to achieve alignment*. Marques Pereira and Sousa (2003) state in this context that analyzing alignment in organizations, requires a more detailed interpretation and definition than presented in Henderson and Venkatraman's Strategic Alignment Model. The maturity models on alignment, developed by Luftman (2000) and Scheper (2002), provide a promising approach to more prescriptive insights. Their application to specific organizational contexts, however, still needs to grow.

Limited measurability of alignment

For anyone interested in managing alignment in an organization, it is important to have a clear picture of what alignment is and how it can be assessed (Silva et al., 2006). This statement refers to the frequently heard management wisdom, that tells us that you cannot change what you cannot manage, and that you cannot manage what you cannot measure. An important condition for the improvement of BIA in organizations is therefore the availability of metrics for alignment (Luftman and Kempaiah, 2007). And while the models and definitions presented in earlier sections point out several components contributing to alignment, no agreement is reached on how these components can be assessed and the respective contribution to alignment of these components (Silva et al., 2006).

Alignment requires a holistic approach

As another reason why alignment is so elusive, Luftman and Kempaiah (2007) point out that professionals have often been looking for a simple solution to alignment. On different moments in time, this 'silver bullet' was expected from process frameworks (For example ITIL or CobiT), IT architecture, IT governance or IT value benchmarking. The conceptualizations and operationalizations of alignment presented in section 1.2.2., however, show that BIA requires a holistic approach in which there are very few simple solutions.

The unfamiliarity or ambiguity of business

Chan and Reich (2007a) point out that "alignment is not possible if the business strategy is unknown or in process" (Chan and Reich, 2007a: p.298). As most alignment models identify business strategy as one of the organizational components to align to, or align with, an unknown or unclear business strategy poses a logical challenge in BIA. And however unlikely this argument may seem, the unfamiliarity or ambiguity of business strategy is a recurring theme in research on alignment (for example Reich and Benbasat, 2000; Beats, 1992; Campbell, 2005).

A dynamic reality

A practical issue with aligning IT to business strategy is caused by the increasing dynamics in markets and organizations. Organizations are continuously adapting to changes in market circumstances, technology, customer preferences, etc. Because of this continuous process of change, Chan and Reich (2007a) observe that "there may be no such thing as a 'state' of alignment" (Chan and Reich, 2007a: p. 299). BIA is therefore a destiny that may never be reached. Several authors have emphasized that alignment is a process, rather than a 'state' (Parker et al., 1988; Niederman et al., 1991; Baets and Galliers, 1998; Chan and Reich, 2007a). Weill and Broadbent (1998) also support this process view when they state "Alignment is a journey, not an event". Luftman (2003) connects the two perspectives when he states, "The endless, quicksilver shifting of business strategies and technology makes aligning them as difficult as surveying sand dunes in the Sahara. Organizations must draw 'a line' in the sand, however, and continuously ensure that the process for aligning IT and business is appropriately managed." (Luftman, 2003: p. 143).

The evolving role of IT

A final explanation of the disconnect between alignment theory and practice should be found in the changing role of IT in organizations. Many important studies on alignment (For example Chan et al., 1997; Sabherwal and Kirs, 1994) were performed 10 to 20 years ago (Yayla and Hu, 2009). The last decennium, however, saw a shift in the role of IT in organizations, as internet allowed companies to open up new markets, develop new services or provide new means of developing customer loyalty, thereby innovating the business of a company (Silvius, 2006). So, from an enabler of business, which was the traditional view on IT in the ISP methods, IT developed into an innovator of business. And since IT is more and more integrated in the products, services and market propositions of organizations, the changing role of IT can also be expected to influence the way alignment can be achieved. Alignment should not only address how IT aligns to business but, more than ever, also how business aligns to IT (Luftman and Kempaiah, 2007).

We conclude that alignment continues to be a challenge for many organizations because organizational or situational circumstances influence alignment, and that these influences are not adequately addressed in the available models and frameworks of BIA. Alignment is not a 'one-size fits all' concept (Palmer and Markus, 2000). Shams and Wheeler (2003) ask what alignment states or modes fit different strategic orientations and organizational contexts and structures. Also Chan and Reich (2007a) observe the need for more research on situational influences on alignment, when they call upon the academic community to take a contingency perspective in their further studies on alignment.

1.2.4 Towards a theoretical foundation of business IT alignment

A critique on the models and conceptualizations of BIA is that they are largely atheoretic (Chan and Reich, 2007a). One of the reasons for this being that the theoretical foundation of BIA is still immature (Chan and Reich, 2007a). Hence, theoretical elaboration of concepts that undergird alignment research is much needed (Baker and Jones, 2008).

In their analysis of the underlying theoretical perspectives in alignment research, Baker and Jones (2008) observe that many models and studies on BIA apply *a resource-based perspective*. The resource-based view of the firm (RBV) originates from the work of Penrose (1959) and was formalized as a theory by Barney (1991). RBV focuses on resources as the primary source of organizational performance and competitive advantage. In economic theory, the 'resources', as considered in the RBV, were initially confined to categories such as labor, capital, and land (Wernerfelt, 1984). It took until the 1990s that the RBV was extended to include a broader set of unique, non-duplicatable resources, such as 'technology skills' (Wernerfelt, 1984).

RBV has frequently been applied in alignment research (Wade and Hulland, 2004), for example to explain that sharing domain knowledge between business and IT managers supports strategic alignment, improves the quality of project planning, reduces problems with IT projects, and improve organizational performance (Kearns and Sabherwal, 2006-7). Other examples of the application of the RBV include studies on how the strategy of an organization influences its productive interactions with other organizations (Madhok, 2002) and on how the capabilities of an organization allow it to use information resources to build competitive advantage (Johnston and Carrico, 1988). And in his RBV study on the relationship between IT capability and firm performance, Bharadwaj (2000) concludes that the organizational capability to create a "synergistic combinations of IT resources and other organizational resources and capabilities" is one of the explaining factors behind the inconsistent statistical findings about the relationship between IT and firm performance (Bharadwaj, 2000: p.186). Implicitly or explicitly, the RBV is one of the theoretical underpinnings of alignment research (Chan and Reich, 2007a).

The focus on internal resources through the RBV created some critiques (Eisenhardt and Martin, 2000; Winter, 2003). The first critique concerns RBV's focus on resources that are internal to the firm. Because of this internal focus, RBV tends to overlook cooperation on external sources or capabilities. And although the RBV recognizes that the value of an organization's resources and capabilities is determined by the market context within the firm is operating (Wernerfelt, 1984; Priem and Butler, 2001), it tends to overlook the role of joint exploration and exploitation of resources (Dyer and Singh, 1998).

The background of a second critique, is the debate regarding what, in the RBV, is meant by a resource. The RBV assumes that resources can be acquired and owned by the organization (Ballantyne and Varey, 2008), which has led to the interpretation of a firm's resources as being primarily tangible, static assets (Lusch and Vargo, 2006). This led to the critique that RBV is inherently static in nature (Eisenhardt and Martin, 2000). However, researchers using the RBV have also included intangible assets, such as competencies (Prahalad and Hamel, 1990) and skills (Grant, 1991), in the firm's resources. These intangible resources are important for the dynamic capability of an organization to innovative, thereby countering the critique of the static nature of the RBV. In this view, resources provide the organizational capability to be dynamic (Bharadwaj, 2000).

The organizational capability to adapt and change developed into the *dynamic capabilities (DC) perspective* (Teece et al., 1997). This perspective elaborates the view that, in addition to assets, also (intangible) capabilities should be seen as resources that influence firm performance. The DC perspective can also be found in the literature on BIA, especially with those authors that take a

development view on BIA (for example Luftman, 2000; Avison et al., 2004), or define BIA as a process (for example Campbell, 2005). The DC perspective was introduced by Teece et al. (1997) and Eisenhardt and Martin (2000). DC attempt to provide a more dynamic perspective on an organization's resources and capabilities, by recognizing the fact that the business environment of organizations changes and by adopting a process approach to adapt the organization's resources to this changing business environment. DC complements the 'static' view of RBV by emphasizing the organization's process of resource development and renewal. Baker and Jones (2008) apply DC to alignment in the development of what they call "a framework for Sustained Strategic Alignment", i.e. a framework of how alignment can be sustained over time.

More recently, Baker and Jones (2008) observe that the studies on alignment also imply a *contingency perspective*, as the degree of alignment is contingent to factors that make up alignment. However, next to this implicit interpretation of contingency, also another contingency perspective should be identified, namely the way the factors that make up alignment are influenced by *situational or contextual factors* that are *not* covered in the models of alignment. The key proposition is that successful alignment of business and IT requires an understanding of how the organization's contextual factors influence alignment (Kearns and Lederer, 2004). In fact, this conclusion might be one of the fundamental reasons why alignment is so elusive. Research on alignment should therefore address the influence of situational and contextual factors. The studies by Batenburg and Versendaal (2004, 2008a, 2008b), Helms et al. (2006), Wijngaert et al. (2008) and Wetering et al. (2011) actually apply a contingency perspective, by analyzing BIA in different business functions and industries. However, the application of the contingency perspective on BIA alignment is still in its infancy. Other situational or contextual factors that are suggested in studies on alignment include the strategic orientation (Chan et al., 2006), company size (Chan and Reich, 2007a), outsourcing of the IT function (Lacity et al., 1996; Cybulski and Lukaitic, 2005) and culture (Pyburn, 1983; Chan, 2002).

In this dissertation, we specifically take a contingency perspective on BIA. As described in the next sections, the studies presented address different contingencies, i.e. the influence of IT outsourcing, strategic orientation, organizational culture and national culture on alignment.

1.3 Research approach and questions

In this section the research approach of the dissertation, the research questions and the research methods that are applied are presented.

1.3.1 A contingency perspective on alignment

As is mentioned above, our study will elaborate the contingency perspective on alignment. This perspective is based on two leading assumptions (Galbraith, 1973):

1. there is no one best way to organize;
2. any way of organizing is not equally effective in different organizations.

Contingency theory claims that "the best way to organize depends on the nature of the environment to which the organization relates" (Scott, 1992: p.132). The termed was coined by Lawrence and Lorsch in 1967 who argued that the amount of uncertainty and rate of change in an environment impacts the internal structure and processes of organizations. Organizations should therefore not strive towards a universal best way of organizing, but towards the best 'fit' of their organization's resources and the external environment.

Following Galbraith's assumptions, a contingency perspective on alignment implies that:

1. there is no one best way to organize *alignment*;
2. any way of organizing *alignment* is not equally effective in different organizations.

Or as Chan and Reich (2007a: p. 307) state: "Applied to IT alignment, contingency theory tells us that certain contextual and organizational factors fit together to facilitate alignment.". Studies that aim to find a universal 'recipe' for developing BIA (for example Poels, 2006) are, in this view, over-simplifying the alignment challenge. Causal relations between actions and alignment are not straightforward, but are influenced by contextual and situational factors of a specific case.

A theoretical positioning for studying the influence of contextual and organizational factors on causal relationships can be provided by Coleman's model of social mechanisms, the so-called Coleman's boat model (Coleman, 1990). Coleman distinguishes a 'macro' and a 'micro' level in explaining the relationship between two phenomena.

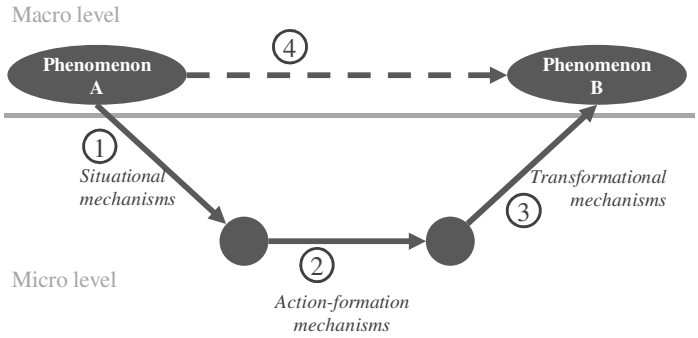

Figure 1-2. Coleman's model of social mechanisms (Hedström and Ylikoski, 2010).

The macro relationship, illustrated by line (4) in Figure 1-2, is the main target to be explained, and relates two macro phenomena. In many studies in the field of social sciences, this macro relationship is poorly understood, explanations are incomplete and not consistent, leading to unsatisfactory results about the characteristics of the relationship (Hedström and Ylikoski, 2010). The reason for this is that this type of causal relationships is an abstraction (Coleman, 1990). And although the relationship is relevant for creating a general (descriptive) understanding, it is not specific enough for the actual (explanatory) identification of causal influences (Little, 2012). As Little puts is, the causal relationship between the phenomena "can only work through disaggregated effects at the micro level" (Little, 2012: p.141).

Coleman's model implies that the relationship at micro level, should be understood by mechanism-based explanations of phenomena on a more detailed level. First, it identifies *situational mechanisms* ('1' in Figure 1-2), "by which social structures constrain individuals' action and cultural environments that shape their desires and beliefs" (Hedström and Ylikoski, 2010: p.59). Second, *action-formation mechanisms* ('2' in Figure 1-2), that are "linking individuals' desires, beliefs, etc., to their actions" (Hedström and Ylikoski, 2010: p.59). And third, *transformational mechanisms* ('3' in Figure 1-2) "by which individuals, through their actions and interactions, generate various intended and unintended social outcomes" (Hedström and Ylikoski, 2010: p.59). "Only by understanding the whole chain of situational, action-formation, and transformational mechanisms" (Hedström and Ylikoski, 2010: p59), can the relationship between the two phenomena be understood (Coleman, 1990).

When applied to the relationship between actions to improve alignment and BIA, through explicitly recognized contingencies (situational factors), the specification Coleman's model can be as illustrated in Figure 1-3.

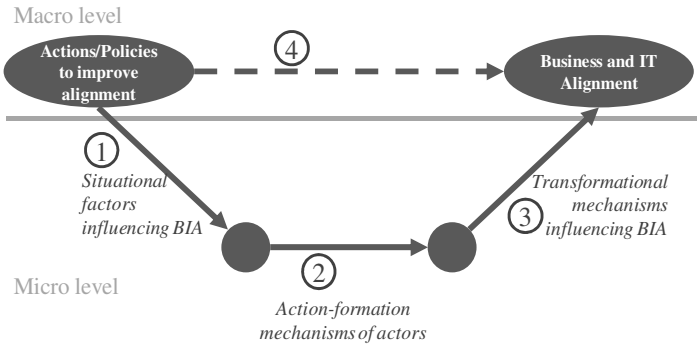

Figure 1-3. Coleman's model applied to the alignment question.

This Figure 1-3 actually depicts the key objective and plan of this dissertation, that can be shortly stated as to debunk the situational influences on BIA. This will be elaborated in the research questions in the next paragraph.

1.3.2 Research questions

In order to explore and understand the influence of situational factors, the main research question (MRQ) of this dissertation is formulated as follows:

MRQ: ***How do situational factors influence business and IT alignment maturity?***

This MRQ is broken down into three research questions (RQs) that follow the line of reasoning we built up in section 1.2:

RQ A: ***How does business and IT alignment effect the valuation of IT in organizations?***

RQ B: ***How do variables of business and IT alignment differ in their contribution to an organization's business and IT alignment maturity?***

RQ C: ***How do specific situational factors influence an organization's business and IT alignment maturity?***

The next section discusses the three RQs in more detail.

RQ A: ***How does business and IT alignment effect the valuation of IT in organizations?***

> As discussed in section 1.2.3. the value derived from IT in an organization can be considered as the output, or goal, of business and IT alignment. However, it was also concluded that the relation between alignment and IT valuation is not reflected in a vast amount of research

regarding the value of IT in organizations (Tallon and Kraemer, 1999). The question remains therefore, how BIA effects, or should effect, the valuation of IT in organizations.

In order to develop an answer to this question, we will first present a literature study on IT valuation models to understand *What IT valuation methods are available to capture the value of IT?* Researchers and practitioners have created numerous models and valuation methods to capture the value of IT. And although payoffs from IT investment are a function of strategic alignment, most of these models do not address the alignment of business and IT as a factor that influences or creates value. A second question is *How these IT valuation method fit with the specific characteristics, impacts and organizational context of an IT asset or investment?* This question explores the role of BIA in the valuation methods of IT assets and investments. It focuses on the impacts resulting from the use of IT assets, considering the function and nature of the impacts. It also explores the alignment of IT valuation and business strategy.

RQ B: ***How do variables of business and IT alignment differ in their contribution to an organization's business and IT alignment maturity?***

This question aims to identify the most 'important' factor or 'working ingredient' in creating of alignment. A logical sub-question would therefore be *What factors or variables make up alignment?* This question was answered in section is 1.2.2, where we discussed the different models and conceptualizations of BIA. In this section, we selected Luftman's SAM model as the operationalization of BIA in our studies. We can therefore reformulate this RQ as *How do variables of Luftman's SAM model differ in their contribution to an organization's business and IT alignment maturity?* The SAM model consists of 6 variables and 38 sub-variables. In the model, all variables and sub-variables are given equal weight, indicating equal importance. But the question arises whether this implicit assumption is correct? Do all variables contribute equally to alignment? Or do some variables of the SAM model contribute more than others? And, if so, how much do they contribute? The relevance of these questions are evident. Adding relative weights to the variables would refine Luftman's SAM model and contribute to a better understanding of how alignment can be influenced and achieved.

In answering the question which variables contribute most, we will take a twofold approach. Firstly, we will ask business and IT professionals working in the field of alignment their opinion on which variables of SAM contribute most. The research question of this study will be *How do IT and business professionals perceive the contribution of the different variables and sub-variables of the SAM model to the alignment of business and IT?* This study will provide valuable insights in the views and experiences of practitioners. However, these views represent the perceived contributions of the variables. The question remains whether these perceived contributions also represent the actual contributions.

In order to shed light on the actual contributions of the SAM variables, we challenged the premise of the SAM model, that maturity on the six criteria should be developed more or less equally (Luftman and Kempaiah, 2007). And since some studies (Chen, 2010; Silvius and De Waal, 2010;) suggest that an equal development of all six variables is not always desirable, we studied *How do scoring patterns of organizations on the six SAM criteria differ? and How are these scoring patterns related to the overall alignment maturity level of the organizations?* Addressing these question, provides organizations with a tool to determine their alignment strategy, and to develop their alignment maturity.

RQ C: ***How do specific situational factors influence an organization's business and IT alignment maturity?***

The third RQ can be positioned in our application of Coleman's model by the relationship between organizational actions and policies aimed at improving alignment and alignment maturity in organizations. In this dissertation, a selection of situational influences are addressed: IT outsourcing, strategic orientation, organizational culture and national culture. These influences are studied in coordinate studies on specific situational factors, with no interrelations between the research questions of these studies.

A first specific situational factor studied in our research is the effect of IT outsourcing. Outsourcing of business processes and IT operations is an important trend in large and middle-sized organizations. Logically, outsourcing will affect the organization's ability to align its IT with business strategy and operations, for example communication and governance structures may be more formalized, making the value of IT services more transparent, but possibly hindering partnership between service provider and service requester. However, only few studies relate this outsourcing trend to BIA. Lacity et al. (2009), in their study of 357 publications on ITO, found only two articles relating ITO with BIA, and Chan and Reich (2007b) in their overview of 156 studies related to BIA, only six. These studies did not provide a conclusive answer as to how the concepts are interrelated. The research question of this study is therefore *What is the effect of IT outsourcing on the business and IT alignment of companies that have outsourced their IT?*

A second specific situational factor is addressed in the question *What is the relationship between business strategy, IT strategy and alignment capability?* This study refers to Shams and Wheeler's question on what alignment states or modes fit different strategic orientations (Shams and Wheeler, 2003). The conclusion that organizations that successfully align their business strategy and their IT strategy, outperform their non-aligned peers (Chan et al., 1997), may be valid in general. However, business strategies differ between organizations, like IT strategies do. And how do these differing strategies relate to alignment capability or maturity? This research question explores the relationship between business strategy, IT strategy and alignment capability, in order to create a better understanding of the specific situational factor of strategic orientation.

Another situational factor that is expected to influence alignment is organizational culture (Pyburn, 1983; Chan, 2002). The research question of the study that explored this influence is therefore *What is the relationship between organizational culture and the alignment of business and IT?* This research question is aimed at analyzing and understanding the relationship between organizational culture and BIA. More specifically, instead of just looking for a general relationship between organizational culture and BIA, this study aimed to understand the relationship between specific aspects of organizational culture and BIA.

The last study in this dissertation concerns the influence of national cultures on alignment. National cultures are a strong influencer of personal values and of organizational culture. And as culture was identified as one of the organizational contingency factors, it makes sense to understand the influence of national culture on BIA. The specific research question of this study was *How does national culture influence the alignment of business and IT in organizations?* This question analyzes and explains the relationship between national culture and BIA and seeks to develop insights that may guide practitioners in taking national cultures into account, when aligning business and IT.

1.3.3 Research methods

As is generally acknowledged, research can be defined as a process of systematic detection to improve knowledge (Saunders et al., 2007). It requires rigor, appropriateness of research methods and soundness of data-gathering methods and analysis, and relevance, contributing to theoretical or practical knowledge development (Rosemann and Vessey, 2008). More specifically, Gregor (2006) identifies four central goals of theory: analysis, explanation, prediction and prescription. Based on these four goals, she proposes a taxonomy that classifies information systems theories with respect to the manner in which these goals are addressed. Table 1-5 presents this classification.

<table>
<tr><td>Theory type</td><td colspan="3">Distinguishing attributes</td></tr>
<tr><td>I. Analysis</td><td colspan="3">Says “what is”.
The theory does not extend beyond analysis and description. No causal relationships among phenomena are specified and no predictions are made.</td></tr>
<tr><td>II. Explanation</td><td>Says “what is”, “how”, “why”, “when”, “where”. The theory provides explanations but does not aim to predict with any precision. There are no testable propositions.</td><td rowspan="2">IV. Explanation and prediction</td><td rowspan="2">Says “what is”, “how”, “why”, “when”, “where” and “what will be”. Provides predictions and has both testable propositions and causal explanations.</td></tr>
<tr><td>III. Prediction</td><td>Says “what is” and “what will be”. The theory provides predictions and has testable propositions but does not have well-developed justificatory causal explanations.</td></tr>
<tr><td>V. Design and action</td><td colspan="3">Says “how to do something”.
The theory gives explicit prescriptions (e.g., methods, techniques, principles of form and function) for constructing an artifact.</td></tr>
</table>

Table 1-5. Types of theory in IS research (adapted from Gregor, 2006)

Given the research questions of our study, which can be characterized as ‘How?’ questions, the nature of our research is largely that of analysis and explanation. In answering these questions, we combined different research methods: Literature study, Quantitative research based on structured surveys and Qualitative research based on case studies. These research methods were ‘mixed’, identifying the study as a mixed methods approach. Mixed methods research is formally defined as “the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study” (Burke Johnson and Onwuegbuziein, 2004). The mixed methods paradigm recognizes the strengths, and limitations, of both quantitative and qualitative research methods (Burke Johnson and Onwuegbuziein, 2004). Mixed methods methodology is increasingly recognized by the IS research community as a methodology that adequately addresses the multidisciplinary nature of the IS discipline (Gutek, 1991; Kling, 1991). In this case, it offers the opportunity to add contextual features with practical value, to the outcomes of rigorous quantitative IS research (Benbasat and Zmud, 1999).

The following section explains how different research methods were applied to the three RQs of the dissertation. The explanation links the RQs also to the respective chapters of this dissertation and indicates whether the methods were used to achieve the goal of analysis, explanation, prediction or design and action.

RQ A: *How does business and IT alignment effect the valuation of IT in organizations?* is addressed in chapters 2 and 3 of this dissertation. These chapters both report literature based conceptual studies. Chapter 2 provides an overview of IT valuation methods, based on literature analysis. Chapter 3 builds upon this overview and designs a conceptual framework to align IT valuation methods with the impacts resulting from the use of IT assets.

RQ B: *How do variables of business and IT alignment differ in their contribution to an organization's business and IT alignment maturity?* is addressed in chapters 4 and 5 of the dissertation. Chapter 4 reports a survey based study into the perceived contribution of the different variables and sub-variables of Luftman's SAM model. The data were analyzed using statistical techniques. This study focuses on analysis and explanation, and concludes with the design of modification to Luftman's SEM model.
Chapter 5 reports a literature study and a quantitative analysis of 22 case studies (with 216 respondents). This study analyzed the BIA maturity scoring patterns of the organizations in the cases, in order to understand whether scoring patterns of high mature differ from those of average mature and low mature organizations. The scoring patterns were analyzed using statistical techniques.

RQ C: *How do specific situational factors influence an organization's business and IT alignment maturity?* is addressed in chapters 6 to 9.
Chapter 6 explores the relationship between IT outsourcing and alignment in a multiple case study (n=4). In the cases, the data collection on BIA maturity was done using a validated survey instrument. The data collection on the IT outsourcing relationship was done using interviews and document analysis.
Chapter 7 explores the relationship between business strategy, IT strategy and alignment capability, based on a literature review, combined with a dual case study. In the cases, the data collection on BIA maturity was again done using a validated survey instrument. The data collection on IT strategy was done using interviews and document analysis.
Chapter 8 reports a single case study to explore the relationship between organizational culture and the alignment of business and IT. Data collection within the case was done using validated survey instruments and interviews. The quantitative data from the surveys were analyzed using statistical techniques. The qualitative data was used to analyze the organizational context of the case.
Chapter 9 reports a multiple case study (n=6) in a comparative study of BIA maturity in Belgian and Dutch financial services companies. Data collection on BIA maturity of the cases was done using a validated survey instrument. Data collection on the national cultures of Belgium and the Netherlands was based on literature review.

1.4 Dissertation Structure

The content of the dissertation follows the structure of the research questions as described above. Apart from this introduction chapter 1, and the closing chapter 10, the chapters/papers are clustered in three parts.

Part A (chapters 2 and 3) addresses RQ A: *How does business and IT alignment effect the valuation of IT in organizations?* in two studies on the valuation of IT in organizations and the relationship between valuation and BIA. Chapter 2 (A.J.G. Silvius (2006), "Does ROI matter? Insights into the true business value of IT", *Electronic Journal of Information Systems Evaluation*, Volume 9 Issue 2) provides an overview of valuation methods and describes a framework for assessing the organizational impact of IT and the relation between IT impact and organizational performance.

Chapter 3 (A.J.G. Silvius (2010), "A conceptual model for aligning IT valuation methods", *International Journal on IT/Business Alignment and Governance*, Volume 1 Issue 3) presents a comprehensive selection model to match valuation methods of IT assets and investments with the impacts resulting from the use of the assets, considering the function and nature of the impacts.

Part B (chapters 4 and 5) addresses RQ B: *How do variables of business and IT alignment differ in their contribution to an organization's business and IT alignment maturity?* In this part, chapter 4 (A.J.G. Silvius and J. Smit (2011), "Maturing business and IT alignment capability; the practitioners view", 44th Hawaii International Conference on Systems Science, Koloa HI) presents the results of a survey into the perceived contribution of the different variables and sub-variables of Luftman's Strategic Alignment Maturity (SAM) model. The study found that IT management practitioners perceive the contribution of the individual SAM variables as not equally, with communications maturity as the most significant contributor.
Chapter 5 (A.J.G. Silvius and R. Batenburg, "Maturing business and IT alignment; analyzing differences in scoring patterns", submitted for publication) presents a study that took an analytical approach to the question of which variables of business and IT alignment contribute most, and analyzed the scoring patterns of high mature, average mature and low mature organizations in order to study whether scoring patterns of organizations on the six SAM criteria differ significantly? By doing this, the study challenged the premise of the SAM model that maturity on the six criteria of the model should be developed more or less equally. The study found that the scoring pattern of high mature organizations indeed differs substantially and significantly from that of low mature companies. The most striking differences are that high mature organizations excel on Partnership maturity, whereas low mature organizations 'underperform' on this criterion and 'excel' on Skills maturity.

Part C (chapters 6 to 9) explores the influence of different situational factors on BIA, thereby addressing RQ C: *How do specific situational factors influence an organization's business and IT alignment maturity?* In this part, the different chapters report the application of Luftman's SAM model in organizations in relation to situational circumstances in or around these organizations. The situational factors studied, are outsourcing of IT (chapter 6), business strategy and IT strategy (chapter 7), organizational culture (chapter 8) and national culture (chapter 9).
Chapter 6 (A.J.G. Silvius, J. Turkiewicz, A. Keratsinov and H. Spoor (2012), "The relationship between IT outsourcing and business and IT alignment: an explorative study", to appear in *Computer Science and Information Systems*) reports a multiple case study into the relationship between IT outsourcing and BIA. The research question of this study was What is the effect of IT outsourcing on the business and IT alignment of companies that have outsourced their IT? The study revealed that a higher level of motivation for outsourcing paired with a higher level of the relationship between outsourcer and service provider and with a higher level of alignment maturity of the outsourcer.
Chapter 7 (A.J.G. Silvius (2011), "The relationship between business strategy, IT strategy and alignment capability", *Enterprise IT Governance, Business Value and Performance Measurement*, S. NanSi and A.J.G. Silvius (Eds.)) explores the relationship between business strategy, IT strategy and alignment capability. Regarding the relationship between business strategy and IT strategy, we found no conclusive relationship. Regarding the relationship between IT strategy and alignment capability, however, a clear relationship appeared.
Chapter 8 (A.J.G. Silvius, J. Smit and H. Driessen (2010), "The relationship between organizational culture and the alignment of business and IT", 16th Americas Conference on Information Systems, Lima) will explore the relationship between organizational culture and the alignment of business and IT. The chapter will report that there is a relationship between organizational culture and BIA maturity, especially on the variables 'governance', 'partnership' and 'skills'.

Chapter 9 (A.J.G. Silvius, S. de Haes and W. van Grembergen (2010), "Explorative study on the influence of national cultures on business/IT alignment maturity", *International Journal of IT/Business Alignment and Governance*, Volume 1 Issue 2) addresses the influence of national cultures on BIA, in a comparative study of BIA maturity in Belgian and Dutch financial services companies. The results of the study support a potential effect of national cultures on BIA maturity, especially in 'governance maturity' and 'skills maturity', but not all expected results are confirmed.

The final chapter, chapter 10, presents the conclusions of this research, as well as discussion and considerations for further research.

PART A

How does business and IT alignment effect the valuation of IT in organizations?

2 DOES ROI MATTER? INSIGHTS INTO THE TRUE BUSINESS VALUE OF IT[2]

Ever since the introduction of an 'IT productivity paradox' by Robert Solow, the business value of information technology (IT) has been the topic of many debates by practitioners as well as by academics. In these discussions a distinction can be made between the variance approach, investigating what the relationship between IT investments and organizational performance is, and the process approach, investigating on how this relationship works. Following the process approach, this paper describes a useful framework for assessing the organizational impact of IT. Secondly the paper considers the relation between IT impact and organizational performance and reviews the IT investment evaluation methods. The paper concludes with a proposal for a multivariable value assessment sheet, based on insights derived from the balanced scorecard theory.

2.1 Introduction

The business value of information technology (IT) is a topic that is cause for a lot of discussion. Scepticism roars again in the boardrooms of many companies, as the e-business hype exploded in the face of many 'believers' of the new-economy gospel. Without strong technological developments to thrive upon and an uncertain economic perspective the pressure on IT budgets is high. For investments in IT the requirement of sufficient returns and a clear 'business case' is even more severe than before. Several surveys indicate that the issue of measuring benefits of IT investments is a concern in many organizations (Whitling et al, 1996). Measuring IT benefits and value is frequently reported as one of the most important issues for senior IT management. (Brancheau and Wetherbe, 1987; Niederman, Brancheau and Wetherbe, 1991; Watson, Kelly, Galliers and Brancheau, 1997).

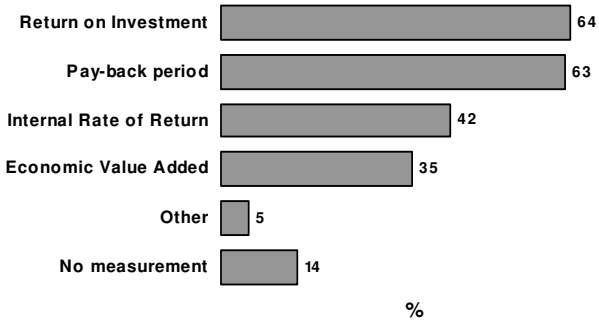

Figure 2-1. Use of investment evaluation methods by CFOs.

[2] Originally published as: A.J.G. Silvius (2006), "Does ROI matter? Insights into the true business value of IT", *Electronic Journal of Information Systems Evaluation*, Volume 9 Issue 2.

Based on research into 'the changing role of finance executives regarding Information & Communication Technology' (Paul and Tate, 2002, Figure 2-1) it can be concluded that CFOs use typical financial methods to evaluate IT investments. Over 86%, of the 288 CFOs that responded, claim to use traditional capital budgeting methods like Return on Investment, Pay-back period, Discounted Cash Flow and Internal Rate of Return. The strong use of financial appraisal techniques is also found in surveys of Ballentine er al. in the United Kingdom (Ballentine et al, 1997) and Wong and Behling in Australia (Wong and Behling, 1997). However, CIOs tend to estimate the use of these financial methods a lot lower. Of the 456 CIOs and senior IT managers that responded in the research into 'the issues and challenges facing senior IT executives' (IDG Research and Getronics, 2002) only 18% indicated to use Return on Investment. For the CIOs the mere effects of the investment, like decreased costs and increased productivity, topped the list.

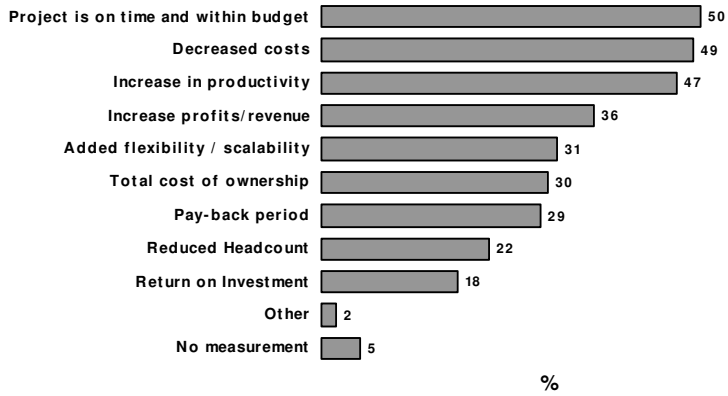

Figure 2-2. Use of investment evaluation methods by CIOs.

The different results of the research illustrate the problems in capturing the full business value of IT investments in an understandable measure. This paper aims to give some insight in the concepts, possibilities and limitations in this quest for value.

2.2 The quest for business value

In the research to the value of IT two approaches can be distinguished: the variance approach and the process approach (Devaraj and Kohli, 2002).

2.2.1 The variance approach

The variance approach measures the relationship between IT investments and organizational performance in terms of higher revenues, lower costs, improved market share, etc. This approach focuses on the 'what' question. What is the relationship between IT investments and organizational performance? Over the years, a vast amount of work has been done regarding this relationship. Several studies showed that the relationship between IT investments and organizational performance could not be proven (Loveman, 1988; Salmela, 1997). This result became known as the 'IT productivity paradox' (Brynjolfsson, 1993). Probably the best known statement about this paradox

was done by Robert Solow when he stated: 'You can see the computer age everywhere but in the productivity statistics'. Notorious as this 'IT productivity paradox' may be, it does not turn up in all studies about IT returns. Table 2-1 provides an overview of selected firm-level studies.

Study	*Data Sample*	*Findings*
IT and Firm Performance		
Strassmann (1990)	38 U.S. companies	No correlation between IT spending and firm performance.
Loveman (1994)	60 Business units in 20 U.S. companies	IT investments add nothing to output.
Barua et al. (1995)	Same as Loveman (1994)	IT improves intermediate output if not final output.
Brynnjolfsson and Hitt (1993)	Large U.S. manufacturers	Gross-marginal product of IT is over 50% per year in manufacturing.
Brynnjolfsson and Hitt (1995)	Large U.S. manufacturers	Firm effects account for half of productivity benefits of earlier study.
Lichtenberg (1995)	U.S. firms, 1989-1991	IT has excess returns; one IS employee can be substituted for six non-IS employees without affecting output.
Brynnjolfsson and Hitt (1996)	367 Large U.S. firms	Gross return on IT investments of 81%. Net return ranges from 48% to 67% depending on depreciation rate.
Brynnjolfsson and Hitt (1996)	370 U.S. firms	IT investments increase firm productivity and consumer welfare, but not profitability.
Dewan and Min (1997)	300 Large U.S. firms	IT is a net substitute for both capital and labor, and shows excess returns relative to labor input.
Black and Lynch (1997)	1621 U.S. manufacturing establishments	Productivity not affected by presence of particular management practice but by implementation, especially degree of employee involvement.
Brynjolfsson et al. (1998)	Sample of Fortune 1000 U.S. firms, 1987 – 1994	The stock market value of $ 1 of IT capital is the same as $ 5 - $ 20 of other capital stock.
Gilchrist et al. (2001)	Sample of Fortune 1000 U.S. firms	IT productivity is greater in IT producer firms than in user firms and in durable manufacturing.
Gilchrist et al. (2001)	French firms	Gross returns to IT investments are positive and greater than returns to non-IT investments.

Table 2-1. Selected firm-level studies of IT returns (Dedrick et al., 2003).

The advantage of this approach is that it reveals statistically 'proven' effects of IT. These effects are of particular relevance for the development of economic policy. The disadvantage of the approach is

that the effects are valid in general, but might not appear for a particular investment in a particular company. This notion is illustrated in Table 2-2 which shows another overview of firm-level studies.

Study	*Data Sample*	*Findings*
Organizational Complements and IT Returns		
Bresnahan et al. (2002)	400 Large U.S. firms, 1987 – 1994	The effects of IT on labor demand are greater when IT is combined with particular organizational investments.
Brynjolfsson er al. (1998)	Sample of U.S. firms, 1996	Decentralized organizational practices, in combination with IT investments, have a disproportional positive effect on firm market value.
Ramirez et al. (2001)	200+ U.S. firms	Firm use of employee involvement and total quality management enhances IT returns.
Francalanci and Galal (1998)	52 U.S. life insurance companies, 1986 – 1995	Productivity gains result from worker composition (more informational workers) and IT investments.
Deveraj and Kohli (2002)	8 hospitals, over 3 years	IT investment combined with business process reengineering positively and significantly influences performance.
Tallon et al. (2000)	300+ U.S. firms, 1998	Perceived business value of IT is greater when IT is more highly aligned with business strategy.

Table 2-2. Selected firm-level studies of IT returns if combined with organizational transition (Dedrick et al., 2003).

These studies however analyzed the returns of IT investments in combination with organizational and process changes. The results of these studies show that the return on IT is influenced by the organizational transition that accompanies it. The same IT investment therefore can have a positive return in organization A and a negative or neutral return in organization B. This raises the question how IT is used in an organization. A question that is better addressed with the process approach. For corporate decision makers therefore the variance approach is of limited use.

2.2.2 The process approach

On a company level more insight in the 'how' question is required. How do IT investments improve organizational performance? This question is addressed in the process approach (Mooney et al, 1995).

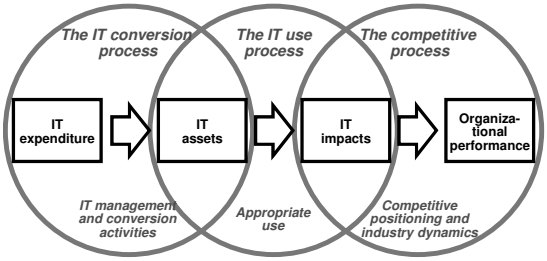

Figure 2-3. The process approach for understanding IT value. (Soh and Markus, 1995)

Soh and Markus synthesized the different models of the process approach into a comprehensive framework for the IT value creation process (Figure 2-3, Soh and Markus, 1995). This paper is constructed along this framework. First we will explore the relation between IT expenditures and IT assets: the IT efficiency question. In the next paragraph the organizational impacts of IT will be discussed in search of IT effectiveness. The following paragraph considers the relation between IT impact and organizational performance: the question of business and IT alignment.

The paper will be concluded with an overview of investment valuation techniques and a proposal for a more balanced understanding of the value of IT.

2.3 IT Efficiency

One of the core concepts of the process approach is the time dimension of IT value (Bannister, 2001). Most technologies have a life cycle, i.e. value dissipates over time, Utilizing available technologies as optimal as possible and switching to new technologies at the right moment are the keys to a minimal cost of managing and maintaining the IT in an organization. A well-established concept is this area is that of the Total Cost of Ownership (TCO). TCO covers all costs related to the asset. All cost meaning both registered and unregistered 'hidden' costs, for example peer support in solving a problem. Regarding the optimal use of technologies, and the effects on the TCO, a lot of research has been done by the Gartner Group.

The relationship between TCO and the life cycle of a technology is a less researched field (Devaraj and Kohli, 2002). Figure 2-4 shows the expected relationship between the TCO and the life cycle of a technology. In its younger years, the knowledge and utilization of a technology are less developed, resulting in a relatively high TCO. If the technology evolves into an industry standard, the TCO will decline as the technology matures. At the end of its life cycle the use of the technology will decline and the TCO will rise again as a result of scarcity of resources. Its economic life has passed and the technology is outperformed, probably both technically and economically, by a newer technology. An example of this lifecycle is the rise of MS-DOS and its replacement by MS-Windows as the standard operating system for personal computers. Within a technology a similar life cycle pattern can be expected for successive versions or releases.

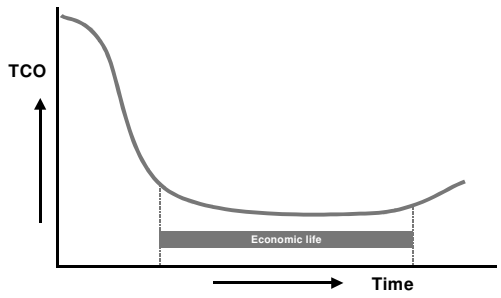

Figure 2-4. The expected relationship between TCO and the life cycle of a technology.

For a discussion about the value of IT, it should be understood that TCO does not express a value. TCO expresses a cost! This cost reflects the IT Efficiency challenge; one of the most important challenges for CIOs and IT Executives:

How to minimize the cost of utilizing, managing and maintaining the current IT, whilst delivering the agreed 'quality of service'?

Notwithstanding the fact that TCO has no value on its own, a decline in TCO has! IT investments that result in a higher IT efficiency, for example the implementation of a IT management suite, contribute to a lower TCO of the managed IT systems or components. The decline of TCO that can be achieved is a return on the investment involved.

2.4 IT Effectiveness

Another challenge for CIOs is the question:

How to maximize the 'business value' of IT investments?

This challenge addresses not the efficiency of IT, but its effectiveness. How does IT contribute to the business strategy and goals?

2.4.1 Understanding the impact of IT

The impact of IT on business is rapidly shifting from an efficiency enhancing production factor towards a source of business innovation. This development is illustrated in Figure 2-5.

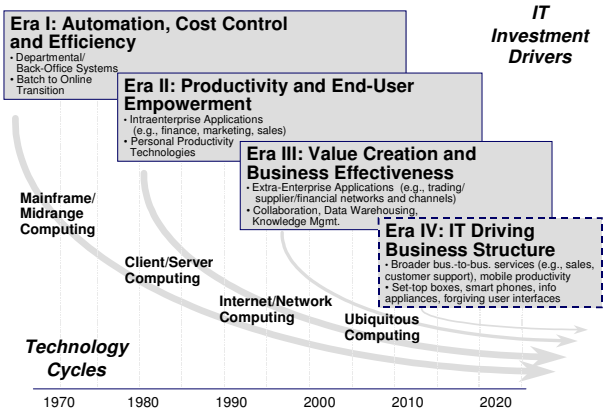

Figure 2-5. The development of IT. (Gartner Group)

The changing role of IT has to be reflected in the way IT investments are evaluated. The traditional 'IT-economics' focus on cost savings should evolve to also include productivity and business value drivers. This notion has inspired several authors (For example Hammer and Mangurian, 1987, Riggins, 1999, Smit and Silvius, 2001) to provide frameworks for identifying value of IT solutions. From these frameworks a common understanding arises that IT can make a business more efficient, more effective, more flexible and/or more innovative. These four 'sources of value' identify the way IT creates value for an organization. The four terms mentioned summarize the development of the value of IT over the past decades. Starting from a calculation tool to improve efficiency in administrative processes, the opportunity to provide decision makers with more detailed information

much quicker than before arose, hereby improving the effectiveness of the organization. In recent years it has become clear that a revolutionizing technology like the Internet can open up new markets, new products or provide new means of developing customer loyalty, thereby innovating the business of a company. So, from an enabler of business, IT developed into an innovator of business. The latest notion is that the lower cost of communication, which IT provides, enables organizations to swap resources more easily, For example moving business activities offshore, thereby enhancing the managerial flexibility.

2.4.2 Understanding more of the impact of IT

Thus, for a better understanding of the impact of IT on an organization we should consider its effect in terms of efficiency, effectiveness, innovation and flexibility. Logically, these 'sources of value' can be applied to the external positioning of the organization or to the internal business processes.

For understanding the external positioning marketing, provides us with the four 'P's: Price, Product, Placement and Promotion. Combining the sources of value with these fields of competition provides a practical 'grid' to identify the possible effects of an IT investment. For example, an IT system that allows a company to differentiate its prices is identified on the grid as having an impact in the field effectiveness combined with price.

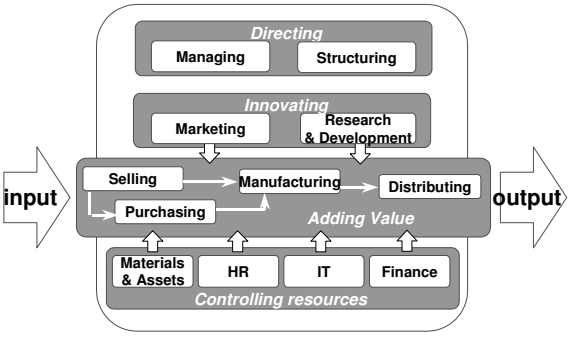

Figure 2-6. The generic business model.

To understand how IT adds value to the internal business processes, these processes are categorized in main business functions as illustrated in Figure 2-6. The 'generic business model', as developed by James Martin & Associates, distinguishes as main business functions: adding value, innovating, controlling resources en directing. An example of an IT investment with impact in the directing function is the implementation of a management information system that allows for better decision-making.

When the variables of the 'external impact', the four 'P's, and the variables of the 'internal impact', the business functions, are plotted across the sources of value, a graphical grid can be constructed to identify the impact of IT investments on an organization. This 'IT value grid', as illustrated in Figure 2-7 with a number of sample impacts, provides a useful aid to understand, communicate and discuss the impact of an IT investment. Without this understanding, any discussion about the value of IT will be without foundation.

4 dimensions of competition \ 4 sources of value	Efficiency	Effectiveness	Innovation	Flexibility
Price		*Enable for price differentiation*		
Product			*Enable build to order*	
Promotion	*Enable one-to-one marketing*		*Create new promotion channels*	
Placement		*Enable when/where you want delivery*		
Value Adding	*Increase use of production resources*		*Create new channels*	*Allow for deferral of investments*
Innovating				
Directing		*Speed-up decision making*		
Controlling resources	*Automate supportive tasks*			*Increase scalability of resources*

4 groups of business processes

Figure 2-7. The IT value grid. (Smit and Silvius, 2001 and Targowski, 2004)

A preliminary understanding however is that the relation between IT and business value is not always straightforward. Business applications will usually have an identifiable impact on business processes, but for components of the IT infrastructure their effect is mostly indirect as enabler of applications.

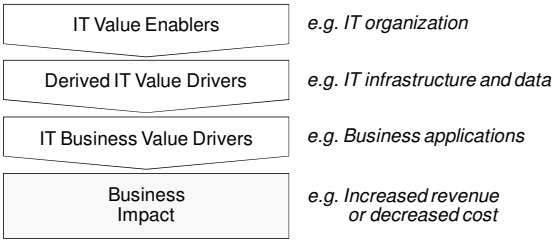

Figure 2-8. The complex relation between IT and business value.

These ‘levels’ of impact brought us to distinguish three categories of IT ‘value drivers’. The first category, ‘IT Business Value Drivers’ consist of business applications with a direct impact on the business. The second category is the ‘Derived IT value drivers’ and consists of the IT infrastructure and the data architecture of the organization. The third category, ‘IT value enablers’, consists of the variables regarding the organization of IT in the company.

2.5 Business and IT alignment

After creating a thorough understanding of how an IT investment influences the business, the next step is to come to understand the returns of this impact. Since IT itself has no returns, the returns are always in ‘the business’, it is helpful to have a close look at the business. First of all the strategy and goals of the business have to be considered. After all, it is this strategy IT should align with.

2.5.1 Aligning with business strategy

In modern business strategy literature, three dominant strategies are identified: product leadership, customer intimacy and operational excellence (Treacy and Wiersema, 1997).

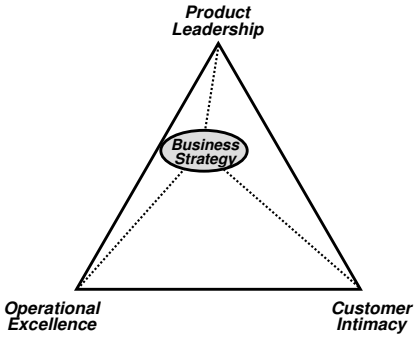

Figure 2-9. Typology of business strategy

In a operational excellence strategy the organization only survives if it realizes high volumes with low costs. IT investments that create business efficiency, for example an ERP system that optimizes the utilization of resources, are particularly relevant in this type of strategy. In a product leadership strategy the unique selling proposition of the company is that of high quality of products and services. For these companies the ability of IT systems to enable this quality would therefore probably be of greater value than the efficiency of the company. For example, a smart warehouse management system that enhances order fulfillment by optimizing stock levels could fit this strategy. Finally, in a customer intimacy strategy the organization will benefit most from IT systems that strengthen their ability to tailor their offer to the customer's needs. An example of such a system could be a CRM application for a fashion retailer that allows him to capture the measurements, preferences and buying history of his individual customers.

The way in which business strategy gives input to the evaluation of IT investments can be summarized as follows.

Dominant Business Strategy		*Corresponding dominant source of value*
Price Leadership	<>	Business Efficiency
Product Leadership	<>	Business Effectiveness
Customer Intimacy	<>	Business Innovation

Table 2-3. Relationship between business strategy and dominance of the sources of value.

A possible weakening of the argument made above is that all 'sources of value', efficiency, effectiveness, innovation and flexibility, are always relevant, regardless the strategy. This is true of course, but the analysis of the business strategy provides an indication of the relative weight of the criteria used in the evaluation of IT investments. However we should add that another angle is missing: the business process.

2.5.2 Aligning with business processes

Not all business processes 'make the difference' in the strategy of a company. In the typology of business processes provided by the generic business model (Figure 2-9) typically the 'adding value' and 'innovating' processes create the Unique Selling Propositions of the organization. Logically, the impact of business strategy on the valuation of IT investments will be most relevant for investments in IT systems with an impact on these 'adding value' and 'innovating' business processes. Supporting processes like facility management or personnel administration are also important but do not typically have a direct effect on the external positioning of the organization. For IT investment supporting these business processes, 'business efficiency' will therefore be the most important source of value.

Adding the volatility of the business function can further expand the alignment between the sources of value and the business process. Logically, the more volatile the business process, the more valuable the flexibility that IT can add to that business process.

An overview of the relationship between business strategy, business processes and the sources of value of IT can be illustrated as shown in Figure 2-10.

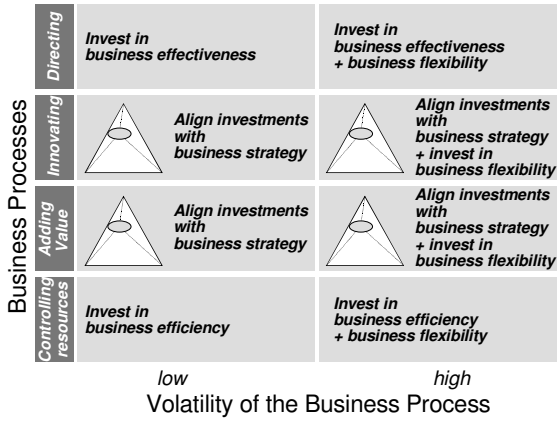

Figure 2-10. The relation between business processes, business strategy and the sources of value of IT investments.

Several studies also show the nature of the 'adding value' business processes as a factor of influence in the value of IT investments. Studies that show returns on IT investments (Harris and Katz, 1991) typically concentrated on information intensive industries like financial services, whereas studies that concentrated on manufacturing or information non-intensive industries (Loveman, 1988; Olson and Weill, 1989) found no returns from IT.

2.6 Valuing investments

After creating an understanding of the impact of IT on business and the relevance of this impact in relation to the business strategy, the issue of valuation is next on the list. This is a typical economic issue for which it is irrelevant whether the investment is in IT or in any other resource. As long as the effects of the investment are understood, calculating the value of it is merely a financial technicality.

This sounds almost too good to be true. Indeed, it is not quite that simple. Valuation methods all have assumptions and limitations.

2.6.1 Traditional valuation methods

Table 2-4 provides an overview of these valuation methods and their most important qualities and limitations.

Valuation method	*Qualities*	*Limitations*
Return on investment	• Easy to calculate • Easy to interpret (a simple percentage) • In line with the financial administration	• Outcome sensitive to amortization method • Ignores the time-value of money • Ignores risk
Pay-back period	• Quite easy • Intuitively coping with risk	• Ignores part of the revenues • Simplistic, does not determine value
Internal Rate of Return	• Includes the time-value of money • Easy to interpret (a simple percentage) • Based on cash-flows	• Complex • Not in line with the financial administration • Ignores risk • Multiple outcomes, or none, possible
Discounted Cash Flow / Net Present Value	• Includes the time-value of money • Based on cash-flows • Copes with risk	• Complex • Complex to interpret • Not in line with the financial administration • Not conclusive in case of projects with different durations
Economic Value Added	• Includes the opportunity value of money • In line with 'shareholder value'	• Value calculation based upon one of the other methods • Not in line with the financial administration

Table 2-4. Overview of investment valuation methods.

The shortcomings of these methods are especially clear when IT investments are made to participate in today's e-business economy. In this arena it is hard to make informed decisions when many variables are in flux. Traditional calculation methods are all limited in their ability to cope with risk and managerial flexibility. For example if a project proves to be a success, it can be sped up. If however the market deteriorates, the investment outlays of the project can be lowered or postponed. Despite the logic of this, in reality management adapts plans based on actual conditions all the time, this flexibility is not adequately valued in any of the valuation methods mentioned earlier. The result is an inadequate decision process for new projects. In some cases this even results in competitive investment proposals being rejected. Therefore it is clear that companies need to come up with new ways of judging IT investments.

2.6.2 Valuing flexibility

A new insight is provided by the Real Options Valuation (ROV) theory. In the ROV an additional value is calculated on top of the Net Present Value (NPV) of a project. This 'flexibility value' valuates the optionality of the investment. Optionality reflects the ability to alter the investment outlay

and the timing of outlays based on changes in the competitive environment. ROV treats the possibilities of adapting the investment plan as (real) options.

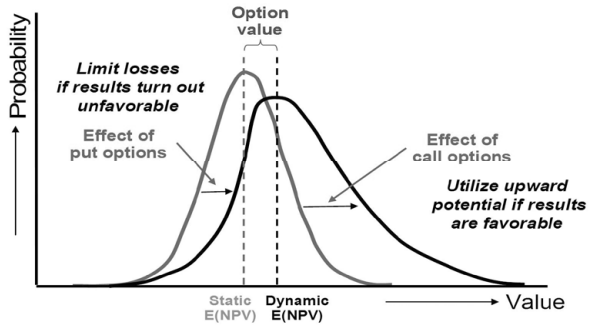

Figure 2-11. The effect of real options on value. (Smit and Silvius, 2001)

Note: Downside risk is limited by enabling investors/ management to abandon the investment or to wait with future investments. Upside value is optimized by enabling investors/ management to expand investment, to progress with projects or to seek other opportunities for the initial investment.

The opportunity to invest can be seen as a call option, involving the right to acquire an asset for a specified price (investment outlay) in a future moment. A call option gives the holder the right, for a specified price within a given amount of time, to exercise the option to acquire the underlying asset. The techniques derived from option pricing, quantify the management's ability to adapt its future plans to capitalize on favourable investment opportunities or to respond to undesirable developments in a dynamic environment by cutting losses.

The Value of the real-option depends on three major elements:

- maturity of the option;
- business or project risk;
- interest rates.

A valuable insight that can be gained from option theory is the effect of changes of the variables of the investment on the value of the investment. Figure 2-12 shows these effects. An interesting fact is that, for example, an increase in the volatility of the returns decreases the NPV, but increases the ROV!

		Effect on NPV	*Effect on ROV*	*Effect on the sum of NPV and ROV*
Present Value of the cash-flows	⇗ :	⇗	⇗	⇗
Height of the investment	⇗ :	⇙	⇙	⇙
Volatility of the returns	⇗ :	⇙	⇗	?
Level of the interest	⇗ :	⇙	⇗	?
Maturity of the option	⇗ :	⇙	⇗	?

Figure 2-12. The effect of changes in the variables of the underlying investment.

Corporate strategists embrace the ROV approach, acknowledging the importance of active managerial flexibility in adapting to a changing market environment.

2.6.3 Taking the competition into account

Another addition to the traditional valuation methods is the notion that the returns of an investment are not only influenced by the organizations own decisions, but also by the decisions of the competition. For example the first telecom operator that implements an innovative new service will enjoy, temporary, first mover advantages that the other players will miss when they implement the same service. Combining the real options approach with game theory, taking into account competitive counteractions, closes the gap between traditional corporate finance theory and strategic planning. Management investment decisions are made with the explicit recognition that they may invite competitive reaction, which in turn impacts the value of the firm's investment opportunity. The strategic value of early commitment in such cases must be set off against the option value of waiting and may potentially justify early investment. These decisions are often seen as strategic games against both nature and competition.

Of course, in many cases the players may not exactly be 'symmetrical', with one of them enjoying a more dominant market power position. The value of organizational capabilities and of a firm's bundle of corporate real options, like uncertainty itself, is idiosyncratic to each firm. Similarly, the exercise price of a corporate real option may be idiosyncratic, depending on what other resources and assets the firm already has. Exercising the option to launch a new Windows-based software package, for instance, will be less expensive for Microsoft than for another player, by virtue of its earlier strategic investments and complementary assets that enable dominance in the desktop market. The firm pre-empted competition and captured a dominant share of the market by setting the product standard early on. Analysis of competitive behavior and the effects on the valuation of real options is executed using elements of the Game Theory.

A 'Grab the dollar' game, for example, is a strategic context that is often associated with IT investments. Firms obtain a negative payoff when they end up investing simultaneously. 'Grab the dollar' illustrates the situation where the current market prospects are only favorable if one of the players invests, but simultaneous investment results in a battle with an expected negative payoff. Only the first player captures the dollar (For example, patent), but when they all enter the market, they all end up loosing the battle. A dominant firm has an advantage to win this simultaneous game.

2.6.4 A complete valuation framework

Based on the insights provided by the real options and game theories the traditional NPV calculation can be and should be expanded to include the effects of managerial flexibility and competitive behaviour.

This 'Expanded NPV' can be calculated as:

$$\textit{Expanded NPV} = \textit{NPV} + \textit{Flexibility value} + \textit{Strategic value}$$

Figure 2-13 summarizes this more complete valuation framework. This framework provides a better understanding of the value of IT investments.

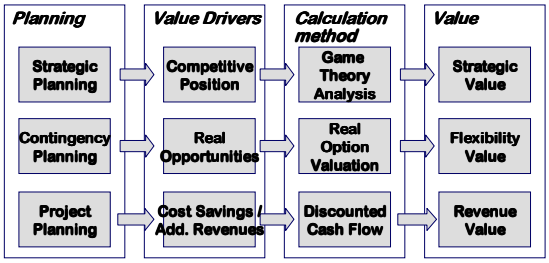

Figure 2-13. A complete valuation framework.

What does this mean for the calculation of the value? In theory the knowledge is available to calculate a 'complete' value according to the framework. This calculation however will be complex and hard to understand in boardrooms. It is a drawback not to be taken lightly. The tendency to fall back on simple and comprehensible calculation methods leads to systematic underestimation of the value of IT investments especially when their effects are more than just efficiency improvement. This pitfall should be well understood. Financial theory just cannot provide us with a simple and undisputed figure or percentage that expresses the complete value of an investment. It is therefore the opinion of the economist Professor Michael Brennan that "*It is better to have the approximately optimal solution to the right problem than the exact solution to the wrong problem!*" (Actual quote on the 2000 Real Options Group conference, May 2000).

This opinion may not be very satisfying but it is not without grounds. A last insight to be added is the characteristic of the investment under scrutiny. For an IT system with a mainly internal 'business efficiency' impact, the additional 'flexibility value' and 'strategic value' will not be that significant. However, if an IT system has impact on the external positioning of the organization, the additional value elements will be significant for a good valuation of the investment. Logically a relationship between the impact of the investment and the relevance of the different value elements can be suspected, as is shown in Figure 2-14.

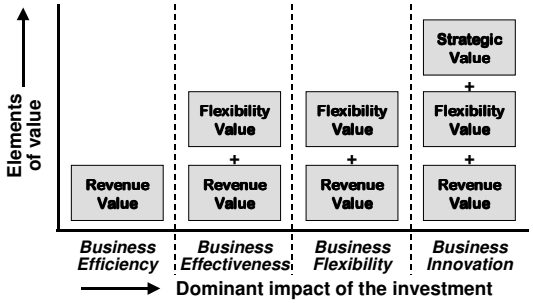

Figure 2-14. The relationship between the impact of an investment and the relevance of different value elements.

2.7 Conclusion

The value of IT is a much discussed and often misunderstood subject. This paper aims to add new insight to the discussion by providing a practical grid in understanding the impact of IT investments

on the organization and by showing the conceptual relationships between IT value and business strategy and functions. In its use of the latest developments in financial theory this paper hopefully develops a more complete framework for the valuation of IT projects. This framework warns about rushing into possibly wrong decisions about IT investments based on incomplete calculations of value.

Different evaluation and valuation methodologies reveal different aspects of value. However, we are still far away from a simple and easy-to-understand calculation method unveiling the complete and true value of any investment. A boardroom focus on simple Return on Investment metrics therefore should be qualified as either mismanagement or macho-talk. Company executives should focus their attention on creating a thorough understanding of how an investment in IT impacts the business of the organization, instead of focus on oversimplified value calculations based on questionable assumptions.

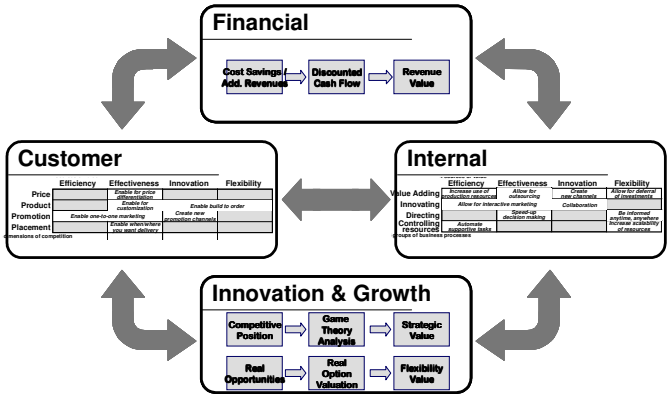

Figure 2-15 An IT investment Balanced Scorecard.

Since a simple Return of Investment calculation cannot capture all elements of value, a more balanced approach is appropriate. Figure 2-15 shows a possible example of an 'IT investment Balanced Scorecard'. In this scorecard the financial perspective can be filled with the traditional Return on Investment calculation. This scorecard is enriched with the customer perspective showing the impact of the investment on the marketing proposition of the organization. The internal perspective shows the impact of the investment on the business processes. The innovation & growth perspective finally shows the future options and possible competitive effects of the investment.

3 A CONCEPTUAL MODEL FOR ALIGNING IT VALUATION METHODS[3]

The relation between IT and value is a complex and often disputed one. Researchers and practitioners have created numerous models and valuation methods to capture this value. And although payoffs from IT investment are a function of strategic alignment, most of these models do not address the alignment of business and IT as a factor that influences or creates value.

This paper explores the role of business and IT alignment in the valuation methods of IT assets and investments. It focuses on the impacts resulting from the use of IT assets, considering the function and nature of the impacts. It also explores the alignment of IT valuation and business strategy.

The paper is concluded with the construction of a comprehensive selection model that provides guidance for aligning the IT valuation method with the specific characteristics, impacts and organizational context of an IT asset or investment.

3.1 Introduction

The relation between information technology (IT) and value is a complex and often disputed one (Stewart et al., 2007; Silvius, 2008a). Measuring IT benefits and value is frequently reported as one of the most important issues for senior IT management. (Brancheau and Wetherbe, 1987; Niederman, Brancheau and Wetherbe, 1991, Whitling et al, 1996). Researchers and practitioners have created numerous models and valuation methods to capture this value (Renkema en Berghout, 1996; Frisk, 2007). And although some researchers suggest (a.o. Henderson and Venkatraman, 1993; Woolfe, 1993) that payoffs from IT investment are a function of strategic alignment, most of these models do not address the alignment of business and IT as a factor that influences or creates value. One could also argue that the goal of any viable business strategy should be to create value and that, since the alignment of IT and business is aimed at enabling business strategy, the goal of alignment is to create value (Poels, 2006).

The logical relation between alignment and value is, however, not reflected in the vast amount of research into the value of IT in organizations (Tallon and Kraemer, 1999; Silvius, 2008a). Numerous models and methodologies have been developed to capture this value. Without claiming to be complete, Renkema en Berghout (1996) list over 50 methods, and many more have been added since then. Nijland (2004) however concluded that more advanced methods are hardly used. Managers only use methods they intuitively understand. So where science is developing more sophisticated instruments, is practice turning its back to it. What is missing that causes this mismatch?

[3] Originally published as: A.J.G. Silvius (2010), "A conceptual model for aligning IT valuation methods", *International Journal on IT/Business Alignment and Governance*, Volume 1 Issue 3.

This paper aims to add to the understanding of valuation methods by providing a comprehensive selection model for aligning the IT valuation method with the specific characteristics, impacts and organizational context of an IT asset or investment. Hereto we will analyze the relevance of the organizational context of IT assets for the value they generate and explore different perspectives on the function and nature of the impacts resulting from the use of IT assets. We will then provide a categorized overview of valuation method and discuss the applicability of these methods in practice. We will conclude the paper with the construction of the selection model for aligning the IT valuation method with the specific characteristics, impacts and organizational context of an IT asset or investment.

3.2 The IT Productivity Paradox

The relationship between IT investments and value in terms of enhanced organizational performance has been well studied in the last decades. The empirical studies in this field produced mixed results (Soh and Markus, 1995). Several studies showed that the relationship between IT investments and organizational performance could not be proven (Loveman, 1988; Kauffman and Weill, 1989; Salmela, 1997). This result became known as the 'IT productivity paradox' (Brynjolfsson, 1993). Probably the best known statement about this paradox was done by Robert Solow when he stated: 'You can see the computer age everywhere but in the productivity statistics' (Watherbe et al., 2007). Notorious as this 'IT productivity paradox' may be, it does not turn up in all studies about IT returns. Table 3-1 provides an overview of selected firm-level studies.

Author	Data Sample	Findings
Strassmann (1990)	38 U.S. companies	No correlation between IT spending and firm performance.
Loveman (1994)	60 Business units in 20 U.S. companies	IT investmets add nothing to output.
Barua et al. (1995)	Same as Loveman (1994)	IT improves intermediate output if not final output.
Brynnjolfsson and Hitt (1995)	Large U.S. manufacturers	Firm effects account for half of productivity benefits of earlier study.
Lichtenberg (1995)	U.S. firms, 1989-1991	IT has excess returns; one IS employee can be substituted for six non-IS employees without affecting output.
Brynnjolfsson and Hitt (1996)	367 Large U.S. firms	Gross return on IT investments of 81%. Net return ranges from 48% to 67% depending on depreciation rate.
Hitt and Brynnjolfsson (1996)	370 U.S. firms	IT investments increase firm productivity and consumer welfare, but not profitability.
Dewan and Min (1997)	300 Large U.S. firms	IT is a net substitute for both capital and labor, and shows excess returns relative to labor input.
Brynjolfsson and Yang (1997)	Sample of Fortune 1000 U.S. firms, 1987 – 1994	The stock market value of $ 1 of IT capital is the same as $ 5 - $ 20 of other capital stock.
Black and Lynch (2001)	1621 U.S. manufacturing establishments	Productivity not affected by presence of particular management practice but by implementation, especially degree of employee involvement.
Gilchrist et al. (2001)	Sample of Fortune 1000 U.S. firms	IT productivity is greater in IT producer firms than in user firms and in durable manufacturing.
Brynnjolfsson and Hitt (2003)	527 large U.S. firms over 1987–1994	Computerization makes a contribution to measured productivity and output growth in the short term. However, the productivity and output contributions associated with computerization are up to 5 times greater over long periods .

Table 3-1 Selected firm-level studies of IT returns (Based from Dedrick et al., 2003, edited and completed).

The studies listed in Table 3-1 present what is called the 'variance approach' to IT value in organizations (Soh and Markus, 1995). This approach focuses on the 'what' question. What is the relationship between IT investments and organizational performance? The advantage of this approach is that it reveals statistically 'proven' effects of IT. These effects are of particular relevance for the development of economic policy. The disadvantage of the approach is that the effects are valid in general, but might not appear for a particular investment in a particular company. Stefanou (2001) notes that organizational change is required if any benefits are to be realized. Barua and Mukhopadhyay (2000) noted that IT value research ignored the synergistic effects of IT with other organizational factors and Brynjolfsson and Hitt (2000) suggested that research into the relationships between IT and other organizational factors and the resulting effects on performance is needed in order to advance our understanding of the value of IT. Table 3-2 therefore shows another overview of firm-level studies. These studies analyzed the returns of IT investments in combination with organizational and process changes.

Author	Data Sample	Findings
Bresnahan et al. (2002)	400 Large U.S. firms, 1987 – 1994	The effects of IT on labor demand are greater when IT is combined with particular organizational investments.
Brynjolfsson et al. (1998)	Sample of U.S. firms, 1996	Decentralized organizational practices, in combination with IT investments, have a disproportional positive effect on firm market value.
Ramirez et al. (2001)	200+ U.S. firms	Firm use of employee involvement and total quality management enhances IT returns.
Francalanci and Galal (1998)	52 U.S. life insurance companies, 1986 – 1995	Productivity gains result from worker composition (more informational workers) and IT investments.
Deveraj and Kohli (2002)	8 hospitals, over 3 years	IT investment combined with business process reengineering positively and significantly influences performance.
Tallon et al. (2000)	300+ U.S. firms, 1998	Perceived business value of IT is greater when IT is more highly aligned with business strategy.

Table 3-2. Selected firm-level studies of IT returns if combined with organizational transition (Adapted from Dedrick et al., 2003).

The results of the studies in Table 3-2 show that the return on IT is influenced by the organizational transition that accompanies it. The same IT investment therefore can have a positive return in organization A and a negative or neutral return in organization B, depending on when, how and why IT is used in an organization (Soh and Markus, 1995). This approach to the value of IT, not focusing on value as a function of IT investments, but focusing on the conditions and situational circumstances in which IT can create value in organizations, is known as the process approach to IT value (Mooney et al, 1995). With its focus on the why, how and when questions of IT value creation in organizations, the process approach clearly links business and IT alignment to the value of IT.

Table 3-3 shows the distinct differences of the two approaches.

Characteristic	*Variance approach*	*Process approach*
Outcome	A variable	A discrete occurrence
Logical form	If X (independent variable, necessary and sufficient conditions), then Y (dependent variable); If more X then more Y	If not X (necessary conditions), then not Y (outcome); Cannot be extended to "more X" or "more Y"
Assumptions	Outcome will invariably occur when necessary and sufficient conditions are present	Outcomes may not occur even when conditions are present unless a particular "recipe", involving external directional forces and probabilistic processes, unfolds
Role of time	Irrelevant Necessary and sufficient conditions can occur in any order	Crucial The time ordering in which necessary conditions combine is consequential
How to 'read' the theory	The cause is necessary and sufficient to produce the effect	Causation consists of necessary conditions occuring in a particular sequence in which change and random events play a role

Table 3-3. Overview of the variance and process approaches to IT value (Soh and Markus, 1995).

Soh and Markus (1995) synthesized the different models of the process approach into a comprehensive framework for the IT value creation process (Figure 3-1).

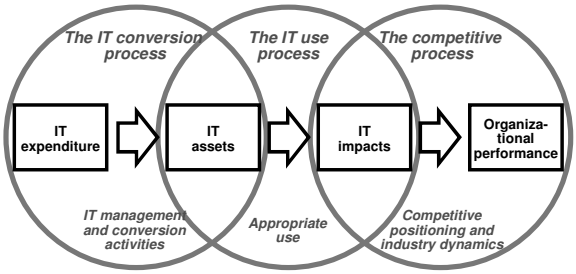

Figure 3-1. The process approach for understanding IT value (Soh and Markus, 1995)

3.3 Business and IT alignment and IT value

The process approach of IT value focuses on the appropriate management, use, impact and positioning of IT in the context of an organization, with its business visions, goals, strategy, culture, people and processes. It recognizes that the relationship between IT expenditures and organizational performance is influenced or determined by the fit, or alignment, between the IT assets and the organizational or contextual aspects. This approach therefore links the value IT to business and IT alignment.

An influential conceptualization of business and IT alignment (BIA) is that of Henderson and Venkatraman (1993). Their widespread framework of alignment, known as the Strategic Alignment Model (Figure 3-2), describes BIA along two dimensions. The dimension of strategic fit differentiates between external focus, directed towards the business environment, and internal focus, directed towards administrative structures. The other dimension of functional integration separates business and IT. Altogether, the model defines four domains that have been harmonized in order to achieve

alignment. Each of these domains has its constituent components: scope, competencies, governance, infrastructure, processes and skills.

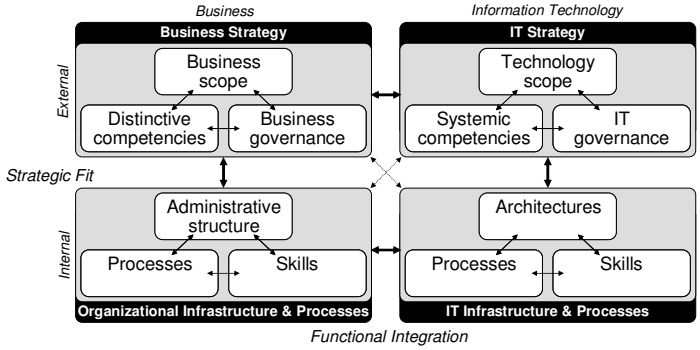

Figure 3-2. The 'Strategic Alignment Model' (Henderson and Venkatraman, 1993).

Several authors confirm that organizations that successfully align their business and IT strategies, outperform their non-aligned peers (a.o. Chan et al., 1997; Irani, 2002; Kearns and Lederer, 2004). However, studies by Palmer and Markus (2000) and Sabherwal and Chan (2001) found more inconsistent results with alignment leading to better performance under certain contingencies. The relationship between BIA and IT value is therefore a complex one. We can use the different logical steps of the process approach of IT value to analyze this relationship in more detail. Table 3-4 provides an overview of these processes, their inputs and outputs, important challenges and the role of alignment.

Process	Input	Output	Challenges	Domain
IT conversion	IT investments and expenditures	IT assets	How to minimize the cost of utilizing, managing and maintaining the IT assets, whilst delivering the agreed 'quality of service'?	IT management
IT use	IT assets	IT impacts	How to optimize the use of IT assets? How to get most impact from the use of IT assets?	Business and IT alignment
Competitive and supporting business processes	IT impacts	Organizational performance	How to maximize value from assets? How to valuate assets?	Business management

Table 3-4. Analysis of main questions of the process approach to IT value.

The influence of BIA on the value derived from IT is most prominent in the IT use process, where the question is how IT assets translate to impact on business processes and strategy. Figure 3-3 visualizes this, by combining the process approach framework and the Strategic Alignment Model. (Note that the pillars of the Strategic Alignment Model have been flipped in order to match the process approach framework.)

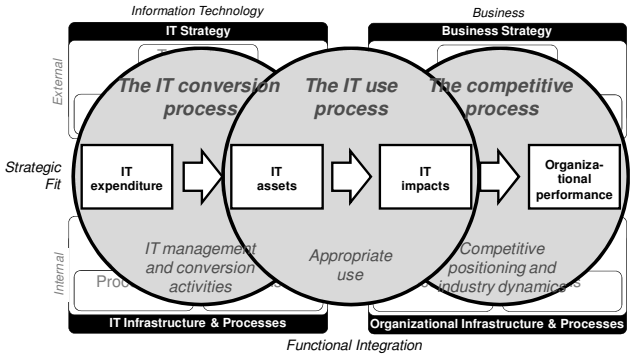

Figure 3-3. The process approach to IT value mapped on the Strategic Alignment Model.

From Figure 3-3 it shows that the 'IT use' process is in the heart of the relation between alignment and IT value.

3.4 Alignment in the IT Use Process

The IT use process covers the relationship between IT assets and IT impacts. This addresses the effectiveness of IT. How does IT contribute to the business processes, strategy and goals?

3.4.1 The nature of IT assets

A preliminary understanding about the impact of IT is that the relation between IT assets and business impact is not always straightforward (Silvius, 2008a). Business applications will usually have an identifiable impact on business processes, but for components of the IT infrastructure their effect is mostly indirect as enabler of applications. These 'levels' of impact brought us to distinguish three categories of IT 'value drivers'. The first category, 'IT business value drivers' consist of business applications with a direct impact on the business. The second category is the 'Derived IT value drivers' and consists of the IT infrastructure and the data architecture of the organization. The third category, 'IT value enablers', consists of the variables regarding the organization of IT in the company.

3.4.2 The impact of IT

The impact of IT on business is rapidly shifting. Starting from a calculation tool to improve efficiency in administrative processes, IT provided decision makers with more detailed information much quicker than before, hereby improving the effectiveness of the organization. The last decennium saw another shift as internet allowed companies to open up new markets, develop new services or provide new means of developing customer loyalty, thereby innovating the business of a company. So, from an enabler of business IT developed into an innovator of business. The latest notion is that the lower cost of communication, which IT provides, enables organizations to swap resources more easily, For example moving business activities offshore, thereby enhancing the managerial flexibility (Silvius, 2006). Measures of IT productivity need to be expanded to capture the impacts of contemporary IT use (Mooney et al., 1995).

Porter's value chain model (Porter, 1985) provided one of the earlier frameworks for considering the role of IT in supporting and creating competitive advantage at the activity (process) level. Davenport

(1993) states that "Process improvement and innovation are the best hope we have for greater value of our vast information technology expenditures". Business processes therefore provide a functional perspective to consider the impact of IT. For further analysis, these processes can be categorized into main business functions as illustrated in Figure 3-4. The 'generic business model' (Martin, 1982) distinguishes as main business functions: Adding Value, Innovating, Controlling Resources and Directing.

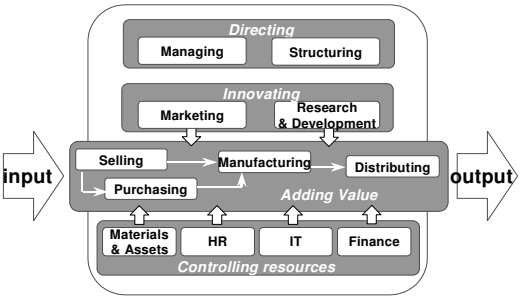

Figure 3-4. The generic business model (Martin, 1982).

The internally focused, business process perspective, however, fails to capture the impact of IT use in the externally focused commercial communication. Over the last decade E-Marketing and online promotion channels have developed into an integrated part of an organization's market proposition. Silvius (2006) provides an "IT value grid" for the analysis of IT impacts, that expands the functional internally focused business process perspective with an externally focused market proposition perspective. For analyzing the impact of IT on the market proposition, the marketing discipline, provides the four 'P's: Price, Product, Placement and Promotion.

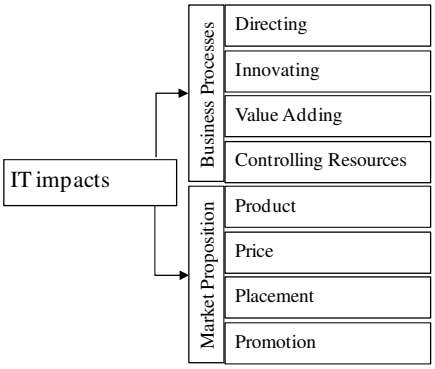

Figure 3-5. Overview of the functional perspective on IT impact (based on Silvius, 2006).

Figure 3-5 provides an overview of the combined internal and external functional perspective of IT impact.

Mooney et al. (1995) expand the functional perspective on IT impact with a view that captures the nature of the impact. They propose three potential effects that IT can have on business processes and through which IT creates value. These effects are:

- *Automational effects*

  derived from the role of IT as a substitution of human labor, thereby creating impacts as productivity improvements and cost savings.

- *Informational effects*

  derived from IT's ability to collect, store, process and disseminate information, creating impacts as improved decision making and employee empowerment, resulting in enhanced resource utilization and more effective communication.

- *Transformational effects*

  derived from IT's ability to facilitate process, service and product innovations and to support the exploration of new markets.

We feel that this perspective on IT impact is complimentary to the functional view presented earlier. However, the effects presented by Mooney et al. (1995), again seem to fail to capture the contemporary use of 'Web 2.0' applications like social media, virtual worlds, viral campaigns and consumer-to-consumer communication. We therefore propose the addition of a fourth potential effect:

- *Relational effects*

  derived from IT's ability to influence and create an organization's reputation and image, thereby creating consumer preference and/or loyalty.

3.4.3 Business strategy

After creating an understanding of the functional impact of IT and the nature of this impact, a next step is to understand how these impacts support business strategy. According to Kefi (2002), it is important to match the IT investments to the strategic context of the organization. This notion is confirmed by Stewart and Mohamed (2002), Irani and Love (2002), Love and Irani (2004), Gemmell and Pagano (2003).

In modern business strategy literature, three dominant strategies are identified: product leadership, customer intimacy and operational excellence (Treacy and Wiersema, 1997). In a operational excellence strategy the organization wins if it realizes high volumes with low costs, resulting in low prices. IT investments that create business efficiency, for example an ERP system that optimizes the utilization of resources, are particularly relevant in this type of strategy. In a product leadership strategy the Unique Selling Proposition of the company is that of high quality of products and services. For these companies the ability of IT systems to enable this quality would therefore probably be of greater value than the efficiency of the company. For example, a smart warehouse management system that enhances order fulfillment by optimizing stock levels could fit this strategy. Finally, in a customer intimacy strategy the organization will benefit most from IT systems that strengthen their ability to tailor their offer to the customer's needs. An example of such a system could be a customer relationship management application for a fashion retailer that allows him to capture the measurements, preferences and buying history of his individual customers.

Not all business processes 'make the difference' in the strategy of a company. In the typology of business processes provided by the generic business model (Figure 3-4) typically the 'adding value'

and 'innovating' processes create the Unique Selling Propositions of the organization. Logically, the impact of business strategy on the valuation of IT investments will be most relevant for investments in IT systems with an impact on these 'adding value' and 'innovating' business processes. Supporting processes like facility management or personnel administration are also important but do not typically have a direct effect on the external positioning of the organization. For IT investment supporting these business processes, efficiency will therefore always be the most important source of value.

Cumps and Viaene (in PriceWaterhouseCoopers, 2005) studied the relationship between business strategy, IT strategy, alignment maturity and IT investment portfolios in 641 Western-European organizations in seven countries. They categorized the business strategies of the responding organizations in the typology of Treacy and Wiersema described earlier and concluded that "the primary factor driving investment is IT strategy" (PriceWaterhouseCoopers, 2005) and not that much business strategy. Companies that focus on keeping the IT running are more often those that have a conservative IT strategy, whatever their business strategy might be.

Several studies also show the nature of the 'adding value' business processes as a factor of influence in the value of IT investments. Studies that show returns on IT investments (Harris and Katz, 1991) typically concentrated on information intensive industries like financial services, whereas studies that concentrated on manufacturing or information non-intensive industries (Loveman, 1988; Olson and Weill, 1989) found no returns from IT.

3.4.4 Unintended impact

A final notion is that IT assets tend to have not just intended impacts, but also unintended or unexpected impacts, or side effects. For example an investment in innovative technology can raise media attention and lead to free publicity in professional journals. This publicity can in its turn enhance the familiarity of the organization amongst the public and increase company pride amongst employees. Investment proposals will logically address mainly the intended impact within the scope of the project. But it can be of value to also imagine what possible side effects can occur. Both positive and negative.

After this analysis of the impact of IT on an organization's business processes and market proposition, and the alignment with business strategy, the next step is to analyze how these aspects are reflected in the different valuation methods for valuing IT investments?

3.5 IT Valuation

The valuation of IT investments is basically an economic issue for which it is irrelevant whether the investment is in IT or in any other resource. As long as the effects of the investment are understood, calculating the value of it is merely a financial technicality. This sounds almost too good to be true. Indeed, it is not quite that simple. Financial valuation methods all have assumptions and limitations, which caused both practitioners and academics to develop (e)valuation methods that consider more than just the financial aspects. After considering over 50 evaluation methods Renkema and Berghout (1996) grouped these methods into four categories: Financial methods, Multi-Criteria methods, Ratio methods and Portfolio methods.

3.5.1 Financial methods

The group Financial evaluation methods comprises of the traditional economic investment selection and valuation methods. Table 3-5 provides an overview of these valuation methods and their most important qualities and limitations.

Valuation method	*Qualities*	*Limitations*
Return on investment	Easy to calculate Easy to interpret (a simple percentage) In line with the financial administration	Outcome sensitive to amortization method Ignores the time-value of money Ignores risk
Pay-back period	Quite easy Intuitively coping with risk	Ignores part of the revenues Simplistic, does not determine value
Internal Rate of Return	Includes the time-value of money Easy to interpret (a simple percentage) Based on cash-flows	Complex Not in line with the financial administration Ignores risk Multiple outcomes, or none, possible
Discounted Cash Flow / Net Present Value	Includes the time-value of money Based on cash-flows Copes with risk	Complex Complex to interpret Not in line with the financial administration Not conclusive in case of projects with different durations
Economic Value Added	Includes the opportunity value of money In line with 'shareholder value'	Value calculation based upon one of the other methods Not in line with the financial administration

Table 3-5. Overview of Financial valuation methods (Silvius, 2008a).

The shortcomings of these methods are especially clear when IT investments are made that impact the organizations market proposition. In this arena it is hard to make informed decisions when many variables are in flux. Traditional calculation methods are all limited in their ability to cope with risk and managerial flexibility. For example if a project proves to be a success, it can be sped up. If however the market deteriorates, the investment outlays of the project can be lowered or postponed. Despite the logic of this, in reality management adapts plans based on actual conditions all the time, this flexibility is not adequately valued in any of the valuation methods mentioned earlier. The result is an inadequate decision process for new projects. In some cases this even results in competitive investment proposals being rejected. Therefore it is clear that companies need to come up with new ways of judging IT investments.

3.5.2 Advanced financial methods

A new insight is provided by the Real Options Valuation (ROV) theory (Trigeorgis, 1996). In the ROV an additional value is added on top of the Net Present Value (NPV) of a project. This 'option value' valuates the flexibility of the investment. Flexibility reflects the ability to alter the investment outlay and the timing of outlays based on changes in the competitive environment. ROV treats the possibilities of adapting the investment plan as (real) options.

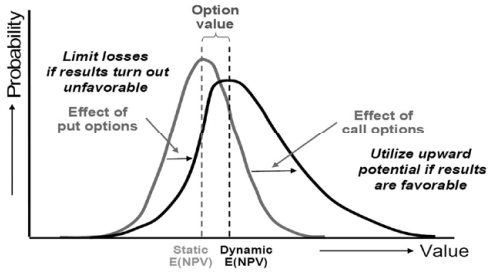

Figure 3-6. The effect of real options on value. (Smit and Silvius, 2001)

The opportunity to invest can be seen as a call option, involving the right to acquire an asset for a specified price (investment outlay) in a future moment. A call option gives the holder the right, for a specified price within a given amount of time, to exercise the option to acquire the underlying asset. The techniques derived from option pricing, quantify the management's ability to adapt its future plans to capitalize on favorable investment opportunities or to respond to undesirable developments in a dynamic environment by cutting losses.

A valuable insight that can be gained from option theory is the effect of changes of the variables of the investment on the value of the investment. An interesting fact is that, for example, an increase in the volatility of the returns decreases the NPV, but increases the ROV! (Smit and Silvius, 2001)

Another addition to the traditional valuation methods is the notion that the returns of an investment are not only influenced by the organizations own decisions, but also by the decisions of the competition. For example the first telecom operator that implements an innovative new service will enjoy, temporary, first mover advantages that the other players will miss when they implement the same service. Combining the real options approach with game theory, taking into account competitive counteractions, closes the gap between traditional corporate finance theory and strategic planning. Management investment decisions are made with the explicit recognition that they may invite competitive reaction, which in turn impacts the value of the firm's investment opportunity. The strategic value of early commitment in such cases must be set off against the option value of waiting and may potentially justify early investment.

A 'Grab the dollar' game (Fudenberg and Tirole, 1985), for example, is a strategic context that is often associated with IT investments. Firms obtain a negative payoff when they end up investing simultaneously. 'Grab the dollar' illustrates the situation where the current market prospects are only favourable if one of the players invests, but simultaneous investment results in a battle with an expected negative payoff. Only the first player captures the dollar (For example, patent), but when they all enter the market, they all end up losing the battle. A dominant firm has an advantage to win this simultaneous game.

Based on the insights provided by the real options and game theories the traditional NPV calculation can be and should be expanded to include the effects of managerial flexibility and competitive behavior. This 'Expanded NPV' can be calculated as:

$$\textit{Expanded NPV} = \textit{NPV} + \textit{Flexibility value} + \textit{Strategic value}$$

Figure 3-7 summarizes this more complete valuation framework (Silvius, 2006). This framework provides a better understanding of the value of IT investments.

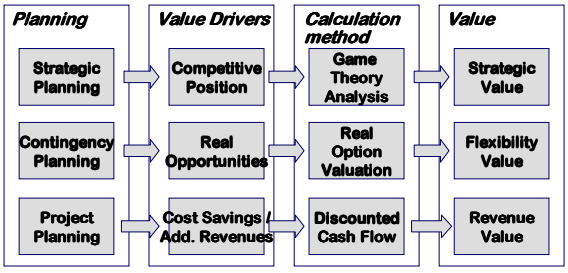

Figure 3-7. A complete valuation framework (Silvius, 2006).

What do these new insights mean for the calculation of the value? In theory the knowledge is available to calculate a 'complete' value according to the framework. This calculation however will be complex and hard to understand in boardrooms. It is a drawback not to be taken lightly. The tendency to fall back on simple and comprehensible calculation methods leads to systematic underestimation of the value of IT investments especially when their effects are more than just efficiency improvement. This pitfall should be well understood. Financial theory just cannot provide us with a simple and undisputed figure or percentage that expresses the complete value of an investment. It is therefore the opinion of the economist Professor Michael Brennan that "It is better to have the approximately optimal solution to the right problem than the exact solution to the wrong problem!" (Actual quote on the 2000 Real Options Group conference, May 2000).

3.5.3 Multi-Criteria methods

Multi-criteria methods are a reaction to the problems of capturing the full value of IT investments in just financial metrics. These methods aim to identify different relevant aspects of value and risk in order to enable a thorough discussion and an informed discussion (Frisk, 2007). The most important method using multiple criteria is information economics (Parker, Benson and Trainor, 1988). This method is suited for evaluating a single project as well as a portfolio of projects. It is built on a step-by-step evaluation process.

Step 1. Determine the evaluation criteria.

In this step the management of the organization determines which criteria to use in the evaluation of IT investments. One or more of the financial criteria described above will logically be included in the set, but less measurable criteria as 'strategic fit', 'competitive advantage' will be also be part of the model. Parker et al. (1988) identify criteria in two domains: business (= demand) and IT (= supply).

Step 2. Determine the relative weights of the criteria.

The importance or 'weight' of the different criteria may not be equal. Management therefore has to decide upon a weight factor for each criteria. The weight is expressed on a scale from 0 (not important at all) to 5 (very important).

Step 3. Evaluating the different investments.

Based upon the set of criteria and weight factors each project or investment is given a score on all of the criteria. This may seem like a very arbitrary score, but Parker et al. (1988) provide situational descriptions for each score. It is crucially important that the scores are underpinned in this more objective way in order to create acceptation for the results of the evaluation process.

Step 4. Presenting the results.

The results of the evaluation process can be presented in a graphically attractive way. The scores of the '+' criteria are totaled to a score representing the 'value' of the investment, whereas the scores of the '-/-' criteria add up to a total 'risk' score. Combining the two scores in a two-dimensional graph provides management with a concise overview of the investment portfolio. Based upon their preferences regarding the risk-return relationship, priorities can be determined and investments selected.

3.5.4 Ratio Methods

Different from the financial and multi-criteria methods are ratio methods not aimed at evaluating a specific investment or project, but at finding the 'right' level of total IT costs in an organization. This level is expressed as a ratio, For example IT costs / total revenue or IT costs / employee. The outcome of these ratios should be considered relative to the same ratios at competitors or for one organization in time. Lower or higher scores on these ratios than comparable organizations are not per-se right or wrong, but should give reason for investigation and discussion.

The most prominent author on ratio methods is Paul Strassmann. This former CIO of several distinguished companies developed sophisticated ratios for specific industries. Based on his research he remains sceptical about the value of IT investments. He states that "For 55% of U.S. firms the computer budget exceeds their economic value-added." and "The "right" level of spending for computers reflects the bureaucratic characteristics of a firm, not revenue or profits."(Strassmann, 1997). A limitation to the applicability of the ratio method however is the availability of (public) data required for the ratios.

3.5.5 Portfolio methods

In 1981, F. Warren McFarlan suggested to analyze and manage IT investments and projects in terms of revenues and risks using portfolio theory, as was done in the financial world (Warren McFarlan, 1981). 'Portfolio theory' referred to the 'modern portfolio theory' as developed by Markowitz in 1952 (Markowitz, 1952). Although appealing, the use of this insight did not really take off until the Clinger-Cohen Act. This Act states that the management of IT in US government institutions 'must reflect a Portfolio Management approach …… and decisions to terminate or make additional investments are based on performance much like an investment broker is measured and rewarded based on managing risk and achieving results'.

With its appeal on portfolio theory, the Clinger-Cohen Act aims to bring transparency to IT costs and benefits. When applying portfolio theory to IT projects however, some issues may occur regarding the scalability of the investments, the tradability of the investments, the unique character of some investments, the exchangeability of benefits, the unfamiliarity of project risks, etc. Although the difference in characteristics between financial investments and IT investments does imply limitations to the applicability of portfolio theory, some useful insights could be derived (Van Rossum and Silvius, 2006).

An important insight in portfolio theory is the understanding that the value of an investment will be influenced by other investments or assets in the portfolio. In other words, investment decisions are not taken in isolation. Whereas all other evaluation methods study the value of an investment as an autonomous value, portfolio methods study value of investments in conjunction to other investments and assets. An insight that appeals to the common sense when considering architectural aspects. Portfolio theory also points out the importance of having a structured process in place for the continuous evaluation of the total portfolio of IT investments and projects.

3.6 Alignment in IT valuation

The changing role of IT needs to be reflected in the way IT investments and expenditures are evaluated. The traditional 'IT-economics' focus on cost savings should evolve to also include the informational, transformational and reputational impacts. The valuation methods described in last

paragraph all have specific qualities, but fail to cover the aspects of impact and alignment mentioned earlier. Based upon an understanding of these different qualities, Table 3-6 provides an overview of the coverage of the valuation methods of the impact of IT, function and nature, and the business strategy.

		Valuation Methods			
		Financial Methods	Multi-Criteria Methods	Ratio Methods	Portfolio Methods
Functional impact	Business processes	implicit	covered	covered	implicit
	Market proposition	not covered	covered	not covered	not covered
Nature of impact	Automational	covered	covered	covered	covered
	Informational	implicit	covered	not covered	not covered
	Transformational	implicit	implicit	not covered	not covered
	Reputational	not covered	covered	not covered	not covered
Business Strategy	Operational excellence	contribution to strategy implicit	contribution to strategy covered	contribution to strategy not covered	contribution to strategy implicit
	Product leadership				
	Customer intimacy				

Table 3-6. Coverage of the function and nature of IT impacts and business strategy.

Given the specific characteristics of all methods, it remains to be seen whether combining different methods into an overall 'best' valuation model would deliver satisfactory results (Silvius, 2008b). In the ongoing search for 'optimal' methods, the nature and functional impact of IT seems to be overlooked, as well as the role of business strategy. Given the variety of characteristics of IT investments and assets, there is a point to be made for aligning the criteria and methods of IT valuation, and the relative weight of these criteria, with the specific characteristics and impacts of the IT investments and assets. For example, it could make good sense to select a specific investment because it's risky and another investment because it's safe. Or, to accept that a certain level of risk could be well acceptable for an investment in new marketing channels, but totally unacceptable for an investment in a new payroll system. Different types of IT assets require different considerations. Therefore, the characteristics of the asset, and its impacts, should be added to the discussion about valuation methods (Silvius, 2008b).

3.7 A Comprehensive Selection Model

Silvius (2008b) suggests that the choice of (e)valuation methods should be aligned with the impact of the IT asset or investment under scrutiny. He constructed a 'decision tree' shaped selection model aimed at aligning the valuation method with the specific characteristics of the IT asset. His classification took into account:

- The impact of the IT investment (external market proposition vs. internal business processes);
- The tangibility of the returns (tangible vs. intangible);
- The certainty of the returns (certain vs. uncertain).

Based on this concept and our analysis of IT impacts, we can now construct an improved selection model. In this model the variables will be:

- *The nature of the impact of the IT asset.*

  Being Automational, Informational, Transformational or Reputational. For automational impacts it will be possible to value these with financial methods like NPV or IRR. Informational, transformational and reputational impacts, however, will require a more qualitative approach, for example in a multi-criteria method.

- *The functional perspective on the impact of the IT asset.*

  As depicted in figure 3-5. Based on the insights derived from the 'advanced financial methods' described earlier, it can be concluded that for investments with an impact on the market proposition, the value is influenced by the behavior of the competition. Therefore game theory comes into the valuation. For investments with an internal impact this is not likely.

- *The business strategy of the organization.*

  Based on the leveraging effect of strategic alignment found by Byrd et al. (2006) and the findings of Cumps and Viaene (in PriceWaterhouseCoopers, 2005) mentioned earlier, it can be expected that business strategy does not provide specific directions for the selection of valuation methods. It should, however, be of influence in the relative weights of different arguments, for example in a multi-criteria method, in the valuation model and process.

Based on these three perspectives, a comprehensive selection model is constructed (Figure 3-8) that provides guidance for aligning the IT valuation method with the specific characteristics, impacts and organizational context of an IT asset or investment.

The selection model is derived from the characteristics, impacts and organizational context of the IT asset or investment and the strengths and weaknesses of the different investment valuation methods. It is therefore a conceptual model that is aimed at providing guidance to practitioners in the selection of the most appropriate valuation method. The basic point that the model makes is that (e)valuating IT assets and investments is not a 'one size fits all' task. The concept of an ultimate evaluation method that unveils the 'true' value is an illusion. IT value is a multidimensional concept that is difficult to express in a simple number. Besides that, value is also circumstantial, depending on organizational and strategic factors and the ability to execute of the organization.

Practitioners should therefore focus their attention on understanding how a IT asset can impact business processes and/or market positioning, the nature of this impact and on how this impact can be utilized fully to achieve the strategic goals of the organization. As pointed out already by Stewart et al. (2007): "The final decision of whether to adopt an IT technology or not must be in line with the firm's strategic plan and business direction. It is only at this point that IT is likely to have a pay-off.".

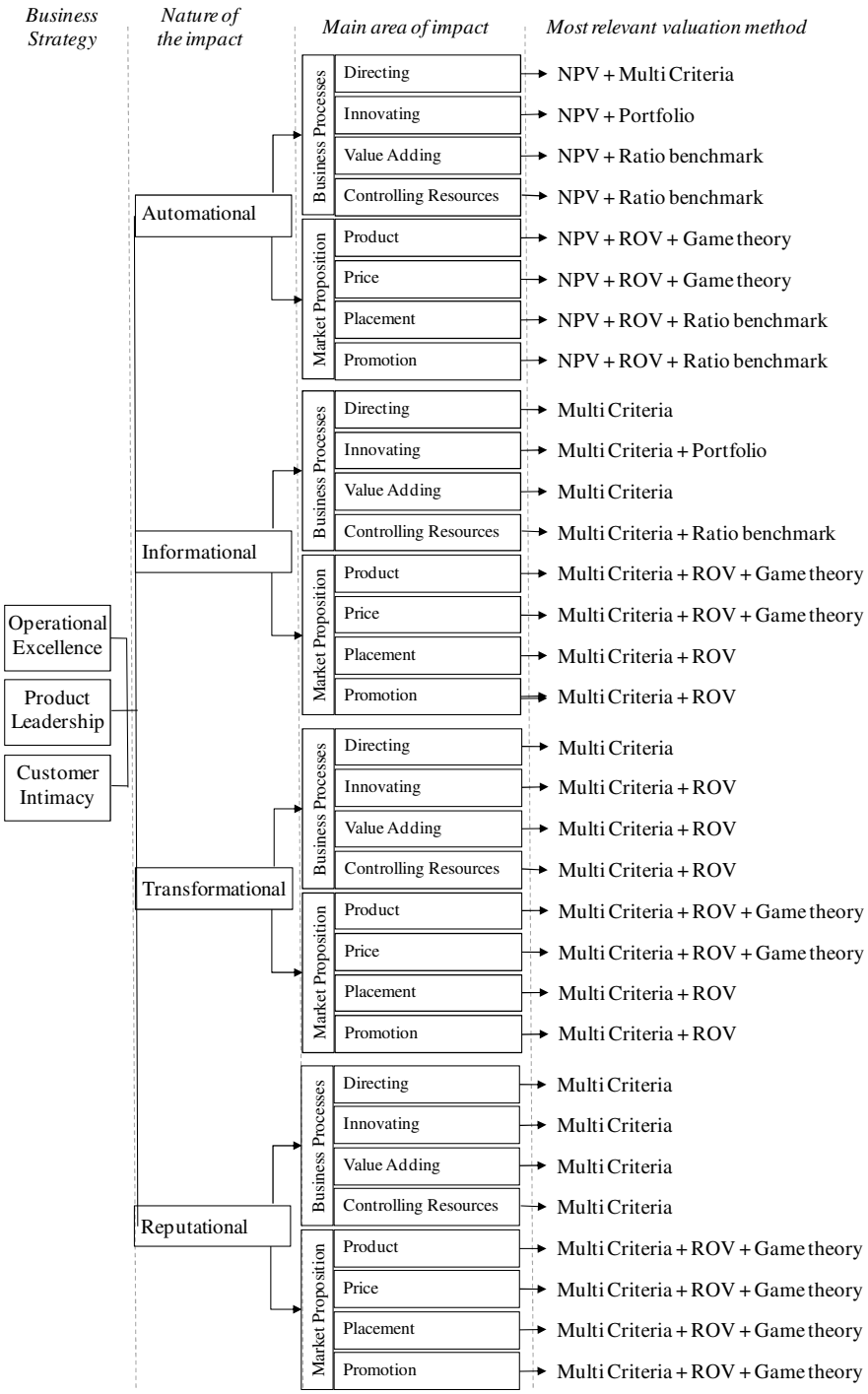

Figure 3-8. A comprehensive selection model.

3.8 Conclusion

The value of IT is a much discussed and often misconceived concept. This paper aims to add new understanding to the discussion by providing an overview of theoretical and practical insights. We discussed different perspectives on the nature and impact of the IT asset and the business context in which it creates value. We also discussed various valuation methods and showed that different methods reveal different aspects of value. However, combining the contextual aspects of IT and the qualities and drawbacks of the different valuation methods means that we are still far away from a simple and easy-to-understand calculation method unveiling the complete and true value of any IT asset or investment. A boardroom focus on simple Return on Investment metrics therefore should be qualified as oversimplified. This conclusion may not be very satisfying but it is not without grounds.

An important insight to be added is the characteristic and nature of the impact of the asset or investment under scrutiny. For an IT asset with a mainly internal and automational impact, the evaluation method used should be a different one than for an reputational IT asset with significant impact on the external positioning of the organization. We provided a conceptual model that provides guidance for aligning the IT valuation method with the specific characteristics, impacts and strategic context of an IT asset or investment.

As an academic challenge this selection model should be empirically tested. None of the earlier studies took the nature and characteristics of the impacts of the investment into account, whereas this is likely to be a factor of influence in selecting the ‘right’ valuation method.

PART B

How do variables of business and IT alignment differ in their contribution to an organization's business and IT alignment maturity?

4 MATURING BUSINESS AND IT ALIGNMENT CAPABILITY; THE PRACTITIONER'S VIEW[4]

Aligning IT and business needs is still one of the most important concerns for senior management. The message of business and IT alignment (BIA) is logical and undisputed, but implementation is apparently difficult. Luftman and Kempaiah (2007) conclude that business and IT alignment needs a tool that can provide an assessment of an organization's level of alignment and a roadmap on how to improve alignment. A broadly used framework for assessing business and IT alignment maturity is Luftman's Strategic Alignment Maturity (SAM) model (Luftman, 2000).

The paper presents a survey study into the perceived contribution of the different variables and sub-variables of the SAM model. We found that the perceived contribution of the variables are not equally spread and suggest a modification of the model.

4.1 Introduction

The necessity and desirability of aligning business needs and information technology (IT) capabilities has been examined in numerous articles (Pyburn, 1983; Reich and Benbasat, 1996; Chan et al., 1997; Luftman and Brier, 1999; Maes et al., 2000; Sabherwal and Chan, 2001) and its importance is well recognized (Cumps et al. 2006a). The annual survey of concerns for senior management executives by the Society for Information Management (www.simnet.org), however, continues to show 'IT and business alignment' as a top concern for (business and) IT managers (Society of Information Management, 2003, 2004, 2005, 2006, 2007, 2008 and 2009). After assessing the business and IT alignment maturity in 197 organizations, Luftman and Kempaiah conclude that alignment is elusive for three main reasons (Luftman and Kempaiah, 2007). Firstly because many organizations view business and IT alignment as a responsibility of IT executives, rather than as a joint concern for both business and IT. Secondly because the solution to the alignment issue is multidimensional. Industry advocated solutions like IT architecture, Governance, ITIL, Cobit and Portfolio management provide support on certain aspects of alignment, but are not 'silver bullets'. Thirdly, business and IT alignment is missing "a tool that can provide both a descriptive assessment and a prescriptive roadmap on how to improve" (Luftman and Kempaiah, 2007).

The alignment maturity study reported by Luftman and Kempaiah (2007), is based on the Strategic Alignment Maturity (SAM) assessment framework developed in Luftman's earlier work (Luftman, 2000). This framework has been applied in several studies on business and IT alignment (among others Ekstedt, et al, 2005; Cumps et al., 2006b; Silvius, 2007b; De Haes and Van Grembergen, 2008; Silvius et al., 2010).

[4] Originally published as: A.J.G. Silvius and J. Smit (2011), "Maturing business and IT alignment capability; the practitioners view", 44th Hawaii International Conference on Systems Science, Koloa HI.

The SAM model consists of 6 variables and 38 sub-variables. In the assessment, all variables and sub-variables are given equal weight, indicating equal importance. But the question arises whether this implicit assumption is correct? Do all variables contribute equally to alignment? Or do some elements from the SAM model contribute more than others? And, if so, how much do they contribute? The relevance of these questions are evident. Adding relative weights to the variables would refine Luftman's model and contribute to a better understanding of how alignment can be influenced and achieved.

A first way to investigate the relative weights of the variables is to explore the perceived contribution to alignment that these variables make. This paper reports a study into the perceived contribution to alignment that IT and business professionals experience or expect from the different variables and sub-variables in their work on growing alignment in their respective organizations. The aim of the study is to provide new insights on the application of SAM and thereby enhancing an organization's ability to improve alignment.

The paper is organized as follows. The next section will provide a brief introduction into the concepts of business and IT alignment and Luftman's SAM model. Following this, we will explain the research design and provide insight into the respondents of the study. The second part of the paper will present the results of the study and some recommendations on the further development of the SAM model.

4.2 Defining business and IT alignment

Business and IT alignment (BIA) can be defined as the degree "to which the IT applications, infrastructure and organization, the business strategy and processes enable and shape, as well as the process to realize this." (Silvius, 2007a). An influential conceptualization of BIA is that of Henderson and Venkatraman (1993). Their widespread framework of alignment, known as the Strategic Alignment Model, describes BIA along two dimensions. The dimension of strategic fit differentiates between external focus, directed towards the business environment, and internal focus, directed towards administrative structures. The other dimension of functional integration separates business and IT. Altogether, the model defines four domains that need to be harmonized in order to achieve alignment. Each of these domains has its constituent components: scope, competencies, governance, infrastructure, processes and skills.

Despite of the apparent importance of aligning IT and business, the majority of publications is rather vague in terms of how to practice alignment (Maes et al., 2000) Luftman's SAM model for measuring and developing alignment (Luftman, 2000) is an exception to this, because it provides both a descriptive assessment tool as a prescriptive insight in how to achieve a higher level of alignment.

4.3 Alignment maturity assessment

Based on the components of the strategic alignment model and his research on the enablers and inhibitors of BIA (Luftman and Brier, 1999), Luftman developed SAM as a tool to assess the business and IT alignment maturity or capability of an organization. In SAM, six criteria are used to determine the maturity of the alignment of IT and business (Luftman, 2000). These criteria are described in Table 4-1. The criteria are further detailed in 38 sub-criteria.

BIA maturity variable	*Description*
Communication	How well does the technical and business staff understand each other? Do they connect easily and frequently? Does the company communicate effectively with consultants, vendors and partners? Does it disseminate organizational learning internally?
Value measurement	How well does the company measure its own performance and the value of its projects? After projects are completed, do they evaluate what went right and what went wrong? Do they improve the internal processes so that the next project will be better?
Governance	Do the projects that are undertaken flow from an understanding of the business strategy? Do they support that strategy? Does the organization have transparency and accountability for outcomes of IT projects.
Partnership	To what extend have business and IT departments forged true partnerships based on mutual trust and sharing risks and rewards?
Scope & Architecture	To what extend has technology evolved to become more than just business support? How has it helped the business to grow, compete and profit?
Skills	Does the staff have the skills needed to be effective? How well does the technical staff understand business drivers and speak the language of the business? How well does the business staff understand relevant technology concepts?

Table 4-1. BIA maturity variables.

In the concept of BIA maturity, the level of maturity indicates an organization's capability to align IT and business needs. As in many maturity models, SAM involves five levels of maturity:

1. Initial / Ad Hoc Process
2. Committed Process
3. Established Focused Process
4. Improved / Managed Process
5. Optimized Process

In this study we explored the perceived contribution of the SAM variables and sub-variables in the eyes of business and IT professionals. In the original description of the SAM model, Luftman states that "The relative importance of each of the attributes within the criteria may differ among organizations." (Luftman, 2000). Later publications, however, fail to recognize specific relative weights of variables and sub-variables and assign, implicitly, equal weights.

4.4 Assessing the relative weights of the SAM variables

Considering that there is an interest in the relative weight that can be assigned to the variables and sub-variables of alignment, it stands to reason that quantitative research is an appropriate way to do a first exploration of these weights. Issues of a more qualitative nature, such as why certain variables make more, less or the same contribution, can be the topic of future research. Therefore the study was designed as a computerized self-administered questionnaire (Babbie, 2003). The questionnaire consisted of 9 general descriptive question (5 about the respondent's background, 4 about the respondents work environment) and 7 questions about the relative contribution to alignment that the

respondents assign to the variables and sub-variables of Luftman's SAM framework. Appendix A shows the design of the questionnaire. The questions about the contribution to alignment were designed as a 'constant sum' question in which the respondents had to distribute a total of 100 points to the different variables, relative to the contribution they assigned to the respective variables. The question was asked once for the relative contribution of the 6 main variables of SAM and 6 times for the relative contribution of the sub-variables of each main variable.

The study was conducted in November 2009 to January 2010. The questionnaire was brought to the attention of randomly selected IT and business professionals of several professional network groups on the Linkedin social network.

4.5 Respondents of the questionnaire

The questionnaire was completed by 110 European professionals. Table 4-2 shows the descriptive characteristics of the respondents.

Questions describing the respondent		*Values*	*Response [%]*
1	Gender	[Male]	81.8
		[Female]	18.2
2	Age group	[<25]	8.2
		[25-34]	16.4
		[35-44]	34.5
		[45-54]	28.2
		[55-64]	8.2
		[>64] years	0
3	Work experience	[<2]	7.6
		[3-5]	10.5
		[6-10]	5.7
		[11-15]	19.0
		[16-20]	22.9
		[>20] years	34.3
4	Highest education	[Vocational training]	2.7
		[Higher vocational training]	5.5
		[Undergraduate degree]	55.5
		[Master's degree]	27.3
		[PhD]	4.5
		[Other]	4.5
5	Position	Business domain	
		[- General Management]	3.5
		[- Commercial Management]	2.1
		[- Financial Management]	4.9
		[- Project Managemnt non-IT]	5.7
		[- Other non-IT]	5.5
		IT/IS domain	
		[- Information Manager]	7.1
		[- Functional Administrator]	3.5
		[- IT/IS Manager]	11.3
		[- System Administrator]	7.1
		[- Service Level Manager]	4.3
		[- IT Service Desk]	1.4

Questions describing the respondent		*Values*	*Response [%]*
		[- IT Project Manager]	16.9
		[- Software Developer]	2.8
		[- Account Manager IT]	2.1
		[- Other IT/IS]	21.2

Table 4-2. Respondents descriptives.

Based on the age distribution and average work experience (>15 years), the group of respondent can be classified as experienced and quite senior. Their professional opinion should therefore be of some value. Regarding the positions of the respondents, it is not surprising that the positions in the IT field are strongly represented (78.3%). However, still 21.7% of respondents worked in other business functions or general management.

Table 4-3 shows the descriptive characteristics of the work environment of the respondents.

Questions describing the work environment		*Values*	*Response [%]*
6	# of employees in the organization	[<10]	16.3
		[11-50]	6.3
		[51-250]	20.1
		[251-500]	7.3
		[>500]	50.0
7	Industry sector	[Agriculture]	0.9
		[Industry]	10.0
		[Energy]	10.9
		[Building & Construction]	2.7
		[Wholesale & Retail]	3.6
		[Logistic Services]	15.5
		[Financial Services]	32.7
		[Information & Communication Services]	42.8
		[Facility Services]	4.5
		[HR Services]	3.6
		[Consulting]	19.1
		[Public Administration]	27.3
		[Education]	17.3
		[Healthcare]	14.5
		[Other]	12.7
8	International activities?	[yes]	65.7
		[no]	34.3
9	External Service Provider?	[yes]	60.6
		[no]	39.4

Table 4-3. Work environment descriptives.

From table 4-3 it becomes clear that the study represented both small and medium sized organizations and large organizations in more or less equal proportion. The industries of the respondents showed a

broad representation, with the professional services industries (information and communication, consulting and financial services) strongly represented.

4.6 Perceived weight of the SAM variables

4.6.1 Overall

Figure 4-1 shows the overall perceived weight of the variables. Clearly 'Communication' is perceived as having the highest contribution to alignment. In fact, almost double as the contribution experienced from the other variables.

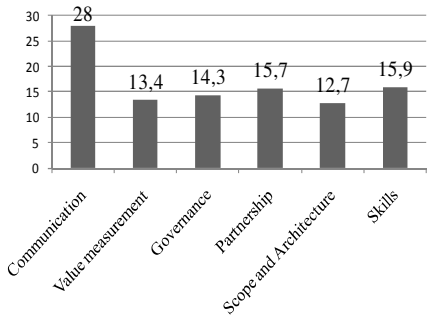

Figure 4-1. Perceived contributions of the main SAM variables.

This result suggests that organizations should pay even more attention to building efficient and effective communication structures between business and IT, than suggested by the Luftman model.

4.6.2 Communications

Figure 4-2 shows the perceived contribution of the sub-variables of the variable Communication.

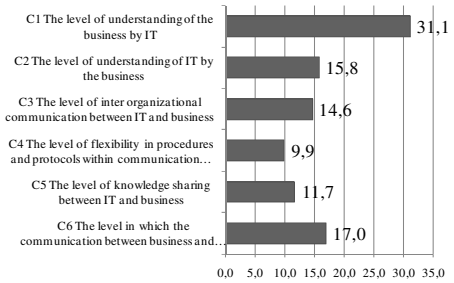

Figure 4-2. Perceived contributions of the Communication sub-variables.

Figure 4-2 shows that all sub-variables of Communication are considered to have a substantial contribution the level alignment. However, the sub-variable understanding of business by IT is considered to have a considerably larger contribution than the other sub-variables.

4.6.3 Value measurement

Figure 4-3 shows the perceived contribution of the sub-variables of Value measurement. The perceived contributions of the different sub-variables do not differ a lot. However, the low score of IT performance benchmarking is remarkable, considering the popularity of benchmarking in recent years.

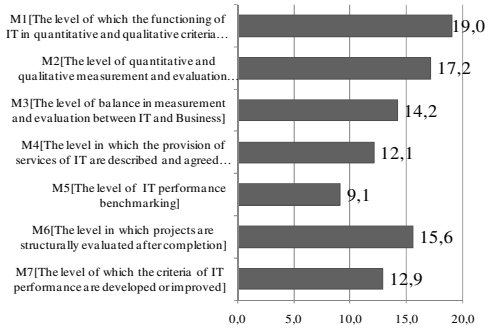

Figure 4-3. Perceived contributions of the Value measurement sub-variables.

4.6.4 Governance

Figure 4-4 shows the perceived contribution of the sub-variables of the variable Governance.

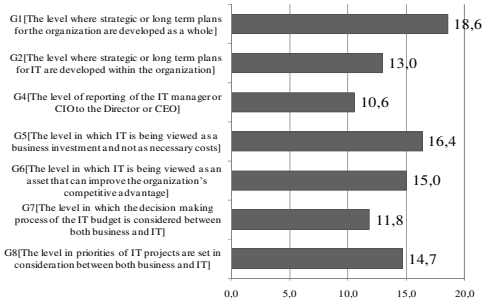

Figure 4-4. Perceived contributions of the Governance sub-variables.

Again, the contribution of the different sub-variables is not considered to be substantially different. The lowest scoring sub-variable is the line of reporting of the IT manager. Again, this should be surprising, since Luftman emphasizes that the biggest improvement in alignment has been the introduction of the Chief Information Officer (Luftman, 2009) and that his reporting line is an important aspect of alignment maturity (Luftman, 2000).

4.6.5 Partnership

The perceived contribution of the sub-variables of the variable Partnership are presented in Figure 4-5.

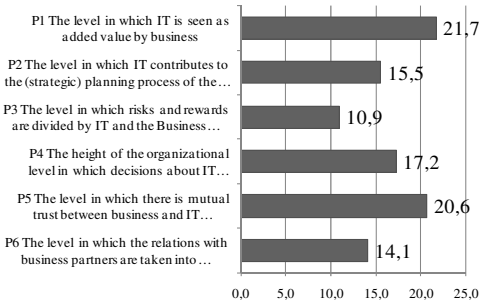

Figure 4-5. Perceived contributions of the Partnership sub-variables.

Not surprisingly, the perception of IT as an added value to the business and the mutual trust between business and IT are considered as contributing most to alignment. The sharing of risks and rewards is considered as contributing considerably less.

4.6.6 Scope and Architecture

Figure 4-6 shows the perceived contribution of the sub-variables of the variable Scope and Architecture. It shows that all sub-variables are considered to have a more or less equal contribution to alignment.

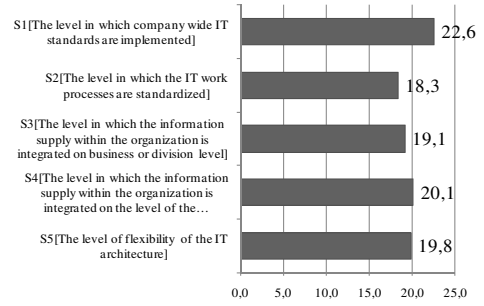

Figure 4-6. Perceived contributions of the Scope and Architecture sub-variables.

4.6.7 Skills

Figure 4-7 shows the perceived contribution of the sub-variables of the variable Skills. The lowest contribution to alignment is expected from the career crossover possibilities between business and IT. This is confirmed by the study of Poels (2006) on effective and non-effective alignment interventions. The highest contribution to alignment is considered to come from a culture of innovation and entrepreneurship in the organization, that allows for personal initiative and experimentation.

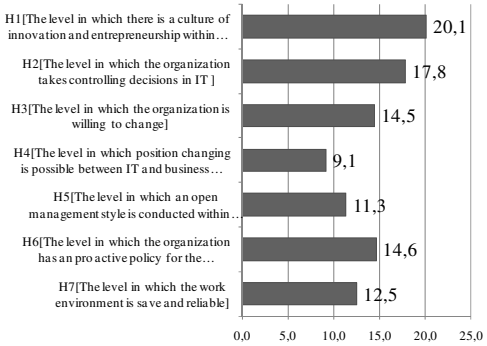

Figure 4-7. Perceived contributions of the Skills sub-variables.

4.7 Developing contribution coefficients

Multiplying the perceived contribution of the main variables with the contributions assigned to the sub-variables results in the 'contribution coefficients' of the different sub-variables. These contribution coefficients indicating the percentage of contribution of the individual sub-variables to the overall alignment maturity of the organization. Table 4-4 shows the contribution coefficients, resulting from our study, compared to the 'original' coefficients in SAM. The difference between the two is shown as an absolute number and as a percentage of the original contribution coefficients.

Variable	Contribution		Difference SAM-Weighted	
	Original in SAM	Weighted	Absolute	%
Communication				
C1[The level of understanding of the business by IT]	0.0278	0.0870	+0.059	213
C2[The level of understanding of IT by the business]	0.0278	0.0441	+0.016	59
C3[The level of inter organizational communication between IT and business]	0.0278	0.0409	+0.013	47
C4[The level of flexibility in procedures and protocols within communication between business and IT]	0.0278	0.0278	0	0
C5[The level of knowledge sharing between IT and business]	0.0278	0.0327	+0.004	18
C6[The level in which the communication between business and IT is not only limited to IT developments, but also concerns the developments within the business and her environment]	0.0278	0.0475	+0.019	71
Value Measurement				
M1[The level of which the functioning of IT in quantitative and qualitative criteria are measured and evaluated]	0.0238	0.0255	-0.002	7

Variable	Contribution		Difference SAM-Weighted	
	Original in SAM	Weighted	Absolute	%
M2[The level of quantitative and qualitative measurement and evaluation within the organization]	0.0238	0.0230	-0.001	-3
M3[The level of balance in measurement and evaluation between IT and business]	0.0238	0.0190	-0.005	-20
M4[The level in which the provision of services of IT are described and agreed upon]	0.0238	0.0162	-0.008	-32
M5[The level of IT performance benchmarking]	0.0238	0.0122	-0.012	-49
M6[The level in which projects are structurally evaluated after completion]	0.0238	0.0209	0.003	-12
M7[The level of which the criteria of IT performance are developed or improved]	0.0238	0.0173	-0.006	-27
Governance				
G1[The level where strategic or long term plans for the organization are developed as a whole]	0.0238	0.0265	-0.003	11
G2[The level where strategic or long term plans for IT are developed within the organization]	0.0238	0.0186	-0.005	-22
G4[The level of reporting of the IT manager or CIO to the Director or CEO]	0.0238	0.0151	-0.009	-37
G5[The level in which IT is being viewed as a business investment and not as necessary costs]	0.0238	0.0234	-0.000	-2
G6[The level in which IT is being viewed as an asset that can improve the organization's competitive advantage]	0.0238	0.0215	-0.002	-10
G7[The level in which the decision making process of the IT budget is considered between both business and IT]	0.0238	0.0169	-0.007	-29
G8[The level in priorities of IT projects are set in consideration between both business and IT]	0.0238	0.0210	-0.003	-12
Partnership				
P1[The level in which IT is seen as added value by business]	0.0278	0.0340	-0.006	22
P2[The level in which IT contributes to the (strategic) planning process of the business]	0.0278	0.0244	-0.003	-12
P3[The level in which risks and rewards are divided by IT and the business when achieving goals]	0.0278	0.0171	-0.011	-38
P4[The height of the organizational level in which decisions about IT budgets and projects are made]	0.0278	0.0270	-0.001	-3
P5[The level in which there is mutual trust between business and IT departments within the organization]	0.0278	0.0324	-0.005	17

Variable	Contribution		Difference SAM-Weighted	
	Original in SAM	Weighted	Absolute	%
P6[The level in which the relations with business partners are taken into account in IT planning]	0.0278	0.0221	-0.006	-20
Scope and Architecture				
S1[The level in which company wide IT standards are implemented]	0.0333	0.0286	-0.005	-14
S2[The level in which the IT work processes are standardized]	0.0333	0.0233	-0.010	-30
S3[The level in which the information supply within the organization is integrated on business or division level]	0.0333	0.0243	-0.009	-27
S4[The level in which the information supply within the organization is integrated on the level of the organization as a whole]	0.0333	0.0256	-0.008	-23
S5[The level of flexibility of the IT architecture]	0.0333	0.0252	-0.008	-24
Skills				
H1[The level in which there is a culture of innovation and entrepreneurship within the organization]	0.0238	0.0320	-0.008	34
H2[The level in which the organization takes controlling decisions in IT]	0.0238	0.0284	-0.005	19
H3[The level in which the organization is willing to change]	0.0238	0.0230	-0.001	-3
H4[The level in which position changing is possible between IT and business functions]	0.0238	0.0145	-0.009	-39
H5[The level in which an open management style is conducted within the organization]	0.0238	0.0180	-0.006	-25
H6[The level in which the organization has an pro active policy for the development of her employees]	0.0238	0.0233	-0.001	-2
H7[The level in which the work environment is save and reliable]	0.0238	0.0199	-0.004	-16

Table 4-4. Contribution coefficients.

From the overview in Table 4-4 it becomes clear that the professionals in our study perceive the contribution of the different variables in SAM quite different from the original, un-weighted, model. Some sub-variables, such as “C1: The level of understanding of the business by IT”, gain weight up to +213%, while some others, such as “M5: The level of IT performance benchmarking”, are considered less influential, up to –49%.

Based on the contribution coefficients it can also be determined that the five sub-variables that contribute the most to alignment account for 25% of the organization's overall alignment maturity. These five sub-variables are:

- C1 [The level of understanding of the business by IT]
- C6 [The level in which the communication between business and IT is not only limited to IT developments, but also concerns the developments within the business and her environment]
- C2 [The level of understanding of IT by the business]
- C3 [The level of inter organizational communication between IT and business]
- P1 [The level in which IT is seen as added value by business]

4.8 Conclusions and limitations

Luftman's Strategic Alignment Maturity model provides practitioners and academics with a practical tool to assess and develop an organization's capability to align IT to business requirements and opportunities. In our study we explored the professional opinion of IT and business professionals regarding the contribution of the different variables and sub-variables of the SAM model to alignment. The study reveals that some variables contribute more to alignment than others. We found, for instance, that the professionals in our study assign the highest contribution to the variable Communication, followed (at some distance) by the variables Partnership and Skills.

One important implication of these findings is that the somewhat implicitly assigned and generally equal contribution coefficients of the different variables and sub-variables in SAM may be different from the comparative contributions that these variables make in practice. Therefore it is justified to suggest a refinement of SAM towards a model in which the relative contributions of each variable and sub-variable are accounted for.

A limitation of our study is the sample size. For a validation of the contribution coefficients, further research and a larger sample size could be required.

Another limitation is the geographical scope of our study. As indicated by Silvius et al. [19], SAM scores are influenced by national cultures. For this reason it should be expected that the contribution coefficients are influenced by national cultures as well. A multi-national study would be required to test this hypothesis.

Appendix A. Questionnaire design

Questions describing the respondent		*Type of question*	*Values*
1	Gender	Single select	[Male] [Female]
2	Age group	Single select	[<25] [25-34] [35-44] [45-54] [55-64] [>64] years
3	Work experience	Single select	[<2] [3-5] [6-10] [11-15] [16-20] [>20] years
4	Highest education	Single select	[Vocational training] [Higher vocational training] [Undergraduate degree] [Master's degree] [PhD] [Other]
5	Position	Single select	Business domain [- General Management] [- Commercial Management] [- Financial Management] [- Project Management non-IT] [- Other non-IT] IT/IS domain [- Information Manager] [- Functional Administrator] [- IT/IS Manager] [- System Administrator] [- Service Level Manager] [- IT Service Desk] [- IT Project Manager] [- Software Developer] [- Account Manager IT] [- Other IT/IS]
Questions describing the work environment		*Type of question*	*Values*
6	# of employees in the organization	Single select	[<10] [11-50] [51-250] [251-500] [>500]

Questions describing the respondent		*Type of question*	*Values*
7	Industry sector	Multiple select	[Agriculture] [Industry] [Energy] [Building & Construction] [Wholesale & Retail] [Logistic Services] [Financial Services] [Information & Communication Services] [Facility Services] [HR Services] [Consulting] [Public Administration] [Education] [Healthcare] [Other]
8	International activities?	Single select	[yes] [no]
9	External Service Provider?	Single select	[yes] [no]
Questions describing the relative weight of the different alignment variables and sub-variables		*Type of question*	*Variables*
10	Assign relative weights to the alignment maturity main variables	Constant sum	[Communication] [Value measurement] [Governance] [Partnership] [Scope and Architecture] [Skills]
11	Assign relative weights to the alignment maturity sub-variables within Communications	Constant sum	C1[The level of understanding of the business by IT] C2[The level of understanding of IT by the business] C3[The level of inter organizational communication between IT and business] C4[The level of flexibility in procedures and protocols within communication between business and IT] C5[The level of knowledge sharing between IT and business] C6[The level in which the communication between business and IT is not only limited to IT developments, but also concerns the developments within the business and her environment]
12	Assign relative weights to the alignment maturity sub-variables within Value measirement	Constant sum	M1[The level of which the functioning of IT in quantitative and qualitative criteria are measured and evaluated] M2[The level of quantitative and qualitative measurement and evaluation within the organization] M3[The level of balance in measurement and evaluation between IT and business] M4[The level in which the provision of services of IT are described and agreed upon] M5[The level of IT performance benchmarking] M6[The level in which projects are structurally evaluated after completion] M7[The level of which the criteria of IT performance are developed or improved]

Questions describing the respondent		*Type of question*	*Values*
13	Assign relative weights to the alignment maturity sub-variables within Governance	Constant sum	G1[The level where strategic or long term plans for the organization are developed as a whole] G2[The level where strategic or long term plans for IT are developed within the organization] G4[The level of reporting of the IT manager or CIO to the Director or CEO] G5[The level in which IT is being viewed as a business investment and not as necessary costs] G6[The level in which IT is being viewed as an asset that can improve the organization's competitive advantage] G7[The level in which the decision making process of the IT budget is considered between both business and IT] G8[The level in priorities of IT projects are set in consideration between both business and IT]
14	Assign relative weights to the alignment maturity sub-variables within Partnership	Constant sum	P1[The level in which IT is seen as added value by business] P2[The level in which IT contributes to the (strategic) planning process of the business] P3[The level in which risks and rewards are divided by IT and the business when achieving goals] P4[The height of the organizational level in which decisions about IT budgets and projects are made] P5[The level in which there is mutual trust between business and IT departments within the organization] P6[The level in which the relations with business partners are taken into account in IT planning]
15	Assign relative weights to the alignment maturity sub-variables within Scope and Architecture	Constant sum	S1[The level in which companywide IT standards are implemented] S2[The level in which the IT work processes are standardized] S3[The level in which the information supply within the organization is integrated on business or division level] S4[The level in which the information supply within the organization is integrated on the level of the organization as a whole] S5[The level of flexibility of the IT architecture]
16	Assign relative weights to the alignment maturity sub-variables within Skills	Constant sum	H1[The level in which there is a culture of innovation and entrepreneurship within the organization] H2[The level in which the organization takes controlling decisions in IT] H3[The level in which the organization is willing to change] H4[The level in which position changing is possible between IT and business functions] H5[The level in which an open management style is conducted within the organization] H6[The level in which the organization has an pro active policy for the development of her employees] H7[The level in which the work environment is safe and reliable]

5 MATURING BUSINESS AND IT ALIGNMENT; ANALYZING DIFFERENCES IN SCORING PATTERNS[5]

Information technology (IT) is changing the way companies organize their business processes, communicate with customers and deliver their services. An important condition for realizing potential benefits from the use of IT, is the alignment between an organization's business strategy and processes, and its IT capabilities. However, IT and business alignment remains a top concern for IT and business executives.

A frequently used operationalization of business and IT alignment is Luftman's Strategic Alignment Maturity (SAM) model. Since its publication, the application of this SAM model has been applied, reported and validated in almost 20 studies. An important quality of SAM is that its six maturity criteria represent a holistic perspective on maturity. One of the premises of the SAM model is that maturity on the six criteria should be developed more or less equally. It can be questioned, however, whether leveling of criteria scores is necessary or even desirable? In practice organizations not only differ in level of maturity, but also in their scoring pattern on the six criteria around their overall maturity score .

This paper aims to describe and explain the scoring patterns of organizations on Luftman's SAM model. The research question of the study was: Do scoring patterns of organizations on the six SAM criteria differ significantly? And, if so, Are these scoring patterns related to the overall maturity level of the organizations?

The study found that the scoring pattern of high mature organizations indeed differs substantially and significantly from that of low mature companies. The most striking differences are that high mature organizations excel on Partnership maturity, whereas low mature organizations 'underperform' on this criterion and 'excel' on Skills maturity.

These conclusions provide relevant practical directions for organizations that aim to develop their strategic alignment maturity level.

5.1 Introduction: the persistent challenge of aligning IT and business

Information technology (IT) is changing the way companies organize their business processes, communicate with customers and deliver their services (Avolio et al., 2000; Weill and Ross, 2004). Starting from a calculation tool to improve efficiency in administrative processes, IT provided

[5] Originally published as: A.J.G. Silvius and R. Batenburg, "Maturing business and IT alignment; analyzing differences in scoring patterns", submitted for publication.

decision makers with more detailed information much quicker than before, hereby improving the effectiveness of the organization. The rise of internet as a unified connection platform, caused another shift, as it allowed companies to open up new markets, develop new services or provide new means of developing customer loyalty, thereby innovating the business of an organization (Baskerville and Myers, 2002; Silvius, 2010). So, from an enabler of business, IT developed into an innovator of business.

An important condition for benefitting from this potential is the alignment between an organization's business strategy and processes, and its IT capabilities (Reich and Benbasat, 2000; Chan and Reich, 2007a; Chan, Sabherwal and Thatcher, 2006). Several studies (Rosa, 1998; Luftman et al., 1999), however, reported quite low success rates of business and IT alignment (BIA) in organizations, as perceived by business and IT executives. Figures run from 8% (Rosa, 1998) to "less than half" (Luftman et al., 1999) when asked if they succeeded in achieving successful alignment. And already for two decades, IT alignment consistently is mentioned as one of the top concerns for IT and business executives (Luftman, 2009; Gallagher and Gallagher, 2010).

A frequently used operationalization of BIA is Luftman's Strategic Alignment Maturity (SAM) model (Luftman, 2000). Since its publication, the application of this SAM has been reported by several authors (as listed in Table 5-1 in the next paragraph). It has also been validated in several studies (Sledgianowski et al., 2006; Luftman et al., 2008; Chen, 2010). An important quality of SAM is that it represents a holistic perspective on maturity (Mekawy et al., 2009)., whereas many maturity models are derived from the Software Engineering Institute's Capability Maturity Model (Carnegie Mellon Software Engineering Institute, 2002) in the sense that they limit their concepts of maturity to process maturity. Recent insights show that true organizational maturity also requires non-process factors, such as "Human factors" (Pasian et al., 2012), making the holistic approach on maturity, that SAM represents, the preferable one.

One of the premises of the SAM model is that maturity on the six criteria should be developed more or less equally (Luftman and Kempaiah, 2007) to achieve balance between them. However, some studies (Chen, 2010; Silvius and De Waal, 2010;) suggest that this balance is not always desirable. In practice, organizations will differ not only in their level of maturity, but also in their scoring pattern on the six maturity criteria. The interesting question is then if variation, or equality, of maturity scores, matters for the overall alignment maturity, and performance, of the organization. Addressing this question, responds to the call to have more practically relevant research output in information systems research (Desouza et al., 2006), and provides organizations with a tool to determine their alignment strategy.

The study reported in this paper analyzes the scoring patterns of a substantial number of organizations on the SAM model. It aims to understand the variation of these patterns in practice and their relationship with the overall alignment maturity, as proxy for the performance of an organization. In short the research questions of the study is:

How do scoring patterns of organizations on the six SAM criteria differ? and *How are these scoring patterns related to the overall alignment maturity level of the organizations?*

Answering this question provides relevant insight for organizations on which scoring pattern and which criteria are most relevant for the development of their overall maturity level. This insight provides practical guidance on how organization may grow their maturity to a higher level, and how they can allocate their resources to the different criteria accordingly.

This paper is organized as follows. After a brief introduction of the concept of BIA and the SAM model, we will provide an overview of the studies that empirically applied SAM. Based on these

studies, we will then formulate hypothesis on how scoring patterns over the six SAM criteria relate with the overall level of alignment maturity of the organization. The following section will than lay out our research approach and methodology, and present the findings (i.e. the testing of the hypotheses). The paper concludes with a reflection on the findings and recommendations how the results may entail professionals to develop maturity in their organization, and for academics to further study alignment in the IS and business domain.

5.2 Concepts of business and IT alignment and maturity

The necessity and desirability of aligning business needs and IT capabilities is considered to be one of the key issues in IT management (Brancheau and Wetherbe, 1987; Reich and Benbasat, 1996; Chan et al., 1997; Sabherwal and Chan, 2001; Peak and Guynes, 2003; Cumps et al., 2006a; Luftman et al., 2006). An influential conceptualization of business and IT alignment (BIA) is that of Henderson and Venkatraman (1993). Their 'Strategic Alignment Model' (Figure 5-1), describes BIA along two dimensions. The dimension of strategic fit differentiates between external focus, directed towards the business environment, and internal focus, directed towards administrative structures. The other dimension, functional integration, distinguishes the business and IT domains. Combining these two dimensions, the model defines four 'quadrants' of strategic choice: business strategy, IT strategy, organization infrastructure and processes, and IT infrastructure and processes. Each of these quadrants has its constituent components. On the strategic level: scope, competences and governance, and on the organization level: infrastructure, processes and skills.

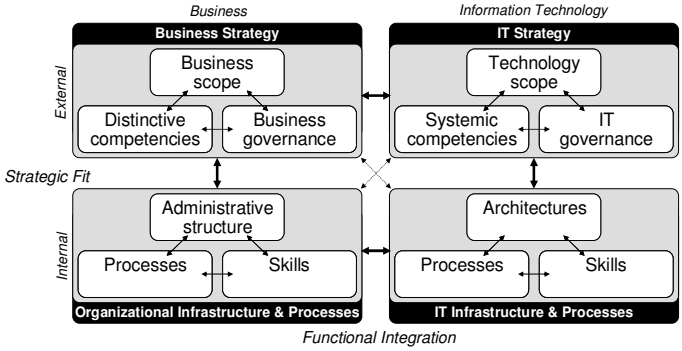

Figure 5-1. The 'Strategic Alignment Model'.

In the Strategic Alignment Model, alignment is about creating fit between the domains, business and IT, and the perspectives, external perspective on the strategic level, and internal perspective on the organizational level. Henderson and Venkatraman (1993) suggest different potential approached to achieve alignment: (1) strategy execution, (2) technology potential, (3) competitive potential, and (4) service level. Each approach has its own starting point (anchor quadrant), mean (pivot quadrant) and effect domain (target quadrant) (Coleman and Papp, 2006). The anchor quadrant represents the business area that will generally be the initiator of change and will provide the majority of requests for IT services. The pivot quadrant represents the functional area that will 'translate' the change initiated by the anchor quadrant into implementable plans, requirements and actions. The impact quadrant, finally, is impacted the greatest by the change initiated by the anchor quadrant (Avison et al., 2004).

Despite being the foundation for many studies on alignment (Avison et al., 2004; Maur et al., 2009), the Strategic Alignment Model does not provide a construct or instrument on how to measure and evaluate alignment (Marques Pereira and Sousa, 2003). Empirical studies on alignment therefore mostly apply models that should be considered extensions of the Strategic Alignment Model (Mekawy, et al., 2009).

Probably one of the most cited and empirically applied development models on BIA is the Strategic Alignment Maturity (SAM) model designed by Luftman (2000). This model presents BIA both in constituting factors and in levels of organizational maturity. A maturity model is a practical way to 'translate' complex concepts into organizational capabilities and to raise awareness for potential development. They provide guidance for action plans and allow organizations to monitor their progress (Dinsmore, 1998).The SAM model therefore provides not just a empirical conceptualization of alignment, but also a path of action, an operationalization, for organizations that aim to develop alignment maturity. Since its publication, the application of the SAM model has been reported in several scholarly publications (for example Ekstedt et al., 2005; Cumps et al., 2006a; De Haes and Van Grembergen, 2008; Luftman and Kempaiah, 2007; Chen, 2010].

The SAM model combines a multidimensional perspective on alignment with a practical assessment tool, that organizations can use for developing their alignment capability. In the SAM model, Luftman defines six criteria to determine the maturity of the alignment between IT and business (Luftman, 2000). These six criteria are:

- *Communications maturity*

  How well does the technical and business staff understand each other? Do they connect easily and frequently? Does the organization communicate effectively with consultants, vendors and partners? Does it disseminate organizational learning internally?

- *Value measurement maturity*

  How well does the organization measure its own performance and the value of its projects? After projects are completed, do they evaluate what went right and what went wrong? Do they improve the internal processes so that the next project will be better?

- *Governance maturity*

  Do the projects that are undertaken flow from an understanding of the business strategy? Do they support that strategy?

- *Partnership maturity*

  To what extend have business and IT departments forged true partnerships based on mutual trust and sharing risks and rewards?

- *Scope & Architecture maturity*

  To what extend has technology evolved to become more than just business support? How has it helped the business to grow, compete and profit?

- *Skills maturity*

  Does the staff have the skills needed to be effective? How well does the technical staff understand business drivers and speak the language of the business? How well does the business staff understand relevant technology concepts?

Figure 5-2 provides an overview of the SAM model.

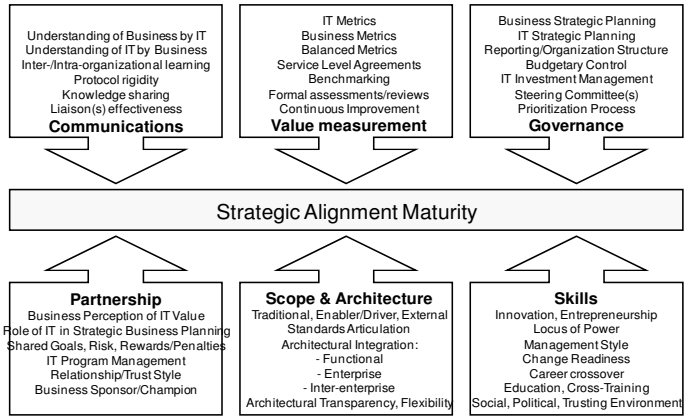

Figure 5-2. The Strategic Alignment Maturity model (Luftman, 2000)

In the concept of strategic alignment maturity, the level of maturity indicates an organization's capability to align IT to business needs. And despite the fact that the model presents a holistic vision on BIA, not just process maturity, the SAM model recognizes five levels of maturity in similar terms as the Capability Maturity Model (Carnegie Mellon Software Engineering Institute, 2002): (1) Initial / Ad Hoc Process; (2) Committed Process; (3) Established Focused Process; (4) Improved / Managed Process; (5) Optimized Process. In this respect, Luftman's SAM model is not a new conceptualization of BIA maturity. In fact, Nolan's classic 'stages of growth' model (Nolan, 1973) may be considered an early maturity model in the field of IT management.

The broad recognition of the SAM model as a validated instrument to measure BIA maturity or capability is demonstrated by the studies listed in Table 5-1. We analyzed and structured each study by extracting the approach and main findings, in particular with regard to the measurement and impact of alignment in organizations. The study overview enables us to perform a meta analysis, to describe how the SAM model and BIA maturity have been operationalized, and which meaningful indicators of an organizations alignment capability were found.

Author	*Research approach*	*Main findings*
Sledgianowski and Luftman, 2005	Case study (n=1) of BIA in a specialty chemical manufacturer.	The study found several 'best practices' that foster BIA maturity, such as (based on Chan and Reich, 2007b): - Communication between IT and business, and inter-organizational, should be pervasive, informal and regular, and use rich methods such as email, videoconferencing, as well as face-to-face communication. - Service level agreements should be periodically reviewed between IT and business representatives, in order to mandate continuous improvement and the attainment of business objectives. - IT investments should be formally assessed between IT and business representatives, and if possible with business partners. - Existence of an IT steering committee increases the alignment of IT and business strategies. - IT should be a teammate with the business that co-adapts and improvises with their business partners in bringing value to the firm and meeting strategic objectives. - IT assets should be leveraged on an enterprise-wide basis, and if possible into supply chains of customers and suppliers.
Ekstedt et al, 2005	This study discusses the SAM criteria and antecedents, and focused on the process of the BIA maturity assessments. The proposed approach is tested, using a case study approach (n=2).	The authors develop and test an approach to the maturity assessments that assumes that alignment is best obtained if all levels of the organization are represented in the data collection, not just the executives.
Cumps et al., 2006b	Survey amongst 641 executives from European firms (Belgium, France, UK, Germany, The Netherlands, Italy and Spain) of different industries.	The study showed that BIA maturity varied significantly across organizations and is approximately bell shaped around a mean maturity level of between 2.85. From the contextual ss in the study, only ICT strategy showed to have a significant effect on BIA maturity.
Sledgianowski et al., 2006	Survey amongst 153 IT and business executives from 11 business units across 8 organizations in the USA.	The authors empirically tested the SAM model and validated the theoretical framework of the maturity levels of management practices, and strategic IT choices that facilitate alignment, against the respondents' self-rated maturity. The study validated the six SAM criteria and identified 22 indices to measure BIA maturity.
Silvius, 2007b	Survey amongst 42 executives from 5 companies. The study focused on the difference in perception by different respondents, grouped by position.	The study showed some differences in perception between business management, information management and IT management respondents. The largest difference was not between business management and IT management, but between information management and the two other groups. The implication of this is that liaison positions between business and IT deserve specific attention in studies on BIA.
Luftman and Kempaiah, 2007	BIA maturity assessments of 197 Global 1,000 organizations in the United States, Latin America, Europe, and India. The results were analyzed by industry sector and respondent group.	The study found that most organizations were at Level 3. The study also found positive correlations between the maturity of BIA and (1) IT's organizational structure and (2) the CIO's reporting structure. Federated IT structures are associated with higher alignment maturity than centralized or decentralized structures. Companies with CIOs reporting directly to the CEO, president, or chairman have significantly higher alignment maturity than those where the CIO reports to a business unit executive, the COO, or the CFO.

Author	*Research approach*	*Main findings*
Dorociak J. (unpublished) referenced in Luftman and Kempaiah (2007)	Surveying executives from 27 companies i nthe banking industry on the relationship between BIA maturity and company performance.	The study is reported as finding a strong association between higher company performance measures (market share, use of new products, customer reputation, quality, return on investments (ROI), and technical innovation) and higher IT-business alignment maturity levels.
Luftman et al., 2008	Survey results from 385 responses from 138 global 1,000 companies from USA (126) and India (12). This study focused on the relationship between BIA maturity and firm performance, using Structural Equation Modeling (SEM).	This study provided SEM statistical substantiation of the relationship between BIA maturity and business performance (covariance of .55). The SEM showed statistical significance, giving empirical support to a previously established theoretical background. The study also showed that valid SAM assessments may be conducted using a reduced set of questions.
Gutierrez and Serrano, 2008	Conceptual modification of the SAM model. Validation using a case study approach (n=1).	Based on the SAM model, the authors develop an alternative instrument that aims to the understanding of IT alignment at all three levels: strategic, tactical and operational. Finally this paper presents the findings of applying this instrument on a SME. The results demonstrate the feasibility of use the proposed instrument when determining the level of maturity.
De Haes and Van Grembergen, 2009	Multiple case studies (n=10) in the financial industry, exploring the relationship between IT governance measures and BIA maturity.	The authors found that there is a clear relationship between the use of IT governance practices and BIA maturity. It appeared that highly aligned organizations do leverage more mature IT governance practices compared to poorly aligned organizations.
Nash, 2009	Surveying business and IT executives (n=145) of 9 large pharmaceutical firms on the relationship between BIA maturity and firm-level productivity and profitability.	The author found that companies with higher total sales and higher productivity generally reported higher levels of alignment maturity.
Gutierrez, Orozco and Serrano, 2009	Survey amongst business and IT executives of SMEs and larger organizations (n=104).	The authors compared the factors affecting alignments between SMEs and larger organizations, using an assessment model based on the SAM model. Their findings concluded that although SMEs and large organizations have different resources and IT expertise, the factors that influence BIA are the same regardless of organizations' size.
Khaiata and Zualkernana, 2009	Conceptual modification of the SAM model. Validation using a case study approach (n=1).	The authors develop a modified assessment instrument based on the SAM model. This instrument can be customized to incorporate the contextual parameters of the companies assessed. The instrument was applied in a case study, revealing some major gaps in alignment.
Luftman et al., 2009	Survey results from 2081 responses from 240 global 1,000 companies from USA (140), India (39), Europe (20), Latin America (40) and Africa (1), across various industry sectors. This study focused on the relationship between BIA maturity and firm performance, using Structural Equation Modeling (SEM).	The authors validated the SAM model, using Structural Equation Model (SEM). They found that the regression impact of the individual six SAM criteria (Communications, IT Governance, Value, Partnership, Technology Scope, and Skills) to the overall SAM score range from .16 to .20. The study further validated the contribution of BIA maturity to firm performance. The SAM maturity score had an impact of .34 on company performance.
Chen, 2010	Survey amongst 130 executives of 22 companies,	The study showed a good fit between IS strategic alignment and the six SAM criteria. Communications maturity had the

Author	*Research approach*	*Main findings*
	covering a wide range of industries. Half of the companies were Chinese domestic companies, while the other half were multinationals operating in China.	biggest influence on IS strategic alignment, followed by governance maturity, technology scope maturity, partnership maturity, and value measurements maturity. Skills maturity was not found to significantly impact IS strategic alignment. The study found that the current state of BIA maturity of companies in China was 2.87 (Std. dev. = 0.71). The results showed no significant difference in the perception about alignment between IT and business executives. The study also found that there was a significant difference in BIA maturity between Chinese domestic companies and multinationals operating in China. On average, multinationals were found to have a higher alignment maturity than Chinese domestic enterprises.
Silvius and De Waal, 2010	Survey amongst 88 executives from 10 organizations for Vocational Education and Training in the Netherlands.	This sectoral study confirmed the relatively low maturity levels of the educational sector reported earlier by Luftman and Kempaiah (2007), although the maturity levels were a bit higher. The most interesting result, however, was the difference between high scoring organizations and low-scoring organizations. This result could indicate that the six criteria of the SAM are not 'equal' in the development of alignment.
Silvius et al., 2010	Survey amongst 51 executives from 6 Dutch and Belgium companies in the financial industry. The study focused on the influence of national cultures on BIA maturity.	The study explored the potential effects of national cultures on BIA maturity assessments and concluded that effects should be expected. In the test of these effects, a mixed result was found. The SAM criteria 'skills' and 'governance' showed the expected influence of national culture. However, the criteria 'communications', 'value measurement' and 'partnership' did not show the expected difference in scores.
Luftman et al., 2010	Survey of over 2000 business and IT executives from more than 250 global 1,000 organizations in the United States, Latin America, Europe, and India. The study focused on the relationship between BIA maturity and IT Governance elements.	The study showed positive correlation between IT governance and firm performance, demonstrating that IT governance matters, and between BIA maturity and IT governance. This last relationship, however, showed different results for the different elements of IT governance.
Khanfar and Zualkernan, 2010	Multiple case study (n=2)	This paper uses SAM to assess the alignment maturity between business and IT in a large hospitality and exhibitions company in the middle-east. Gaps between business and IT are identified and measures to suggest these gaps have been proposed.
Marrone and Kolb, 2011	Survey amongst IT executives (n=441), including the perceived maturity of BIA and the perceived maturity of ITIL implementation	The authors concluded that the perceived business and IT alignment was significantly affected by the implementation maturity of ITIL. The study showed that companies that were highly mature in the ITIL implementation, also were highly mature on BIA. The greatest increase in the perceived level of maturity showed in the higher stages of maturity: Level 3 (Defined) and Level 5 (Optimized).

Table 5-1. Overview of studies using the SAM model

Analyzing the studies listed in Table 5-1, some conclusions appear.

First of all, the studies of Dorociak (unpublished), Luftman et al. (2008), Nash (2009), Luftman et al. (2009) and Chen (2010) proved an effect of BIA maturity on organizational performance. And

although the different studies showed different intensities of the effect, the effect was consistently positive.

Secondly, the studies of Cumps et al. (2006b), Silvius (2007b), Luftman and Kempaiah (2007), De Haes and Van Grembergen (2009), Silvius and De Waal (2010) and Chen (2010), all showed an average level of BIA maturity of the organizations of between 2.5 and 3. This positions the average BIA maturity level between a Committed Process and an Established Focused Process. Some of these studies also showed that the scoring pattern of organizations over the six SAM criteria may differ. However, none of the studies elaborated on this.

Thirdly, the studies of Luftman et al. (2008), Luftman et al. (2009) and Chen (2010), showed the validity of the six criteria of SAM, although the studies concluded differently on the relative 'weight' of the criteria in BIA maturity. The Luftman et al. studies (2008 and 2009) showed a more or less equal impact of each maturity criterion on the total SAM score, whereas Chen (2010) found that communications had the biggest influence on the SAM score, followed by governance maturity, technology scope maturity, partnership maturity, and value measurements maturity. Skills maturity was not found to influence alignment significantly.

Another point on which the studies provided contradicting results is that of differing perceptions of alignment maturity by different respondent groups. The studies of Luftman and Kempaiah (2007) and Silvius (2007b) showed differing scores for business executives and IT executives. However, the study of Chen (2010) reported no significant difference in the perception of alignment between IT and business executives.

Finally, the research methods of the studies seem to concentrate on case studies, mostly qualitative, and surveys, as method of quantitative research. The unit of analysis of most studies quite logically is an organization. The studies are predominantly of a static nature. They provide an assessment of an actual situation. With the results of the studies, organizations can benchmark their level of maturity to other organizations. However, the studies do not answer the question what organizations need to do to develop a higher level of BIA maturity. Of course, the answer categories of SAM provide some guidance for this, but this development perspective should be studied further.

Based on these conclusions we observe that, surprisingly enough, no study specifically tested the assumption behind the SAM model that equality or balance in alignment criteria, and scores, is beneficial and to be aimed for. Also, no study applied quantitative methods and data to validate relationships between the criteria. From these white spots, we find support for the relevance of our research question. We address the question which scoring patterns on the six SAM criteria are found in practice and how these relate to overall maturity level. In analyzing this, we aim to investigate the question if high mature organizations in overall alignment excel in all or only certain aspects of maturity. As we argued before, this is highly relevant for organizations that seek guidance on how to develop their alignment maturity.

5.3 Building a hypothesis on scoring patterns

The formulation of hypothesis that answers our research questions (*How do scoring patterns of organizations on the six SAM criteria differ*? and *How are these scoring patterns related to the overall alignment maturity level of the organizations*?) is not straightforward. To this end, we first draw back on some indications in the studies presented in the previous section. One central study reported by Luftman and Kempaiah (2007). In this study, 197 companies were assessed using the

SAM model. An overview of the alignment maturity scores of this sample, grouped by industry, is presented in Table 5-2.

		BIA maturity score						
Industry	*# of Com-panies*	*Communi-cation*	*Value measure-ment*	*Gover-nance*	*Partner-ship*	*Scope & Archi-tecture*	*Skills*	*Overall maturity*
Retail	7	3.65	3.57	3.52	3.90	3.81	3.51	3.70
Transportation	3	3.10	3.80	3.57	3.53	3.63	3.60	3.54
Hotel/Entertainment	6	3.46	3.46	3.53	3.44	3.62	3.45	3.49
Services	27	3.18	3.21	3.28	3.32	3.28	3.22	3.20
Insurance	6	3.16	3.15	3.30	3.17	3.24	2.90	3.15
Manufacturing	46	3.22	3.10	3.15	3.30	3.17	2.90	3.15
Health	5	3.06	2.79	3.34	3.06	3.24	3.17	3.11
Chemical	7	2.78	2.84	2.93	2.87	3.28	2.84	2.93
Financial	57	2.83	2.92	2.98	2.86	3.03	2.70	2.90
Government	6	2.94	2.70	3.07	3.07	2.99	2.67	2.90
Oil/Gas/Mining	3	2.96	2.86	2.92	2.84	3.22	2.64	2.90
Utilities	7	2.96	2.94	2.81	2.84	3.13	2.60	2.88
Pharmaceutical	14	2.74	2.58	2.71	2.64	2.85	2.71	2.70
Educational	3	1.86	1.74	1.66	1.41	1.78	1.83	1.71

Table 5-2. Alignment scores per industry sector (Luftman and Kempaiah, 2007)

From this table, it appears that the 'highest mature industry', Retail, has particular high scores on Partnership maturity and Scope & Architecture maturity, when compared to its scores on the other SAM criteria. Interesting enough, the 'lowest mature industry', Education, has a particular low score on Partnership maturity. This could be an indication of a scoring pattern, i.e. that organizations with an overall high maturity score excel in Partnership. However, contradicting this hypothesis, the second highest scoring industry, Transportation, shows specific high scores on other criteria.

As a next step in developing hypothesis, we performed a systematic analysis of the data in Table 5-2. Starting from the 'dependent variable' in our research, the overall alignment maturity of organizations, we grouped the industries into three groups: 'High mature', with a (overall) maturity score higher than 3.0, 'Average mature' with a maturity score of between 2.5 and 3 and 'Low mature, with a maturity score of below 2.5. Figure 5-3 shows the scores of these three groups: overall maturity score and the average maturity scores on the different SAM criteria.

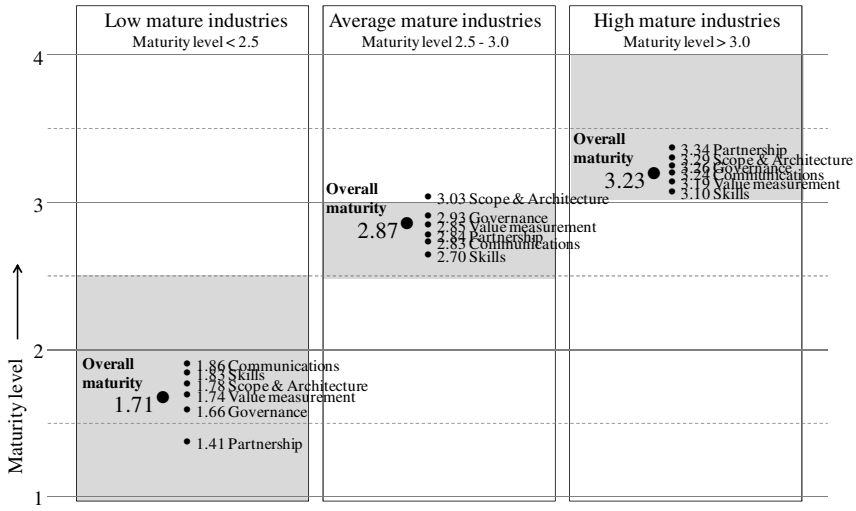

Figure 5-3. Alignment scores of industry sectors grouped by overall level of alignment (based on Luftman and Kempaiah, 2007)

Figure 5-3 shows that the scoring patterns of the three groups indeed systematically differ. In the study of Luftman and Kempaiah (2007), high mature companies excel on Partnership, whereas in the scoring pattern of the low mature organizations, this criterion is the lowest scoring one. The high scoring criteria in the low mature group, Communications and Skills, are in the high mature group in fact only number four and number last in scoring order.

Another study that provides us with a base for hypothesis formulation is Cumps et al. (2006b). In this study, detailed SAM scores of the organizations are not reported, but the authors conclude that of all contextual factors, only IT strategy correlated with BIA maturity. This correlation suggests that an innovative IT strategy relates to a high level of BIA maturity. An innovative IT strategy, may in its turn, logically relate to the criterion Partnership, since Partnership is the criterion that specifically includes the 'business perception of IT value' which is directly related to innovative IT strategies. Thereby confirming the indications from the study of Luftman and Kempaiah.

Also, Silvius and De Waal (2010) conclude in their study in the Educational sector, that the top-scoring organizations consistently scored the criteria Skills, Partnership and Governance highest and the criterion Value measurement lowest. This is remarkably consistent with the pattern that Luftman et al. (2008) conclude in their SEM analysis of 138 companies. However, partly contradicting these results, Chen (2010) concludes that "Skills maturity was not found to significantly impact IS strategic alignment".

Interpreting the results mentioned above, it appears that the most influential factor in BIA is the perception of business professionals on the role and value of IT for the organization, expressed in the criterion Partnership. If business professionals see high value of IT for business, this conviction seems to replace the need for demonstrating this value. And also more 'technical' actions, like investing in a solid IT architecture, or established service management processes, are better accepted in the organization. In fact, a relationship between IT savvy business professionals and alignment was also established by Bassellier and Benbasat (2007). Hence, we derived the following hypothesis that will be tested in the next sections:

Organizations with an overall high score on alignment maturity do not show an evenly scoring patterns across the SAM criteria. Instead, they excel on Partnership, more than organizations with an overall low score on alignment maturity.

5.4 Research design

Data was collected through a study that included SAM assessments of 22 organizations that employ a total of 216 respondents in the Netherlands. Table 5-3 presents the details of the organizations in the study and the respondents. The assessments were performed over the period 2007 – 2011.

The SAM assessments followed the process suggested by Ekstedt et al. (2005). Assessments were not limited to respondents from executive levels, but also interviewing respondents from lower management levels. An important condition was that the respondent was in a position to give an informed answer to the questions of the assessment. The assessments were organized as structured interviews, mostly individually, in some cases through group interviews.

	Organization	*Industry*	*# Employees*	*# Respondents*		
				total	*IT Management*	*Business Management*
1	Hogeschool Utrecht	Education	1000-2500	16	7	9
2	NIBC	Financial Services	250-500	8	5	3
3	ALEX	Financial Services	100-250	9	5	4
4	Interpolis	Financial Services	1000-2500	6	3	3
5	CFI	Public	250-500	6	4	2
6	Reinaerde	Healthcare	250-500	7	4	3
7	Strict	Professional Services	100-250	8	3	5
8	Conquestor	Professional Services	250-500	8	4	4
9	Gelderse Valleij	Healthcare	1000-2500	9	5	4
10	Getronics	Professional Services	>2500	10	5	5
11	Centraal Boekhuis	Logistics	500-1000	22	4	18
12	Citaverda	Education	250-500	8	4	4
13	Deltion	Education	250-500	9	5	4
14	Leeuwenborgh	Education	250-500	16	7	9
15	Regiocollege	Education	250-500	18	4	14
16	Grafisch lyceum	Education	250-500	8	3	5
17	Hoornbeeck college	Education	250-500	5	1	4
18	Horizon college	Education	250-500	8	2	6
19	Plus Retail	Retail	1000-2500	9	4	5
20	Euler Hermes	Professional Services	100-250	11	3	8
21	Grafische Bedrijfsfond	Professional Services	100-250	10	6	4
22	ROC Midden Nederla	Education	250-500	5	2	3
				216	90	126

Table 5-3. Overview of the organizations participating in the study

In 14 of the 22 organizations, operations are limited to the Netherlands. Eight companies operate internationally. The study used the original SAM assessment questionnaire, as provided by Luftman (2000). In some assessments a Dutch translation of the questionnaire was used.

5.5 Findings: maturity scores and scoring patterns

Table 5-4 provides an overview of the overall assessment scores of the 22 organizations in the study, ranked from high to low overall alignment maturity. The average maturity score is 2.83, which is in line with earlier studies, in particular Luftman and Kempaiah (2007). Alignment maturity ranks from 3.59 (highest) to 2.05 (lowest). Many of the higher maturity scores in our study are achieved by organizations in the financial services industry. Organizations in the educational sector hold relatively low score maturity scores. Also, this result is in line with the study of Luftman and Kempaiah (2007).

Organization	*Industry*	*# Respondents*	*Mean*
4	Financial Services	6	3,59
3	Financial Services	9	3,36
10	Professional Services	10	3,31
7	Professional Services	8	3,23
5	Public	6	3,18
11	Logistics	22	3,13
8	Professional Services	8	3,10
16	Education	8	3,00
1	Education	16	2,88
21	Professional Services	10	2,87
14	Education	16	2,86
19	Retail	9	2,78
15	Education	18	2,67
2	Financial Services	8	2,61
9	Healthcare	9	2,59
20	Professional Services	11	2,57
6	Healthcare	7	2,56
17	Education	5	2,49
18	Education	8	2,34
13	Education	9	2,34
22	Education	5	2,10
12	Education	8	2,05
Overall			2,83

Table 5-4. BIA maturity scores of the participating organizations

In order to study the potential differences in scoring patterns, we classified the 22 organizations into three groups, based on their overall maturity score:

- Organizations with a maturity score of 3.00 and higher:

  classified as high mature, n = 77 respondents, from 8 organizations;

- Organizations with a maturity score of between 2.50 and 3.00:

  classified as average mature, n = 104 respondents, from 9 organizations;

- Organizations with a maturity score of lower than 2.50:

  classified as low mature, n=35 respondents, from 5 organizations.

This classification was based on the conclusion from the earlier studies assessing SAM, that showed that an average level of BIA maturity of between 2.5 and 3.

Next, Table 5-5 shows the scoring patterns of these three groups on the six criteria and the overall maturity.

Groups		Communica-tions maturity	Value measurement maturity	Governance maturity	Partnership maturity	Scope & Architecture maturity	Skills maturity	Total
High-aligned	Mean	2,83	3,05	3,45	3,66	3,09	3,21	3,22
N=77	*Std. Deviation*	*0,63*	*0,62*	*0,44*	*0,56*	*0,57*	*0,61*	*0,35*
Average-aligned	Mean	2,62	2,29	2,87	2,74	2,87	3,07	2,74
N=104	*Std. Deviation*	*0,55*	*0,56*	*0,51*	*0,57*	*0,58*	*0,58*	*0,38*
Low-aligned	Mean	2,05	2,07	2,42	2,30	2,24	2,42	2,25
N=35	*Std. Deviation*	*0,54*	*0,55*	*0,57*	*0,49*	*0,52*	*0,68*	*0,39*
Total	Mean	2,60	2,52	3,01	3,00	2,85	3,01	2,83
N=216	*Std. Deviation*	*0,63*	*0,70*	*0,61*	*0,76*	*0,63*	*0,66*	*0,50*

Table 5-5. The scores of the three groups in the study

From Table 5-5 it appears that, not surprisingly, the high mature group shows consistent higher scores on all SAM criteria than the average mature and the low mature group, and the average mature group has consistent higher scores on all criteria than the low mature group. This is visualized in Figure 5-4.

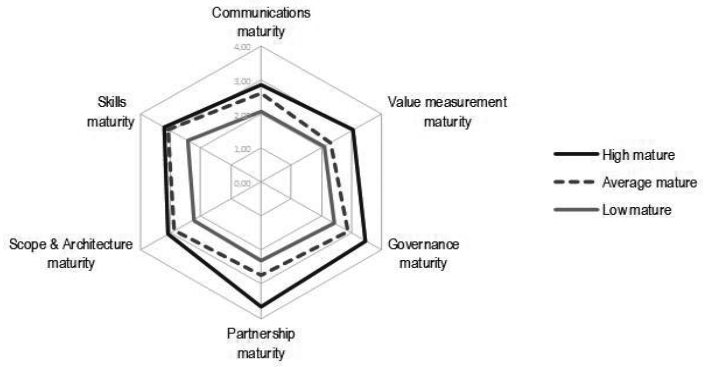

Figure 5-4. The maturity scores of the three groups of organizations

Then to test our hypothesis, differences between the groups were analyzed regarding their scoring patterns on the SAM criteria. First, we performed Levene's test for equality of variances and a t-test for equality of means between the three groups. No irregularities were found that require modified data procedures to execute the next parametric tests.

To measure (non)equality in scoring patterns, we introduced a set of new variables indicating the relative (proportional) differences of the maturity score on each of the six criteria compared to the overall maturity score. For example, an organization that holds an overall maturity score of 3.0, and scores 3.3. on Communications maturity, gets a 'Communications difference' score of 10, as Communications maturity scores 10% higher than the overall maturity.

Table 5-6 shows these differences scores of the three groups by criterion, revealing differences in the patterns of scoring between the groups.

Groups		Communica-tions maturity	Value measurement maturity	Governance maturity	Partnership maturity	Scope & Architecture maturity	Skills maturity
High mature	Relative difference	-12,00	-5,58	7,38	13,90	-3,99	-0,18
N=77	*Std. Deviation*	*15,95*	*16,09*	*10,63*	*12,94*	*15,28*	*16,68*
Average mature	Relative difference	-4,89	-16,67	5,05	-0,49	4,88	12,11
N=104	*Std. Deviation*	*13,76*	*16,35*	*13,70*	*15,22*	*16,37*	*15,24*
Low mature	Relative difference	-9,14	-7,76	7,77	2,77	-0,51	6,62
N=35	*Std. Deviation*	*14,73*	*19,47*	*18,56*	*17,13*	*15,43*	*21,94*
Total	Relative difference	-8,05	-11,27	6,32	5,17	0,85	6,84
N=216	*Std. Deviation*	*15,00*	*17,53*	*13,63*	*16,13*	*16,28*	*17,80*

Table 5-6. Relative differences between maturity scores on the individual SAM criteria and the overall maturity score (measured in % of the overall maturity score).

Figure 5-5 illustrates the scoring patterns further. For each group, the differences of the scores on the six criteria are plotted as the relative deviation from the overall maturity score. The point in the heart of the figure represents a -20% score on a criterion, and the points on the outside rim of the figure a +15% score.

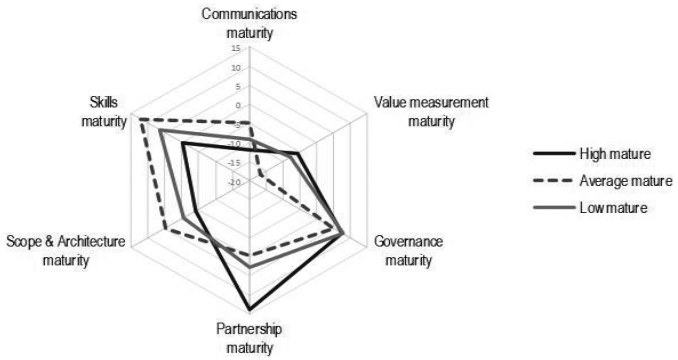

Figure 5-5. Scoring patterns of the three groups around the value of the overall maturity per group.

5.6 Analysis of scoring patterns

A visual inspection of Figure 5-5 suggests that the scoring pattern of (overall) high mature organizations indeed differs from that of low and average mature companies. The most striking difference is the relatively high score on Partnership maturity, as expected from our hypothesis. The (overall) high maturity scoring organization also show substantial differences on the criteria Skills and Value measurement, which was not predicted. On the other four SAM criteria, the differences between the high mature group and the low mature group is less evident, although differences on Scope & Architecture maturity and Skills maturity are also visible. In general, the scoring pattern of (overall) average mature group takes the same shape as the low mature group.

In order to assess the significance of the group differences on the relative SAM dimensional scores, we performed the Benferroni test, taking a p-value of .05 as a threshold. Table 5-7 shows the results of this test. On five of the six SAM criteria, the relative difference in maturity alignment between the high mature organizations and the low mature organizations is significant. The relative differences between the average mature organizations and low mature organizations also shows to be significant on the same five of the six criteria. The difference between high mature organizations and average mature organizations only proves to be significant on Partnership maturity.

Bonferroni test on group differences (p<.05)	*Communica-tions maturity*	*Value measurement maturity*	*Governance maturity*	*Partnership maturity*	*Scope & Architecture maturity*	*Skills maturity*
Group differences High mature vs Low mature	**significant**	**significant**	not significant	**significant**	**significant**	**significant**
Group differences High mature vs Average mature	not significant	not significant	not significant	**significant**	not significant	not significant
Group differences Average mature vs Low mature	**significant**	**significant**	not significant	**significant**	**significant**	**significant**

Table 5-7. Significance of the relative differences between maturity scores on the individual SAM criteria and the overall maturity score shown in Table 5-6.

Regarding our hypothesis on the differences in scoring pattern between high mature organizations and low mature organizations, we can conclude that high mature organizations, as expected, excel on Partnership. The analysis showed a consistent and significant difference between the three groups (high versus low mature, high versus average mature, and average versus low mature) on the criterion Partnership maturity. This supports the hypothesis that high mature organizations indeed excel on Partnership maturity. On the other SAM criteria, significant differences were found between the low mature group and the other two groups (high mature and average mature), except for the criterion Governance maturity, that showed no significant difference. Low mature organizations appeared to perform relatively weak on Partnership and scored relatively high on Skills maturity.

5.7 Conclusion; scoring patterns matter

The alignment of business and IT is still a challenging task in many organizations. Maturity models can help organizations in 'translating' the conceptual models of alignment into concrete actions and development plans. A frequently used and validated maturity model on BIA is Luftman's SAM model. This model identifies six criteria for alignment and includes the premise that maturity on the six criteria should be developed more or less equally, in order to achieve balance between them. Our study challenged this premise and analyzed the differences in scoring patterns of high mature organizations, average mature organizations and low mature organizations.

The research question of the study reported in this paper was: *How do scoring patterns of organizations on the six SAM criteria differ?*, and *How are these scoring patterns related to the overall alignment maturity level of the organizations?*

From our analysis we can conclude that the scoring pattern of high and average mature organizations indeed differs substantially and significantly from that of low mature companies. The most striking differences are that high mature organizations excel on Partnership maturity, whereas low mature organizations 'underperform' on this criterion and 'excel' on Skills maturity.

This conclusion provides guidance for organizations on their development path to alignment maturity. The next section will elaborate in the practical and theoretical implications of this conclusion.

5.8 Limitations and discussion

This study showed that scoring pattern on alignment maturity do not necessary need to develop evenly or equally on the different criteria of alignment. In fact, the results we found may imply that investing in actions to enhance maturity on Communications maturity (for example implementing ITIL processes), or Value measurement (for example developing service level agreements), or Architecture

maturity (for example implementing an architecture based approach to business processes and IT), or Governance maturity (for example implementing a structured IT planning process) will not be very effective if the condition of a certain level of trust, mutual understanding and shared vision between business and IT professionals is not met. Silvius and Stoop (2013) confirm this conclusion in their study on successful IT planning.

The challenge for many IT professionals, however, is that partnership is hard to organize. Trust, relationship and vision cannot be 'bought'. If partnership is present on the side of the business professionals, the IT function in the organization still needs to prove that it is 'up to par', but the basic condition for alignment is in place. If business professionals lack partnership, the IT function can perform to the best of their abilities, but alignment will still suffer.

A logical way of stimulating partnership of business professionals may be to enhance their IT competences. Bassellier and Benbasat (2007) showed the positive effect of this on alignment. Our recommendation to practitioners would therefore be to focus on developing partnership first, before investing in the development of the other alignment criteria.

For researchers, this study showed that the suggestion of most maturity models, that the different criteria or variables need to be balanced in order to develop maturity, may be too easily assumed. An interesting direction for further research would be to study the scoring patterns of organizations over the criteria and to relate this to their level of maturity. To the knowledge of the authors, this kind of analysis has not been done before.

A limitation of the study is its focus on Dutch organizations, that partly operate internationally, as earlier studies (Silvius et al., 2010) showed an influence of (national) cultures on SAM scores. A recommendation for further research would therefore be to test the hypothesis derived and confirmed in this study in a larger sample, covering also non-European regions.

PART C

How do specific situational factors influence an organization's business and IT alignment maturity

6 THE RELATIONSHIP BETWEEN IT OUTSOURCING AND BUSINESS AND IT ALIGNMENT: AN EXPLORATIVE STUDY[6]

Outsourcing of business processes and IT operations is an important trend in large and middle-sized organizations. However, outsourcing could affect the organization's ability to align its IT with business strategy and operations. This article reports a qualitative study into the relationship between IT outsourcing and business and IT Alignment. It aims to provide recommendations for outsourcers and service providers on how outsourcing relationships should develop in order to support business and IT alignment. The research question of the study is "What is the effect of IT outsourcing on the business and IT alignment of companies that have outsourced their IT?"

After a review of relevant literature and concepts, four cases are reported. The study revealed that a higher level of motivation for outsourcing paired with a higher level of the relationship between outsourcer and service provider and with a higher level of alignment maturity of the outsourcer. The study also showed that the ITO relationship is influenced by organizational turbulence on one or either side of the relationship and that the service providers tend to assess the relationship on a higher level than the outsourcers. These conclusions provide relevant directions for both outsourcers and service providers for improvement of the their relationship.

6.1 Introduction: relating business and IT alignment and IT outsourcing

The necessity and desirability of aligning business needs and information technology (IT) capabilities is considered to be one of the key issues in IT management (Brancheau and Wetherbe, 1987; Reich and Benbasat, 1996; Chan et al., 1997; Sabherwal and Chan, 2001; Peak and Guynes, 2003; Cumps et al., 2006a; Luftman et al., 2006). IT is changing the way companies organize their business processes, communicate with customers and deliver their services (Avolio et al., 2000). Therefore a successful alignment of business and IT increases an organization's competitive advantage, profit margins and growth (Alter, 2005; Byrd et al., 2006; Luftman et.al, 2008).

Several studies (Rosa, 1998; Luftman et al., 1999), however, reported quite low success rates of business and IT alignment (BIA) in organizations, as perceived by business and IT executives. Figures run from 8% (Rosa, 1998) to "less than half" (Luftman et al., 1999) when asked if they succeeded in achieving successful alignment. And the annual survey of top management concerns by the Society for Information Management (www.simnet.org) ranked 'IT and business alignment' as

[6] Originally published as: A.J.G. Silvius, J. Turkiewicz, A. Keratsinov and H. Spoor (2012), "The relationship between IT outsourcing and business and IT alignment: an explorative study", to appear in *Computer Science and Information Systems*.

one of the top concerns for IT and business executives (Society of Information Management, 2003; 2004; 2005; 2006; 2007; 2008; 2009; 2010).

An influencing factor in achieving BIA, is IT outsourcing (ITO) (Lacity et al., 1996). In the last two decades, the ITO industry has been growing with an impressive rate (Cullen and Willcocks, 2003), with estimations ranging up to an annual growth rate of 12 percent (DeGraw and Ye, 2008). More and more companies decide to outsource partly, or completely, their IT resources and processes to specialized external service providers. However, only few studies relate this outsourcing trend to BIA. Lacity et al. (2009), in their study of 357 publications on ITO, found only two articles relating ITO with BIA. A similar bibliography was created for BIA as well: Chan and Reich (2007b) listed more than 150 studies related to BIA. Here the results were more promising: the BIA studies intertwined six times with ITO ones.

So far, the studies did not provide a conclusive answer as to how the concepts are interrelated. Some authors (Lacity et al., 1996) claim that ITO causes an organization to lose alignment, while others (Tallon, 2003; Pollalis, 2003), conclude a positive relationship between ITO and BIA. It is for this reason that this article reports a qualitative study into the relationship between ITO and BIA. The main research question of the study is: What is the effect of IT outsourcing on the business and IT alignment of companies that have outsourced their IT?

This article is organized as follows. The next paragraph will explore relevant literature on the main concepts of the study and their relationship. From this literature we derived the models to operationalize the concepts of ITO and BIA. Based on these models we analyzed four ITO cases. These case studies are reported in the following sections. The article concludes with our observations on the relationship between ITO and BIA, based upon comparison of the case studies.

6.2 Literature and concepts

This section will review the literature on the two main concepts of the study, ITO and BIA, and their relationship.

6.2.1 Business and IT alignment

Despite of the apparent importance of aligning IT and business, the majority of publications are rather vague in terms of how to define or practice alignment (Maes et al., 2000). An influential conceptualization of business and IT alignment (BIA) is that of Henderson and Venkatraman (1993). Their 'Strategic Alignment Model', describes BIA along two dimensions. The first dimension, strategic fit, differentiates between external focus, directed towards the business environment, and internal focus, directed towards administrative structures. The second dimension, functional integration, distinguishes between business and IT. Altogether, the model defines four domains that need to be aligned with each other: Business Strategy, IT Strategy, Organization Infrastructure & Processes, and IT Infrastructure & Processes. Each of these domains has its constituent components: scope, competencies, governance, infrastructure, processes and skills.

Alignment is a "complex phenomena" (Plazaola et al., 2006) that requires a multidimensional approach. Next to the organizational components identified in Henderson and Venkatraman's Strategic Alignment Model, alignment also requires human relationships (Keen, 1991), competencies (Bassellier and Benbasat, 2007). and shared visions (Kaplan and Norton, 2004; Poels, 2006). This multidimensionality is illustrated Luftman's Strategic Alignment Maturity (confusingly also abbreviated as 'SAM') model (Luftman, 2000). Since its publication, the application of this SAM

model has been reported by several authors (Ekstedt, et al, 2005; Cumps et al., 2006b; Silvius, 2007b; Luftman and Kempaiah, 2007; De Haes and Van Grembergen, 2009; Luftman et al., 2008; Silvius et al., 2010). In this study we therefore also adopted SAM as a framework for analyzing the potential impact of ITO on BIA.

In SAM, six criteria are used to determine the maturity of the alignment of IT and business (Luftman, 2000). These six criteria are:

- Communications maturity

  How well does the technical and business staff understand each other? Do they connect easily and frequently? Does the organization communicate effectively with consultants, vendors and partners? Does it disseminate organizational learning internally?

- Value measurement maturity

  How well does the organization measure its own performance and the value of its projects? After projects are completed, do they evaluate what went right and what went wrong? Do they improve the internal processes so that the next project will be better?

- Governance maturity

  Do the projects that are undertaken flow from an understanding of the business strategy? Do they support that strategy?

- Partnership maturity

  To what extend have business and IT departments forged true partnerships based on mutual trust and sharing risks and rewards?

- Scope & Architecture maturity

  To what extend has technology evolved to become more than just business support? How has it helped the business to grow, compete and profit?

- Skills maturity

  Does the staff have the skills needed to be effective? How well does the technical staff understand business drivers and speak the language of the business? How well does the business staff understand relevant technology concepts?

Figure 6-1 provides an overview of the SAM model.

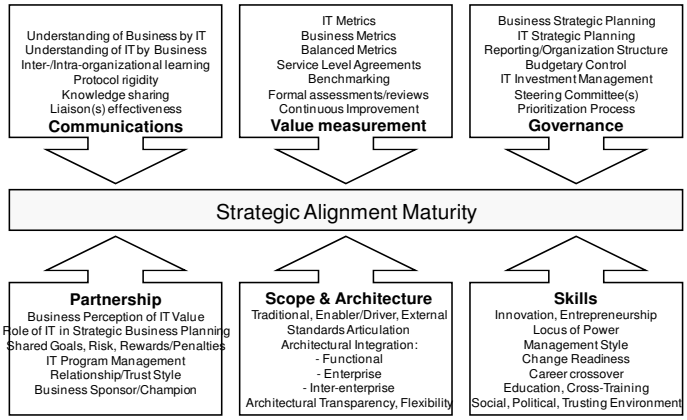

Figure 6-1. The Strategic Alignment Maturity model (Luftman, 2000)

In the concept of strategic alignment maturity, the level of maturity indicates an organization's capability to align IT to business needs. As in many maturity models, the SAM model recognizes five levels of maturity:1.Initial / Ad Hoc Process; 2. Committed Process; 3. Established Focused Process; 4. Improved / Managed Process; 5. Optimized Process.

6.2.2 IT outsourcing

Earlier studies offer several definitions of ITO (for example Hu et al., 1997; Willcocks et al., 2000; Willcocks and Lacity, 2001; Fink, 2010). And while these definitions vary to some extent, they generally refer to an organization's decision to turn over the management of (part of) its IT resources and activities to one or more external IT providers (Fink, 2010). For our study we adopted the definition as provided by Willcocks et al. (2000): ITO is "a decision taken by an organization to contract-out or sell some or all of the organization's IT assets, people and/or activities to a third party vendor, who in return provides and manages the services for a certain time period and monetary fee".

The most commonly sourced services in ITO are IT infrastructure, application development and helpdesk outsourcing (Miozzo and Grimshaw, 2006). Many studies on ITO include the motivations for outsourcing. Cost savings are most named as main driver for ITO (Lacity et al., 2009; Pfannenstein and Tsai, 2004). DiRomualdo and Gurbaxani (1996) claim that ITO could be used for strategic purposes as well. They assert that outsourcing can be used for Information Systems improvement, business impact (for instance, improving business processes) and commercial exports. Quinn (1999) took the motivations for ITO to an even higher level, by concluding that outsourcing could help an organization to decrease its innovation cycle time and costs by 60% to 90%. However, Earl (1996) denied this view by stating that in order to innovate, an organization should possess slack resources, organic and organizational processes, and experimental or intra-preneurial competences, all of which are usually not provided by external suppliers.

Linked to the motivations for outsourcing, is the relationship between the requester of the services, the 'outsourcer', and the provider of the services, the 'service provider'. A familiar model to depict or develop this relationship is the eSourcing Capability Model (eSCM). This is a "best practice" capability model, which has three purposes: (1) to give service providers guidance that will help them improve their capability across the sourcing life-cycle, (2) to provide outsourcers with an objective means of evaluating the capability of service providers, and (3) to offer service providers a standard to use when differentiating themselves from competitors (Hyder et al., 2010). However, the eSCM

model focuses specifically on the service provider side of the relationship, whereas a relationship is logically developed by both sides of a relationship.

A model that considers both sides of the ITO relationship is that of Gottschalk and Solli-Sæther (2006). This maturity model analyses the relationship through agency theory. The model identifies three stages or types of the ITO relationship, as is shown in Figure 6-2.

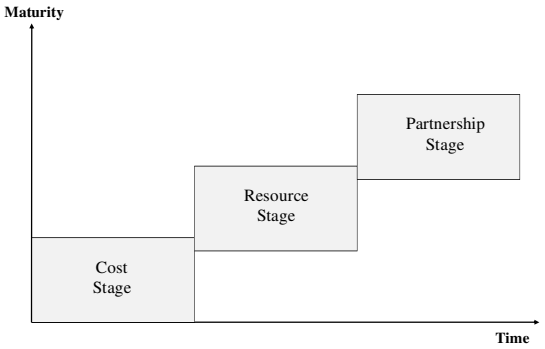

Figure 6-2. Maturity typology model for ITO relations (Gottschalk and Solli-Sæther, 2006)

The first stage in the Gottschalk and Solli-Sæther model is the Cost Stage. In this stage an organization`s main motive to outsource is cost minimization (Gottschalk and Solli-Sæther, 2006). During this level there are a lot of contractual negotiations between the outsourcer and the service provider. From an agency theory perspective, one organization (the principal) engages another organization (the agent) to perform some service on its behalf. The most challenging aspect of this relationship for the agent is the delegation of some decision-making authority to the principal.

Once the organizations resolve the issues accompanying this Cost Stage, they can develop into the Resource Stage. In this stage, the main tenet is that a outsourcer has access to the service provider`s resources. They in turn, could produce innovation for the outsourcer. However, in order this to occur, the outsourcer side should gain some insight about that how to manage resources that do not possess, namely the service providers' ones. On the other hand, the service provider is ought to understand the business its customer is in, so he will know what type of resources to offer him. Based on the success of these practices and service provider`s possession of strategic resources, there is a substantial chance for the outsourcer to gain competitive advantage over its competitors. Additional aspect of this stage is the outsourcer`s concentration on its internal resources. After outsourcing, the organization will have more resources and time to concentrate on its internal strengths and core competencies. This is another premise for the outsourcer side to create competitive edge over its rivals on the market.

Once the vendor secures a value proposition which works successfully in the outsourcer`s organization, and when the outsourcer is able to concentrate on its core competencies, then the two parties can move up to the Partnership Stage. During the partnership stage the outsourcer and the service provider work together in order to achieve mutual goals. In order to reach these targets, the two companies should have already gained enough mutual trust, comfort and understanding (Hancox and Hacknet, 2000).

The Gottschalk and Solli-Sæther model appends with 11 benchmarks (Table 6-1). Each of these benchmarks can be perceived as a different dimension and correspond to a particular level of maturity of the relationship.

Benchmarks (BMK)	*Stage 1* *Cost stage*	*Stage 2* *Resource stage*	*Stage 3* *Partnership stage*
BMK1 (economic benefits)	Cost minimization and operational efficiency	Business productivity Technology Innovation	Business benefits Mutual goals
BMK2 (primary transactions)	Infrastructure	Applications	Joint investments
BMK3 (contractual completeness)	Specified obligations	Key competence Critical projects Access to resources	Profit sharing Personnel exchanges
BMK4 (vendor behavior)	Service level agreements	Project performance Service quality	Strategy implementation
BMK5 (demarcation of labor)	Procurement	Innovation projects	Continuous innovation
BMK6 (core competence)	Client defines technology requirements	Vendor is regarded as a strategic resource	Co-developing business processes
BMK7 (vendor resource exploitation)	Excellent operations	Technology initiatives	Complementary capabilities, skills, competences and methods
BMK8 (alliance exploitation)	Account manager; IT manager	Operations manager Division manager	Business manager
BMK9 (relationship exploitation)	Interfirm information sharing	Joint planning	Relational norms
BMK10 (social exchange)	Low	Medium	High
BMK11 (stakeholder management)	Economic interests has priority	Recognizing a number of stakeholder groups	Balancing interests

Table 6-1 Benchmarks of the ITO Relationship (Source: Gottschalk and Solli-Sæther, 2006)

In our study we adopted the Gottschalk and Solli-Sæther model for the analysis of the ITO relationship. We converted the benchmarks to a set of attributes, which in turn were adapted to different questions. The answers of these questions provided insight in the current level of the relation between outsourcer and the service provider.

6.2.3 The relationship between ITO and BIA

Chan and Reich (2007b) analyzed over 150 articles and studies on BIA. Based on their bibliography, only a few articles connected the concepts of BIA and ITO:

An early recognition of the relationship between BIA and ITO is suggested by Yetton (1994). The author sees the most important challenge of BIA as balancing between achieving IT cost effectiveness, and achieving business driven added value. In this valance, ITO could contribute to

alignment by delivering cost effective IT services. In another early study, Dutta (1996) analyses a dual case study of two banks: one engaged in ITO, the other one not. Based on this study, the author found that outsourcing does not change the fundamental issues of IT management. In the case studies, the outsourced IT was as successful as the internal IT group. More important, however, is the author's conclusion, that the physical IT may be outsourced, but the management of that IT cannot be outsourced. And that, regardless of outsourcing or not, active participation of management is vital.

In a study into BIA in 183 banks, Pollalis (2003) concludes that ITO could affect performance positively as long as the organization's IT is well aligned to its business requirements. This would suggest that well aligned organizations benefit from ITO, but that in organizations with a low level of BIA, ITO does not contribute to alignment. In another study, Tallon (2003) concludes that alignment in organizations can benefit from ITO for example when outsourcing of legacy systems frees up scarce IT capacity that can be redeployed in the development of new systems. Thorogood et al. (2003) showed in a case study on a publicly owned water company, that outsourcing can also benefit BIA by providing skills that were formerly not available to the outsourcer company.

However, also more critical conclusions can be found. Beimborn et al. (2006) argue that ITO has a negative effect on BIA, because of the related loss of core IT competences of the outsourcer. This view is supported by Lacity et al. (1996) who also claim that ITO causes an organization to lose alignment between its IT and business strategy.

Because of these conflicting conclusions, we adopted both a positive and the negative hypothesis in this study:

H1: ITO has a positive effect on BIA

and

H2: ITO has a negative effect on BIA

Potential explanations for the conflicting results of earlier studies may be the influence of contextual factors. For example, Pollialis (2003) and Beimborn et al. (2006), analyzed companies only from the bank industry. Also it should be mentioned that some of the studies mentioned are also considerably older than the other studies. Since the IT industry is such a dynamic sector, the results of the study could reflect the situation in that time frame.

6.3 Research design

6.3.1 Conceptual model

Based on the concepts adopted from the literature, we can now specify the research question of the study: What is the relationship between the ITO relationship, according to the Gottschalk and Solli-Sæther model (2006), and the BIA maturity, according to the strategic alignment maturity model of Luftman (2000) in companies that have outsourced their IT for at least two years?

Figure 6-3 visualizes the conceptual model of the study.

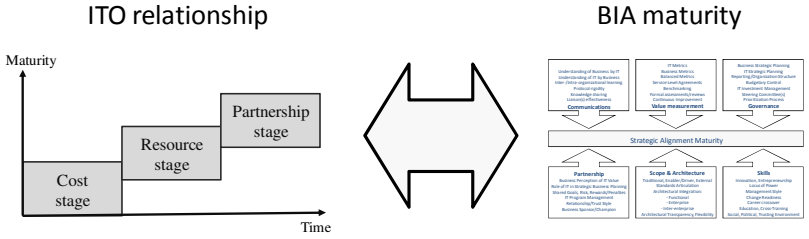

Figure 6-3. Conceptual model of the study

The prerequisite that the ITO relationship should be in place at least two years is based on Lacity and Willcocks (1995), that found that an organization should use ITO for at least two years before it experiences any effect on the organizational internal processes.

6.3.2 Research approach

Given the conflicting results of earlier studies, and the potential influence of the context on the relationship of BIA and ITO, we selected a case study approach for the empirical part of our study, The cases allowed us to study the concepts of ITO, BIA and their relationship in the context of a outsourcer – service provider relationship. In order to cover the diversity of ITO relationships, the cases were selected to reflect this diversity.

Table 6-2 provides an overview of the studies.

	Case A	*Case B*	*Case C*	*Case D*
Outsourcer	Leading Dutch energy provider	Leading Dutch bank	Large publishing company	Leading gas trading company
Number of employees	>10,000	>10,000	1,000 - 2,500	200
Number of staff interviewed	5	4	1	4
Service provider	Worldwide provider of outsourcing, IT and consulting services	Leading Dutch IT services and consultancy company + Large IT services provider in India	Leading Dutch IT services provider	Worldwide provider of outsourcing, IT and consulting services
Number of employees	>10,000	5.000 + >10,000	5,000 - 10,000	>10,000
Number of staff interviewed	3	2	2	2
ITO contract since	2008	2007	2007	2008
Main focus of the ITO contract	IT Infrastructure services	Development of business applications	IT Infrastructure services	Maintenance of business applications

Table 6-2. Overview of the case studies.

The data collection strategy was based on semi structured interviews and documentation review. For the assessment of the ITO relationship, the structure of the interviews was derived from the earlier

described Gottschalk and Solli-Sæther ITO relationship model (2006). For the assessment of BIA maturity, Luftman's SAM model (Luftman, 2000) was used. The assessments followed the process suggested by Ekstedt et al. (2005) in which the assessments were not limited to the executive levels, but also lower levels were included. The study was conducted in the Netherlands in the spring of 2010.

6.4 Findings of the case studies

This section of the article will report the findings from the four case studies we conducted. The case descriptions are structured as follows. Firstly, an overview of the ITO contract between the two organizations will be given, followed by the analysis of the ITO relationship. Next, the outsourcer's BIA maturity will be reported. We will conclude each of the case studies with specific remarks derived from the case.

6.4.1 Case A

The ITO contract

The contract between the two parties was signed in 2008. The main focus of the contract is hosting the outsourcer's applications and maintaining the infrastructure from the outsourcer's premises to the service provider's data centers. As the majority of interviewees indicated, the main focus of the contract is to decrease the costs related to the outsourced IT operations.

The ITO relationship

The relationship between the two parties started with rather a frenzy, due to the outsourcer's rapid switch from its old service provider to the service provider in the case. Owing to this change on short notice, the new ITO service provider had to transfer more than 400 applications from the old ITO service provider's data centers to its own ones in less than 8 months. As could be expected, this caused some issues at the service provider and he was not able to deliver up to expectation. On the other hand, one of the service delivery managers from the service provider claimed that the outsourcer did not help them resolve this issue, because the outsourcer himself had problems to 'let go' of responsibilities. The situation gradually improved, but still mutual trust is low.

Also influencing the 'bumpy' start of the ITO relationship was the organizational unrest that arose from new government regulations, the Dutch Independent Grid Management Act, that requires the outsourcer to separate their grid management activities from their transaction and supplies business.

Additional reason for the relatively low level of mutual trust is the perceived lack of proactive behavior from the service provider. According to all of the interviewees from the outsourcer, the service provider does not offer them enough new or improved services and solutions. This lack of proactive behavior is depicted by the fact that the service provider does not offer any additional services to its customer, that are outside the scope of the contract. According to Raghuram (2006), if exemplified by the service provider, the proactive behavior could facilitate closing the cultural gap between the two parties, and help a better understand the actual needs of the outsourcer. Another reason for the less proactive behavior of the service provider, may be the lack of direct contact between the outsourcer's end-users and the service provider. According to Lee and Kim (1999), this direct contact is one of the determinants influencing the partnership quality between an outsourcer and a service provider.

The outsourcer assessed the ITO relationship between the organizations as Cost Stage 'orientated'. According to the service provider, the two companies are already on higher level of relationship, at least oriented towards the 'Resource Stage'. An aspect that contributes to the relatively low level of ITO relation may be the inability to resolve the agency problem between the two organizations. According to Gottschalk and Solli-Sæther (2006), in such a case the outsourcer still will have some issues in relying to its service provider that the latter will be able to deliver all the services which were already agreed upon. Another factor influencing the relationship is probably the outsourcer's main motive for ITO: cost reduction. As Gottschalk and Solli-Sæther (2006) claim, an organization engaged in ITO just for the cost reduction opportunity, will not achieve a high level of partnership with its service provider. For example by evaluating the performance of the service provider through rigorous service level agreements, instead of a broader assessment of the overall quality of the services.

BIA maturity

As Figure 6-4 shows, the overall BIA maturity of outsourcer A is around 2.5, to be specific: 2.7. Unfortunately in this case it was not possible to get separate assessments, ex-ante and an ex-post the ITO contract.

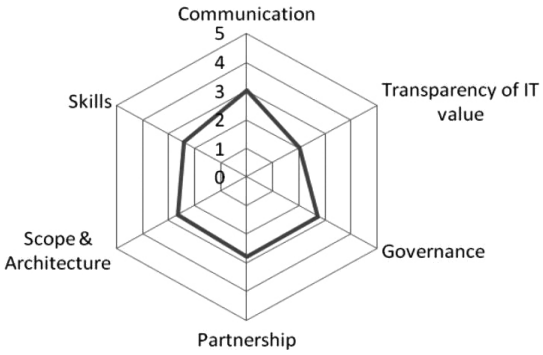

Figure 6-4. The BIA maturity score of outsourcer A

According to Luftman and Kempaiah (2007), most of the companies today are on the second level of BIA maturity, similarly to outsourcer. In this case, the Communication criteria is level 3, implying that there is relatively good understanding between the business and IT sides of the business. On the other hand, the Transparency of IT value is level 2, suggesting that outsourcer perceives the organization's IT as cost centre. In regards to the Governance criteria, the organization is almost level 3, suggesting that some inter-organizational planning is being conducted in regards to IT. However, in this case IT is still considered as cost centre. Considering the Partnership criteria, this criterion is assessed closely to level 3, suggesting that IT is considered as an asset and business enabler, supporting the organization's key operations. In terms of Scope & Architecture, the organization was assessed as level 3, implying that IT is still not fully integrated. The last criterion, Skills is assessed as somewhere between level 2 and level 3. This implies that outsourcer`s IT management is results based. However, the innovation and locus of power related to IT is still entirely dependent upon the organizational functions, instead of IT managers themselves.

Conclusions from this case study

From case A we derived the following conclusions.

- If from the outset, the relation between an outsourcer and ITO service provider is marked by dynamic and unpredictable events, there is a high chance the overall relationship between the two parties to be affected.
- If one of the companies in the relationship is overwhelmed by internal changes and reconstructions, there is a high probability the partnership between the two parties to be rather basic.
- The outsourcer expects proactive behaviour from its service provider, also at the 'Cost stage' of the ITO relationship.
- The service provider expects the outsourcer will give it some freedom to execute the tasks and determine which the best solution is for the outsourcer in a particular situation.
- The service provider values the relation between the two parties on a higher level in comparison with the outsourcer.
- ITO does not have a negative effect on BIA.

6.4.2 Case B

The ITO contract

The outsourcing contract is focusing on development of business applications. The contract is quite substantial and has a duration of seven years. The IT service provider selected is a combination of Dutch organization (acting as principal) and a large IT services provider in India. The objectives behind the contract are knowledge retention, business continuity and the desire to create a stable and safe working environment for the system developers of the bank. As a result of the contract a few hundred employees of the outsourcer changed employment to the service provider. Cost were not mentioned as an important argument for outsourcing, but the contract is based on a business case and increased productivity of systems development is also reported as one of the goals.

The ITO relationship

The interviewees at the bank positioned the ITO relationship with the service provider at the Resource Stage. At the service provider side, the relationship was positioned also at Resource Stage, but a little bit higher, oriented towards the Partnership stage. Bank and service provider work closely together in the demand – supply organization that has been set up to manage the contract. The provider understands the business objectives of the outsourcer and is perceived as proactive, taking initiatives that are beneficial for the outsourcer. Projects are agreed upon on the basis of open calculations. Service provider's performance is monitored and audited on a regular basis. There is a mutual drive to improve performance and to create best practices, but one of the interviewees at the bank also reports that there are constant negotiations. Overall, parties trust each other mutually and realize that together they can achieve better results and share the risks.

There are a number of factors that can explain this positive relationship. One possible explanation is that there has been an exchange of employees on both sides. Not only did the service provider employ former employees of the outsourcer, but also the outsourcer employed some consultants that formerly worked for the service provider. This helps the two

companies to gain mutual understanding about their operations, strategies and corporate cultures. Another factor in the relatively high level of ITO relationship may be the motivation of outsourcer. One of the main motives for the bank to outsource is to have access to the service provider`s resources and knowledge, which in turn are supposed to improve outsourcer B`s business productivity and innovativeness. These goals also justified outsourcer`s choice for this service provider.

Another factor in high level of collaboration between the two companies is the proactive approach the service provider has taken in this relationship. According to one of the interviewees at the bank, the service provider already helped the outsourcer a couple of times to find commercial feasibility for new ideas and innovative projects, although this was outside the scope of the contract.

BIA maturity

The bank reports a quite high BIA maturity level of 3.4. Notwithstanding the relatively high maturity scores, the service provider reports that he feels excluded from the business and IT alignment processes and mechanisms. And because the provider isn't in direct contact with the business side decision making, he assessed the BIA maturity of the outsourcer somewhat lower.

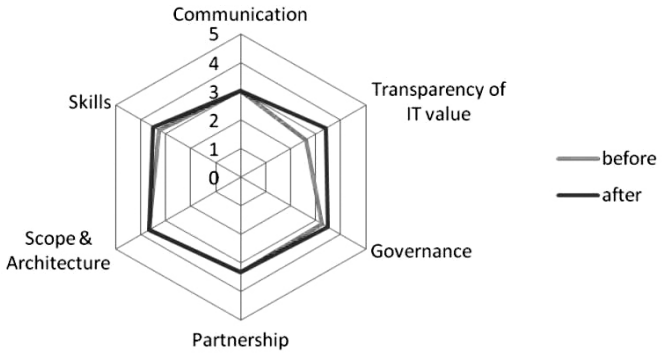

Figure 6-5. The BIA maturity score of outsourcer B

In this case, some interviewees were able to give an assessment of the BIA maturity before the establishment of the ITO relationship and after (as illustrated in Figure 6-5). The ex-post scores are equal to or slightly higher than the ex-ante scores. The interviewees reported that ITO especially helped them to improve the transparency of IT value to the organization. On this variable, the maturity level increased from level 2.7 to level 3.4. According to the interviewees, this improved BIA maturity resulted in smoother discussions between the business and IT regarding priorities and allocation of IT resources and enhanced the IT skills set within the organization. These findings support the conclusions of Tallon (2003) and Pollialis (2003), that ITO has a positive effect on BIA.

Notwithstanding the very positive ITO relationship, the outsourcer and the service provider still face some serious challenges. A first challenge is that the service provider is not financially compensated for being proactive. As a result, the service provider is logically 'pushed back' in a dependent role and cannot speed up the innovation process. A second concern is research and best practice information. The bank in fact expects the service provider to provide research and best practice information on innovative trends in the banking

industry. And although the service provider has a few other contracts in the banking sector, they are working mainly on operational projects and tasks that so not provide a basis for innovation. A third concern is that the outsourcer evaluates personal trust on a much lower level than (1 on scale 1-3) than the service provider (3). This confirms the relation between both parties is not in the partnership stage yet. There is still room for further growth.

Conclusions from this case study

In this case study we found that:

- Innovation can be one of the objectives in an outsourcing relationship
- Outsourcer and provider position their relationship at different maturity levels: the provider has a more optimistic view of the maturity level. The same is true for the level of personal trust.
- BIA maturity increased slightly after the outsourcing contract was closed. This supports for the hypothesis that outsourcing has a positive effect on alignment.
- Expectations regarding the contribution of the service provider to BIA and innovation, are mostly met. However, there are issues regarding what is included in the ITO contract and what not.

6.4.3 Case C

The ITO contract

The contract between the two companies started three years ago. The main focus of the relationship is outsourcing of the IT infrastructure of the outsourcer, and most particularly managing of the outsourcer's workstations.

The ITO relationship

A specific circumstance to this case is provided by the fact that the service provider was recently acquired by the largest telecommunication company in the Netherlands. Owing to this event, the service provider had to undertake a number of restructures, in order to align with the corporate culture of the new owner. However, also the outsourcer was in flux. The outsourcer altered its IT governance structure from decentralized to centralized. As a result of the reshuffle, the business side of the outsourcer did not have a direct access to the IT departments. Another specific circumstance is that the outsourcer capitalizes on multi-vendor sourcing. According to the outsourcer's managers, sometimes it is rather challenging to manage various service providers, because in case of fault in the IT system, none of them takes the responsibility for the defect.

The service provider perceived the ITO relationship as Resource Stage. However, according to the Outsourcer's managers, the relation between the two companies should be considered at Cost Stage. There are number of reasons for this substantial difference in the perception of the relationship. First of all, according to the outsourcer, the relationship with the service provider is mainly concentrated on reduction of costs. Contrarily to this viewpoint, the service provider conceives the relationship as a joint venture between themselves and the outsourcer, for reaching mutual business goals benefits. Another point of difference between the outsourcer and the ITO provider is the way the service provider`s performance is managed. According to the outsourcer, the service provider`s performance is managed through various SLAs. The service provider, however, reckons his performance is assessed through an assessment of the overall service quality. In addition, the service provider claimed that the

outsourcer uses its resources in order to obtain a set of capabilities and competences. The outsourcer considers the service provider as a means to securing excellent operations. The last point which contributes to the difference of opinions between the two parties is the overall way they look at their contractual relationship. According to Outsourcer C, the most important aspect of this relationship is the economic benefits which the organization would obtain. Nonetheless, The service provider claims that he recognizes the importance of both economic and social values which could be derived from the relationship.

Similarly to the first case study, the outsourcer complains about the service provider's lack of pro activeness and lack of knowledge about the business of outsourcer C. An example that was mentioned was the outsourcer's request for a new infrastructure. Instead of providing a business proposition for outsourcer, the service provider started asking questions about the technical requirements. These questions caused friction because the expectations were differing. Such events deteriorated the trust in the service provider`s capabilities. Another aspect that deteriorated the development of the relationship between the two parties is the lack of personal 'chemistry' between the outsourcer`s business managers and those working for the ITO provider. According to the interviewees, this lack of personal relation refrained the business managers from directly communicating their needs to the service provider, an aspect which could have helped for the progress of the ITO relationship.

BIA maturity

According to the interviewees of the outsourcer, it appears that the organization holds BIA of almost 3 (2.9, to be specific). This is also evident by Figure 6-6 shown bellow. According to Luftman and Kempaiah (2007), this is a relatively high level of BIA. However, in this particular case, the high level of BIA was not (just) achieved by the incorporation of ITO, but was also influenced by the corporate restructure described above.

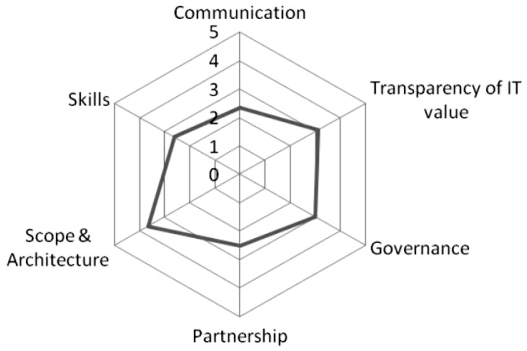

Figure 6-6. The BIA maturity score of outsourcer C

Conclusions from this case study

Based on this care, the following conclusions could be drawn:

- In this case, ITO had a positive effect on the Scope & Architecture maturity.
- Multi-vendor complicates an ITO relationship.
- Corporate restructures, both from the service provider and the outsourcer's side complicates the ITO relationship.

- The ITO relationship will have better perspectives for development if the business managers of the outsourcer side have a direct contact with the service provider.
- Outsourcers expect more proactive behavior from its service provider.
- ITO providers rank the ITO relationship on a higher level, in comparison with the outsourcers.
- Trust is essential for the well-being of the ITO relationship between two parties.

6.4.4 Case D

The outsourcer in this case, a gas trading company, achieved revenues of €18 billion in the most recent fiscal year. This significant turnover was achieved by just 200 employees of the company, creating a culture that was very much revenue oriented and less IT cost oriented. The company spent only €15 million on its IT budget and less than 10% of this budget was allocated to ITO.

The ITO contract

The contractual relationship between the two companies began in 2008. The main focus of the contract is maintenance of the business applications.

The ITO relationship

The interviewees from the outsourcer consider the relationship as between Cost Stage and Resource Stage. Similarly to the other three cases, the interviewees from the service provider assessed the relation on a higher level, namely at Resource Stage. In comparison with Case A and Case C, this relationship could be considered as relatively more progressed. One of the reasons for this observation is the observation that the outsourcer already recognized the added value of the service provider`s capabilities and skills. Another factor that contributes to the higher level of ITO relationship is the higher responsibility which is assigned to the service provider. Maintaining business applications can be considered more business oriented and therefore more complex than providing IT infrastructure services. Another argument supporting this level of relationship is the fact that the two companies capitalize on joint planning of their activities.

Despite of the relative high level of the ITO relationship, the outsourcer again considers the service provider not proactive enough. However, the same respondent admitted that the outsourcer also did not challenge the service provider enough in these regards.

BIA maturity

In this case, the ITO collaboration between these two parties resulted in a BIA maturity score of the outsourcer of level 3 (Figure 6-7).

Compared to cases A and C, this result again supports Tallon's (2003) and Pollialis' (2003) viewpoint that ITO has a positive effect on BIA.

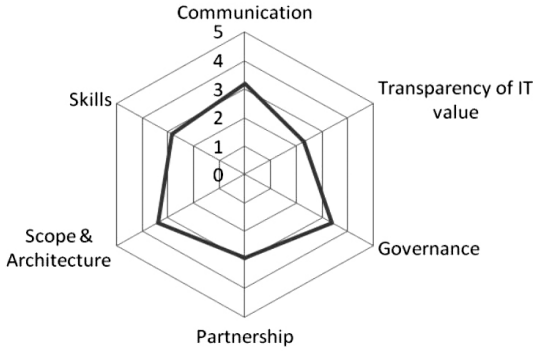

Figure 6-7. The BIA maturity score of outsourcer D

Conclusions from this case study

- The ITO relationship resulted in relative high scores on Governance and Scope & Architecture maturity.
- The more responsibilities an ITO provider is assigned, the higher level of partnership between the two parties will be.
- The service provider always perceives the level of relationship with its customer on a higher level, in comparison with the outsourcer itself.
- The outsourcer is the leading party in a partnership which determines whether innovation will be attained from the collaboration with its service provider.
- If an ITO provider wants to offer innovations to its customer, it has to be more proactive.

6.5 Analysis of the relationship between BIA and ITO

6.5.1 BIA maturity

Table 6-3 summarizes the results of the BIA maturity assessments of the outsourcers in the four cases.

	Communi-cations maturity	*Value measurement maturity*	*Governance maturity*	*Partnership maturity*	*Scope & Architecture maturity*	*Skills maturity*	*Overall maturity*
Outsourcer A	3,0	2,0	2,8	2,9	2,7	2,5	**2,7**
Outsourcer B	3,0	3,4	3,5	3,3	3,7	3,6	**3,4**
Outsourcer C	2,4	3,1	3,0	2,6	3,7	2,7	**2,9**
Outsourcer D	3,2	2,3	3,4	3,0	3,3	2,9	**3,0**
	2,9	*2,7*	*3,2*	*3,0*	*3,4*	*2,9*	*3,0*

Table 6-3. BIA maturity scores of the outsourcers in the four cases

The scores of the BIA assessments of the outsourcers in the four cases reveals an interesting point. The overall maturity scores are in line with the scores reported by Luftman and Kempaiah (2007), but the distribution of the score over the variables follows a remarkable pattern. Consistent over the four cases is a high (higher than the overall score per case) score on the variables Governance maturity and Scope & Architecture maturity. And although the four case studies do not provide ground for statistical analysis, this pattern appears to be different from Luftman and Kempaiah (2007) who suggest that all variables should be developed more or less equally. This could indicate that ITO has a positive effect on the Governance maturity and Scope & Architecture maturity of BIA.

Also consistently, the variable Skills scores lower than the overall maturity in the individual cases. This is perhaps even more surprising, because Thorogood et al. (2003) identified improved skills as one of the aspects of alignment on which ITO could help. On the other hand, this result is in line with Beimborn et al. (2006), that argued that ITO caused a loss of core IT competences of the outsourcer.

6.5.2 ITO relationship

Bases on the reports of the four case studies, the ITO relationships can be clustered in two groups. We could tag the case studies A and C as the Cost Stage group, and the cases B and D as the Resource Stage group.

There are certain similarities between the companies and the contracts of the companies in this cluster. For the Cost Stage Group these are:

- The main focus of the ITO relationship is simply IT infrastructure outsourcing.
- The companies in the cluster have undertaken some internal corporate restructures, which most probably have affected the ITO relationship.
- The client companies had some complaints about the quality of the service provided by the Service Providers.

The Resource Stage Group, has the following traits:

- The ITO relationship is concentrated on business applications.
- The corporate environment was not as dynamic as with the first two companies, which most probably has fostered the better development of the ITO relationship.
- The interviewed clients were rather satisfied with the quality offered by their service providers.
- The outsourcers in this group showed a BIA maturity slightly higher than the companies in the Cost Stage Group.

Even though the companies in the Resource Stage Group showed rather similar characteristics, there are certain aspects in which there are significant differences:

- The main goal of service provider B was to develop business applications, whereas service provider D`s role was directed towards the maintenance of business applications.
- In case study B, innovation was an explicit part of the contract, whereas in the other cases, innovation was not present in the terms of the contract.

6.5.3 Reflection on the initial hypothesis

The hypothesis of our study were two-fold:

H1: ITO has a positive effect on BIA and H2: *ITO has a negative effect on BIA*.

From the cases it appears that the outsourcers in case study B and D achieved a 'higher' level of ITO relationship in comparison with the companies from case study A and C. From Table 6-3 it shows that also regarding BIA maturity, the outsourcers in the cases B and D show higher scores than the outsourcers in the cases A and C, although the difference between case D and case C may be immaterial. Within the limitations of the limited number of cases we studied, these findings provide support for the hypothesis that ITO has a positive effect on BIA (H1). This conclusion is in line with the findings of Tallon (2003) and Pollalis (2003). More interesting, however, is the analysis of how ITO benefits alignment.

In all cases, the scores on Governance maturity and Scope & Architecture maturity were remarkably high, and the scores on Skills maturity remarkably low. This indicates that outsourcing, in all its forms, enables organizations to strengthen their governance of IT. Interestingly enough, this effect does not appear in studies on the motivations for ITO (Lacity et al., 2009). The positive effect on Scope & Architecture relates to the "access to leading edge technology" and "ability to adapt to change" (Lacity et al., 2009) motivations for ITO. The low scores our study found on Skills maturity show that one of the strongest motivations for ITO found in earlier studies, "Access to expertise/skills" (Lacity et al., 2009), may actually not appear.

The one case that could provide an ex-ante and an ex-post assessment of BIA maturity showed a strong increase in Value measurement maturity, but this pattern was not consistent in the four cases. Also the effect on the variables Partnership maturity and Communications maturity did not appear consistently in all cases and thus do not provide an indication for the effect of ITO on BIA.

6.5.4 Reflection on the ITO relationship model

In the course of the case studies, it appeared to us that the ITO model as presented by Gottschalk and Solli-Sæther (2006) is too simplified to properly present the ITO relationship, especially if that relationship starts developing. The model provides a distinct typology, but reality is more nuanced. It is for this reason that we propose a modified model, that includes four transition levels, to better exemplify the actual relationship between the two companies. All these new transition stages contain some of the characteristics of the levels preceding and/or succeeding them. Figure 6-8 presents this modified ITO relationship model.

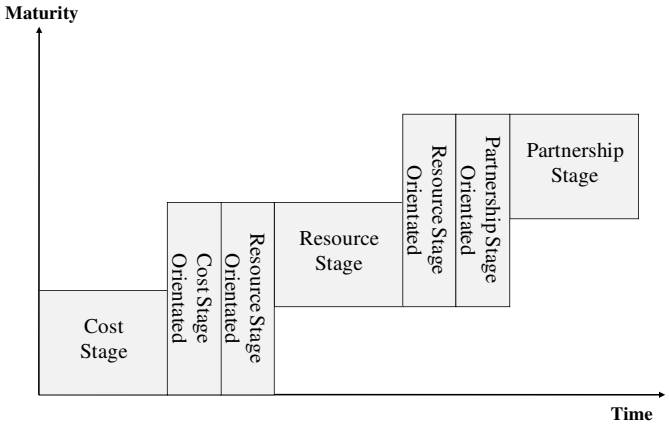

Figure 6-8. Modified maturity typology model for ITO relations

6.5.5 Further research

In this section of our article, we will offer a number of hypothesis based on the findings from the four case studies. We want to make it clear that due to the number of limited interviewees, these hypotheses are not statistically proven, but given the explorative nature of our study, it is justified to provide some hypotheses that also suggest directions for further research.

H3: Service providers assess the level of the ITO relationship higher than the outsourcers do.

> From the four case studies, we concluded that the service provider tends to see the relationship in a brighter light in comparison with the outsourcer. It is an hypothesis for further studies to test if this holds for ITO relationships in general. Moreover, it could be intriguing to discover what the motives for such evaluation of the relationship from the provider` side are.

H4. A proactive attitude and behaviour of the service provider has a positive effect on the level of the ITO relationship.

> In the case studies, three out of the four outsourcers stated that their service providers are not proactive enough. In a sense, this could irritate the customer and deteriorate the relation between the two parties. It could be interesting, if a research with a broader scope is conducted looking at before (not proactive) and after (proactive) service providers` behaviour and the effect on the ITO relationship.

H5. Involvement of IT end-users in the ITO relationship has a positive effect on the level of this relationship.

> In the case study with the highest level of ITO relationship, case B, the business end-users had a direct contact with the service provider. This was not the case with case A and case C. Furthermore, one of the managers from outsourcer C confirmed that for the next negotiation of a contract with a service provider, business people should be included in the whole process. A main motive for this is the fact that most of the time the innovative ideas spring out from the business side. Therefore, the service provider should be familiar with the strategy and vision of the business side of the outsourcer.

H6. Innovation requires partnership.

> In the case study analysis section became clear that outsourcer B was the most innovative in comparison with its counterparts. To a certain degree this success could be devoted to the efforts of its service provider. However, as the examination indicated, the outsourcer itself sustains innovative spirit within the firm and constantly challenges its service provider to offer it innovative ideas. This implies that in order for an outsourcer to be innovative, it should not only have a good service provider, but also constantly demand new ideas and services from its service provider. This claim is further backed up by case D, in which the service provider is quite innovative, but the outsourcer does not aspire to innovativeness. The same holds for cases A and C, where the outsourcers claimed that they are interested in innovations, but their service providers did not offered them any.

H7. Service providers that employ former employees of the outsourcers, or vice versa, achieve a higher level of ITO relationship.

> In case B, the outsourcer employed some consultants from service provider B, which helped the two companies to gain better mutual understanding and attain the highest level of ITO relationship from the four case studies in the study. In case D we saw the reversed situation,

service provider D hired some ex-workers of the outsourcer, but with similar positive effect on the ITO relationship. It would be interesting if this holds true for other cases and what the precise details for such an occurrence.

H8. The monetary value of the ITO contract has a positive effect on the ITO relationship.

When we compared the value of the ITO contracts of the four case studies, the worth of the contract of case B, €350 million, stuck out. This figure is much higher in comparison with the value of the other three cases. Also the level of ITO relationship between the parties in case B is much higher in comparison with the rest of the cases. It would be an interesting study to find out if this holds in general. A plausible explanation for this hypothesis could be that the monetary value if the contract also represents a measure of trust in the ITO relationship.

H9. Corporate restructures deteriorate ITO relationships.

Cases A and C showed that in case of a corporate restructure, either on the side of the outsourcer or on the side of the service provider, the ITO relationship suffered. These corporate dynamics do not seem to be addressed in the existing models and theory on ITO relationships, but the frequent turbulence of the IT industry make these dynamics a very realistic factor of influence.

We suggest that these hypothesis provide direction for further research into the relationship between ITO and BIA.

6.6 Conclusion

This article reported a qualitative study into the relationship between IT outsourcing and business and IT alignment. The study provided indications that ITO indeed influences BIA and that this effect in general is positive. The indicators came from both the comparison of the cases and from one case in which the engagement in the ITO was explicitly reported to have had a positive effect on the BIA maturity of the outsourcer.

The cases also provided indication that ITO influences BIA maturity most positively on the variables Governance and Scope & Architecture, The effect on the variable Skills appeared to be negative, thereby confirming the earlier results of Beimborn et al. (2006). The study also showed a distinct difference in the cases, where two cases combined a Cost Stage ITO relationship with a IT infrastructure focus and a cost saving motivation from the outsourcer and the other two cases combined an ITO relationship that was more developed towards Resource Stage with a business applications focus and a combined cost saving, resources and IT capabilities motivation. The outsourcer's motivation for ITO may therefore have a strong influence on both the domain of the ITO and the ITO relationship. In the study, a more developed ITO relationship also corresponded with a higher level of BIA maturity at the outsourcer.

The study also provided some general insights into the ITO relationship. In two cases, the ITO relationship was influenced by organizational turbulence on one or either side of the relationship. This effect is in itself not surprising, but the organizational dynamics within companies is hardly covered in the maturity or development models in this domain. Another conclusion from the cases was that the service providers tend to assess the ITO relationship on a higher level than the outsourcers. The outsourcer in general also consider the service provider less proactive than desired.

These conclusions provide relevant directions for both outsourcers and service providers for improvement of the ITO relationship.

7 THE RELATIONSHIP BETWEEN BUSINESS STRATEGY, IT STRATEGY AND ALIGNMENT CAPABILITY[7]

A key success factor for a successful company in a dynamic environment is effective and efficient information technology (IT) supporting business strategies and processes. Organizations that successfully align their business strategy and their IT strategy, outperform their non-aligned peers (Chan et al., 1997). This chapter explores the relationship between business strategy, IT strategy and alignment capability.

Regarding the relationship between business strategy and IT strategy, we found no conclusive relationship. Each business strategy can be supported by all IT strategies, but certain combinations provide a better fit than others. Regarding the relationship between business strategy and alignment capability, also no conclusive relationship was found.

Regarding the relationship between IT strategy and alignment capability however a clear relationship appeared. We explored this relationship further in a dual case study of two organizations having distinctly different IT strategies. One organization sees IT as an enabler for the business processes with mainly an internal impact, whereas the other organization IT sees as a driver for business innovation that can create competitive advantage in the market place. Based upon an assessment of their alignment capabilities we found that the company with the 'innovative' IT strategy scored a distinctly higher alignment capability than the company with the 'essential' IT strategy. Although this conclusion may not be surprising, it provides further evidence for the statement that a more progressive IT strategy pairs with a better alignment of business and IT.

7.1 Introduction

The necessity and desirability of aligning business needs and IT capabilities is examined in numerous articles (Pyburn 1983, Reich and Benbasat 1996, Chan et al. 1997, Luftman and Brier 1999, Maes et al. 2000, Sabherwal and Chan 2001) and its importance well recognized (Cumps et al. 2006a). In a review of over 150 studies into business and IT alignment (BIA) however, Chan and Reich (2007a) show that many different perspectives on and aspects of BIA exist. Although Henderson and Venkatraman are often credited for launching 'alignment' as a new concept for the fit between business and IT in their Strategic Alignment Model (Henderson and Venkatraman, 1993), the challenge of fitting IT solutions to business requirements is not new. Together with the rise of information systems in organizations, the need for alignment of its use with business processes and strategy grew. As a response to this challenge, methodologies of IT planning and system development were developed. Amongst others: Business Systems Planning (International Business Machines

[7] Originally published as: A.J.G. Silvius (2011), "The relationship between business strategy, IT strategy and alignment capability", *Enterprise IT Governance, Business Value and Performance Measurement*, S. NanSi and A.J.G. Silvius (Eds.).

Corporation, 1981), Information Systems Study and Information Engineering (Martin 1982). These methodologies of information systems planning (ISP) can be regarded as early appearances of BIA (Chan and Reich, 2007a). As these early methodologies were developed in the 1970s and 1980s, at a time when the use of IT in organizations was relatively new, it is not surprising that they were designed for building foundations for the development of large bespoke information systems. The methodologies therefore focused heavily on the methodological analysis of the organization's business processes and data (Silvius, 2007a).

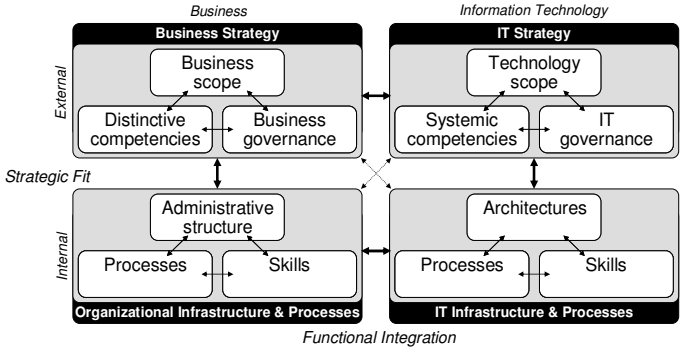

Figure 7-1. The 'Strategic Alignment Model' (Henderson and Venkatraman, 1993).

Some researchers (Lederer and Sethi, 1988; Earl, 1993; Segars et al., 1998) suggest that the methodological focus in the development of ISP methods, failed to identify the broader set of practices that influenced the use and effectiveness of ISP, such as the level of participation, the ownership of the project or the focus of the planning exercise. Consequently, Earl (1993) suggested a strategic information systems (SISP) approach that combines method, process and implementation, as the most complete way of planning IT systems and investments. The most significant differences between SISP, and the ISP methodologies described earlier, were its explicit emphasis on strategic alignment and competitive impact (Doherty, et al. 1999). In the Strategic Alignment Model (Figure 7-1) this is visualized by the top layer of factors. Strategic BIA refers to the alignment of business strategy, plans and priorities and IT strategy, plans and priorities (Chan and Reich, 2007a). Several authors confirm that organizations that successfully align their business strategy and their IT strategy, outperform their non-aligned peers (For example Chan et al., 1997; Irani, 2002; Kearns and Lederer, 2003). The relationship between business strategy and IT strategy is therefore a relevant area of concern.

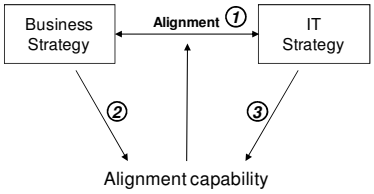

Figure 7-2. The relationships this chapter explores.

Figure 7-2 illustrates the relationships this chapter aims to explore. First the alignment of business and IT strategies will be explored (relationship 1). Hereafter the relationships between business strategy and alignment capability and IT strategy and alignment capability will be explored (relationships 2 and 3). We will elaborate on this last relationship in a dual case study of two financial services companies. The chapter concludes with some limitations and suggestions for further research.

7.2 Aligning Business and IT Strategies

The impact of IT on business is rapidly shifting. Starting from a calculation tool to improve efficiency in administrative processes, IT provided decision makers with more detailed information much quicker than before, hereby improving the effectiveness of the organization. The last decennium saw another shift as internet allowed companies to open up new markets, develop new services or provide new means of developing customer loyalty, thereby innovating the business of a company. So, from an enabler of business, IT developed into an innovator of business (Silvius, 2006).

7.2.1 Business strategy

In modern business strategy literature, three dominant strategies are identified: operational excellence, product leadership and customer intimacy (Figure 7-3, Treacy and Wiersema, 1997).

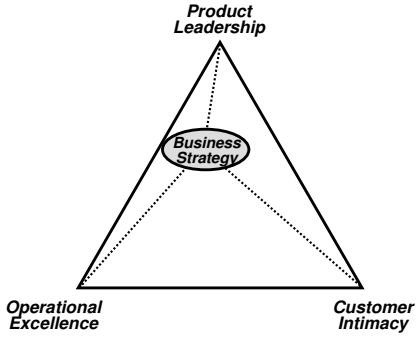

Figure 7-3. A typology of business strategies. (Based on Treacy and Wiersema, 1997)

In an operational excellence strategy the success of an organization is based on realizing high volumes with low costs. IT investments that create business efficiency, for example an ERP system that optimizes the utilization of resources, are particularly relevant in this type of strategy. In a product leadership strategy the Unique Selling Proposition of the company is that of high quality of products and services. For these companies the ability of IT systems to enable this quality would therefore probably be of greater value than the efficiency of the company. Finally, in a customer intimacy strategy the organization will benefit most from IT systems that strengthen their ability to tailor their offer to the customer's needs. An example of such a system could be a Customer Relationship Management application for a fashion retailer that allows him to capture the measurements, preferences and buying history of his individual customers.

7.2.2 IT strategy

IT strategy has been defined as the prioritizing and selection of IT projects, based on their benefits and added value for the organization (Ward and Peppard, 2002). This rather technical definition does not provide any indication regarding the content of the strategy. In order to develop a more meaningful typology of IT strategies we build upon the work of Cumps et al. (2006b) and Galliers (1993). They view IT strategy as determining IT adoption, ranging from conservative to innovative. We categorize IT strategy on a framework that distinguishes how (senior) management perceive the impact of IT. This impact can be on the external positioning of the organization and/or on the internal business processes (Silvius, 2006). Given a 'high' or 'low' perception of the internal and/or external impact, the different IT strategies can be categorized as follows (Figure 7-4).

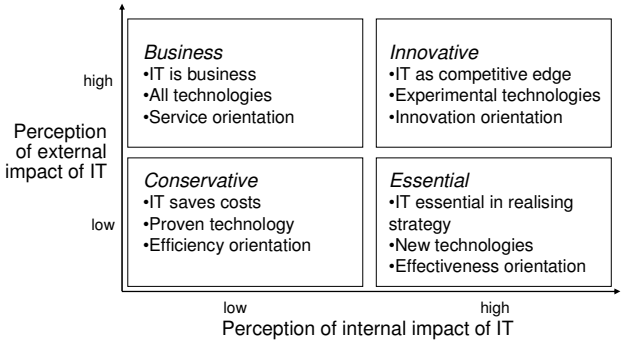

Figure 7-4. A typology of IT strategies.

7.2.3 The relationship

Cumps and Viaene (in PriceWaterhouseCoopers, 2005) studied the relationship between business strategy and IT strategy in a survey in seven West-European countries with 640 respondents. They categorized the business strategies of the responding organizations in the typology of Treacy and Wiersema described earlier. For the classification of IT strategies of the organizations they used the typology 'Conservative' – 'Essential' – 'Innovative' described above. (The 'Business' type of IT strategy is not recognized in their study.) The results of the Cumps and Viaene's study are summarized in Table 7-1.

		Business Strategy			
		Operational Excellence	*Product Leadership*	*Customer Intimacy*	
IT Strategy	Conservative	14%	5%	21%	40%
	Essential	11%	10%	25%	45%
	Innovative	2%	4%	8%	15%
		27%	19%	54%	100%

Table 7-1. Combinations of business and IT strategies
(Developed from PriceWaterhouseCoopers, 2005)

From these results it can be concluded that all IT strategies can be relevant to all business strategies. However, some combinations seem to be more obvious than others. In an operational excellence strategy, the Conservative and Essential IT strategies seem to be dominant, with the Innovative strategy underrepresented. In a customer intimacy strategy, the dominant IT strategies are also Conservative and Essential, but in opposite order. Also the Innovative strategy is relatively more present in this business strategy. In the product leadership strategy, the dominant IT strategy is Essential, with the Conservative strategy clearly underrepresented.

The debate on whether IT can create a competitive advantage to organizations seems to have been settled on the conclusion that this type of competitive advantage, if any, will be short-lived, and thus not sustainable, if it solely results from the deployment of superior technology (Cumps, et al., 2006a; Clemons, and Row, 1991; Weill and Broadbent, 1998). This is because of the well developed market for IT solutions, that makes any solution, once deployed as a strategic advantage, easily available for competitors in the market place. It has therefore been suggested that the competitive value of IT results not from the technology itself, but from the management and alignment of it (Earl, 1989; Kean, 1993; Henderson and Venkatraman, 1993; Broadbent and Weill, 1993). The alignment capability therefore is a relevant factor in the success of the combination of business and IT strategy.

7.3 Alignment capability

In their research into BIA in European organizations, Cumps et al. (2006b) also studied the relationship between business strategy, IT strategy and alignment capability. Alignment capability is measured by using Luftman's alignment maturity assessments (Luftman, 2000), et al. In these assessments six criteria are used to determine the maturity of the alignment of IT and business . These six criteria are described in Table 7-2.

BIA maturity variable	*Description*
Communication	How well does the technical and business staff understand each other? Do they connect easily and frequently? Does the company communicate effectively with consultants, vendors and partners? Does it disseminate organizational learning internally?
Value measurement	How well does the company measure its own performance and the value of its projects? After projects are completed, do they evaluate what went right and what went wrong? Do they improve the internal processes so that the next project will be better?
Governance	Do the projects that are undertaken flow from an understanding of the business strategy? Do they support that strategy? Does the organization have transparency and accountability for outcomes of IT projects.
Partnership	To what extend have business and IT departments forged true partnerships based on mutual trust and sharing risks and rewards?
Scope and Architecture	To what extend has technology evolved to become more than just business support? How has it helped the business to grow, compete and profit?
Skills	Does the staff have the skills needed to be effective? How well does the technical staff understand business drivers and speak the language of the business? How well does the business staff understand relevant technology concepts?

Table 7-2. Alignment maturity variables.

In the concept of BIA maturity, the level of maturity indicates an organization's capability to align IT to business needs. As in many maturity models, Luftman's BIA maturity assessments involves five levels of maturity:

1. Initial / Ad Hoc Process
2. Committed Process
3. Established Focused Process
4. Improved / Managed Process
5. Optimized Process

In their study, Cumps et al. (2006b) express alignment capability in a single score, showing the average maturity on all six variables where a level 5 score is measured as 100%. Their results are shown in Table 7-3.

		Business Strategy			
		Operational Excellence	Product Leadership	Customer Intimacy	
IT Strategy	Conservative	18%	30%	33%	27%
	Essential	59%	61%	60%	60%
	Innovative	55%	65%	66%	62%
		44%	52%	53%	

Table 7-3. Alignment capability scores for combinations of business and IT strategies (Developed from PriceWaterhouseCoopers, 2005)

From these results it can be concluded that business strategy does not seem to have a decisive effect on the alignment capability. The capability scores range on average from 44% to 53% for the different business strategies. The differences are relatively small. The relationship between IT strategy and alignment capability shows a larger spread in scores. In the study a Conservative IT strategy paired consistently with a low alignment capability whereas an Essential or Innovative IT strategy paired with a relatively high alignment capability. From these results it can be expected that the typology of IT strategies, Conservative - Essential – Innovative, corresponds with a growing alignment capability.

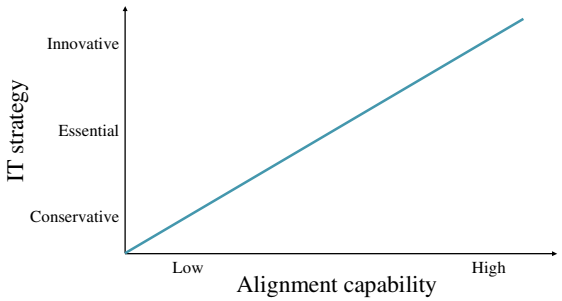

Figure 7-5. The expected relationship between IT strategy and alignment capability.

Figure 7-5 illustrates this expected relationship. Although this relationship can be expected, it cannot be concluded from this study. Regarding the 'essential' and 'innovative' strategies, the results are not conclusive on the effect on, or from, alignment capability.

In our study we elaborate on this relationship in on a dual case study. Here fore we selected two medium sized organizations, working in the same industry (financial services). One of which can be classified as having an Essential IT strategy, the other one as having an Innovative IT strategy. The organizations were the Dutch based NIBC Merchant Bank and ALEX Investment Bank.

The choice for case studies as research design was made because of the nature of the data required. Assessing the IT strategy and BIA capability maturity requires multiple interviews in each organization and is therefore impossible to obtain through surveys or external data analysis.

7.4 Case 1 NIBC Merchant Bank

7.4.1 The organization

NIBC is an independent merchant bank focusing on business-to-business financing of corporations, transactions and real estate. As a medium-sized merchant bank, NIBC has a value proposition based on superior sector knowledge and customer intimacy. It focuses on the mid-cap market. NIBC believes that its conservative strategy and diversified business model will guide it through the continuing challenging market conditions.

NIBC is organized in business units that reflect their main activities: Corporate Finance, Real Estate Markets, Financial Markets, Principal Investments and Investment Management. NIBC has 624 employees (full time equivalents) and has offices in 5 countries.

7.4.2 IT organization

In NIBC the IT department is centrally organized as part of the 'Corporate Center' support unit. The IT manager reports to the Director of the Corporate Center. The business units have no IT staff of their own and also no specific business-IT liaison positions. The IT organization does have liaison positions, so called information managers, that manage the relationship with the business units. The IT processes are partly outsourced to an external service provider.

7.4.3 IT strategy

The annual reports 2006 and 2007 of NIBC do not include any information about their IT strategy or the role of IT in NIBC's business. In interviews with NIBC staff members it is stated that within NIBC IT is following the business. The importance of IT as a supporter of the business is acknowledged, but IT does not play a role in the business strategy of NIBC. Between senior business and IT staff it was agreed that NIBC's IT strategy could be identified as 'essential'.

7.4.4 Alignment capability

In the assessment of NIBC's alignment capability we used Luftman's alignment maturity assessment described earlier. The maturity was assessed by seven respondents. Three of them were classified as 'business management', the other four as 'IT'. They assessed NIBC's BIA maturity as shown in Figure 7-6.

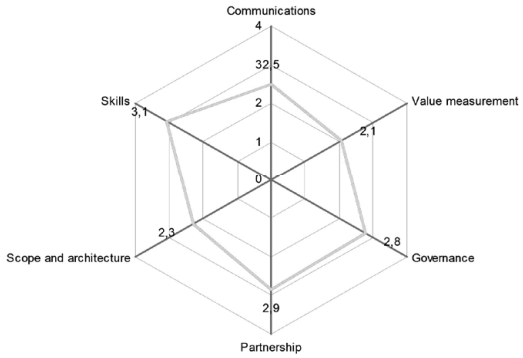

Figure 7-6. BIA maturity score for NIBC.

The maturity on the different BIA variables are assessed on levels between level 2 Committed Process and level 3 Established Process. Although it is difficult to assess this result in itself, a first benchmark is provided by Luftman's study into the BIA capability of 160 organizations (Luftman, 2007). In this research, the financial sector showed an average maturity of 2.9 which provides some indication that the NIBC score is relatively low regarding 'Value measurement', 'Communications' and 'Scope and Architecture' . Especially the score on 'Value measurement' is particularly low (2.1), indicating that IT only weakly demonstrates its value to the business.

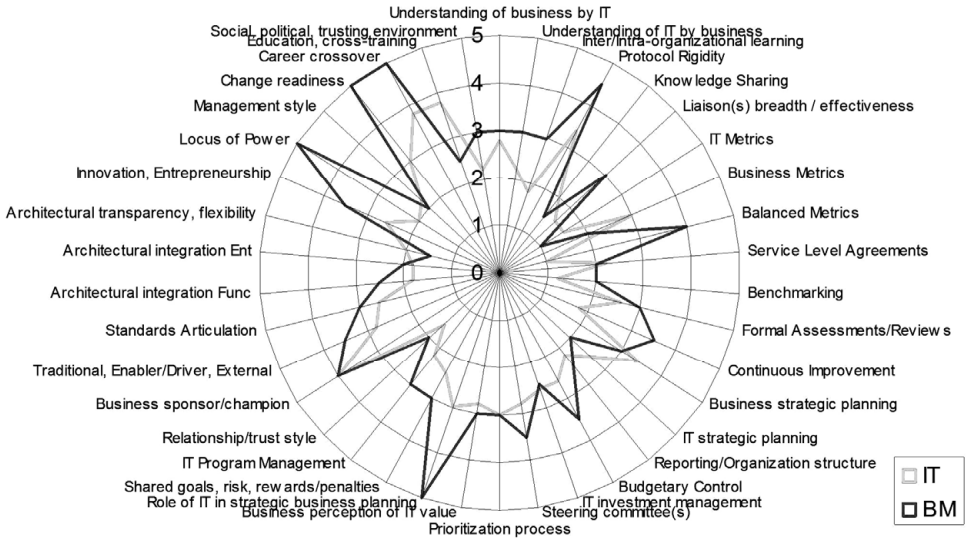

Figure 7-7. Detailed BIA maturity score for NIBC.

A more elaborated analysis of the maturity assessment is shown in Figure 7-7. This graph shows the assessment scores, split by respondent group business management (BM) and IT staff (IT), on the level of the sub-variables. From this figure it becomes apparent that on average the business management respondents rate the alignment maturity higher than the IT respondents. On average the

difference is in fact 0.55, which corresponds to more than half a level of maturity. Remarkable differences in perception occur for 'Business perception of IT value', 'Change readiness' and 'Locus of power'. These differences may indicate that the alignment between business and IT in NIBC is not undisputed. The information received in interviews with the IT staff acknowledge this difference in view.

7.5 Case 2 ALEX Investment Bank

7.5.1 The organization

ALEX is a relatively young (founded in 1996) bank that focuses on investment and funds management in the consumer market. Its market proposition is built on product leadership and superior customer service, allowing the customers to manage their portfolios in real time. ALEX was the first bank to offer this service at the end of the nineties. Later innovations included fully automated analysis of stocks, assets and portfolios, thereby automating the advise process. ALEX employs 156 full time equivalents and has one office located in Amsterdam.

7.5.2 IT organization

The IT organization of ALEX is organized as a supporting business unit. The IT manager reports to the CEO. Regularly IT staff members fulfill customer service tasks and participate in relation management events to understand the issues and experiences of ALEX's customers. ALEX has a strict in-sourcing policy for system development projects resulting from the philosophy that competitive advantage from the application of IT can never result from standard systems that are available to all market parties.

7.5.3 IT strategy

In interviews and presentations ALEX positions IT as a 'business driver' (Lanen, 2008). The CEO even went as far as calling ALEX first of all an IT company and secondly a bank. Of course the business activities of ALEX are that of a banker, but IT clearly plays an important role in their proposition to customers. It is IT that has enabled ALEX to launch new and innovative services as "ALEX assist", a fully automated advice service on investment portfolios, into their market. With these new services ALEX had been able to exploit new market segments and to become market leader in their segment within a matter of years. ALEX no doubt is a textbook example of an 'innovative' IT strategy.

7.5.4 Alignment capability

In the assessment of ALEX's alignment capability, nine respondents were found. Five of them were classified as 'business management', the other four as 'IT'. They assessed ALEX's BIA maturity as shown in Figure 7-8.

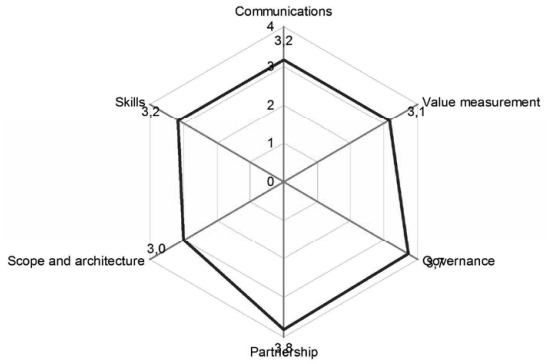

Figure 7-8. BIA maturity score for ALEX.

The maturity on the different BIA variables are assessed on levels between level 3 Established Process and level 4 Improved/Managed Process. When compared with Luftman's benchmark for the financial sector this indicates that ALEX scores relatively high. All scores are above the average found by Luftman. Especially the scores on 'Partnership' and on 'Governance' are particularly high, indicating a good co-operation between business and IT.

Again a more elaborated analysis of the maturity assessment is shown in Figure 7-9. In ALEX the two respondent groups, BM and IT, were quite close together in their assessment. On average the difference is a mere 0.09. This indicates that business management and IT staff share their views on the strong and weak points of BIA within ALEX.

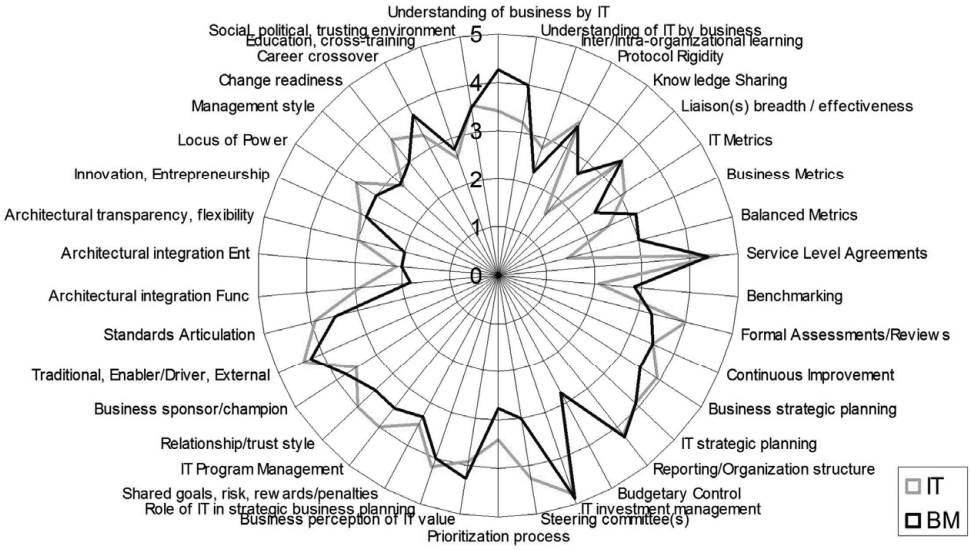

Figure 7-9. Detailed BIA maturity score for ALEX.

7.6 Comparison of the two cases

Table 7-4 summarizes the results of the two cases.

		NIBC	ALEX
IT Strategy		Essential	Innovative
Alignment capability	Average	2,61	3,34
	Av. Difference (BM-IT)	0,55	0,09

Table 7-4. Summary of the results of the two cases.

7.6.1 IT strategy

The IT strategies of NIBC and ALEX show the typical difference between an 'essential' strategy and an 'innovative' one. Since the two cases were selected on their different IT strategies, this is not surprising.

7.6.2 Alignment capability

As is apparent from Table 7-4 and Figures 7-6 and 7-8, ALEX scores consistently higher on the BIA maturity variables than NIBC. Figure 7-10 shows the maturity scores of the two companies on a more detailed level. Also on this more detailed view, ALEX scores almost consistently higher than NIBC.

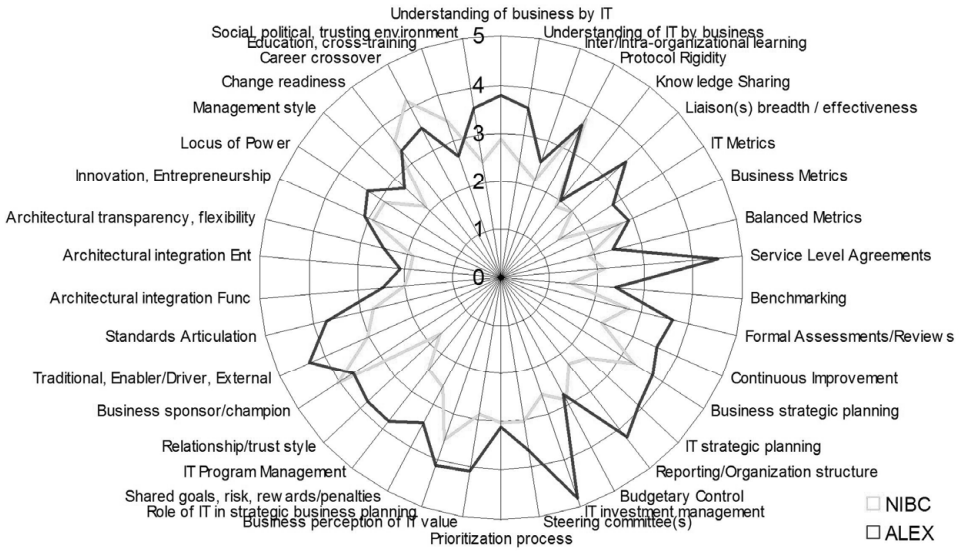

Figure 7-10. BIA maturity score for NIBC and ALEX.

This strengthens the impression that also the 'essential' and 'innovative' IT strategies pair with distinct different levels of alignment capability.

7.6.3 Alignment consensus

Another indicator for the alignment between business and IT is the level of consensus between business management and IT staff about the assessment of an organization's alignment capability. Table 7-4 shows that NIBC shows a substantial lower level of consensus than ALEX. The difference in alignment capability perception is on average 0,55 in case of NIBC and 0,09 in case of ALEX.

7.7 Conclusions

Aligning IT to business needs is still an important challenge for many organizations. This chapter explored the relationships between business strategy, IT strategy and alignment capability.

Regarding the relationship between business and IT strategies it was concluded that all possible combinations of business strategy and IT strategy occur in reality. Some combinations however appear to be more dominant than others. Logical combinations were formed by:

- Conservative and Essential IT strategies with an operational excellence business strategy;
- Essential and Conservative IT strategies with a customer intimacy business strategy;
- An Essential IT strategy with a product leadership business strategy.

Regarding the relationship between business strategy and alignment capability, it appeared that business strategy does not have a decisive effect on the alignment capability.

Regarding the relationship between IT strategy and alignment capability the case studies described in this paper confirm the expectation that IT strategy is a distinct factor in the alignment capability of organizations. We expanded the work done by Cumps et al. (2006b) and showed that also the 'essential' and 'innovative' types of IT strategies pair with distinctly different levels of alignment capability.

7.8 Discussion and limitations

An important limitation of the relationship between business and IT strategies that appeared in the study is that it is not linked to the success of the combination. The mere fact that each possible combination occurs in practice is an important, but not decisive indication. Further research is required to establish the rate of success of each combination.

The relationship between IT strategy and alignment capability that appeared in the studies confirm the expected pattern (Figure 7-5). It is clear that pursuing an innovative IT strategy requires a high alignment capability. A question that remains unsolved however is the causality of this relationship. Does a more innovative IT strategy result from a high alignment capability or the other way around. Another suggestion for further research is therefore the causality of the IT strategy – alignment capability relationship. This would require longitudinal research of multiple organizations.

The limitations of case study research in general also applies to our study of NIBC and ALEX. The decision to use case studies in this study was made for practical reasons of in-depth data collection. The relationship found between IT strategy and alignment capability could be strengthened by including more cases in the study.

8 THE RELATIONSHIP BETWEEN ORGANIZATIONAL CULTURE AND THE ALIGNMENT OF BUSINESS AND IT[8]

A key success factor for a successful company in a dynamic environment is effective and efficient information technology (IT) supporting business strategies and processes. Organizations that successfully align their business strategy and their IT strategy outperform their non-aligned peers (Chan et al., 1997). In recent surveys IT executives consistently name IT to business alignment their top-concern. The alignment between business needs and IT capabilities is therefore still a prominent area of concern. This paper aims to contribute to the understanding of the alignment challenge by exploring the relationship between organizational culture and the maturity of business and IT alignment (BIA).

The paper relies on the X-model of organizational culture (Smit et al., 2008) and Luftman's framework for measuring BIA maturity (Luftman, 2000) to explore the relationships between these concepts A quantitative study was conducted in a middle-sized logistics service provider using a questionnaire that was derived from the afore-mentioned models. The results support the notion that there is a relationship between organizational culture and BIA maturity, especially on the variables 'governance', 'partnership' and 'skills'. Further research is required to determine causality in these relationships.

8.1 Introduction

Information technology (IT) is changing the way companies organize their business processes, communicate with their customers and potential customers, and deliver their services. A key factor for a successful company is an effective and efficient alignment of the way IT supports business strategies and processes. The necessity and desirability of aligning business needs and IT capabilities has been examined in numerous articles (Pyburn, 1983; Reich and Benbasat, 1996; Chan et al., 1997; Luftman and Brier, 1999; Maes et al., 2000; Sabherwal and Chan, 2001) and its importance is well recognized (Cumps et al. 2006a). The annual survey of top management concerns by the Society for Information Management (www.simnet.org) ranked 'IT and business alignment' as the no. 1 concern in five of the last seven years (Society of Information Management, 2003; 2004; 2005; 2006; 2007; 2008; 2009). In the years that it did not make the top spot, alignment ranked as the no. 2 concern. The alignment between business needs and IT capabilities is therefore still a prominent area of concern.

[8] Originally published as: A.J.G. Silvius, J. Smit and H. Driessen (2010), "The relationship between organizational culture and the alignment of business and IT", 16th Americas Conference on Information Systems, Lima.

After many years of research into business and IT alignment (BIA), Chan and Reich (2007b) list over 150 studies, the prominent position of BIA as one of the top concerns, should be surprising. Why didn't we solve the 'problem'? Should it be concluded that academic research still cannot provide solutions to the issues business and IT executives face in practice? We believe this is at least partly true.

Some questions that practitioners face are not addressed sufficiently in academic literature (Chan and Reich, 2007a; Silvius, 2007a). Among these questions is the relationship between organizational culture and BIA. Embedding IT in organizations requires careful consideration of the organization's culture and the culture of its surrounding context (Ross, 2001 and Westrup et al., 2003). Chan (2002) suggests that a strong company culture is a precondition to the type of informal structure that fosters alignment. Farrell (2003) points out that there are several culturally-specific antecedents to alignment.

There are however limited studies that specifically focus on the role of organizational culture in achieving IT alignment (Leidner and Kayworth, 2006). It is therefore relevant to study the relationship between organizational culture and the alignment of business and IT, especially if one can assume that organizations are increasingly depending on IT for their communication and business processes. Information has become ubiquitous in many organizations and IT is therefore one of the most important resources of production and knowledge.

This paper aims to further explore the way organizational culture relates to the alignment of business and IT in organizations. The general research question in our study was what is the relationship between organizational culture and alignment of business and IT? More specifically, this research also went one step further than previously mentioned research in the effort to understand this relationship; instead of just looking for a general relationship between organizational culture and BIA, this study aimed to explore the relationship between very specific aspects of organizational culture and BIA.

The rest of the paper is structured as follows. The next section presents a review of the literature on organizational culture and BIA. This is followed by a section that describes the research methodology and finally the findings are discussed and conclusions are drawn.

8.2 Literature review BIA and organizational culture

8.2.1 Business and IT alignment

The majority of publications on BIA are rather vague in terms of how to define or practice alignment (Maes et al., 2000). Expressions used in this context are 'fit' (Venkatraman, 1989), 'harmony' (Luftman et al., 1993), 'integration' (Weill and Broadbent, 1998), 'linkage' (Henderson and Venkatraman, 1993), 'bridge' (Ciborra, 1997) or 'fusion' (Smaczny, 2001). Chan (2002) distinguishes two prevailing conceptualizations of the alignment problem. The first one focuses on planning and objectives integration and views alignment as the degree to which the business mission, objectives and plans are supported by the IT mission, objectives and plans. This view can be found in Reich and Benbasat (1996), Kearns and Lederer (2004) and Hirschheim and Sabherwal (2001). The second one is a more holistic conceptualization of BIA, that can be found in Henderson and Venkatraman (1993). Their widespread framework of alignment, known as the Strategic Alignment Model, describes BIA along two dimensions (Figure 8-1). The dimension of strategic fit differentiates between external focus, directed towards the business environment, and internal focus, directed towards administrative structures. The other dimension of functional integration separates business and IT. Altogether, the model defines four domains that have been harmonized in order to achieve alignment. Each of these

domains has its constituent components: scope, competences, governance, infrastructure, processes and skills.

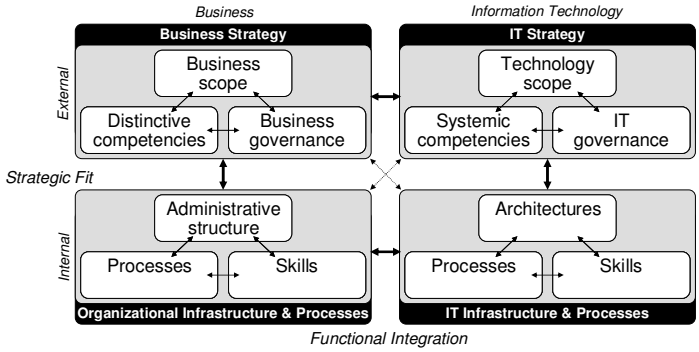

Figure 8-1. The 'Strategic Alignment Model' (Henderson and Venkatraman, 1993).

Henderson and Venkatraman pay extensive attention to the different approaches of achieving this alignment. Maes et al. (2000) refine the Strategic Alignment Model by identifying three, instead of two, columns: business, information/communication and technology, and three, instead of two, rows: strategy, structure and operations.

Based on the components of the Strategic Alignment Model and his research on the enablers and inhibitors of BIA (Luftman et al., 1999), Luftman developed a business and IT alignment maturity model. In this model six criteria are used to determine the maturity of the alignment of IT and business (Luftman, 2000). These criteria are described in Table 8-1. In the concept of BIA maturity, the level of maturity indicates an organization's capability to align IT to business needs. As in many maturity models, Luftman's BIA maturity assessments involve five levels of maturity: 1. Initial / Ad Hoc Process; 2.Committed Process; 3. Established Focused Process; 4. Improved / Managed Process; 5. Optimized Process.

BIA maturity variable	*Description*
Communication	How well does the technical and business staff understand each other? Do they connect easily and frequently? Does the company communicate effectively with consultants, vendors and partners? Does it disseminate organizational learning internally?
Value measurement	How well does the company measure its own performance and the value of its projects? After projects are completed, do they evaluate what went right and what went wrong? Do they improve the internal processes so that the next project will be better?
Governance	Do the projects that are undertaken flow from an understanding of the business strategy? Do they support that strategy? Does the organization have transparency and accountability for outcomes of IT projects.
Partnership	To what extend have business and IT departments forged true partnerships based on mutual trust and sharing risks and rewards?
Scope & Architecture	To what extend has technology evolved to become more than just business support? How has it helped the business to grow, compete and profit?
Skills	Does the staff have the skills needed to be effective? How well does the technical staff understand business drivers and speak the language of the business? How well does the business staff understand relevant technology concepts?

Table 8-1. BIA maturity variables.

What is striking about the variables of BIA maturity in Luftman's model, is that they are covering both organizational, procedural, technical and organizational aspects. This is consistent with other researchers who added social elements of alignment to the formal methodological elements (Keen 1991, Reich and Benbasat 2000, Chan 2002). BIA therefore also seems to result more from the relationship between IT executives and business executives and not just from a methodological analysis of business strategy. This observation gives even more reason for a suspected influence of culture on alignment.

Since its publication, the application of Luftman's maturity model has been used and reported by several authors (Ekstedt, et al, 2005; Cumps et al., 2006b; Silvius, 2007b; Luftman and Kempaiah, 2007; De Haes and Van Grembergen, 2008, Luftman et al., 2008). These studies analyze the results of the assessments by industry sector, by respondent and/or by organizational contingencies. The potential relationship between organizational culture and BIA maturity, however, is not investigated or explored in these reports. In this sense it is therefore useful that we adopted Luftman's model as a framework for analyzing the relationship between organizational culture and BIA maturity.

8.2.2 Organizational culture

The concept of culture stems from studies in sociology, anthropology and social psychology. Wilson (2001) takes the various definitions of culture and focuses on key elements, the first being that organizational culture is a shared phenomenon (as described by Tichy, 1982; Pfeffer, 1981; Wilkins and Ouchi, 1983). Secondly, Wilson (2001) identifies that the majority of authors believe that there are two levels of culture – the visible level and the deeper, more hidden level. Accordingly, visible aspects encompass behavior patterns, the physical and social environment and the written and spoken language by the group. The deeper, less visible level relates to the group's values and basic assumptions. Smit et al. (2008) offer a simplified definition and refer to Bower (1966) who suggested that culture refers at the visible level to "the way things are done around her" and at the hidden level to "the way we think about things around here".

Along with the interest in the notion of organizational culture came several models that could be used as a frame of reference to better understand organizational culture. Some of these models include those suggested by Hofstede (1980), Deal and Kennedy (1982), Handy (1985), Johnson (1988), and Denison (1984; 1990).

A fairly new model that manages to some extent to consolidate the above-mentioned models (and several more) is that of Smit et al. (2008). This model suggests that the culture of an organization can be described in terms of 5 core elements namely, Leadership, Strategy, Adaptability, Coordination, and Relationships. Each of these core elements contains sub-elements that serve to explain the core elements in more detail. This model has been used as the basis for the development of an organizational culture diagnostic tool that has been validated (Forster, 2006). The model and with definitions of the core elements is presented in Figure 8-2.

Focusing on the core elements, this model and its validated questionnaire, was used as the basis for the organizational culture aspect of the study that is reported here and it was chosen for its depth and because it allows for a detailed overview of several organizational culture related factors in organizations.

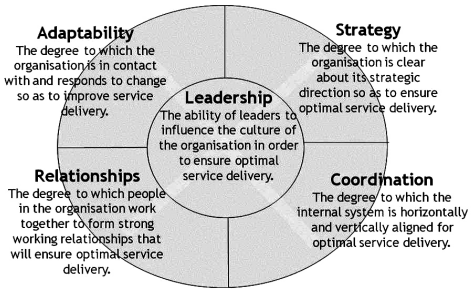

Figure 8-2. The core elements of the X Model (Smit et al., 2008)

As is clear from the preceding two sections the models of Luftman (2000) and Smit et al. (2008) and their respective validated tools were used as the basis for the study that is reported here. However it is necessary to contextualize this study somewhat further in the literature on the relationship between the main concepts.

8.2.3 BIA and Organizational Culture

Although the relationship between culture and IT has drawn the interest of many IT researchers, Leidner and Kayworth (2006) list over 70 studies, the specific relationship between alignment of management of IT and organizational culture has not been studied that often. Most studies on culture and IT cover the impact of national cultures on IT adoption and use (Leidner and Kayworth, 2006).

Without denying the possible relationships between national culture and organizational culture, we focus our study on the latter one and its relationship with BIA. As mentioned in the introduction, a number of earlier studies suggest a relationship between culture or cultural aspects and BIA. Table 8-2 provides an overview of relevant literature on this topic.

Author	*Main findings*
Tomlin (1991)	Organizations that use IT most strategically are strongly committed to IT and embrace its value. These organizations have developed strong internal information cultures, that typically exhibit a leader-driven vision as to how IT will be strategically used in the organization.
Grover, Teng, and Fiedler (1998)	The presence of planning cultures at the top levels of an organization helps to facilitate recognition of the importance of strategic systems investments.
Kaarst-Brown and Robey (1999)	Using magic as a metaphor, five basic archetypes of IT cultures that influence how IT is managed and used in organizations are identified. These five archetypes are: revered, controlled, demystified, integrated and fearful IT cultures.
Kanungo, Sadavarti, and Srinivas (2001)	Innovative organization cultures are found to be most closely associated with firms having a delineable IT strategy.
Chan (2002)	There is no one right way to align; organizations align in different ways. Strategic alignment matters more than structural alignment. The informal organizational is more important than previously thought in achieving alignment. This informal structure is reinforced by organizational culture. A strong company culture is a precondition to the type of informal structure that fosters alignment.
Farrell (2003)	Alignment is achieved buy a number of factors in organizations. This study identified 21 factors that fell into three categories: management and planning, business, and technology. Several factors were culturally-specific. CEO attitude was found to be the most important factor overall.

Author	*Main findings*
Westrup, et al. (2003)	IT can be incorporated into cultural networks to enhance, stabilize or change cultural characteristics. Culture change the way IT is perceived and managed. The management of IT can benefit from taking culture seriously.
Tallon (2003)	IT alignment can sometimes fail to produce a business payoff. This alignment paradox cannot be avoided just by picking certain technologies and avoiding others. Flexibility takes vigilance and smart management, and as always culture is important. There needs to be a mind-set that encourages shared networks and common IT procurement policies, and an across-the-board willingness to give up best-of-breed systems that could be incompatible.
Baker (2004)	Successful alignment between business strategy and IT requires a collaborative corporate culture and strong leadership. A strong culture and shared values guides an organization's employees to work together successfully toward a common goal
Sledgianowski and Luftman (2005)	Inter-organizational communication is fostered by a culture that promotes regularly occurring communication as a fundamental task of every manager and employee.

Table 8-2. Studies that suggest a relationship between organizational culture and BIA.

There is sufficient ground to suspect a relationship between organizational culture and the adoption, management and use of IT, and therefore the alignment of business strategy and IT Considering the notion that there is indeed evidence of a relationship between these concepts and the selected theoretical models that could help explore these relationships, it is therefore possible to present the conceptual model for this study. With five variables in the X-model for organizational culture and six variables in Luftman's BIA maturity assessment model, we can identify 30 specific potential relationships between culture and alignment as depicted in Figure 8-3.

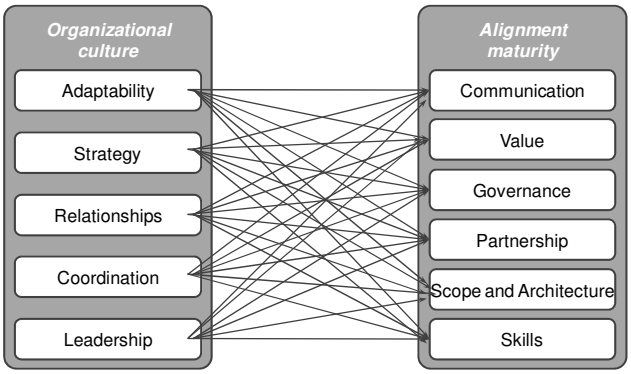

Figure 8-3. Specified conceptual model of the study

The literature does give some indication of relationships between some of these variables that could be expected.

Adaptability

> Adaptability is defined as the ability of the organization to understand and respond to the needs of its clients (Kotter and Heskitt, 1992), and to create change based on new knowledge gained (Kotter, 1995; Senge, 1999). Adaptability also requires the organization's ability to tap into the individual's creativity and innovativeness (Denison, 2000). It should therefore be

expected to correlate positively with the alignment maturity variable 'skills', which includes the organization's 'readiness for change' (Luftman, 2000).

Adaptability also implies the ability of the organisation to share knowledge, information and experience (Handy 1995). This aspect is also found in the alignment maturity variable 'communication' (Luftman, 2000). Therefore adaptability is likely to correlate positively with 'communication'.

On a more technical level, one could argue that a high level of 'adaptability' would require a relatively high level of IT 'architecture' maturity since flexibility is one of the promised benefits of architecture. An interesting question however is whether a value of organizational culture translates into a rather technical architecture. We would therefore classify the relationship as 'potential'.

Strategy

Strategy is defined as the ability of the organization to create long term direction and meaning (Kotter, 1995; Denison, 2000), to concretize vision into tangibles goals (Denison, 2000) and to create line of sight between individual jobs and strategic direction of the organization (Denison, 2000). It should therefore be expected that a higher level of strategy correlates with a high BIA maturity in general. However, given the meaning of the alignment maturity variables, this effect is most likely to occur for the variables 'governance' and 'partnership' since they imply specifically the long term direction and vision of business management (Luftman, 2000; Farrell, 2003).

Relationships

Relationships is defined as the ability of the organization's staff, teams and organizational units to work together as a collective towards a common goal (Denison, 2000; Wallace et al,1999). Logically, a high level of 'relationships' would therefore correlate with a high score on the alignment maturity variable 'partnership', that covers the business-IT relationship. However, Zee and Jong (1999) argue that in order for business and IT to work together as a team, they should learn to speak 'the same language'. This aspect also would imply a correlation between 'relationship' and 'communication'.

Relationships is also defined as the organization's ability to attract, place, develop, and retain human talent that is needed to deliver optimal services through, for instance through training and development (Clinton et al, 2004). This aspect is likely to correlate with the alignment maturity variable 'skills' (Luftman, 2002).

Coordination

Coordination is defined as the ability of the organization to align its organizational structure, systems and processes with the needs of the client (Burke et al., 1996). This alignment requires adequate planning (Grover, Teng, and Fiedler, 1998) and performance management (Burke et al., 1996; Lopez et.al., 2004). A more planning oriented culture is likely to correlate with a high maturity on 'governance',

Coordination also implies the ability of the organization to align its communication channels to ensure coordination (Frank and Fahrbach, 1999; Larkin and Larkin, 1994). It should therefore be expected to correlate positively with the alignment maturity variable 'communication' (Luftman, 2000).

Leadership

Chan (2002) highlights the positive impact of leadership on alignment in general. Leadership as a cultural antecedent is defined as the ability of leaders to demonstrate energy and to energize others (Krames, 2005), thereby converting energy into action and results (Kotter and Heskitt, 1992). It also implies the ability of leaders to see the bigger picture and give meaning to it (Koestenbaum, 1996). These characteristics are most likely to correlate positively with the alignment variables 'partnership' and 'governance'.

Leadership also refers to the locus of power in an organization. This aspect is addressed in alignment maturity variable 'skills' (Luftman, 2000). A high score on 'leadership' should therefore also be expected to score high on 'skills'.

The preceding discussion suggests relationships between certain variables in the X Model of organizational culture and Luftman's BIA maturity model, and these are summarized in Table 8-3.

		BIA maturity					
		Communi-cation	Value	Governance	Partnership	Scope and Architecture	Skills
Organi-zational culture	Adaptability	*likely*				*potential*	*likely*
	Strategy			*likely*	*likely*		
	Relationships	*likely*			*likely*		*likely*
	Coordination	*likely*		*likely*			
	Leadership			*likely*	*likely*		*likely*

Table 8-3. Expected correlations between culture variables and alignment variables.

As can be seen in Table 8-3, BIA maturity levels that are most likely positively correlated with culture variables, according to the literature are 'governance', 'partnership', 'skills' and 'communication'. The expected correlations depicted in Table 8-3 therefore essentially represent the hypotheses of the study. The next section describes the methodology for testing these expected relations.

8.3 Research method

The expected relationships between organizational culture and alignment maturity were tested in a quantitative cross-sectional study. Data collection was done in the second half of 2009. Questionnaires, based in the X-model assessment of Smit et al. (2008) and the BIA assessment questionnaire by Luftman (2000), was put to the respondents as self-administrated internet-mediated questionnaires.

The site selected for data collection is a middle sized logistics company, for this paper called 'CB', based in the Netherlands and specialized in warehousing and logistic services of books. The case was selected based on the enabling role of IT in CB's business processes, without IT being the core business of the company, and based on the awareness of the role of IT that the organization displayed.

In total 23 respondents were selected that covered all main organizational units of the case. These respondents were best placed to respond to questions about the culture of the organization as well as the BIA alignment maturity of the organization.

Item		*% of respondents*
Organizational role	Operational management	74
	Strategic management	26
Functional area	Marketing & Commerce	9
	Finance & Controlling	13
	Human Resources Management	9
	Logistics	30
	Information Technology	17
	Project Management	18
	General Management	4
Age	< 25 years	0
	26-35 years	9
	36-45 years	61
	46-55 years	13
	56-65 years	17
Years of service with CB	0-2 years	9
	3-5 years	17
	6-10 years	43
	11-20 years	13
	21-30 years	13
	> 30 years	4
Gender	Male	91
	Female	9

Table 8-4. Descriptive statistics of the respondents.

8.4 Results: relating organizational culture and alignment

The general results for each major concept is briefly discussed in the next two sections and this is followed by a discussion on the relationships between the concepts.

8.4.1 Results organizational culture

Figure 8-4 summarizes the results of the assessment of the organizational culture. The results are presented on a scale of 1 to 5, where 5 represents a stronger or more positive score on the relevant element of culture, and where 1 represents a weaker or more negative score on the relevant element of culture.

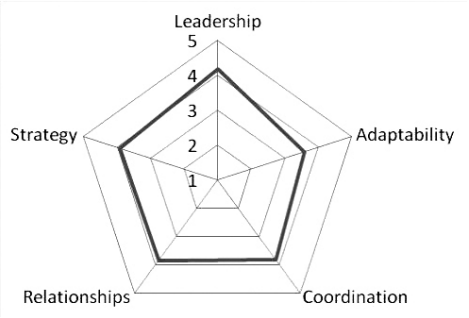

Figure 8-4. Assessment of CB's organizational culture.

As can be seen in Figure 8-4 this organization scored fairly high in general on organization culture, or in other words, this organization seems to have a fairly strong organizational culture. The lowest score is for Adaptability (3.6) which implies that the organization may struggle somewhat with dealing with change. On the other hand leadership seems to be quite high (4.2). A closer look at the data revealed that the energy levels of leaders are quite high and they seem to be able to transfer this energy to those around them.

8.4.2 Results alignment maturity

Figure 8-5 summarizes the results of the assessment of the organizational culture.

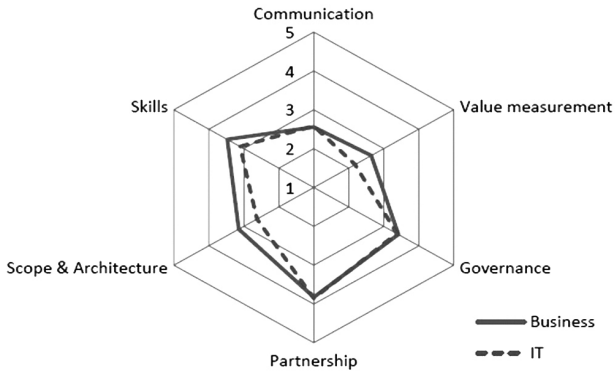

Figure 8-5. Assessment of CB's alignment maturity.
(business respondents and IT respondents separated)

The results of the BIA maturity assessment shows an overall maturity level of 3.1 on Luftman's scale of 1 to 5 (Luftman, 2000). This level expresses an 'Established Focused Process', a score that is in line with the average scores found by Luftman and Kempaiah (2007). The scores of the different variables shows a relatively high score on 'partnership' and 'skills' and a relatively low score on 'communication', 'value' and 'scope & architecture'. This pattern implies an organization that is developing in its vision of the strategic use of IT. The partnership between business and IT seems well established, but the organization of the alignment process, expressed in 'communication' and 'value', and the technical capability, expressed in 'scope & architecture' lack behind this vision. Regarding the relationship between organizational culture and alignment, could this pattern indicate a relative high level of leadership.

8.4.3 The relationship between organizational culture and BIA maturity

Table 8-5 summarizes the correlations between the variables of organizational culture and Luftman's BIA maturity variables found in the case study.

		BIA maturity					
		Communi-cation	Value	Governance	Partnership	Scope and Architecture	Skills
Organi-zational culture	Adaptability	0,211	0,416	0,209	0,113	0,028	0,101
	Strategy	0,219	0,204	**0,611(**)**	**0,564(**)**	-0,078	0,354
	Relationships	0,209	0,381	0,347	0,201	-0,178	0,357
	Coordination	0,296	**0,448(*)**	**0,491(*)**	0,411	0,116	**0,515(*)**
	Leadership	0,291	0,278	**0,601(**)**	**0,537(*)**	-0,109	**0,521(*)**

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Table 8- 5. Correlations between culture variables and alignment variables found in the case study.

Compared to the expected correlations it can be concluded that most of the relationships that appeared in the case study, were also expected. This is true for the relationships:

- Culture variable Strategy with BIA variable Governance;
- Culture variable Strategy with BIA variable Partnership;
- Culture variable Coordination with BIA variable Governance;
- Culture variable Leadership with BIA variable Governance;
- Culture variable Leadership with BIA variable Partnership;
- Culture variable Leadership with BIA variable Skills.

Next to these relationships, 15 combinations of culture variables and BIA variables that were not expected to show correlations, indeed did not show this in the study.

Expected relationships that were not confirmed by the case study however were those between:

- Culture variable Adaptability with BIA variable Communication;
- Culture variable Adaptability with BIA variable Skills;
- Culture variable Relationships with BIA variable Communication;
- Culture variable Relationships with BIA variable Partnership;
- Culture variable Relationships with BIA variable Skills;
- Culture variable Coordination with BIA variable Communication.

Remarkable about this result is that no correlation between organizational culture variables and Communication appeared from the study. This result, however, seems to be consistent with the earlier observation that the organization showed a well established partnership between business and IT, but with the organization of the alignment process lagging behind.

The study also showed two relationships that were not expected, as suggested by the literature. These relationships were:

- Culture variable Coordination with BIA variable Value;
- Culture variable Coordination with BIA variable Skills.

The case study confirms most expected likely relationships between organizational culture and alignment maturity. This sheds more light on how alignment is related to organizational culture.

8.5 Conclusion and limitations

The conceptual analysis of the relationship between of organizational cultures on BIA maturity provides indications that there are indeed some strong positive relationships between certain elements of the core concepts in this study. Given the multidimensional character of alignment maturity, this relationship can be expected to be strongest on the variables 'Governance', 'Partnership', 'Skills' and 'Communication', and weak on the variables 'Value' and 'Scope & Architecture'. Our empirical exploration provided support for the existence of positive relationships between all but one variable. The likely relationship between organizational culture and the variable 'Communication' was not confirmed by our study. A potential explanation for this result could be the specific characteristic of the organization, which has an established partnership between business and IT, but with the organization of the alignment process lagging behind.

A more practice orientated finding from this study is that from the organizational culture side, three elements (namely 'Strategy', 'Coordination', and 'Leadership') show a reasonably strong relationship with 'Governance' on the BIA maturity side. This suggests that if these three culture elements are nurtured and strengthened, then it is likely that the 'Governance' aspect of BIA will be more mature. In addition it becomes clear that the 'Leadership' element of organizational culture also has a reasonably strong relationship with two additional elements of BIA maturity namely 'Value', and 'Skills'. This implies that also these two aspect of BIA are likely to be more mature, if there is strong 'Leadership' in the organization. Put simplistically, it seems that specifically three elements of organizational culture need to be fairly strong in order to achieve BIA maturity and that is strong leadership, a good strategy, and coordination.

However it has to be pointed out that the sample in this study was fairly small, and so in order to validate the potential relationships between organizational culture and alignment, further study should be made, based on larger samples. Such studies can expand the understanding of how organizational cultures influence alignment of business and IT beyond the indications found in our study. Further studies could also take one step further to investigate the causal relationships, if any, between these variables. Nevertheless, at the very least, this paper introduces a concrete way, with validated models, to study the relationship between the culture of an organization and the maturity of its business and information technology alignment, and also reports on the likely relationships revealed from a first study.

9 EXPLORATIVE STUDY ON THE INFLUENCE OF NATIONAL CULTURES ON BUSINESS AND IT ALIGNMENT MATURITY[9]

A key success factor for a successful company in a dynamic environment is effective and efficient information technology (IT) supporting business strategies and processes. Organizations that successfully align their business strategy and their IT strategy, outperform their non-aligned peers (Chan et al., 1997). In recent surveys IT executives consistently name IT to business alignment their top-concern. The alignment between business needs and IT capabilities is therefore still a prominent area of concern. This paper aims to contribute to the understanding of the alignment challenge by exploring the impact of (national) cultures on the maturity of business and IT alignment (BIA).

The paper relies on Hofstede's framework of cultural dimensions (Hofstede, 1980) to understand the concept of national culture. After a brief introduction on BIA and Luftman's framework for measuring BIA maturity (Luftman, 2000), we analyze the influence of Hofstede's cultural dimensions on the variables of BIA maturity. This conceptual exercise is than tested in a small-scale empirical exploration by comparing BIA maturity scores of Belgium and Dutch financial institutions.

The results support a potential effect of national cultures on BIA maturity, especially in 'governance maturity' and 'skills maturity', but not all expected results are confirmed.

9.1 Introduction

Information technology (IT) is changing the way companies organize their business processes, communicate with their (potential) customers and deliver their services (Avolio et al., 2000). A key success factor for a successful company is an effective and efficient alignment of the way IT is supporting business strategies and processes. The necessity and desirability of aligning business needs and IT capabilities is examined in numerous articles articles (Pyburn, 1983; Reich and Benbasat, 1996; Chan et al., 1997; Luftman and Brier, 1999; Maes et al., 2000; Sabherwal and Chan, 2001) and its importance is well recognized (Cumps et al. 2006a). The annual survey of top management concerns by the Society for Information Management (www.simnet.org) ranked 'IT and business alignment' as the no. 1 concern in five of the last seven years (Society of Information Management, 2003, 2004, 2005, 2006, 2007, 2008, 2009). In the years that it did not make the top spot, alignment ranked as the no. 2 concern. The alignment between business needs and IT capabilities is therefore still a prominent area of concern.

[9] Originally published as: A.J.G. Silvius, S. de Haes and W. van Grembergen (2010), "Explorative study on the influence of national cultures on business/IT alignment maturity", *International Journal of IT/Business Alignment and Governance*, Volume 1 Issue 2.

After many years of research into business and IT alignment (BIA), Chan and Reich (2007b) list over 150 studies, the prominent position of BIA as one of the top concerns, indicates that business and IT executives still face issues and questions that are not tackled by research (Chan and Reich, 2007a; Silvius, 2007a). One of these questions concerns the impact of culture on BIA. Several authors (Watson et al., 1997; Kaarst-Brown and Robey, 1999; Baker, 2004) suggest a relationship between the effectiveness of BIA and the culture within an organization. Other authors show that national cultures affect the way IT is used or perceived (Veiga, Floyd and Dechant, 2001; Livonen et al, 1998). This paper aims to explore the way national culture affects the maturity of BIA in organizations.

The study of the impact of culture on the alignment of business and IT is important because organizations are increasingly depending on IT for their communication and business processes. Information has become ubiquitous in many organizations and IT is therefore one of the most important resources of production and knowledge. However, embedding IT in organizations requires careful consideration of the organization's culture and the culture of its surrounding country (Ross, 2001; Westrup et al, 2003).

The central question that this paper addresses is how national culture influences the alignment of business and IT in organizations. After a brief paragraph on the concepts of BIA, and a framework for studying national cultures, we explore the relationship between culture and BIA. The last part of the paper presents a small-scale empirical study to explore the expected influence from national culture on BIA maturity.

9.2 Background

The central question in this paper, how does national culture influence the alignment of business and IT in organizations, resolves from a research program aimed at exploring and understanding the differences of BIA in theory and in practice. With this knowledge the theory on BIA can be further developed.

Step one of the research was a literature review on the topic. The literature review focused on the following questions.

- How is BIA defined and interpreted?
- Which theories are developed on BIA?
- What was the development path of BIA?

This literature is not reported in his paper, but some relevant parts are included in the paragraph defining BIA.

The second step in the program was a number of focused group discussions in order to explore the practical side of BIA. The discussions were aimed at exploring the following questions.

- Which issues are faced in aligning IT with business requirements in practice?
- Which actions are taken to align IT with business requirements?

This research was reported in Silvius (2007a). The results of the discussions give input to the construct of BIA as a result of the relationship between business professionals and IT professionals instead of a systematic methodology. This insight was also found in other studies (Luftman et al., 1999). The relationship can be well established and matured within an organization, with a clear process and assessment, or it can be still in its infancy. The third step of the research program therefore focuses on the assessment of the maturity of BIA in real-life companies and on

understanding the factors that influence these assessments. The results of BIA maturity assessments are recently reported by Luftman and Kempaiah, (2007). Luftman's studies, however, pay little explicit attention to the influence of culture on the assessment scores of individual companies. Given the influence of culture on the use and perception of IT, as was found in several studies (referenced in the paragraph 'Culture and IT'), it seems not unlikely that culture may also have an influence on BIA maturity.

9.3 Business and IT alignment

Despite of the apparent importance of aligning IT and business, the majority of publications are rather vague in terms of how to define or practice alignment (Maes et al., 2000). A first question seems to be how to define the word 'alignment'. Other expressions used in this context are 'fit' (Venkatraman, 1989), 'harmony' (Luftman et al., 1993), 'integration' (Weill and Broadbent, 1998), 'linkage' (Henderson and Venkatraman, 1993), 'bridge' (Ciborra, 1997) or 'fusion' (Smaczny, 2001). A second question is whether BIA is a 'state' or level that can be achieved or a 'process' to get to a certain (higher?) state. The concept of BIA as a 'state' is further developed by Luftman (2000), who assesses the BIA maturity level of organizations. Also Reich and Benbasat (1996) 'measure' a degree or level of BIA. The process approach to BIA can be found in the methodologies of IT planning developed in the '70s and '80s (International Business Machines Corporation 1981, Martin 1982). Also Weill and Broadbent (1998) support the process view when they state 'Alignment is a journey, not an event'.

In this jungle of opinions, Chan (2002) distinguishes two prevailing conceptualizations of the alignment problem. The first one focuses on planning and objectives integration and views alignment as the degree to which the business mission, objectives and plans are supported by the IT mission, objectives and plans. This view can be found in Reich and Benbasat (1996), Kearns and Lederer (2004) and Hirschheim and Sabherwal (2001). The second one is a more holistic conceptualization of BIA, that can be found in Henderson and Venkatraman (1993). Their widespread framework of alignment, known as the Strategic Alignment Model, describes BIA along two dimensions (Figure 9-1). The dimension of strategic fit differentiates between external focus, directed towards the business environment, and internal focus, directed towards administrative structures. The other dimension of functional integration separates business and IT. Altogether, the model defines four domains that have been harmonized in order to achieve alignment. Each of these domains has its constituent components: scope, competences, governance, infrastructure, processes and skills. Henderson and Venkatraman pay extensive attention to the different approaches of achieving this alignment. Maes et al. (2000) refine the Strategic Alignment Model by identifying three, instead of two, columns: business, information/communication and technology, and three, instead of two, rows: strategy, structure and operations.

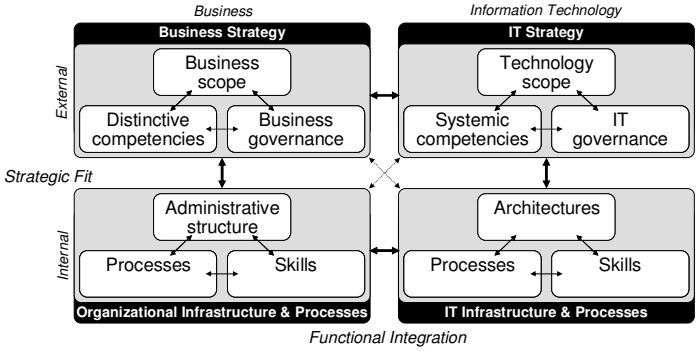

Figure 9-1. The 'Strategic Alignment Model'.

Following this more holistic approach, we define BIA as *the degree to which IT applications, infrastructure and organization enable and shape the business strategy and processes, as well as the process to realize this.*

In this definition, BIA can express both a 'state', the degree of alignment, as a 'process', the activities or methodology to reach a certain state of alignment. The definition also implies that BIA covers not just the alignment process aimed at developing, selecting or enhancing IT applications and infrastructure, but also the agreements regarding the management and maintenance of application and infrastructure services. In the Strategic Alignment Model this is shown in the different levels of alignment. The strategic level covers the alignment between business strategy and IT strategy, whereas the operational level covers the alignment between business processes & organization and IT infrastructure & organization.

In the definition 'business' is defined by business processes and business strategy and 'IT' is defined as IT applications, infrastructure and organization. This view finds support in the methodologies of IT planning. The question whether IT aligns to business or the other way around is answered as 'enable and shape'. This indicates a two-way alignment.

9.4 Business and IT alignment maturity

The message of BIA is logical and undisputed. IT should support the business and this will be more successful if the IT resources are developed and organized with the business strategy and processes in mind. The Society for Information Management studies, identifying alignment as a top concern for seven years in a row (Society of Information Management, 2003, 2004, 2005, 2006, 2007, 2008, 2009), however, indicate that this message is not easily put into practice. This issue is explored by Luftman and Brier (1999). In their studies of BIA they found that enablers and inhibitors of alignment, as shown in Figure 9-2, seem to be different ends of the same situational variable or aspect, The ability of aligning IT to business needs, is therefore a result of the relative 'position' on the variables. What is striking about the variables of BIA, Luftman and Brier found that they are more relational than technical or organizational. This is consistent with other researchers who added social elements of alignment to the formal methodological elements (Keen 1991, Reich and Benbasat 2000, Chan 2002). BIA therefore seems to be a state resulting more from the relation between IT executives and business executives than from a methodological analysis of business strategy. This observation gives even more reason for a suspected influence of culture on alignment.

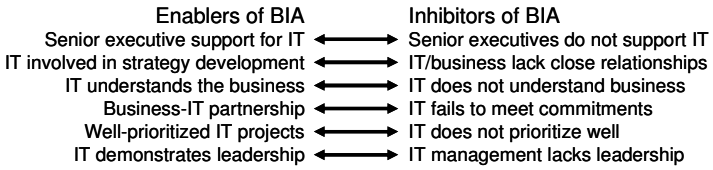

Figure 9-2. Enablers and inhibitors of business and IT Alignment.

Based on the components of the strategic alignment model (Figure 9-1) and the enablers and inhibitors of BIA, Luftman developed his business and IT alignment maturity model. In this model six criteria are used to determine the maturity of the alignment of IT and business (Luftman, 2000). These six criteria are:

Communications maturity

> How well does the technical and business staff understand each other? Do they connect easily and frequently? Does the company communicate effectively with consultants, vendors and partners? Does it disseminate organizational learning internally?

Value Measurement maturity

> How well does the company measure its own performance and the value of its projects? After projects are completed, do they evaluate what went right and what went wrong? Do they improve the internal processes so that the next project will be better?

Governance maturity

> Do the projects that are undertaken flow from an understanding of the business strategy? Do they support that strategy?

Partnership maturity

> To what extend have business and IT departments forged true partnerships based on mutual trust and sharing risks and rewards?

Scope & Architecture maturity

> To what extend has technology evolved to become more than just business support? How has it helped the business to grow, compete and profit?

Skills maturity

> Does the staff have the skills needed to be effective? How well does the technical staff understand business drivers and speak the language of the business? How well does the business staff understand relevant technology concepts?

In the concept of BIA maturity, the level of maturity indicates an organization's capability to align IT to business needs. As in many maturity models, Luftman's BIA maturity assessments involves five levels of maturity:

1. Initial / Ad Hoc Process
2. Committed Process
3. Established Focused Process
4. Improved / Managed Process
5. Optimized Process

Since its publication, the application of Luftman's maturity model has been used and reported by several authors (Ekstedt, et al, 2005; Cumps, et al., 2006b; Silvius, 2007b; Luftman and Kempaiah, 2007; De Haes and Van Grembergen, 2008, Luftman et al., 2008). In this study we also adopted Luftman's model as a framework for analyzing the potential impact of culture on BIA maturity.

9.5 National cultures

Hofstede (1991) defines culture as "the collective programming of the mind, which characterize the members of one organization from others." By "collective programming" Hofstede refers to the symbols, heroes, rituals and values that collectively define a culture. Symbols are specific words, gestures, objects of status symbols that carry a particular meaning to people of the same culture. Heroes are people, real or imaginary, dead or alive, that have the ability to influence behavior based on their status, skills or charisma. Rituals are activities that in itself are seemingly unnecessary, but in the culture are considered essential. Symbols, heroes and rituals are the practices of a culture. They are visible and observable to an outside spectator. At the core of a culture lie the values. Values are "broad tendencies to prefer certain states of affairs over others" (Hofstede, 1991). They represent how things "ought to be".

Cultures come in many different kinds or layers. Such as national cultures, organizational cultures, organizational subcultures and occupational cultures (Gefen and Straub, 1997; Hofstede, 1991). In this paper we investigate the impact of national cultures on business and IT alignment. We therefore rely on Hofstede's dimension framework to understand more about the concept of national culture. Hofstede (1980) presented a model of national cultures, based on a survey of more than 50 countries involving more than 120,000 respondents. This framework characterizes culture on four dimensions:

PDI (Power Distance Index)

> The power distance index is an indication of the extent to which less powerful members of a society accept unequal distribution of power. It reveals dependence relationships in a country. A low PDI shows limited acceptance of power inequality and less dependence of subordinates on managers. It also shows a preference for consultation and cooperation.

IDV (Individualism vs. collectivism)

> In cultures that are considered highly individualistic, individuals are loosely tied and are expected to look out for themselves and their family. In 'collectivist' cultures, people are integrated into strongly cohesive in-groups, and group loyalty lasts a lifetime. In individualistic cultures, time, punctuality and schedules are considered highly important, whereas in collectivistic cultures personal relationships and contacts prevail.

MAS (Masculinity vs. femininity)

> In the dichotomy masculine versus feminine, a masculine culture values assertiveness, performance and material success. In a feminine society values like quality of life, tenderness

and modesty prevail. In a feminine culture, individuals don't like to stand out or be unique, whereas in a masculine society success and career are valued highly.

UAI (Uncertainty Avoidance Index)

The uncertainty avoidance index is defined as "the extent to which the members of a culture feel threatened by uncertain or unknown situations" (Hofstede, 1991). Cultures with a high UAI have a large need for rules and regulations to guide tasks. Cultures with a low UAI are less rule-dependent and are more trusting (Mooij, 2000).

Based on follow-up research among students in 23 countries around the world, and criticism that the model represented a very 'western' way of thinking, a fifth dimension was added (Bond, 1984).

LTO (Long Term Orientation vs. Short Term Orientation)

This dimension is an indication of the perception of time in a culture and is based on the heritage of Confucius, the most influential Chinese philosopher who lived around 500 B.C. Values associated with Long Term Orientation are thrift and perseverance; values associated with Short Term Orientation are respect for tradition, fulfilling social obligations, and protecting one's 'face'.

In his study, Hofstede measured the score of over 74 countries on these five dimensions.

Hofstede's framework may not be perfect, For example the omission of former Eastern European countries in the study has been criticized (Miller, et al., 2006), and some authors (Miller, et al. 2006, Smith and Bond, 1998) prefer alternative frameworks such as Schwartz's (1994) because of its more recent nature. We, however, use Hofstede's framework in this study because it is widely known and used among both academics and practitioners., and the positions of the respondents in our study, management level professionals within an IT context, closely resemble Hofstede's respondents. In addition, alternative frameworks, like Schwartz's, achieved a refinement of Hofstede's work, rather than a contradiction (Miller, et al., 2006).

9.6 Culture and IT

(National) Culture influences the way IT is perceived or used. Several authors found proof of this in their studies. Table 9-1 provides an overview of some studies in this field.

Authors	*Main findings*
Straub (1994)	The author studied the effect of culture on IT diffusion of email and fax in Japan and the United States. His findings suggested why there are differences in email usage and choice among knowledge worker in different cultures.
Livonen, Sonnenwald, Parma, and Poole-Kober (1998)	The authors studied Finnish and American college students that collaborated in a common course using electronic discussion groups. Findings of the study show that cultural attitudes toward technology may influence people's beliefs and use of the technology.
Leidner, Carlsson, Elam, and Corrales (1999)	This study examined whether cultural differences influence perceptions of the relationship between Executive Information Systems (EIS) use and decision-making outcomes. The authors compared the responses from in Mexico, Sweden, and the United States. The study found significant differences, predicted by cultural factors, in the impact of EIS use on management decision-making.

Authors	*Main findings*
Hofstede (2000)	The paper investigates the specific attributes of countries that influence IT adoption speed. Findings show that cultural variables (individualism and uncertainty avoidance) can be used to predict the ease and speed of changes. Cultures of high uncertainty avoidance are slow of adopting new technologies.
Veiga, Floyd and Dechant (2001)	This study discussed the effects of national culture on the acceptance of IT, using the Technology Acceptance Model (TAM). The authors compared acceptance in Japan and the United States and the findings suggest that Hofstede's dimensions of cultural differences play distinct roles in influencing the acceptance.
Png, Tan and Wee (2001)	This study compared the adoption of frame relay between the United States and Japan. The findings suggest that uncertainty avoidance, one of Hofstede's dimensions, affected the adoption decision of companies differently in the two countries.
Birgelen, Ruyter, Jong and Wtzels (2002)	The authors compared IT use in after-sales service-and-support operations in Sweden, Belgium, France, Spain, Austria, Ireland, Netherlands, United Kingdom, Norway, and the U.S. The findings suggest that cultural characteristics will partly determine the design of effective after-sales service contact modes.
Sørnes, Stephens, Sætre, and Browning (2004)	The authors studied how workers in Norway and the United States use information and communication technology (ICT). Their findings show that IT use reflects Hofstede's findings for PDI and UAI, but that it doesn't reflect cultural differences for IDV and MAS.
Waarts and van Everdingen (2005)	This study investigates if national culture adds to the explanation of differences in adoption of innovations for firms operating in different countries. The authors performed a large-scale empirical study in 10 European countries concerning the adoption of Enterprise Resource Planning (ERP) software by medium-sized companies. Key finding is that variables describing national cultural highly significantly explain variance in adoption decisions in addition to the traditional micro and meso variables.
Miller, Batenburg and van de Wijngaert (2006)	This study investigates the adoption rates of ERP systems from fourteen European countries. The study explores if a national cultural framework could be used to explain the differences. The framework used was Schwartz's seven national cultural value types. After controlling for industry and size, it was found that conservatism has a negative relationship while autonomy, egalitarian commitment, and harmony have a positive relationship with the adoption of ERP systems.
Batenburg (2007)	The author explored country differences in adoption of electronic procurement. Analyses are conducted on 3475 organizations from seven different European countries. The study concludes that there indeed are country differences with respect to e-procurement adoption, and that firms from countries with a low uncertainty avoidance such as Germany and the UK are the early adopters of e-procurement, while countries that are less reluctant to change such as Spain and France have lower adoption rates.
Van Decrean (2007)	The author studied cultural differences in websites in Germany and the United States, using Hofstede's framework. His findings suggest a reflection of national cultures in the websites of international companies.

Table 9-1. Summary of Comparative Studies of cultural impacts on IT practices.

All of these studies show a certain impact of national cultures in the perception and use of IT. Given these findings it can be expected that culture also influences the alignment of IT and business. This influence however is not reflected in any studies on BIA so far.

9.7 The impact of culture on business and IT alignment

Luftman recently reported two extensive studies into the maturity of BIA in organizations (Luftman and Kempaiah, 2007; Luftman et al., 2008). His studies include both international companies and foreign based companies. The potential influence of national cultures on BIA maturity is, however,

not analyzed. Given the impact of national cultures on the use and perception of IT found in earlier studies, it can be expected that cultures could also influence the perception of BIA maturity on the different variables of Luftman's assessment model. For example, an expected relationship can be that countries with a higher uncertainty avoidance score emphasis more the governance of IT issue, resulting in a higher score on governance maturity and value transparency. The reasoning behind this could be the mitigation of risk through better governance. Silvius (2008c) reported a first contextual mapping of the influence of national cultures on BIA. In this section we elaborate upon this work.

In order to specify these relationships, the next section explores how BIA maturity scores on each variable may be influenced by the culture dimensions. The influences that are expected are based on indications provided by literature.

9.7.1 Power Distance Index

- Low PDI – High Communications maturity

  Sørnes et al. (2004) conclude that a low PDI score indicates close working relationships close working relationships between organizational groups, mutually dependent relationships between

  hierarchical levels and assertive behavior by subordinates. Work tasks and IT preferences may be initiated by the subordinates themselves and not just by managers (Sørnes et al., 2004). This can be expected to result in a higher Communications maturity because of more intensive and less formalized communication.

- Low PDI – High Value measurement maturity

  Following the motivation stated under 'Communications', a lower PDI score can be expected to result in less need for creating transparency, procedures and reports that enhance Value measurement, therefore resulting in a lower maturity on this factor.

- Low PDI – Low Governance maturity

  Again based on the findings of Sørnes et al. (2004) that concluded that a low PDI score indicates close working relationships between hierarchical levels and assertive behavior by subordinates, it should be expected that in cultures with a low PDI have less need for formalized governance processes, resulting in a relatively lower Governance maturity.

- Low PDI – High Partnership maturity

  Following the motivation given under ' Communications', a lower PDI score can be expected to result in a higher Partnership maturity because of more intensive, less formalized and richer communication.

- Low PDI – Low Scope & Architecture maturity

  Again, following the findings of Sørnes et al. (2004), a low PDI score indicates close working relationships between hierarchical levels and assertive behavior by subordinates. Therefore, it should be expected that in cultures with a low PDI, there is less need for a formalized architecture.

- Low PDI – High Skills maturity

The high level of assertiveness that is expected to result from a low PDI score is stimulating entrepreneurship and initiative in lower organizational levels and can therefore be expected to result in a high Skills maturity.

9.7.2 Individualism vs. Collectivism

- High IND – High Communications maturity

  In individualistic societies, the task will normally prevail over personal relationships (Hall, 1976; Walls, 1993). A high IND score could therefore indicate more task oriented communication that will result in a high maturity score, but lacks personal warmth that may be important in case of problems.

- High IND – High Value measurement maturity

  Individualistic cultures will normally show a high appreciation of value and performance. It should therefore be expected that these societies score relatively high on Value measurement maturity.

- High IND – High Governance maturity

  In Hofstede's study, the United States scores highest (most individualistic) of all nations on this dimension. The United States also developed strongly in governance as a reaction to fraudulious actions of individuals. It should therefore be expected that High IND cultures also score high on Governance maturity.

- Low/High (?) IND – Low/High (?) Partnership maturity

  In individualistic cultures personal task prevail collective tasks (Veiga, et al., 2001). A high IND culture should therefore be expected to result in a lower Partnership maturity. On the other hand, Van Birgelen et al. (2002) found that in an individualistic culture people seem to be more innovative and trusting in exchange relationships with external parties, which could be reflected in a higher Partnership maturity.

- High IND – Low Scope & Architecture maturity

  Given the more collective nature of architecture it can be expected that a high IND culture should be reflected in a relatively low score on Architecture maturity. On the other hand, the findings of Van Birgelen et al. (2002) provide indication that a more individualistic culture is reflected in a higher Architecture maturity because of its openness to exchange relationships with external parties. Since this last indication applies only at the higher levels of maturity, the first expectation prevails.

- High IND – High Skills maturity

  A high IND culture can be expected to result in a high Skills maturity because of its appreciation of individual skill development.

9.7.3 Masculinity vs. Femininity

- High MAS – Low Communications maturity

  Hofstede's (2000) findings support the claim that one-way communication will be more prominent in masculine countries, while two-way communication prevails in feminine

countries. It should therefore be expected that a high MAS culture scores relatively lower on Communications maturity.

- High MAS – High Value measurement maturity

  A high "masculine" culture values assertiveness and focuses on material success, while "feminine" countries value modesty, tenderness, and quality of life (Hofstede, 1991). A high MAS score can therefore be expected to score high on Value measurement maturity.

- High MAS – High Governance maturity

  Because of its orientation on material success, performance and measurement, a high MAS culture can be expected to score high on Governance maturity.

- Low MAS – High Partnership maturity

  In more feminine cultures individuals don't like to stick out, be unique or conspicuous, unlike the more assertive and career-seeking individuals found in masculine cultures (Sørnes et al., 2004). This 'live and let live' approach could enhance partnerships between individuals, departments or organizations. A less MAS culture should therefore be expected to result in a higher Partnership maturity.

- High MAS – Low Scope & Architecture maturity

  Because of its tendency to appreciate individual performance and success, a more masculine culture should be expected to score lower in Scope & Architecture maturity, which has a non-individual character.

- High MAS – High Skills maturity

  Because of its orientation on work and material success (Hofstede, 1991), a high MAS culture should be expected to result in a higher Skills maturity. On the other hand, a more "feminine" culture can be expected to stimulate a more diverse skills development that in fact could also result in a higher Skills maturity score.

9.7.4 Uncertainty Avoidance Index

- Low UAI – High Communications maturity

  Low UAI cultures, as they represent personal freedom to choose various media without adhering to rigid rules and structures (Sørnes et al., 2004), thereby stimulate open and informal communication, can be expected to show a high Communications maturity.

- High/low (?) UAI – High/low (?) Value measurement maturity

  The descriptions provided by Hofstede (1980) suggest that a high UAI culture should be expected to also avoid uncertainty about value, resulting in a higher score on Value measurement maturity. Sørnes et al. (2004), however, remark that IT use "can be considered a rudimentary activity for reducing uncertainty and ambiguity". A high UAI culture should therefore be expected to be an early adopter of new ICT, that may not have proven its value yet.

- High UAI – High Governance maturity

Following the same argumentation as stated above (Hosdtede, 1980), a high UAI culture can be expected to score high on Governance maturity because of its tendency to require certainty.

- High UAI – Low Partnership maturity

  Given the fact that 'partnership' in general is based more on trust than on certainty, it should be expected that a high UAI culture scores relatively low on Partnership maturity.

- High UAI – High Scope & Architecture maturity

  A high UAI culture can be expected to score high on Architecture maturity because of its tendency to create certainty and security, and the slower rate of adoption of new technologies, as was found by Png et al. (2001).

- High UAI – Low Skills maturity

  Based on the findings of Livonen et al. (1998), it can be expected that a high UAI decreases the pace of individual learning and will result in a lower Skills maturity.

Based on this conceptual mapping, it can be expected that:

- Cultural aspects in general are likely to have an impact on the different variables of BIA maturity assessment.
- The effect of cultural dimensions on BIA maturity scores is not straightforward, the cultural dimensions most likely influence the variables of BIA maturity in different directions.
- Cultural aspects are likely to have the most impact on variables that strongly involve social interaction, therefore the variable 'Scope & Architecture maturity' is expected to be least influenced by cultural aspects.

9.8 Empirical exploration

In this section of the paper the expected relationships between national culture and BIA maturity are further specified for the national cultures of Belgium and the Netherlands. The selection of Belgium and the Netherlands was inspired by the substantial differences on three of the four Hofstede's culture variables by these neighboring countries. Belgium has a more southern European culture, quite close to the cultures of France and Italy, whereas the culture of Netherlands represents the northern European culture of countries such as Norway, Sweden and Denmark. (Table 9-2 shows the culture dimensions of the Netherlands and Belgium (Hofstede, 2008).

	PDI	IND	MAS	UAI
	Power Distance Index	Individualism vs. Collectivism	Masculinity vs. Femininity	Uncertainty Avoidance Index
Maximum score (all nations)	104	91	110	112
Minimum score (all nations)	11	6	5	8
Score for the Netherlands	38	80	14	53
Score for Belgium	65	75	54	94

Table 9-2. Belgium and the Netherlands compared on Hofstede's variables.

Note: Because of the fact that Belgium does not have a score on Hofstede's long term orientation vs. short term orientation variable, this dimension is discarded in the rest of the paper.

Based on these scores, and the analysis in previous paragraphs, the expected relationships between national culture and BIA maturity can now be further specified for the national cultures of Belgium and the Netherlands.

9.8.1 Power Distance Index

- PDI - Communications maturity

  The Belgian PDI is moderately high, whereas the PDI of the Netherlands can be classified as moderately low. Therefore it should be expected that the Netherlands scores higher in Communications maturity than Belgium.

  Expectation: Comm M NL > Comm M BE

- PDI - Value measurement maturity

  The relatively low PDI score of the Netherlands should result in a lower Value measurement maturity, compared to Belgium.

  Expectation: Value M NL < Value M BE

- PDI - Governance maturity

  Given the difference in PDI scores of Belgium and the Netherlands it should be expected that Belgium scores higher in Governance maturity than the Netherlands.

  Expectation: Gov M NL < Gov M BE

- PDI - Partnership maturity

  Given the difference in PDI scores of Belgium and the Netherlands it should be expected that the Netherlands scores higher in Partnership maturity than Belgium.

  Expectation: Par M NL > Par M BE

- PDI - Scope & Architecture maturity

Given the difference in PDI scores of Belgium and the Netherlands it should be expected that Belgian companies scores higher in architecture maturity than the Dutch companies.

Expectation: Arch M NL < Arch M BE

- PDI - Skills maturity

  Given the difference in PDI scores for Belgium and the Netherlands it should be expected that Dutch companies score higher on Skills maturity than Belgian companies.

  Expectation: Sk M NL > Sk M BE

9.8.2 Individualism vs. Collectivism

Since Belgium and the Netherlands both score relatively high on the IDV factor, no specific difference in maturity score is expected on this variable.

Expectation: All variables NL ≈ All variables BE

9.8.3 Masculinity vs. Femininity

- MAS - Communications maturity

  The Dutch culture can be classified as strong feminine, whereas Belgium takes on a middle position on this factor. This strengthens our earlier expectation that the Netherlands scores higher in Communications maturity than Belgium.

  Expectation: Comm M NL > Comm M BE

- MAS - Value measurement maturity

  The difference in MAS scores in Belgium and the Netherlands can be expected to result in a higher Value measurement maturity for Belgian companies, compared to Dutch companies.

  Expectation: Value M NL < Value M BE

- MAS - Governance maturity

  The difference in MAS scores in Belgium and the Netherlands strengthens the expectation that Belgian companies will show a higher Governance maturity score, compared to Dutch companies.

  Expectation: Gov M NL < Gov M BE

- MAS - Partnership maturity

  The high feminine score of the Netherlands provides indication that Dutch companies should be expected to show a higher Partnership maturity score than Belgian companies

  Expectation: Par M NL > Par M BE

- MAS - Scope & Architecture maturity

  The high feminine score of the Netherlands can be expected to reflect in a relatively high score on Scope & Architecture maturity, compared to Belgium.

  Expectation: Arch M NL > Arch M BE

- MAS - Skills maturity

  Given the different expected effects of masculinity/femininity on the Skills maturity score it is not possible to specify an expectation for the difference between Belgian and Dutch culture on this factor.

  Expectation: Sk M NL ? Sk M BE

9.8.4 Uncertainty Avoidance Index

- UAI - Communications maturity

  On UAI Belgium scores quite high and the Netherlands take a middle position. Again this indicates that the Netherlands is expected to score higher on Communications maturity than Belgium.

  Expectation: Comm M NL > Comm M BE

- UAI - Value measurement maturity

  Given the lack of indications for this relationship it is unclear how the difference in PDI scores of Belgium and the Netherlands reflect in the Scope & Architecture maturity scores.

  Expectation: Value M NL ? Value M BE

- UAI - Governance maturity

  Given the high UAI score of Belgium also this factor provides an indication that Belgian companies should be expected to show a higher Governance maturity score than Dutch companies.

  Expectation: Gov M NL < Gov M BE

- UAI - Partnership maturity

  This factor again provides indication that the Netherlands should be expected to score higher on Partnership maturity than Belgium.

  Expectation: Par M NL > Par M BE

- UAI - Scope & Architecture maturity

  Following Png's motivation (2001), it should be expected that the high UAI score of Belgium is reflected in a high score on Architecture maturity.

  Expectation: Arch M NL < Arch M BE

- UAI - Skills maturity

  Given the high UAI score of Belgium, this provides support for the expectation that the Netherlands score higher on Skills maturity than Belgian companies.

  Expectation: Sk M NL > Sk M BE

Based upon this analysis, the expectations for the differences between Belgium and the Netherlands can be summarized as shown in Table 9-3.

	PDI	*IND*	*MAS*	*UAI*	*Expectation*
Communications maturity					**Communications maturity NL > Communications maturity B**
	Comm M NL > Comm M BE	Comm M NL ≈ Comm M BE	Comm M NL > Comm M BE	Comm M NL > Comm M BE	
Value measurement maturity					**Value measurement maturity NL <? Value measurement maturity B**
	Value M NL < Value M BE	Value M NL ≈ Value M BE	Value M NL < Value M BE	Value M NL ? Value M BE	
Governance maturity					**Governance maturity NL < Governance maturity B**
	Gov M NL < Gov M BE	Gov M NL ≈ Gov M BE	Gov M NL < Gov M BE	Gov M NL < Gov M BE	
Partnership maturity					**Partnership maturity NL > Partnership maturity B**
	Par M NL > Par M BE	Par M NL ≈ Par M BE	Par M NL > Par M BE	Par M NL > Par M BE	
Scope & Architecture maturity					**Scope & Architecture maturity NL < Scope & Architecture maturity NL**
	Arch M NL <? Arch M BE	Arch M NL ≈ Arch M BE	Arch M NL > Arch M BE	Arch M NL < Arch M BE	
Skills maturity					**Skills maturity NL > Skills maturity B**
	Sk M NL > Sk M BE	Sk M NL ≈ Sk M BE	Sk M NL ? Sk M BE	Sk M NL > Sk M BE	

Table 9-3. Summary of the expected differences between Belgium and the Netherlands.

9.9 The study

9.9.1 Participants

For this study, three Dutch companies and three Belgian companies in the financial services sector (banks, insurance companies, etc.) were selected. The choice for the financial services sector was made because, among different industries, financial services, together with manufacturing and retailing, is the first industry to use information technologies and as such is already more mature in these domains, making empirical research interesting (Chiasson and Davidson, 2005). To avoid bias by the overall BIA maturity, the participating companies were selected to have matching total maturity scores (deliberate sampling, Yin, 2002). Table 9-4 shows the participants of the study.

	Company	*# Employees*	*# Respondents*
Dutch companies			
1	Merchant Bank	500-1000	8
2	Investment Bank	250-500	9
3	Insurance company	>5000	6

Belgian companies			
1	Bank / Insurance	>5000	11
2	Bank	>5000	9
3	Insurance broker	500-1000	8

Table 9-4. Participants in the study.

9.9.2 Questionnaire

The study used the questionnaire of Luftman's BIA maturity assessment instrument (Luftman, 2000), that was later validated by Sledgianowski, Luftman and Reilly (2006). In each of the organizations, 6 to 11 business and IT managers completed the questionnaire.

Comparing the maturity scores assigned by business and IT per organization reveals that for most organizations the difference between the business and IT rating was not relevant. Trochim (2001) refers to this as convergent validity, providing relative confidence into our measurement tool, as it shows that two totally independent groups (business and IT) within one single organization are coming up with very similar appreciations for the business and IT alignment maturity. This confidence in the measurement instrument is supported by work of Cumps et al. (2006b), who used a very similar measurement instrument based on the Luftman's (2000) maturity model, and found that the alignment scoring was sufficiently robust for further analysis.

9.9.3 Results

Figure 9-3 shows the overall average results of the BIA maturity assessments of the Belgian and Dutch participants. From this graph, some differences are immediately clear, specifically for 'skills' (a distinctive higher score for Dutch firms), 'governance' (a distinctive higher score for Belgian firms) and 'scope and architecture' (again a distinctive higher score for Belgian firms). The variables 'communications', 'value measurement' and 'partnership' show little or none difference between the score of Belgian and Dutch firms.

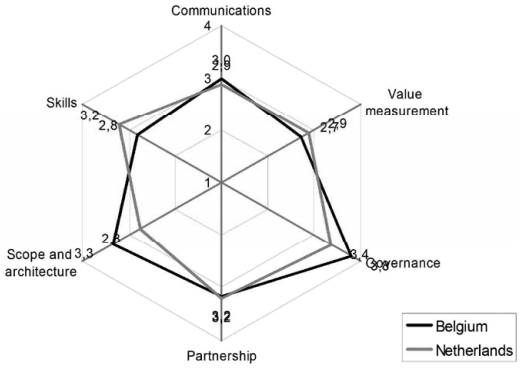

Figure 9-3. BIA maturity scores of the Belgian and Dutch participants.

Figure 9-4 shows the results on a deeper level.

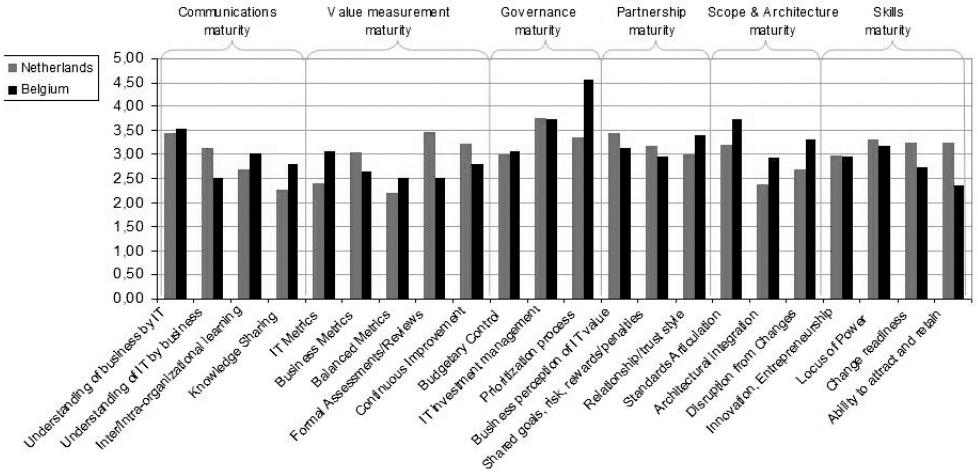

Figure 9-4. Detailed BIA maturity scores of the Belgian and Dutch participants.

Based upon these differences, the following analysis can be made.

Communications maturity

Average maturity of Belgian participants: 3.0.

Average maturity of Dutch participants: 2.9.

Overall, the scores of the Belgian participants and of the Dutch participants do not show a difference. Also on the more detailed level, shown by Figure 9-4, the scores do not show large differences. The Dutch companies score a little higher on 'understanding of IT by the business', whereas the Belgian firms score somewhat higher on 'inter/intra-organizational learning' and 'knowledge sharing'.

The expected difference, communications maturity NL > communications maturity B, is not confirmed. In fact, the Belgian firms show the most characteristics of a more mature communication, such as knowledge sharing.

Value measurement maturity

Average maturity of Belgian participants: 2.7.

Average maturity of Dutch participants: 2.9.

The scores of the Belgian participants and of the Dutch participants on this variable show some difference. On the more detailed level, a substantial difference (higher for The Netherlands) is shown on the item 'Formal assessments / reviews'. The direction of the difference, however, is opposite to the expectation. The expected difference is therefore not confirmed.

Governance maturity

Average maturity of Belgian participants: 3.8.

Average maturity of Dutch participants: 3.4.

On this variable of BIA maturity, the results show the expected difference that the Belgian participants score higher than the Dutch participants. On the more detailed level it becomes clear that especially the prioritization process is scored significantly higher for Belgian firms. This might be an indication that working relationships in a more masculine culture and with a higher PDI score, tend to be more formal.

The expected difference is confirmed.

Partnership maturity

Average maturity of Belgian participants: 3.2.

Average maturity of Dutch participants: 3.2.

The scores of the Belgian participants and of the Dutch participants on this variable are equal. The expected difference is therefore not confirmed.

Scope & Architecture maturity

Average maturity of Belgian participants: 3.3.

Average maturity of Dutch participants: 2.8.

For this variable a higher score for Belgian firms is expected. The expectation is confirmed by the results, that show a remarkably higher score of the Belgian participants than of the Dutch participants. On the more detailed level, as shown in Figure 9-4, this difference shows on all items, such as 'standards articulation' and 'architectural integration'.

Skills maturity

Average maturity of Belgian participants: 2.8.

Average maturity of Dutch participants: 3.2.

For this variable, the results show the expected difference that the Dutch participants score a higher maturity than the Belgian participants. On the more detailed level it becomes clear that this difference shows on all items, but most strongly on 'Ability to attract and retain' and 'Change readiness'. The expected difference is confirmed. A possible explanation for the lower score of Belgian firms on 'change readiness' may be that it relates to the high UAI score of Belgian culture. A high level of uncertainty avoidance is likely to reduce the change readiness, because organizational change creates.

Table 9-5 shows the summary of the results of this exploratory study.

	Expectation	*Result*	
Communications maturity			**Not confirmed**
	Comm M NL > Comm M BE	Comm M NL ≈ Comm M BE	
Value measurement maturity			**Not confirmed**
	Value M NL <? Value M BE	Value M NL ≈ Value M BE	
Governance maturity			**Confirmed**
	Gov M NL < Gov M BE	Gov M NL < Gov M BE	
Partnership maturity			**Not confirmed**
	Par M NL > Par M BE	Par M NL = Par M BE	
Scope & Architecture maturity			**Confirmed**
	Arch M NL < Arch M BE	Arch M NL < Arch M BE	
Skills maturity			**Confirmed**
	Sk M NL > Sk M BE	Sk M NL > Sk M BE	

Table 9-5. Summary of expectations and results.

9.10 Conclusions and limitations

The conceptual analysis of the potential influence of national cultures on BIA maturity provides indications that this influence is indeed more than likely. Our first empirical exploration provided support for the existence of differences in BIA maturity between countries. More specifically, the differences in scores regarding the alignment domains 'governance maturity', 'scope & architecture maturity' and 'skills maturity' could be explained by Hofstede's cultural differences studies, with governance maturity and scope & architecture maturity scoring higher in Belgium and skills maturity scoring better in the Netherlands. One a more detailed level, it was expected and confirmed that the 'portfolio management process' received better in Belgium and that 'Ability to attract and retain' and 'Change readiness' clearly received better scores in the Netherlands.

Our study did not, however, confirm all expected results. The domains 'communications maturity', 'value measurement maturity' and 'partnership maturity' did not show the difference in scores that were expected. In fact, the scores showed no clear substantial at all. A potential explanation for this result could be the small sample size. Therefore, further study should be made, based on larger samples, to further explore and study the impact of cultural differences on business and IT alignment scores. Such studies can expand the comparison between Belgian and Dutch results, but could also address cultural differences between other nations worldwide.

10 CONCLUSION AND CONTRIBUTION

The main research question of this dissertation is:

MRQ: ***How do situational factors influence business and IT alignment maturity?***

This final chapter provides an overview of the concluding answers of the research questions as identified in section 1.3.2., and provided by the studies in parts A, B and C of this dissertation.

10.1 Answering the research questions

The MRQ is broken down into three research questions that follow the line of reasoning we built up in section 1.2.

10.1.1 Research question A

RQ A: ***How does business and IT alignment effect the valuation of IT in organizations?***

In chapter 2 we provided an overview of IT valuation methods. From this overview it was concluded that different evaluation and valuation methods reveal different aspects of value and that the value of an IT investment is related to the alignment of business and IT in the organization. The quest for a universal, and preferably simple and easy-to-understand, calculation method that unveils the complete and true value of any (IT) investment, is elusive.

Given the variety of characteristics of IT investments and assets, there is a point to be made for aligning the criteria and methods of IT valuation, and the relative weight of these criteria, with the specific characteristics and impacts of the IT investments and assets. Different types of IT assets require different considerations. For example, an IT asset with a mainly internal and automational impact, the evaluation method used should be a different one than for a reputational IT asset with significant impact on the external positioning of the organization. Chapter 3 built upon the conclusion that the way IT investments and assets are valued, should reflect the alignment of their impacts with the specific organizational context and strategy. In this chapter, we developed a conceptual model that provides guidance for aligning the IT valuation method with the specific characteristics, impacts and strategic context of an IT asset or investment. With this model, organizations can align the way they value IT with their specific context and strategy, thereby improving the understanding of how alignment relates to value of IT.

10.1.2 Research question B

RQ B: ***How do variables of business and IT alignment differ in their contribution to an organization's business and IT alignment maturity?***

This question was addressed in chapters 4 and 5. In the studies reported in these chapters, the SAM model of Luftman (2000) was used as operationalization of BIA. The studies aimed to indentify the SAM model variable(s) that contribute most to alignment within an organization.

Chapter 4 reported a study in which business and IT professionals were asked to attach relative weights to the contribution of the individual variables and sub-variables of Luftman's SAM model. The study revealed that business and IT professionals do not experience the contributions of the different variables equally and assign different contribution values to the variables. The largest contribution to alignment was assigned to the variable 'Communication' of Luftman's model, followed (at some distance) by the variables 'Partnership' and 'Skills'.

In this study we furthermore concluded that five sub-variables contribute most to alignment the organization's overall alignment maturity:

- The level of understanding of the business by IT (sub-variable of 'Communications').
- The level in which the communication between business and IT is not only limited to IT developments, but also concerns the developments within the business and her environment (sub-variable of 'Communications').
- The level of understanding of IT by the business (sub-variable of 'Communications').
- The level of inter organizational communication between IT and business (sub-variable of 'Communications').
- The level in which IT is seen as added value by business (sub-variable of 'Partnership').

An implication of these findings is that different variables and sub-variables of the SAM model are perceived to have different comparative contributions to the overall alignment maturity of an organization. Therefore it is justified to suggest a refinement of the SAM model in which the relative contributions of each variable and sub-variable are accounted for.

The study reported in chapter 5 presented an empirical study that analyzed the scoring pattern of organizations (n=22) on the six variables of Luftman's SAM model. The aim was to understand how these scoring patterns relate to the overall alignment maturity level of the organizations. Three categories of organization were constructed, those with relative high score on (overall) alignment maturity, those holding an average alignment maturity scores and organization with a relative low score on (overall) alignment maturity. In this study, we concluded that the scoring patterns of high and average mature organizations differ substantially and significantly from that of low mature companies. The most striking difference that appeared was that high mature organizations excel on the variable 'Partnership' maturity, whereas low mature organizations 'underperform' on this variable. Instead, organizations with a low overall alignment maturity 'excel' on the variable 'Skills' maturity. On five of the six SAM criteria, the relative difference in maturity alignment between the high mature organizations and the low mature organizations proved to be significant. The relative differences between the average mature organizations and low mature organizations also shows to be significant on the same five variables of the SAM model. The difference between high mature organizations and average mature organizations only proves to be significant on the variable 'Partnership' maturity.

The two studies of chapters 4 and 5 both show that the different variables that build Luftman's SAM model do not equally contribute to the overall alignment maturity of an organization. Which variables contribute most, differs between the two studies. From chapter 4 it was concluded that in the (sub)variables perception of business and IT professionals and the variable 'Communications' SAM model contributes most to overall alignment maturity. The paper presented in chapter 5 identified the criterion 'Partnership' as the most influential variable. Although these conclusions are seemingly contradicting, they are consistent in the

sense that both studies show that *mutual understanding* of business and IT (IT understands business and business understands IT) and *mutual appreciation* ('Partnership', the way business sees IT as an added value) are factors that clearly contribute to alignment.

This conclusion actually supports the results of earlier studies. Luftman et al. (1999) identified "support from non-IT executives" and "business understands IT" as some of the top ranking enablers of alignment. This implies that non-IT executives recognize the value of IT, and are able to define and communicate vision and strategies that include IT. Bassellier et al. (2003) concluded that business professionals require 'IT competences', in order to have an understanding of the opportunities that IT offers to business.

10.1.3 Research question C

RQ C: ***How do specific situational factors influence an organization's business and IT alignment maturity?***

This research question was explored by four studies, that each highlighted how a specific situational factor is related to alignment.

In chapter 6 the effect of IT outsourcing on the business and IT alignment of companies is addressed. The study reported in this chapter indicates that ITO indeed influences BIA and that this effect in general is positive. The conclusion is drawn from comparison of the cases studied, and from one case in which the engagement in the ITO was explicitly reported to have had a positive effect on the BIA maturity of the outsourcer.
The cases also provided indications that ITO influences BIA maturity most positively on the variables 'Governance' and 'Scope & Architecture' of Luftman's SAM model. The effect on the variable 'Skills' appeared to be negative, confirming earlier results by Beimborn et al. (2006). The study also showed a distinct difference between the cases. Two cases combined a cost saving motivation from the outsourcer with an IT infrastructure focus, and the other two cases combined a more holistic cost saving, access to resources plus IT capabilities motivation, with a business applications focus. The second pair of cases resulted in a ITO relationship that could was assessed as 'Resource Stage', whereas the first pair of cases had a 'Cost Stage' relationship. The outsourcer's motivation for ITO may therefore have a influence on both the domain of the ITO and the ITO relationship. In the study, a more developed ITO relationship also corresponded with a higher level of BIA maturity of the outsourcer.

Chapter 7 explored the relationship between business strategy, IT strategy and alignment capability. Regarding the relationship between business strategy and alignment maturity, no relationship was found. Between IT strategy and alignment maturity, a relationship could be identified. IT strategy showed to be a distinct factor in the alignment capability of organizations. The 'conservative' IT strategy consistently related to a low alignment maturity, and the 'essential' and 'innovative' strategies with high levels of maturities. In this study, we subsequently expanded the work by Cumps et al. (2006b) and showed that the 'essential' and 'innovative' types of IT strategies also pair with different levels of alignment maturity.

Chapter 8 reported a study on the relationship between organizational culture and BIA, i.e. Luftman's SAM model. The study concluded that there are indeed positive relationships between specific variables of organizational culture and BIA. This relationship seems to be strongest on the SAM model variables 'Governance', 'Partnership', 'Skills' and 'Communication', and weak on the variables 'Value' and 'Scope & Architecture'. Further exploration supports the existence of these relationships, except from relationship between organizational culture and the variable 'Communication'.

A more practice orientated finding from this study is that from the organizational culture side, three variables, 'Strategy', 'Coordination', and 'Leadership', show a relationship with the 'Governance' criterion for BIA maturity. This suggests that if these three culture elements are 'nurtured' and strengthened, then it is likely that the 'Governance' criterion of BIA will be more mature. In addition, it was shown that the 'Leadership' element of organizational culture also has a relationship with two additional variables of Luftman's SAM model, 'Value', and 'Skills'. This implies that these two aspects of BIA are likely to be more mature if there is strong 'Leadership' in the organization. This implies that three elements of organizational culture are critical in order to achieve BIA maturity: strong leadership, a clear strategy, and coordination.

Finally, the question how national culture influences the alignment of business and IT in organizations was explored in the study reported in chapter 9. This study shows differences in BIA maturity between countries which implies that there is an influence of national culture. More specifically, country differences were found in scores regarding the alignment domains 'governance maturity', 'scope & architecture maturity' and 'skills maturity'. In the paper we attempt to explain this by the characteristics of the national cultures of the countries in the study, although a final conclusion about the direct effect of national culture is hard to proof.

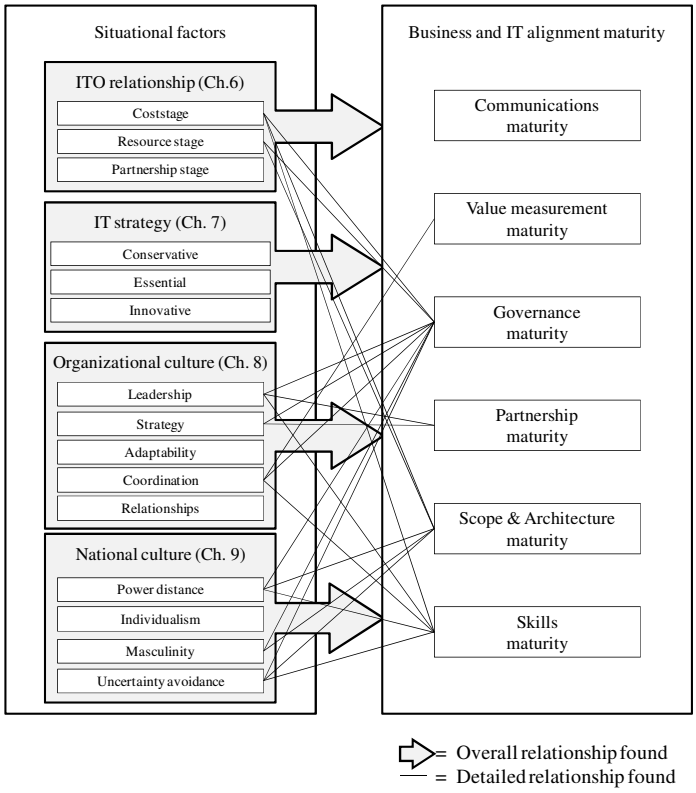

Figure 10-1. Overview of the situational influences found in this study.

Based on these four studies we conclude that the situational factors studied (IT outsourcing, strategic orientation, organizational culture and national culture) indeed hold relationships with BIA maturity of an organization. Some factors were studied in relation to the overall maturity alignment level of an organization, some situational factors were analyzed on detailed levels, i.e. the different variables/criteria of Luftman's SAM model. Figure 10-1 provides an overview of the situational effects found in the studies in this dissertation. In this figure, the solid black lines between the situational factors and the alignment variables indicate a relationship found or identified in our studies. The solid grey lines depicts that an relationship between a situational factor and the overall BIA maturity was identified by our studies.

Through the many lines in Figure 10-1, it can be seen most of the situational influences are related to the 'Governance' dimension of BIA (i.e. criterion of Luftman's SAM model). Also, many lines are connected to 'Skills' and 'Scope & Architecture' as BIA dimensions. The variables 'Communications', 'Partnership' and 'Value measurement' seem to be less connected by the situational factors.

It has to be noted that next to the situational factors studied in this dissertation research, other influences from other (situational) factors may exist. As mentioned in the introduction to this dissertation, factors relevant for alignment might be the industry of the organization (Luftman and Kempaiah, 2007; Wetering et al., 2011), the specific functional domain that alignment applies to (Batenburg and Versendaal, 2004, 2008a, 2008b; Wijngaert et al., 2008) or company size (Levy et al., 2001; Cragg et al., 2002; Ravarini et al., 2002; Cragg et al., 2007; Escofet et al., 2012). This notion will be addressed in the next closing section of this chapter.

10.2 Reflection

In the previous section, we reported the conclusions found on our three research questions in this dissertation. Considering these conclusions, the following reflective observations on our main research question appeared.

Situational influences effect the organizational variables of business and IT alignment

Reflecting on the conclusions of the studies of this research, we can first of all observe that our main research question: ***How do situational factors influence business and IT alignment maturity?*** is a very relevant and justified one. Given the analysis of our research domain and in particular the contingency approach we took in our studies, we believe to have shown that (mastering) business and IT alignment is a situational phenomenon. Existing conceptualizations, models and studies provide relevant and guiding insights for developing or achieving alignment, however, these insights are not specific enough for the identification of causal influences in specific organizations.

The studies reported in chapter 6 to 9, showed that different situational factors do influence an organization's maturity, and thereby its capability, to align business and IT. In some studies, the situational factor showed an overall effect on BIA maturity, however, how this influence exactly effected alignment, required a detailed analysis of relationships between the aspects of the situational factor considered, and the variables of BIA maturity. It appeared that different situational factors have different aspects, that influence different variables of alignment,

thereby creating a complex 'web' of influences and effects (as illustrated in Figure 10.1). These influences and effects can be considered the situational mechanisms, action-formation mechanisms and transformational mechanisms of the application of Coleman's model to situational influences on the development of BIA in organizations.

The studies reported in this dissertation, however, also showed that not all variables of alignment maturity are equally related by the situational factors. An overall observation from our studies is that situational factors seem to be related to the 'organizational' variables of alignment maturity most (i.e. organizational structures, implementation of processes, metrics, plans). This enables interventions that can be organized but should fit the hierarchies, structures and culture of the organization. In terms of Luftman's SAM model, organizational variables are the 'Governance,' 'Skills' and 'Value measurement' criteria, as well as 'Communications' that includes structures and processes that liaise between business and IT.

A relative intangible or 'soft' BIA variable, most prominently 'Partnership' (as well as 'shared understanding', aspect of the variable 'Communications') seems to be less directly related by situational factors. These type of variables typically refer to understandings, beliefs and/or visions regarding the role of IT in business in organizations. They are largely connected to individuals, and appear in leadership with regard to the relationship between business and IT. This observation resembles the work of De Haes and Van Grembergen (2008) who found that interventions that could be categorized as 'structures' or 'processes' are easier to implement than interventions that should be categorized as 'relational mechanisms'. While organizational structures, frameworks and processes create opportunities for communication, the actual use of these opportunities (and therefore the effectiveness) of communication is determined by human interaction.

It remains undecided whether senior management's understandings, beliefs and visions on the role of IT in business are determined by situational factors, such as the IT outsourcing relationship and the IT strategy, or vise versa. In our studies, we cannot analyze the causality of the relationships found. Hence, situational factors that are part of the organizational context in which alignment takes place, might also be influenced by the maturity of the variables of BIA themselves.

Business – IT partnership is key to alignment

In addition to the situational influences on alignment, a recurring insight in our studies was the decisive influence of the leadership, vision and partnership of (senior) business management on alignment.

For example, the study reported in chapter 6 showed that the motivation for IT outsourcing has a strong influence on the development of the ITO relationship and that a more developed relationship also corresponds with a higher level of BIA maturity. And in chapter 7 we concluded that a high alignment capability paired with an innovative IT strategy. This innovative IT strategy was defined as a strategy in which IT is considered part of the business proposition of the organization.
The study in chapter 8 showed that "specifically three elements of organizational culture need to be fairly strong in order to achieve BIA maturity and that is strong leadership, a good strategy, and coordination". In line with this, the study reported in chapter 4 found that the five sub-variables that are perceived to contribute most to alignment are:

- The level by which IT is seen as added value by business,
- The level of understanding of the business by IT,
- The level of understanding of IT by the business,
- The level of inter organizational communication between IT and business and
- The level by which the communication between business and IT is not only limited to IT developments, but also concerns the developments within the business and her environment.

Another indication for this overall observation was found in the study reported in chapter 5, that concluded that "high mature organizations excel on Partnership maturity" and "low mature organizations 'underperform' on this criterion".

The 'Partnership' criterion of Luftman's SAM model is probably the most intangible 'pillar' of BIA, as it covers the (shared) visions, perceptions and goals of business and IT executives. Parise and Henderson (2001) confirm that "success in business collaboration relies on sharing and exchanging of tacit resources, such as knowledge and life-long personal expertise of employees, that is difficult to formalize, communicate, transfer and imitate, and as such are of intrinsic strategic value to the organization". 'Partnership' touches upon the traditional discussion in alignment research: whether alignment is one-way, IT to business, or two-way, with IT and business mutually influencing each other (Luftman and Kempaiah, 2007; Chan and Reich, 2007a). Real business – IT partnership requires a truly two-way process of alignment.

As indicated by the IT and business professionals in the study in chapter 4, effective communication is a key element in creating a shared understanding of the role of IT in the organization. This is confirmed by other studies. Based on a study into alignment in Australian firms, Leonard (2007) found that IT executives view the role of IT to be "as much about its potential to enhance productivity as about its potential as a competitive weapon". Business executives, however, see the role of IT as mainly a tool to enhance productivity, putting less emphasis on its potential as a competitive weapon. Kaplan and Norton (2004) also observe that an organization can be considered as "aligned when all employees have commonality of purpose, a shared vision, and an understanding of how their personal roles support the overall strategy". Sharing and commonality of views between business and IT management and employees can only be established by active communication of each other's needs, vision, values, goals and methods (Segars and Grover, 1998). Reich and Benbasat (2000) reported that one of the most important predictors of alignment was a high level of communications between IT and business executives. Finally, the study by Cybulski and Lukaitis (2005) can be mentioned, who found several issues that impact communication between business and IT professionals: Business is too busy to understand IT, Outsourcing impacts communication and understanding, Scope creep as the beginning of dialogue, Trust as promoting understanding, Language and nomenclature used in communication and Better IT understanding of the business. And also Dale (2004) notes that communication between business and IT professionals is not straightforward and often clouded. The tensions between all participants commonly make communication into impassioned negotiations and consensus making, that makes it difficult to manage expectations. To remove these tensions, face-to-face encounters between IT and business professionals, should be pursued.

10.3 Implications of this study

10.3.1 Implications for academics: Opportunities for further research

The conclusions of this research provide implications for the academic community. These may be considered as opportunities for further research.

Which interventions develop partnership between business and IT?

The implication of the conclusion that business – IT partnership is key to alignment implies a first direction for further research. The majority of (past) research on BIA studied *What determined alignment*, *How alignment related to other aspects of IT/IS management* or *How alignment related to business performance*. The question *Which interventions develop partnership between business and IT?* connects the domain of IT/IS management to the domains of organizational sociology and psychology. The questions that arise are *Which interventions build a shared vision? Which create a common understanding?*, etc.

The importance of 'knowledge' in creating shared visions between business and IT professionals is confirmed by several authors, for example Bassellier and Benbasat (2004) and Ranganathan and Sehti (2002). Regarding the competences of IT professionals, there seems to be a growing awareness that next to being competent in the technical aspects of his job, a modern IT professional also needs social skills and business knowledge, in order to be able to continue to add value to the business of his or her organization (Bassellier and Benbasat, 2007). A similar development is identified by Silvius and Batenburg (2009), for a specific group of professionals, project managers. In his study, the importance of behavioral and contextual competences is expected to increase more than the importance of technical competences. However, the ambition of IT professionals to have more knowledge of business is understandable and constructive, but also insufficient (Duedahl et al, 2005). Bassellier et al. (2003) showed that a great enabler of alignment is the 'IT savvy' business professional. *But what if the business professionals are not IT savvy?* And the reality is that many business professionals are not IT savvy. *How can we, in that case, still develop partnership?*

Study business and IT partnership as the interaction between actors

In the current literature on alignment, the relationship between business and IT is mostly studied in terms of structures, processes, competences, behavior and results (for example in Van Grembergen and De Haes, 2008; Luftman, 2000). Also, the intangible variable 'Partnership' is mostly studied in terms of the attributes (for example education, opinion, competence) of individual actors. Examples of this approach can be found with Ranganathan and Sehti (2002), Bassellier and Benbasat (2004) and Leonard (2007). An alternative to this approach would be to study the relationship between business and IT professionals from a social networks perspective. Social networks theory focuses on the structure and dynamics of relationships, in terms position of the individual actors within networks, and the relationships between the actors (Kadushin, 2012).

A research approach that includes the actual relationship between business and IT professionals, may provide new insights on this relationship that could stimulate the relevant BIA dimension 'Partnership'.

A dynamic perspective

Another perspective on alignment that would require more research is that of the dynamic perspective. As stated earlier, most studies reported in literature, study alignment mostly in terms of structures, processes, competences, behavior and results. The dimension of time is present as an orientation of the future. A future in which alignment can be constructed or developed by creating appropriate actions, that fit the situational circumstances of the organization at hand.

Experiences from the past with BIA initiatives, of both organizations and/or the individual actors were not recognized as a factor of influence in our studies. This may be an omission. For example, Yayla and Hu (2009) point out the role of past experiences in the credibility of IT and the trust between business and IT. They concluded that "a successful IT history has a positive effect on the communication between IT and business managers".

A dynamic perspective in alignment research would also reveal more information on the causality of the situational influences that were found. One way of creating more insight into the causality of effects and influences, is longitudinal research. However, longitudinal research is not very popular in IS research (Benbasat et al., 1987). Good examples are available from Newman and Sabherwal (1996) and Watson et al. (1998), but they are scarce. A better understanding of the situational impacts on alignment, however, requires a longitudinal analysis of causes and effects.

10.3.2 Implications for practitioners: 'One size' doesn't fit all

The conclusion that situational factors influence an organization's maturity to align business and IT, shows the relativity of many standards, frameworks and models in the IT management, governance and alignment domain. Popular 'best practices' like the implementation of standardized process frameworks (for example: ITIL, ASL, COBIT), cost control mechanisms (for example: benchmarking), service management contracts (for example: SLAs) and organizational structures (for example: shared services, IT outsourcing), all have potential benefits, but need to be tailored to the specific context in which they are applied. Too often these concepts are treated as 'one size fits all' solutions to the challenge of aligning business and IT.

The implication of the conclusion that Business – IT partnership is key to alignment actually shows the limitation of the role of IT/IS professionals in alignment. It is difficult to 'convert the unfaithful'. Gartlan and Shanks (2007) already found that "CIOs want to be more involved in business strategy formation however CEOs not always believe that to be necessary". We conclude that if business management does not share the vision on the role that IT can play in the business, alignment will never reach a top level. Of course, aspects like skills, architecture, communication, governance, all can be organized, but partnership and a shared vision of the (potential) role of IT 'make the difference'. And these intangible factors cannot be organized, bought or outsourced. They have to be developed within, and by, the organization itself.

10.3.3 Implications for educator: Answering to future needs

For the educators of future business and IT professionals, the conclusions of our study also bear implications.

Regarding the competences of IT professionals, the conclusion that 'partnership is key to alignment', implies that next to being competent in the technical aspects of his job, a modern IT professional also needs social skills and business knowledge, in order to be able to continue to add value to the business of his or her organization (Bassellier and Benbasat, 2007). Morneau (2006) emphasizes that "The

changing landscape of information technology and security is calling for IT professionals with a strong mix of business and technological acumen". A similar development is identified by Silvius and Batenburg (2009), for a specific group of professionals, project managers. In his study, the importance of behavioral and contextual competences is expected to increase more than the importance of technical competences.

However, business and social competences are not sufficient for creating business – IT partnership in organizations (Duedahl et al, 2005). Partnership also requires business professionals to acquire the competence to understand the opportunities that IT offers to business and therefore also a certain level of IT competence (Bassellier et al., 2003). These IT competences for business professionals were defined as "The set of IT-related explicit and tacit knowledge that a business manager possesses that enables him or her to exhibit IT leadership in his or her area of business" (Bassellier et al., 2001). For business studies, this confirms the importance of including IT/IM, and most of all BIA, content into the curriculum.

The conclusion that business IT alignment is situational, implies for both groups of professionals that educational programs should not limit themselves to teaching 'best practices' and standards. The professional of tomorrow will be required to mix and match insights from these best practices and standards to create the optimal practice for his or her situation. It is therefore more important to learn underlying assumptions and concepts than to be able to memorize a unified set of processes.

REFERENCES

Alter, A.E. (2005). CIOs Shift: Focus is on revenue, not on saving money. *CIO Insight*, October 15.

Avison, D., Jones, J., Powell, P. and Wilson, D. (2004). Using and validating the strategic alignment model, *Journal of Strategic Information Systems*, 133 (3), pp. 223-246.

Avolio, B., Kahai, S., and Dodge, G. (2000). E-leadership: Implications for theory, research, and practice, *Leadership Quarterly*, 11 (4), pp. 615-668.

Babbie, E., (2003). *Survey Research Methods*, 3rd Edition, Wadsworth Pub. Co., Belmont, CA.

Baets, W.R.J., (1992). Aligning Information Systems with Business Strategy, *Journal of Strategic Information Systems*, 1(4), pp. 205–213.

Baets, W.R.J. and Galliers, R.D. (Eds.) (1998). *Information Technology and Organizational Transformation*, John Wiley and Sons, New York.

Baker, E.H. (2004). Leading Alignment, *CIO Insight*, 1(45), pp. 19–20.

Baker, J. and Jones, D. (2008). A Theoretical Framework for Sustained Strategic Alignment and an Agenda for Research, *Proceedings of JAIS Theory Development Workshop*, Sprouts: Working Papers on Information Systems, 8(16).

Ballentine, J.A., Galliers, R.D. and Stray, S.J. (1996). Information systems/technology evaluation practices: evidence from UK organizations, *Journal of Information Technology*, 11, pp. 129-141.

Ballantyne, D. and Varey, R.J. (2008). The service-dominant logic and the future of marketing, *Journal of the Academy of Marketing Science*, 36, pp. 11-24.

Ballentine, J.A. and Stray, S.J. (1997). A comparative analysis of the evaluation of information systems and other capital investments: empirical evidence, *Proceedings of the European Conference on Information Systems* (ECIS), pp. 809 – 822.

Bannister, F. (2001). Dismantling the silos: extracting new value from IT investments in public administration, *Information Systems Journal*, 11, pp. 65-84.

Barney, J. (1991). Firm resources and sustained competitive advantage, *Journal of Management*, 17(1), pp. 99-120.

Barua, A., Kriebel, C. and Mukhopadhyay, T. (1995). Information technologies and business value: an analytic and empirical investigation, *Information Systems Research*, 6(1), pp. 3-23.

Barua, A. and Mukhopadhyay, T. (2000). Information technology and business performance: past, present, and future, in *Framing the Domains of IT Management: Projecting the Future Through the Past*, Zmud, R.M. (Ed.), Pinnflex Education Resources, Cincinnati, OH, pp. 65–84.

Baskerville, R.L. and Myers, M.D. (2002). Information Systems as a Reference Discipline, *MIS Quarterly*, 26 (1), pp. 1-14.

Bassellier, G. and Benbasat, I. (2004). Business Competence of Information Technology Professionals: Conceptual Development and Influence on IT-Business Partnerships, *MIS Quarterly*, 28(4), pp. 673-694.

Bassellier, G. and Benbasat, I. (2007). Assessing the Contributions of Business and IT Knowledge to the Development of IT/business Partnerships, *Proceedings of the ACM SIGMIS CPR conference on Computer personnel research*.

Bassellier, G., Reich, B.H. and Benbasat, I. (2001). IT Competence of Business Managers: A Definition and Research Model, *Journal of Management Information Systems*, 17(4), pp. 159-182.

Bassellier, G., Benbasat, I., and Reich, B. H. (2003). The Influence of Business Managers' IT Competence on Championing IT, *Information Systems Research*, 14(4), pp. 317-336.

Batenburg, R. (2007). E-procurement adoption by European Firms: A quantative analysis, *Journal of Purchasing & Supply Management*, 13, pp. 182-192.

Batenburg, R. and Versendaal, J. (2004). Business Alignment in the CRM Domain: Predicting CRM Performance, *Proceedings of the European Conference on Information Systems* (ECIS), Paper 12.

Batenburg, R. and Versendaal, J. (2008a). Business/IT-Alignment for Customer Relationship Management: Framework and Case Studies, in *International journal of Electronic Customer Relationship Management*, pp. 258-268.

Batenburg, R. and Versendaal, J. (2008b). Maturity Matters: Performance Determinants of the Procurement Business Function, in W. Golden, T. Acton, K. Conbuy, H. van der Heijden & V. Tuuainen (Eds.), *Proceedings of the 16th European Conference on Information Systems*. Galway.

Beimborn, D., Franke, J., Gomber, P., Wagner, H., and Weitzel, T. (2006). Die Bedeutung des Alignments von IT und Fachressourcen in Finanzprozessen: Eine empirische Untersuchung, *Wirtschaftsinformatik*, 48(5), pp. 331-339.

Benbasat, I. and Zmud, W.Z. (1999). Empirical Research in Information Systems: the Practice of Relevance, *MIS Quarterly*, 23(1), pp. 3-16.

Benbasat, I., Goldstein, D.K. and Mead, M. (1987). The Case Research Strategy in Studies of Information Systems, *MIS Quarterly*, 11, pp. 369-386.

Benson, R.J. and Parker, M.M. (1985). Enterprise-Wide Information Management: An Introduction to the Concepts, IBM Los Angeles Scientific Center report G320-2768.

Bergin, T.J. (1993). *Computer-Aided Software Engineering; Issues and Trends for the 1990s and Beyond*, IDEA Group Publishing, Hershey, PA.

Bharadwaj, A.S. (2000). A Resource-Based Perspective on Information Technology Capability and Firm Performance: An Empirical Investigation, *MIS Quarterly*, 24(1), March, pp. 169-196.

Birgelen, M. van, Ruyter, K.D, Jong, A.D., and Wtzels, M. (2002). Customer evaluations of after-sale service contact modes: An empirical analysis of national culture's consequences, *International Journal of Research in Marketing*, 19, pp. 43-64.

Black, S.E. and Lynch, L.M. (2001). How To Compete: The Impact Of Workplace Practices And Information Technology On Productivity, *The Review of Economics and Statistics*, MIT Press, vol. 83(3), pp. 434-445.

Bloem, J., Doorn, M. van and Mittal, P. (2005). *Making IT Governance Work in a Sarbanes-Oxley World*, Wiley, Hoboken, NJ.

Bond, M.H. (1984). Hofstede's Culture Dimensions ; An Independent Validation Using Rokeach's Value Survey, *Journal of Cross-Cultural Psychology*, 15(4), pp. 417-433.

Bower, M. (1966). *The Will to Manage: Corporate Success through Programmed Management*, McGraw-Hill, New York.

Brancheau, J.C. and Wetherbe, J.C. (1987). Key Issues in Information Systems Management, *MIS Quarterly*, 11(1), pp. 23-45.

Bresnahan, T.F., Brynjolfsson, E. and Hitt L. (2002), Information technology, workplace organization and the demand for skilled labor: Firmlevel evidence., *Quarterly Journal of Economics*, 117(1), pp. 339– 376.

Broadbent, M. and Weill, P. (1993). Improving Business and Information Strategy Alignment: Learning from the Banking Industry, *IBM Systems Journal*, 32(1), pp. 162-179.

Brynjolfsson, E. (1993). The productivity paradox of information technology, *Communications of the ACM*, 36(12), pp. 67-77.

Brynjolfsson, E. and Hitt, L. (1995). Information Technology as a Factor of Production: The Role of Differences Among Firms, *Economics of Innovation and New Technology*, 3(4), pp. 183-200.

Brynjolfsson, E. and Hitt, L. (1996). Paradox Lost? Firm-level Evidence on the Returns to Information Systems Spending, *Management Science*, 42(4), pp. 541-558.

Brynjolfsson, E. and Hitt, L. (1998). Beyond the productivity paradox: Computers are the catalyst for bigger changes., *Communications of the ACM*, 41(8), pp. 49–55.

Brynjolfsson, E. and Hitt, L. (2000). Beyond computation: information technology, organizational transformation and business performance, *Journal of Economic Perspectives*, 14(4), pp. 23–48.

Brynjolfsson, E. and Hitt, L. (2003). Computing Productivity: Firm-Level Evidence, *The Review of Economics and Statistics*, 85(4), pp. 793-808.

Brynjolfsson, E. and Yang, S. (1997). The Intangible Costs and Benefits of Computer Investments: Evidence from the Financial Markets, *Proceedings of the International Conference on Information Systems* (ICIS), Atlanta, GA.

Burke, W.W., Coruzzi, C.A. and Church, A.H. (1996). The organisational Survey as an Intervention for Change, in *Organisational Survey*, Kraut, A.I. (Ed), Jossey-Bass Publishers, San Francisco, pp. 41-66.

Burke Johnson, R. and Onwuegbuzie, A.J. (2004). Mixed Methods Research: A Research Paradigm Whose Time Has Come, *Educational Researcher*, 33(7), pp. 14–26.

Byrd, A., Lewis, B.R. and Bryan, R.W. (2006). The Leveraging Influence of Strategic Alignment on IT Investment: An empirical examination, *Information & Management*, 43(3), pp. 308–321.

Campbell, B. (2005). Alignment-resolving ambiguity within bounded choices, Pacific-Asia Conference on Information Systems (PACIS), Bangkok.

Carnegie Mellon Software Engineering Institute (2002). *Carnegie Mellon Software Engineering Institute: Capability maturity models*, Retrieved from http://www.sei.cmu.edu/cmmi/ on 3 February 2010.

Chan, Y.E. (2002). Why Haven't we Mastered Alignment? The Importance of the Informal Organization Structure, *MIS Quarterly Executive*, 1(2).

Chan, Y. and Huff, S. (1993). Investigating Information Systems Strategic Alignment, in proceeding of the 14th International Conference on Information Systems, pp. 345-363, Orlando, FL.

Chan, Y.E., Huff, S.L., Barclay, D.W. and Copeland, D.G. (1997). Business Strategy Orientation, Information Systems Orientation and Strategic Alignment, *Information Systems Research*, 8(2), pp. 125-150.

Chan, Y.E., Sabherwal, R. and Thatcher, J.B. (2006). Antecedents and Outcomes of Strategic IS Alignment: An empirical investigation, *IEEE Transactions on Engineering Management*, 51, pp. 27-47.

Chan, Y.E. and Reich, B.H. (2007a), IT alignment: what have we learned, *Journal of Information Technology*, 22, pp. 297–315.

Chan, Y. E. and Reich, B. H. (2007b). IT alignment: An annotated bibliography, *Journal of Information Technology*, 22, pp. 316-396.

Chen, L. (2010). Business–IT alignment maturity of companies in China, *Information & Management*, 47(1), pp. 9–16.

Chiasson, M.W. and Davidson, E. (2005). Taking industry seriously in Information Systems research, *MIS Quarterly*, 29(4), pp. 591-605.

Ciborra, C.U. (1997). De Profundis? Deconstructing the Concept of Strategic Alignment, *Scandinavian Journal of Information Systems*, 9(1), pp. 67-82.

Clemons, E.K. and Row, M.C. (1991), Sustaining IT Advantage: The Role of Structural Differences, *MIS Quarterly*, 15(3), pp. 275-292.

Clinton, D, Cheese, P. and Brakeley, H. (2004). *High Performance Research Study*, Accenture Consulting.

Coleman, J.S. (1990). *Foundations of Social Theory*, Harvard University Press, Cambridge, MA.

Coleman, P. and Papp, R. (2006). Strategic Alignment: Analysis of Perspectives, *Proceedings of the Southern Association for Information Systems Conference*, pp. 242-250.

Cragg, P., King, M. and Hussin, H. (2002). 'IT alignment and firm performance in small manufacturing firms, *Journal of Strategic Information Systems*, 11, pp. 109-132.

Cragg, P., Tagliavini, M. and Mills, A. (2007). Evaluating the Alignment of IT with Business Processes in SMEs, *Proceedings of the 18th Australasian Conference on Information Systems*, Toowoomba.

Cullen, S. and Willcocks, L.P. (2003). *Intelligent IT Outsourcing: Eight Building Blocks to Success*, Elsevier, Chicester.

Cumps, B., Martens, D., DeBacker, M., Haesen, R., Viaene, S., Dedene, G., Baesensd, B. and Snoecka, M. (2006a), Predicting Business/ICT Alignment with AntMiner+, KBI0708, Research paper Department of Decision Sciences and Information Management (KBI), Catholic University of Leuven.

Cumps, B., Viaene, S., Dedene, G, and Vandenbulcke, J. (2006b). An Empirical Study on Business/ICT Alignment in European Organisations, *Proceedings of the 39th Hawaii International Conference on Systems Science* (HICSS-39), Waikoloa, Big Island, HI.

Cybulski, J. and Lukaitic, S. (2005). The Impact of Communications and Understanding on the Success of Business / IT Alignment?, 16th Australasian Conference on Information Systems, Sydney.

Dale, M. (2004). Defining User Requirements for a Large Corporate Data Warehouse: An Experiential Case Study, 9th Australian Workshop on Requirements Engineering, University of South Australia, pp. 5.1-5.11.

Davenport, T.H. (1993). *Process Innovation: Reengineering Work through Information Technology.*, Boston, Massachusetts, Harvard Business School Press.

Deal T.E. and Kennedy, A.A. (1982). *Corporate Cultures: The Rites and Rituals of Corporate Life*, Penguin Books, Harmondsworth.

Dedrick, J., Gurbaxani, V. and Kraemer, K.J. (2003). *Information Technology and Economic Performance: A critical Review of the Empirical Evidence.*, University of California, Irvine.

DeGraw, B. and Ye, Hye Yu (2008). *Outsourcing, The collections process generates more than $650K improvement for billion-dollar manufacturer, a case study*, The Hackett group, retrieved from http://www.tcd.com/sitebuildercontent/sitebuilderfiles/Hackett.pdf on June 30th 2011.

De Haes, S. and Van Grembergen, W. (2008), Analysing the Relationship Between IT Governance and Business/IT Alignment, *Proceedings of the 41st Hawaii International Conference on Systems Sciences* (HICSS-41), Waikoloa, Big Island, HI.

De Haes, S. and Van Grembergen, W. (2009). An Exploratory Study into IT Governance Implementations and its Impact on Business/IT Alignment, *Information Systems Management*, 26(2), pp. 123-137.

Denison, D.R. (1984). Bringing Corporate Culture to the Bottom Line, *Organisational Dynamics*, 13(2), pp 4-22.

Denison, D.R. (1990). *Corporate Culture and Organizational Effectiveness*, John Wiley & Sons, New York.

Denison, D.R. (2000). Organisational Culture: Can it be a Key Lever for Driving Organisational Change?, Working paper, University of Michigan.

Desouza, K.C., El Sawy, O.A., Galliers, R.D., Loebbecke, C., and Watson, R.T. (2006). Beyond rigor and relevance towards responsibility and reverberation: information systems research that really matters, *Communications of AIS*, (17), pp. 2-26.

Devaraj, S. and Kohli, R. (2002). *The IT Payoff, Measuring the business value of information technology investments*, Prentice Hall.

Devaraj, S. and Kohli, R. (2002). Information technology payoff in the health care industry: A longitudinal study, *Journal of Management Information Systems*, 16(4), pp. 41–68.

Dewan, S. and Min, C. (1997). The Substitution of Information Technology for Other Factors of Production: A Firm Level Analysis, *Management Science*, 43(12), pp. 1660-1675.

Dinsmore, P.C. (1998). How grown-up is your organization? *PM Network*, 12(6), pp. 24-26.

Doherty, N.F., Marples, C.G. and Suhaimi, A. (1999). The relative success of alternative approaches to strategic information systems planning: an empirical analysis, *Journal of Strategic Information Systems*, 8, pp. 263-283.

Duedahl, M., Andersen, J. and Sein, M.K. (2005). When Models Cross the Border: Adapting IT Competencies of Business Managers, *Proceedings of the ACM SIGMIS CPR conference on Computer personnel research*.

Dutta, S. (1996). Linking IT and Business Strategy: The role and responsibility of senior management, *European Management Journal*, 14(3), pp. 255–269.

Dyer, J.H. and Singh, H. (1998). The Relational View; Cooperatice Strategy and Sources of Interorganizational Competitive Advantage, *Academy of Management Review*, 23(4), pp. 660-697.

Earl, M.J. (1989). *Management Strategies for Information Technology*, Business Information Technology Series, Prentice Hall Europe.

Earl, M.J. (1993). Experiences in strategic information systems planning, *MIS Quarterly*, March, pp. 1-24.

Earl, M. J. (1996). The risks of outsourcing IT, *Sloan Management Review*, 37(3), pp. 26-32.

Eisenhardt, K. and Martin, J. (2000). Dynamic capabilities: what are they?, *Strategic Management Journal*, 21, pp. 1105-1121.

Ekstedt, M., Jonsson, N,. Plazaola, L., Molina, E.S. and Vargas, N. (2005). An Organization-Wide Approach for Assessing Strategic Business and IT Alignment, paper presented at the PICMET conference, Portland, OR.

Escofet, E., Rodríguez-Fórtiz, M-J., Garrido, J-L. and Chung, L. (2012). Strategic E-Business/IT Alignment for SME Competitiveness, in *Computer Engineering: Concepts, Methodologies, Tools and Applications*, Information Resources Management Association (Ed.).

Farrell, I.J. (2003). *Aligning IT to Corporate Objectives: Organisational factors in use*, Doctoral Dissertation, Macquarie University, Sydney.

Fink, L. (2010). Information Technology Outsourcing Through a Configurational Lens, *Journal of Strategic Information Systems*, 19(2), pp. 124–14

Fitzgerald, G. (1998). Evaluating information systems projects: a multidimensional approach, *Journal of Information Technology*, 13, pp. 15-27.

Flyvbjerg, B. (2006). Five Misunderstandings About Case-Study Research, *Qualitative Inquiry*, 12(2), pp. 219-245.

Francelanci, C. and Galal, H. (1998). Information technology and worker composition: Determinants of productivity in the life insurance industry., *MIS Quarterly*. 22(2), pp. 227–241.

Frank, K.A. and Fahrbach, K. (1999). Organisational Culture as a complex system. *Organisational Science*, 10(3) pp. 253-277.

Frisk, E. (2007). Categorization and overview of IT perspectives – A literature review., *Proceedings of the European Conference on Information Management and Evaluation* (ECIME), Monpellier.

Fudenberg, D and Tirole, J. (1985). Preemption and Rent Equalization in the Adoption of New Technology", *Review of Economic Studies*, 52 (1985), pp. 383-402; reprinted in *Game Choices*, Grenadier, G. (Ed.), Risk Books.

Galbraith, J. (1973). *Designing Complex Organizations*, Addison-Wesley, Reading,, MA.

Gallagher, K.P. and Gallagher, V.C. (2010). An Exploratory Study of Organizing Structures for Post-Implementation ERP, *Proceedings of the 43rd Hawaii International Conference on Systems Science* (HICSS-43), Koloa, Kauai, HI.

Galliers R. D., (1993), IT strategies: beyond competitive advantage, *Journal of Strategic Information Systems*, 2(4), pp. 283-291.

Gartlan, J. and Shanks, G. (2007) The Alignment of Business and Information Technology Strategy in Australia, *Australasian Journal of Information Systems*, 14(2), pp. 113-139.

Gefen, D. and Straub, D. (1997). Gender differences in the perception & use of e-mail: Extension to the technology acceptance model, *MIS Quarterly*, 21(4), pp. 389-400.

Gemmell, M. and Pagano, R, (2003). A post implementation evaluation of a student information system in the UK higher education sector., *Electronic Journal of Information Systems Evaluation*, 6(2).

Gilchrist, S., Gurbaxani, V. and Town, R. (2001). Productivity and the PC revolution., Working paper, Center for Research on Information Technology and Organizations, University of California, Irvine.

Glazer, R. (1997). Measuring the value of information: The information-intensive organisation, *IBM Systems Journal*, 32 (1), pp. 99-110.

Goedvolk, H., Schijndel, A. van, Swede, V. van, and Tolido, R. (1997). Architecture, in D.B.B. Rijsenbrij (Ed.) *The Design, Development and Deployment of ICT Systems in the 21st Century: Integrated Architecture Framework (IAF)*, Retrieved http://home.hetnet.nl/~daanrijsenbrij/progx/eng/contents.htm on January 15th, 2009.

Gottschalk, P., Solli-Sæther, H. (2006). Maturity model for IT outsourcing relationships, *Industrial Management & Data Systems*, 106(2), pp. 200 – 212.

Grant, R.M. (1991). The Resource-Vased Theory of Competitive Advantage: Implications for Strategy Formulation, *California Management Review*, 33(1), pp. 114-135.

Gregor, S. (2006). The Nature of Theory in Information Systems, *MIS Quarterly*, 30, pp. 611-642.

Grover, V., Teng, J. T. C., and Fiedler, K. D. (1998). IS Investment Priorities in Contemporary Organizations, *Communications of the ACM*, 41(2), pp. 40-48.

Gurbaxani, V. (1996). The new world of information technology outsourcing, *Communications of the ACM*, 39(7), pp. 45-46.

Gutek, B.A. (1991). Commentary on survey and other methodologies applied to IT impact research: experiences from comparative study of business computing, in Kraemer, R. (Ed.), *In the Information Systems Research Challenge: Survey Research Methods*, Harvard Business School Press, Boston, MA, pp. 317-322.

Gutierrez, A., Orozco, J. and Serrano, A. (2009). Factors affecting IT and business alignment: a comparitive study in SMEs and large organizations, *Journal of Enterprise Information Management*, 22(2), pp. 197- 211.

Gutierrez, A. and Serrano, A. (2008). Assessing strategic, tactical and operational alignment factors for SMEs: alignment across the organisation's value chain, *International Journal of Value Change Management*, 2(1), pp. 33- 56.

Hall, E. T. (1976). *Beyond culture*, Anchor Press, New York.

Hammer, M. and Mangurian, G.E. (1987). The changing value of communications technology, *Sloan Management Review*, pp. 65-71.

Hancox, M. and Hackney, R. (2000). IT outsourcing: frameworks for conceptualizing practice and perception, *Information Systems Journal*, 10(3).

Handy, C. (1985). *Gods of management: the changing work of organizations*, Arrow Books Ltd., Lincoln.

Harris, S.E. and Katz, J.L. (1991). Firm size and the information technology investment intensity of lifer insurers, *MIS Quarterly*, 15, pp. 333-352.

Harris, S.E. and Katz, J.L. (1991). Organizational performance and information technology investment intensity in the insurance industry. *Organizational Science*, 2(3), pp. 263–296.

Hedström, P. and Ylikoski, P. (2010). Causal mechanisms in the social sciences, *Annual Review of Sociology*, 36, pp. 49–67

Helms, R.W., Batenburg, R.S. and Versendaal, J.M. (2006). PLM Roadmap: Stepwise PLM implementation based on the concepts of maturity and alignment, *International Journal of Product Lifecycle Management*, 1(4), pp. 333-351.

Henderson, J.C. and Venkatraman, N. (1992). Strategic Alignment: A model for organizational transformation through information technology, in T.A. Kocham and M. Useem (eds.) *Transforming organizations*, 1st edn, pp. 97–117, Oxford University Press, New York.

Henderson, J.C. and Venkatraman, N. (1993). Strategic alignment: Leveraging information technology for transforming organizations, *IBM Systems Journal*, 32(1).

Hirschheim R. and Sabherwal R. (2001), Detours in the Path toward Strategic Information Systems Alignment: Paradoxical Decisions, Excessive Transformations, and Uncertain Turnarounds., *California Management Review*, 44(1), pp. 87-108.

Hitt, L. and Brynjolfsson, E. (1996). Productivity, Profit and Consumer Welfare: Three Different Measures of Information Technology's Value, *MIS Quarterly*, 20(2), pp.121-142.

Hofstede, G. (1980). *Culture's consequences: International differences in work related values*, Sage, Newbury Park, CA.

Hofstede, G. (1991). *Culture and organizations: Software of the mind*, McGraw Hill, London.

Hofstede, G. (2000). The information age across cultures, *Proceedings of the 5th AIM conference – Information Systems and Organizational Change*.

Hofstede, G. (2008). Country scores on culture dimensions, retrieved from http://www.geert-hofstede.com/hofstede_dimensions.php on February 28th, 2008.

Hu, Q., Saunders, C. and Gebelt, M. (1997). Research report: Diffusion of information systems outsourcing: A reevaluation of influence sources, *Information Systems Research*, 8(3), pp. 288-301.

Hyder, E.M., Paulk, M.C., Heston, K.M. and Hefley, B. (2010). *eSourcing Capability Model for Service Providers (eSCM-SP)*, Van Haren publishing.

IDG Research and Getronics (2002). *The CIO Agenda: Taking Care Of Business*, CxO Media.

International Business Machines Corporation (1981). *Business Systems Planning; Information Systems Planning Guide*, IBM Corporation, New York.

International Business Machines Corporation (1986). *Information System Model and Architecture Generator – Operation Guide*, IBM Corporation, New York.

Irani, Z. (2002). Information Systems Evaluation: Navigating through the problem domain, *Information Management*, 40(1), pp. 11–24.

Irani, Z. and Love, P. (2002). Developing a frame of reference for ex-ante IT/IS investment evaluation., *European Journal of Information Systems*, 11, pp. 74-82.

Johnson, G. (1988). Rethinking Incrementalism, *Strategic Management Journal*, 9(1). pp. 75-91.

Johnston, H.R. and Carrico, S.R. (1988). Developing Capabilities to Use Information Strategically, *MIS Quarterly*, (12) 1, pp. 37-47.

Kaarst-Brown, M.L. and Robey, D. (1999), More on myth, magic and metaphor: Cultural insights into the management of information technology in organizations, *Information Technology & People*, 12(2), pp. 192 – 218.

Kadushin, C.(2012). *Understanding Social Networks: Theories, Concepts, and Findings*. Oxford University Press.

Kanungo, S., Sadavarti, S. and Srinivas, Y. (2001). Relating IT Strategy and Organizational Culture: An Empirical Study of Public Sector Units in India, *Journal of Strategic Information Systems*, 10(1), pp. 29-57.

Kaplan, R.S. and Norton, D.P. (2004). Measuring the Strategic Readiness of Intangible Assets, *Harvard Business Review*, 82(2), pp. 52-63.

Kaufmann, R.J. and Weill, P. (1989). An Evaluative Framework for Research on the Performance Effects of Information Technology Investment, *Proceedings of the Tenth International Conference on Information Systems* (ICIS), pp. 377-388.

Kean, P.G.W. (1993). Information Technology and the Management Difference: A Fusion Map, *IBM Systems Journal*, 32(1).

Kearns, G.S. and Lederer, A.L. (2004), The impact of industry contextual factors on IT focus and the use of IT for competitive advantage, *Information & Management*, 41, pp. 899-919.

Kearns, G. S. and Sabherwal, R. (2006-7) . Strategic Alignment Between Business and Information Technology: A Knowledge-Based View of Behaviors, Outcome, and Consequences, *Journal of Management Information Systems*, (23) 3, pp. 129-162.

Keen, P. (1991). *Every Manager's Guide to Information Technology*, Harvard Business School Press, Boston, MA.

Kefi, H. (2002). IS/IT evaluation: A Context Based and Process-Oriented perspective, *Electronic Journal of Information Systems Evaluation*, 6(1).

Khaiata, M. and Zualkernana, I.A. (2009). A Simple Instrument to Measure IT-Business Alignment Maturity, *Information Systems Management*, 26(2), pp. 138-152.

Khanfar, M. and Zualkernan, I.A. (2010). Assessing the IT-business Alignment Maturity in a hospitality and exhibition company, *Proceedings of the 2nd International Conference on Engineering Systems Management and Its Applications* (ICESMA), Sharjah.

King, W. R. (1978). Strategic Planning for Management Information Systems, *MIS Quarterly*, 2(1), pp. 27-37.

King, W.R. and Tao, T. (1996). Integrating between business planning and information systems planning: Validating a Stage Hypothesis, *Journal of Management Information Systems*, 14(1), pp. 185-214.

Kling, R. (1991). Adapting Survey Methods to Survey the Social Consequences of Computerization: A Response to Attewell and Rule based on five---based studies, in Kraemer, R. (Ed.), *In the Information Systems Research Challenge: Survey Research Methods*, Harvard Business School Press, Boston, MA, pp. 337-350.

Koestenbaum, P. (1996). Leadership, *The Inner Side of Greatness*, Jossey-Bass, San Francisco, CA.

Kotter, J. P. (1995). Why transformation efforts fail, *Harvard Business Review*, March-April, pp. 59-67.

Kotter, J.P. and Heskett, J.L. (1992). *Corporate Culture and Performance*, Free Press, New York, NY.

Krames, J. A. (2005). *Jack Welch and the 4E's of Leadership*, McGraw-Hill Companies.

Kyobe, M. (2008). The influence of strategy-making types on IT alignment in SMEs, *Journal of Systems and Information Technology*, 10(1), pp. 22-38.

Lacity, M. C. and Willcocks, L. P. (1995). Information systems outsourcing in theory and practice. *Journal of Information Technology*, 10(4), pp. 203-207.

Lacity, M. C., Willcocks, L.P. and Feeny, D.F. (1996). The value of Selective IT Outsourcing, *Sloan Management Review*, Spring, 13-2

Lacity, M.C., Khan, S.A. and Willcocks, L.P. (2009). A Review of the IT Outsourcing Literature: Insights for Practice, *The Journal of Strategic Information Systems*, 18 (3), pp. 130-146.

Lanen, E. (2008). *IT as business driver*, presentation at the BIA Masterclass, Utrecht.

Larkin, T.J. and Larkin, S. (1994). *Communicating Change*, McGraw-Hill Company, New York.

Lawrence, P.R. and Lorsch, J.W. (1967). *Organization and Environment: Managing Differentiation and Integration*, Harvard University, Boston, MA.

Lederer, A. and Sehti, V. (1988). The implementation of strategic information systems planning methodologies, *MIS Quarterly*, September, pp. 445-461.

Lee, J.-N. and Kim, Y.-G. (1999). Effect of Partnership Quality on IS Outsourcing Success: Conceptual Framework and Empirical Validation, *Journal of Management Information Systems*, 15 (4), pp. 29-61

Leidner D. E., Carlsson S., Elam J. and Corrales, M. (1999). Mexican and Swedish managers' perceptions of the impact of EIS on organizational intelligence, decision making, and structure, *Decision Sciences*, 30 (3), pp. 633-658.

Leidner, D.E. and Kayworth, T. (2006). A review of culture in information systems research: Towards a theory of information technology culture conflict, *MIS Quarterly*, 30(2), pp. 357-399.

Leonard, J. (2007). Sharing a Vision: Comparing Business and IS Managers' Perceptions of Strategic Alignment Issues., *Australasian Journal of Information Systems*, 15(1), pp. 95-112.

Levitt, T. (1960). Marketing myopia, *Harvard Business Review*, 38(4), pp. 45-56.

Levy, M., Powell, P. and Yetton, P. (2001). SMEs: Aligning IS and the strategic context, *Journal of Information Technology*, 16, pp. 133-144.

Lichtenberg, F.R. (1995). The output contributions of computer equipment and personnel: a firm level analysis, *Economics of Innovation and New Technology*, 3(3-4), pp. 201-217.

Little, D. (2012). Explanatory Autonomy and Coleman's Boat, *THEORIA*, 27:74, pp. 137-151.

Livonen, M., Sonnenwald, D. H., Parma, M., and Poole-Kober, E. (1998). Analyzing and understanding cultural differences: Experiences from education in library and information studies, paper presented at the 64th IFLA General Conference, Amsterdam.

Lopez, S. P., Peon, J.M.M. and Ordas, C.J.V. (2004). Managing Knowledge: the link between culture and organizational learning, *Journal of Knowledge Management*, 8(6), pp 84-92.

Love P.E.D. and Irani Z. (2004). An exploratory study of Information Technology Evaluation and Benefits Management Practices of SMEs in Construction, *Information and Management*, 43(2), pp. 227-242.

Loveman, G. (1988). An assessment of the productivity impact of information technologies, Working Paper, Management in the 90s. Sloan School of Management, MIT.

Loveman, G. (1994). An Assessment of the Productivity Impact on Information Technologies, in *Information Technology and the Corporation of the 1990s: Research Studies*, Allen, T. J. and Scott Morton M.S. (Eds.), pp. 84-110, MIT Press, Cambridge, MA.

Luftman, J.N. (2000). Assessing Business-IT Alignment Maturity, *Communications of the Association for Information Systems*, 4, Article 14.

Luftman, J.N. (2003). *Competing in the Information Age, Align in the Sand*, Second Edition, Oxford University Press.

Luftman, J.N. (2009). *Managing the Information Technology Resources: Leadership in Information Age*, Retrieved on 5 June 2011from http://www.lulu.com.

Luftman, J.N., Ben-Zvi, T., Rigoni E.H. and Dwivedi, R. (2009). Strategic Alignment Maturity and Business Performance: A Structural Equation Model, Working Paper.

Luftman, J.N., Ben-Zvi, T., Dwivedi, R. and Rigoni E.H. (2010). IT Governance: An Alignment Maturity Perspective, *International Journal on IT/Business Alignment and Governance*, 1(2), pp. 13-25.

Luftman, J.N. and Brier, T. (1999). Achieving and Sustaining Business-IT Alignment., *California Management Review*, 42(1).

Luftman, J. and Kempaiah, R. (2007). An Update on Business-IT Alignment: A Line Has Been Drawn, *MIS Quarterly Executive*, 6(3), pp. 165-177.

Luftman, J., Kempaiah, R. and Nash, E. (2006). Key Issues for IT Executives 2005, *MIS Quarterly Executive*, 5(2), pp. 81–101.

Luftman, J.N., Kempaiah, R., Dorociak J., and Rigoni E.H. (2008). Strategic Alignment Maturity: A Structural Equation Model Validation, *Proceedings of the 14th America's Conference on Information Systems* (AMCIS), Toronto, Canada.

Luftman, J.N., Lewis, P.R. and Oldach, S.H. (1993). Transforming the Enterprise: The Alignment of Business and Information Technology Strategies., *IBM Systems Journal*, 32(1).

Luftman, J.N., Papp, R. and Brier, T. (1999). Enablers and Inhibitors of Business-IT Alignment, *Communications of the Association for Information Systems*, 1, Article 11.

Lusch, R.F. and Vargo, S.L. (2006). Service-dominant logic: Reactions, reflections and refinements, *Marketing Theory*, 6(3), pp. 281-288.

Ma, L.C.K. and Burn, J.M. (1998). Managing the Dynamics of Information Systems Strategic Alignment, IRMA International Conference, Boston, pp. 240–248.

MacDonald, H. (1991). The Strategic Alignment Process, in S. Morton and S. Michael (eds.) *The Corporation of the 1990s: Information technology and organizational transformation*, 1st edn,, pp. 310–322, Oxford Press, London.

Madhok, A. (2002). Reassessing the Fundamentals and Beyond: Ronald Coase, the Transaction Cost and Resource-Based Theories of the Firm and the Institutional Structure of Production, *Strategic Management Journal*, (23)6, pp. 535-550.

Maes, R., Rijsenbrij, D., Truijens, O. and Goedvolk, H. (2000), Redefining Business-IT Alignment through a unified framework, working paper, Retrieved from http://imwww.fee.uva.nl/~maestro/PDF/2000-19.pdf on 4 March 2005.

Markowitz, H.M. (1952). Portfolio selection, *Journal of Finance*, 7 (1).

Marques Pereira, C. and Sousa P. (2003) Getting into the misalignment between Business and information Systems, *Proceedings of the 10th European Conference on Information Technology Evaluation* (ECITE), Madrid.

Marrone, M. and Kolb, L.M. (2011). Uncovering ITIL claims: IT executives' perception on benefits and Business-IT alignment, *Information Systems and E-Business Management*, (2011)9, pp.363–380.

Martin, J. (1982). *Strategic Data-Planning Methodologies*, Prentice Hall.

Maur, W. in der, Walbeek, W. van and Batenburg, R. (2009). A framework for integrating IT governance and business/IT alignment principles, *International Journal of Business Innovation and Research*, 3(5), pp. 555-573.

McLean, E.R. and Soden, J.V. (1977). *Strategic Planning for MIS*, John Wiley and Sons, Inc., New York.

Mekawy, M. El, Rusu, L. and Ahmed, N. (2009). Business and IT Alignment: An Evaluation of Strategic Alignment Models, in *Best Practices for the Knowledge Society. Knowledge, Learning, Development and Technology for All*, *Communications in Computer and Information Science*, Volume 49, Part 3, 447-455.

Miles, R.E. and Snow, C.C. (1978). *Organizational Strategy, Structure, and Process*, McGraw-Hill Book Co., New York.

Miller, S., Batenburg, R.S. and Wijngaert, L. van de (2006). National Culture Influences on European ERP Adoption, *Proceedings of the 14th European Conference on Information Systems* (ECIS), Ljungberg, J. and Andersson, M. (Eds.), pp. 1-12, Göteborg.

Mills, P. (1986). *Managing Service Industries*, Ballinger, New York.

Miozzo, M. and Grimshaw, D. (2006). Modularity and innovation in knowledge intensive business services: IT outsourcing in Germany and the UK., in *Knowledge Intensive Business Services: Organizational Forms and National Institutions*, Miozzo, M. and Grimshaw, D. (Eds.), Edward Elgar, Cheltenham.

Molenaar, T. (2002). History learns us the value of IT investments (in Dutch), *IT service magazine*, 5 pp. 18 - 21.

Mooij, M. de (2000). The future is predictable for international marketers: Converging incomes lead to diverging consumer behavior, *International Marketing Review*, 17 (2), pp. 103-113.

Mooney, J., Gurbaxani, V. and Kraemer, K. (1995). A process oriented framework for assessing the business value of information technology, *Proceedings of the Sixteenth Annual International Conference on Information Systems* (ICIS), Degross, J., Ariav, G., Beath, C., Hoyer, R. and Kemerer, C. (Eds.), pp. 17-27.

Morneau K. (2006). Presentation on the IT Security World Conference & Expo, San Francisco.

Nash, E.M. (2009). IT and Business Alignment: The Effect on Productivity and Profitability, *IT Professional*, 11(6), 31-36.

Newman, M. and Sabherwal, R. (1996). Determinants of Commitment to Information Systems Development: A Longitudinal Investigation, *MIS Quarterly*, 20 (1), pp. 23-54.

Niederman, F., Brancheau, J.C. and Wetherbe, J.C. (1991). Information systems management issues for the 1990s, *MIS Quarterly*, 15, pp. 475-499.

Nijland, M. (2004). *Understanding the use of IT evaluation methods in organisations*, Ph.D. dissertation, London School of Economics.

Nolan, R. L. (1973). Managing the computer resource: A stage hypothesis. *Communications of the ACM*, 16(7), pp. 399-550.

Olson, M.H. and Weill P. (1989). Managing investment in information technology: mini case examples and implications, *MIS Quarterly*, 13(1), pp. 3-17.

Palmer, J.W. and Markus, M.L. (2000). The performance of quick response and strategic alignment in specialty retailing, *Information Systems Research*, 11(3), pp. 241–259.

Parise, S. and Henderson, J.C. (2001). Knowledge resource exchange in strategic alliances, *IBM Systems Journal*, 40(4).

Parker, M.M., Benson, R.J. and Trainor, H.E. (1988), *Information Economics, Linking Business Performance to Information Technology*, Prentice-Hall, London.

Pasian, B, Sankaran, S. and Boydell, S. (2012). Project management maturity: a critical analysis of existing and emergent factors, *International Journal of Managing Projects in Business*, 5(1), pp. 146-157.

Paul, L.G. and Tate, P. (2002). *CFO Mind Shift: Technology Creates Value*, CFO Publishing Corporation, Boston, MA.

Peak, D. and Guynes, C.S. (2003). Improving Information Quality Through IT Alignment Planning; A Case Study, *Information Systems Management*, 20(4), pp. 22-29.

Penrose, E.T. (1959). *The Theory of the Growth of the Firm*, Wiley, New York.

Pfannenstein L.L. and Tsai, R.J. (2004). Offshore Outsourcing: Current and Future Effects on American it Industry, *Information Systems Management*, 21(4), pp. 72 – 80.

Pfeffer, J. (1981). Management as symbolic action, in *Research in Organisational Behaviour*, Cummings, L.L. and Staw, B.M. (Eds), JAI Press, Greenwich, CT.

Plazaola, L., Silva, E., Vargas, N., Flores, J. and Ekstedt, M. (2006). A Metamodel for strategic business and IT alignment assessment, *Proceedings of the 4th Annual Conference on Systems Engineering Research (CSER)*, Los Angeles.

Png, I.P.L., Tan, B.C.Y. and Wee, K.L. (2001). Dimensions of national culture and corporate adoption of IT Infrastructure, *IEEE Transactions on Engineering Management*, 48 (1), pp. 36-45.

Poels, R. (2006). *Beïnvloeden en meten van business – IT alignment* (in Dutch), Doctoral dissertation VU University Amsterdam, Amsterdam.

Pollalis, Y.A. (2003). Patterns of Co-Alignment in Information-Intensive Organizations: Business performance through integration strategies, *International Journal of Information Management*, 23(6), pp. 469–492.

Pols, R. van der (2003). *Nieuwe informatievoorziening; informatieplanning en ICT in de 21e eeuw*, Academic Services, The Hague. (in Dutch)

Porter, M. (1985). *Competitive Advantage,* Free Press, New York.

Prahalad, C.K. and Hamel, G. (1990). The Core Competence of the Corporation, Harvard Business Review, 68(3), pp. 79-92.

Preston, D.S. and Karahanna, E. (2004). Mechanisms for the Development of Shared Mental Models between the CIO and the Top Management Team, *Proceedings of the International Conference on Information Systems* (ICIS), pp. 465-480.

PriceWaterhouseCoopers (2005). *European Survey on ICT Value Management, research report*, Retrieved from http://www.pwc.com/extweb/onlineforms.nsf/docid/5164DFF81A6BCD9A80256FCB003336FF?opendocument on December 16th 2006.

Priem, R.L. and Butler, J.E. (2001). Is the Resource-Based 'View' a Useful Perspective for Strategic Management Research?, *Academy of Management Review*, 26(1), pp. 22-40.

Pyburn, P.J. (1983), Linking the MIS Plan with Corporate Strategy: An Exploratory Study, *MIS Quarterly*, 7(2), pp. 1-14.

Quinn, J.B. (1999). Strategic Outsourcing: Leveraging Knowledge Capabilities, *Sloan Management Review*, 40 (4), pp. 9-21.

Raghuram, S. (2006). Individual effectiveness in outsourcing, *Human Systems Management*, 25(2), pp. 127-133.

Ranganathan, C. and Sehti, V. (2002). Rationality in strategic information technology decisions: The impact of shared domain knowledge and IT unit structure, Decision Sciences, 22(1), pp. 59-86.

Ramirez, R., Kraemer, K. L. and Lawler, E. (2001). The contribution of information technology investments to firm performance: Influence of management practices. Working paper. Center for Research on Information Technology and Organizations, University of California, Irvine CA.

Ravarini, A., Tagliavini, M. and Buonanno, G. (2002). 'Information systems check-up as a leverage for SME development, in *Managing IT in small business*, S. Burgess (Ed), Idea Publishing.

Reich, B.H. (1993). Investigating the Linkage between Business and Information Technology Objectives: A multiple case study in the insurance industry, Unpublished Doctor of Philosophy Thesis, University of British Columbia.

Reich, B.H. and Benbasat, I. (1996). Measuring the Linkage between Business and Information Technology Objectives, *MIS Quarterly*, 20(1), pp. 55-81.

Reich, B.H. and Benbasat, I. (2000). Factors that Influence the Social Dimension of Alignment between Business and Information Technology Objectives, *MIS Quarterly*, 24, pp. 81-113.

Renkema T.J.W. and Berghout, E.W. (1996). Methodologies for information systems evaluation at the proposal stage: a comparative review, *Information and Software Technology*, Elsevier.

Riggins, F.J. (1999). A Framework for Identifying Web-Based Electronic Commerce Opportunities, *Journal of Organizational Computing and Electronic Commerce*, 9(4), pp. 297-310.

Rosa, J. (1998). CIOs Challenged by Disparate Goals, *Computer Reseller News*, 43, December 7.

Rosemann, M. and Vessey, I. (2008). Toward Improving the Relevance of Information Systems Research to Practice: the Role of Applicability Checks, *MIS Quarterly*, 32(1), pp. 1-22.

Ross, D. N. (2001). Electronic communications: Do cultural dimensions matter?, *American Business Review*, pp. 75-81.

Sabherwal, R. and Chan, Y. E. (2001). Alignment Between Business and IS Strategies: A Study of Prospectors, Analyzers, and Defenders, *Information Systems Research*, 12(1), pp. 11-33.

Sabherwal, R. and Kirs, P. (1994). The Alignment Between Organizational Critical Success Factors and Information Technology Capability in Academic Institutions, *Decision Sciences*, 25(2), pp. 301–330.

Salmela, H. (1997). From information systems quality to sustainable business quality, *Information and Software Technology*, 39(12), pp. 819 – 827.

Saunders, M., Lewis, P. and Thornhill, A. (2007). *Research methods for business students*, Financial Times/Prentice Hall.

Scheper, W. J., (2002). *Business IT Alignment: solution for the productivity paradox* (In Dutch). Deloitte & Touche.

Schwartz, S.H. (1994). Beyond individualism-collectivism: New cultural dimension of values, in *Individualism and collectivism: Theory, method, and applications,* Kim, U., Tirandis, H.C., Kagitcibasi, C., Choi, S-C. and Yoon, G. (Eds.), pp 85-199, Reidel, New York.

Scott, W.R. (1992). *Organizations: Rational, Natural, and Open Systems*, Prentice-Hall, Englewood Cliffs, N.J.

Senge, P. (1999). *The Dance of Change*., Nicholas Drealey Publishing Ltd., London.

Segars, A. and Grover, V. (1998). Strategic information systems planning success; an investigation of the construct and its measurement, *MIS Quarterly*, 22, pp. 139–163.

Segars, A., Grover, V. and Teng, T. (1998). Strategic information systems planning: planning system dimensions, internal coalignment, and implications for planning effectiveness., *Decision Sciences*, 29(2), pp. 303–341.

Shams, R.M. and Wheeler, F.P. (2003). Information-Induced Strategic Alignment: Towards a semiological analysis, in N. Shin (ed.) *Creating Business Value with Information Technology: Challenges and solutions*, 1st edn, Idea Group Publishing, Hershey, PA, pp. 23–49.

Silva, E., Plazaola, L. and Ekstedt, M. (2006). Strategic Business and IT Alignment: A Prioritized Theory Diagram, paper presented at the PICMET conference, Istanbul.

Silvius, A.J.G. (2006). Does ROI Matter? Insights into the True Business Value of IT, *Electronic Journal of Information Systems Evaluation*, Academic Conferences ltd.

Silvius, A.J.G. (2007a). Business & IT Alignment in Theory and Practice, *Proceedings of the 40th Hawaii International Conference on Systems Sciences* (HICSS-40), Waikoloa, Big Island, HI.

Silvius, A.J.G. (2007b). Exploring Differences in the Perception of Business & IT Alignment, *Communications of the IIMA*, 7(2), International Information Management Association Inc., San Bernadino CA.

Silvius, A.J.G. (2008a). The Business Value of IT; Seeing the Forest through the Trees, *European and Mediterranean Conference on Information Systems* (EMCIS), Dubai.

Silvius, A.J.G. (2008b). The Business Value of IT; A Conceptual Model for Selecting Valuation Methods, *Communications of the IIMA*, 8(3), International Information Management Association Inc., San Bernadino CA.

Silvius, A.J.G. (2008c). Cultural Aspects of Business & IT Alignment, paper presented at the 3rd SIKS/BENAIS Conference on Enterprise Information Systems (EIS), Tilburg.

Silvius A.J.G. (2010). A Conceptual Model for Aligning IT Valuation Methods, *International Journal of IT/Business Alignment and Governance*, 1(3), pp.36-54.

Silvius, A.J.G. and Batenburg, R. (2009). Future development of Project Management competences, paper presented at the 42nd Annual Hawaii International Conference on System Sciences (HICSS), Waikoloa (HI).

Silvius A.J.G., De Haes S. and Van Grembergen W. (2010). Explorative study on the influence of national cultures on business/IT alignment maturity, *International Journal of IT/Business Alignment and Governance*, 1(2), pp.26-46.

Silvius, A.J.G. and Stoop, J. (2013). The relationship between the process of Strategic Information Systems Planning and its success; An explorative study, Proceedings of the 46th Annual Hawaii International Conference on System Sciences (HICSS-46), Maui (HI).

Silvius, A.J.G. and Waal, B.M.E. de (2010). Business and IT Alignment in Dutch Vocational Education and Training Organizations, *Communications of the IIMA*, 10(1), pp. 55-63.

Silvius, A.J.G., Waal, B. de, and Smit, J. (2009). Business and IT Alignment: Answers and Remaining Questions, *Proceedings of the Pacific Asia Conference on Information Systems* (PACIS), Hyderabad.

Sledgianowski, D. and Luftman, J.N. (2005). IT-Business Strategic Alignment Maturity: A Case Study*, Journal of Cases on Information Technology*, (7)2, pp. 102-120.

Sledgianowski, D., Luftman, J. N., and Reilly, R. R. (2006). Development and Validation of an Instrument to Measure Maturity of IT Business Strategic Alignment Mechanisms, *Information Resources Management Journal*, 19(3), pp. 18-33.

Smaczny, T. (2001). IS an Alignment between Business and IT the Appropriate Paradigm to Manage IT in Today's Organisation?, *Management Decision*, 39 (10).

Smit, J., Ludik, J. and Forster, S. (2008). Organizational Culture in the South African Context: The X Model, *The International Journal of Knowledge, Culture & Change Management*, 7(10).

Smit, J.T.J. and Ankum. L.A. (1993). A Real Options and Game-Theoretic Approach to Corporate Investment Strategy Under Competition, *Financial Management*, 22, pp. 241-250.

Smit, J.T.J. and Silvius, A.J.G. (2001). Dynamic Investment Planning; Valuing Intuition in the New Economy, *Proceedings of FESMA/DASMA conference*, Heidelberg.

Smit, J.T.J. and Trigeorgis, L. (1999). Flexibility, Strategic Options and Dynamic Competition in Technology Industries, in *Real Options*, A. Micalizzi and L. Trigeorgis (Eds)., Egea Sda Bocconi, Milan.

Smith, P.B. and Bond, M.H. (1998). *Social Psychology across Cultures*, Prentice Hall Europe, Paris.

Society of Information Management (2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010), SIM survey, (http://www.simnet.org/Content/NavigationMenu/About/Press_Releases/PressReleases.htm).

Soh, C.and Markus, M. (1995). How IT Creates Business Value: A Process Theory Synthesis, *Proceedings of the Sixteenth International Conference on Information Systems* (ICIS), pp. 29-41.

Sørnes, J-O., Stephens, K., Sætre, A.S. and Browning, L.D. (2004). The Reflexivity between ICTs and Business Culture: Applying Hofstede's Theory to Compare Norway and the United States, *Informing Science Journal*, 7.

Stefanou, C.J. (2001). A framework for the ex-ante evaluation of ERP software, *European Journal of Information Systems*, 10, pp. 204-215.

Stewart, R. and Mohamed, R. (2002) IT/IS projects selection using multi-criteria utility theory, *Logistics Information Management*, 15(4), pp. 254-270.

Stewart, W., Coulson, S. and Wilson, R. (2007). Information Technology: When is it Worth the Investment?, in *Communications of the IIMA*, 7(3), International Information Management Association Inc., San Bernadino CA.

Strassmann, P.A. (1990). *The Business Value of Computers*, Information Economics Press.

Strassmann, P.A. (1997). *The Squandered Computer*, Information Economic Press.

Straub, D. W. (1994). The effect of culture on IT diffusion: e-mail and fax in Japan and the US. *Information Systems Research*, 5 (1), pp. 23-47.

Tallon, P. (2003). The Alignment Paradox, *CIO Insight*, 1(47).

Tallon, P. and Kraemer, K. L. (1999). A Process-oriented Assessment of the Alignment of Information Systems and Business Strategy: Implications for IT Business Value, University of California, Irvine, Center for Research on Information Technology and Organizations.

Tallon, P., Kraemer, K. L., and Gurbaxani, V. (2000). Executives' Perceptions of the Business Value of Information Technology: A Process-Oriented Approach, *Journal of Management Information Systems*, 16(4), pp.145-173.

Targowski, A. (2004). Making Business Sence of IT, 3rd Annual WMU-Hcob IT Forum, Western Michigan University.

Teece, D.J., Pisano, G. and Shuen, A. (1997). Dynamic capabilities and strategic management, *Strategic Management Journal*, 18(7), pp. 509-533.

Thorogood, A., Yetton, P., Vlasic, A. and Spiller, J. (2003). *Strategic IT at SA water: A case study in alignment, outsourcing and governance*, Australian Graduate School of Management: Cords/Welsearch Ltd and the Fujitsu Centre for Managing Information Technology in Organisations, No. AT- 0910-3.

Treacy, M. and Wiersema, F. (1997). *The Discipline of Market Leaders: Choose your customers, Narrow your focus, Dominate your market*, Perseus Publishing.

Tichy, N.M. (1982). *Managing Strategic Change*, John Wiley & Sons, New York.

Tomlin, R. (1991). Developing a Management Climate Culture in Which Information Technology Will Flourish: How the UK Can Benefit, *Journal of Information Technology*, (6), pp. 45-55.

Trigeorgis, L. (1993). Real Options and Interactions with Financial Flexibility, *Financial Management*, 22, pp. 202-224.

Trigeorgis, L. (1996). *Real Options: Managerial Flexibility and Strategy in Resource Allocation*, MIT Press, Cambridge, MA.

Trochim, W., (2001). *The Research Methods Knowledge Base*, 2nd edition, Atomic Dog Publishing.

Turban, E., McLean, E. and Wetherbe, J. (1999). *Information Technology for Management: Making Connections for Strategic Advantage*, John Wiley & Sons, Chichester.

Van Grembergen, W. and De Haes, S. (2008). *Implementing information technology governance: models, practices, and cases*, IGI Global, Hershey, PA.

Van Grembergen W. and De Haes S. (2010). A research journey into enterprise governance of IT, business/IT alignment and value creation, *International Journal of IT/Business Alignment and Governance*, 1(1), p.1-13.

Veiga, J.F., Floyd, S., and Dechant, K. (2001). Towards modelling the effects of national culture on IT implementation and acceptance, *Journal of Information Technology*, 16 (3), pp. 145-158.

Venkatraman, N. (1989). The concept of fit in strategy research, *Academy of Management Review*, 14(3).

Waarts, E., and Everdingen, Y. van, (2005). The Influence of National Culture on the Adoption Status of Innovations: An Empirical Study of Firms Across Europe, *European Management Journal*, 23(6), pp. 601-610.

Wade, M. and Hulland, J. (2004). The Resource-Based View and Information Systems Research: Review, Extension, and Suggestions for Future Research, *MIS Quarterly*, 28(1), March, pp. 107-142.

Wallace, J., Hunt, J. and Richards, C. (1999). The Relationship between Organizational Culture, Organizational Climate and Managerial Values, *The International Journal of Public Sector Management*, 12(7). pp. 548-546.

Walls, J. (1993). Global networking for local development: Task focused and relationship focused in crosscultural communication, in *Global networks: Computers and international communication*, Harasim, L. (Ed.), The MIT Press,Cambridge, MA.

Ward, J. and Peppard, J. (2002). *Strategic Planning for Information Systems*, 3rd edition, John Wiley & Sons.

Warren McFarlan, F. (1981). Portfolio Approach to Information Systems, *Harvard Business Review*.

Watson, R.T., Kelly, G.G., Galliers, R.D. and Brancheau, J.C. (1997). Key issues in information systems management: an international perspective, *Journal of Management Information Systems*, 13(4), pp. 91 – 115.

Watson, R.T., Pitt L.F. and Kavan, C.B. (1998). Measuring Information Systems Service Quality: Lessons from Two Longitudinal Case Studies, *MIS Quarterly*, 22(1), pp. 61-79.

Weill, P. and Broadbent, M. (1998). *Leveraging The New Infrastructure; How Market Leaders Capitalize on Information Technology*, Harvard Business School Press.

Weill, P. and Ross, J.W. (2004). *IT Governance: How top performers manage IT decision rights for superior results*, Harvard Business School Press, Boston, MA.

Wernerfelt, B. (1994). A Resource-based View of the Firm, *Strategic Management Journal*, 5(2), pp. 171-180.

Westrup, C, Liu, E., El Sayed, H., and Al Jaghoub, S. (2003). Taking culture seriously: ICTs, cultures and Development, in *ICTs and Development: New Opportunities, Perspectives and Challenges*, Krishna, S. and Madon, S. (Eds.), Ashgate.

Wernerfelt, B. (1984). A resource-based view of the firm, *Strategic Management Journal*, 5, pp. 171-180.

Wetering, R. van de, Batenburg, R., Oudkerk, M., Ooijen, P. van, Brinkkemper,S. and Scheper, W. (2011). A Situational Alignment Framework for PACS, *Journal of Digital Imaging*, 24(6), pp. 979–992.

Wetherbe, J.C., Turban, E., Leidner, D.E. and McLean, E.R. (2007). *Information Technology for Management: Transforming Organizations in the Digital Economy* (6th ed.), Wiley, New York.

Whiting, R., Davies, J, and Knul, M. (1996). Investment appraisal for IT systems, in *Investing In Information Systems: Evaluation and Management*., Willcocks, L. (Ed.), Chapman and Hall.

Wieringa, R., Gordijn, J. and Eck, P. van. (2005). Value-Based Business-IT Alignment in Networked Constellations of Enterprises, Proceedings of the 1st International Workshop on Requirements Engineering for Business Need and IT Alignment (REBNITA 2005), Paris.

Wijngaert, L. van den, Versendaal, J. and Matla, R. (2008). Business IT Alignment and Technology Adoption; The Case of RFID in the Logistics Domain, *Journal of Theoretical and Applied Electronic Commerce Research*, 3(4), pp. 71-80.

Willcocks, L.P. and Lacity, M. (2001). *Global IT outsourcing: search for business advantage*, John Wiley & Sons, Chichester.

Willcocks, L. and Lester, S. (1993). How do organisations evaluate and control information systems investments? Recent UK survey evidence, *Journal of Information Systems*, 2, pp. 5-39.

Wilkins, A.L. and Ouchi, W.G. (1983). Efficient cultures: exploring the relationship between culture and organisational performance, *Administrative Science Quarterly*, 28, pp. 468-81.

Wilson, A.M. (2001). Understanding organizational culture and the implications for corporate marketing, *European Journal of Marketing*, 35(3/4), pp. 353-367.

Winter, S. (2003). Understanding dynamic capabilities, *Strategic Management Journal*, 24(10), pp. 991-995.

Wong, J.W. and Behling, R. (1997). Using conventional methods to perform cost-benefit analysis (CBA) on proposed information systems (IS) projects: an Australian study, *Journal of Computer Information Systems*, Summer, pp.30-36.

Woolfe, R. (1993). The Path to Strategic Alignment, *Information Strategy: The Executive's Journal*, 9(2), pp.13-23.

Xiang, Y. Xiaobo, W. and baoliang, H. (2008). A strategic alignment method based on demand classification of information technology, *Advanced Management of Information for Globalized Enterprises*, pp. 1-5.

Yayla, A. and Hu, Q. (2009). Antecedents and Drivers of IT-Business Strategic Alignment: Emperical Validation of a Theoretical Model, *Proceedings of the European Conference on Information Systems* (ECIS), pp. 158 – 169.

Yetton, P. W. (1994). False Prophecies, Successful Practice, and Future Directions in IT Management, in *Steps to the Future: Fresh Thinking on the Management of IT-Based Organizational Transformation*, C. Sauer and P. W. Yetton (Eds.), Jossey-Bass, San Francisco, pp. 27-54.

Yin, (2002). *Case Study Research: Design and Methods*, Third Edition (Applied Social Research Methods), Sage Publications Inc .

Zee, J.T.M. van der, and Jong, B. de (1999). Alignment is Not Enough: Integrating business and information technology management with the balanced business scoreboard, *Journal of Management Information Systems*, 16 (2), pp. 137–156.

OTHER PUBLICATIONS BY GILBERT SILVIUS

Books

Silvius, A.J.G. and Thorpe, J. (Eds.) (2013). *Sustainability Integration for Effective Project Management*, IGI Global Premier Reference Source.

Silvius, A.J.G., Schipper, R., Planko, J., Brink, J. van den, and Köhler, A. (2012). *Sustainability in Project Management*, Gower Publishing, Advances in Project Management.

Nan Si Shi and Silvius, A.J.G. (Eds.) (2011). *Enterprise IT Governance, Business Value and Performance Measurement*, IGI Global Premier Reference Source.

Journal articles

Silvius, A.J.G., and Stoop, J. (2013). The relationship between Strategic Information Systems Planning situational factors, process configuration and success, to appear in *Journal of Information Technology and Information Management* (JITIM).

Silvius, A.J.G., Turkiewicz, J., Keratsinov, A. and Spoor, H. (2013), The Relationship between IT Outsourcing and Business and IT Alignment: An explorative study, to appear in *Computer Science and Information Systems* (ComSIS).

Brookman, F., Smit, J. and Silvius, A.J.G. (2012). Perception of Information Technology enablers for effective Supply Chain Management, *Communications of the IIMA* (CIIMA) , 12(2), pp. 51-63.

Verbaan, M. and Silvius, A.J.G. (2012). The impact of IT management processes on Enterprise Agility, *Communications of the IIMA* (CIIMA) , 12(1), pp. 79-93.

Maarleveld, S. and Silvius, A.J.G. (2012). Adapting PRINCE2® to a Multi Vendor Outsourcing context, *International Journal of Computer Science and Management Research* (IJCSMR), 1(2), pp. 115-122.

Silvius, A.J.G. and Nedeski, S. (2011). Sustainability in IS projects; A case study, *Communications of the IIMA* (CIIMA), 11(4), pp. 1-12.

Ciolac, C.E. and Silvius, A.J.G. (2011). IT Outsourcing: A Comparison between the Romanian and the Dutch Banking Systems, *Journal of Information Technology and Information Management* (JITIM), 19(2), pp.1-28.

Dols, T. and Silvius, A.J.G. (2010). Exploring the Influence of National Cultures on Non-Compliance Behavior, *Communications of the IIMA* (CIIMA), 10(3), pp. 11-32.

Silvius, A.J.G. (2010) A Conceptual Model for Aligning IT Valuation Methods, *International Journal of IT/Business Alignment and Governance* (IJITBAG), 1(3), pp. 36-54.

Silvius, A.J.G, De Haes, S. and Van Grembergen, W. (2010). Explorative study on the influence of national cultures on Business/IT alignment maturity, *International Journal of IT/Business Alignment and Governance* (IJITBAG), 1(2), pp. 26-45.

Silvius, A.J.G. and Waal, B.M.E. de, (2010). Business and IT Alignment in Dutch Vocational Education and Training Organizations, *Communications of the IIMA* (CIIMA), 10(1), pp. 55-63.

Brugh, E. van der, and Silvius, A.J.G. (2009). Good to Great in Service Management; A Case Study, *Communications of the IIMA* (CIIMA), 9(4), pp. 21-36.

Silvius, A.J.G. and Ravesteyn, P. (2009). United we stand? Exploring the willingness to cooperate amongst open source service providers, *Communications of the IIMA* (CIIMA), 9(3), pp. 107-114.

Silvius, A.J.G., Brink, J. van den, and Smit, J. (2009). Sustainability in Information and Communications Technology (ICT) Projects, *Communications of the IIMA* (CIIMA), 9(2), pp. 33-44.

Silvius, A.J.G. (2008). The Business Value of IT; A Conceptual Model for Selecting Valuation Methods, *Communications of the IIMA* (CIIMA), 8(3), pp. 57-66.

Silvius, A.J.G. (2008). The Impact of National Cultures on Business & IT Alignment, *Communications of the IIMA* (CIIMA), 8(2), pp. 11-22.

Silvius, A.J.G. (2007). Exploring Differences in the Perception of Business & IT Alignment, *Communications of the IIMA* (CIIMA), 7(2), pp. 21-32.

Silvius, A.J.G. (2006). Does ROI Matter? Insights into the True Business Value of IT, *Electronic Journal of Information Systems Evaluation* (EJISE), 9(2), pp. 45-56

Book chapters

Silvius, A.J.G. (2012). Change the Game; Sustainability in Projects and Project Management, in *Green Business Process Management - Towards the Environmentally Sustainable Enterprise*, Edited by J. vom Brocke, S. Seidel and J. Recker. pp. 161-177, Springer, Heidelberg.

Silvius, A.J.G., Brink, J. van den, and Köhler, A. (2012). The impact of sustainability on Project Management, in *The Project as a Social System*, Edited by H. Linger and J. Owen. pp. 183 – 200, Victoria: Monash University Publishing.

Silvius, A.J.G. (2012). Does ROI Matter? Insights into the True Business Value of IT, in *Leading Issues in ICT Evaluation*, Edited by E. Berghout. pp. 82-104, Academic Publishing International.

Silvius, A.J.G. (2011). The Relationship between Business Strategy, IT Strategy and Alignment Capability, in *Enterprise IT Governance, Business Value and Performance Measurement*, Edited by S.S. Nan and A.J.G. Silvius. pp. 130-142, IGI Global.

Silvius, A.J.G. (2011). The Business Value of IT: A Conceptual Model for Understanding and Selecting Valuation Methods, in *Enterprise IT Governance, Business Value and Performance Measurement*, Edited by S.S. Nan and A.J.G. Silvius. pp. 102-111, IGI Global.

Silvius, A.J.G., Brink, J. van den, and Köhler, A. (2010). The concept of sustainability and its application to project management, in *Survival and Sustainability as challenges for projects*, Edited by H. Knoepfel. pp. 130-144, International Project Management Association.

Silvius, A.J.G., Brink, J. van den, and Köhler, A. (2009). Views on Sustainable Project Management, in *Human Side of Projects in Modern Business*, Edited by K. Kähköhnen, A. Samad Kazi and M. Rekola. IPMA Scientific Research Paper Series.

Silvius, A.J.G. (2009). Project Management 2027; The future of Project Management, in *Handbook of Research on Technology Project Management Planning and Operations*, Edited by T.T. Kidd. pp.17-36, IGI Global.

Ravesteyn, P. and Silvius, A.J.G. (2008). Willingness to Cooperate Within the Open Source Software Domain, in *Open Source Development, Communities and Quality*, Edited by B. Russo, E. Damiani, S. Hissam, B. Lundell and G. Succi. pp. 267-373, IFIP International Federation for Information Processing, Volume 275, Springer.

Silvius, A.J.G. (2008). Business & IT Alignment in a Multinational Company: Issues and Approaches, in *Handbook of Research on Global Information Technology Management in the Digital Economy*, Edited by M.S. Raisinghani. pp. 156-166, IGI Global.

Silvius, A.J.G. (2004). For what IT's worth: Insights in the true business value of IT, in *Innovations Through Information Technology*, Edited by M. Khosrow-Pour. pp. 319-323, Information Resources Management Association.

Silvius, A.J.G. (2004). IT and Small Business: An Unhappy Marriage, in *Innovations Through Information Technology*, Edited by M. Khosrow-Pour. pp. 316-318, Information Resources Management Association.

Conference papers

Silvius, A.J.G. and Stoop, J. (2013). The relationship between the process of Strategic Information Systems Planning and its success; An explorative study, Proceedings of the 46th Annual Hawaii International Conference on System Sciences (HICSS-46), Maui (HI).

Goedknegt, D. and Silvius, A.J.G. (2012). The implementation of sustainability principles in project management, paper presented at the 26th World Congress of the International Project Management Association (IPMA), Crete.

Silvius, A.J.G. and Schipper, R. (2012). Sustainability in the Business Case, paper presented at the 26th World Congress of the International Project Management Association (IPMA), Crete.

Silvius, A.J.G., Schipper, R. and Nedeski, S. (2012). Sustainability in Project Management: Reality Bites, paper presented at the 26th World Congress of the International Project Management Association (IPMA), Crete.

Silvius, A.J.G. (2012). Sustainability in Project Management: Vision, Mission, Ambition, In: Proceedings of the PMSummit 2012 PMI Turkey Chapter, Istanbul.

Silvius, A.J.G. (2012). Integrating sustainability indicators in IT/IS evaluation, paper presented at the 6th European Conference on Information Management and Evaluation (ECIME), Cork.

Smit, J., Dellemijn, M. and Silvius, A.J.G., (2012). The Relationship between Organizational Culture, Information Systems Management and Change Readiness, paper presented at the 16th Pacific Asia Conference on Information Systems (PACIS), Ho Chi Minh City.

Silvius, A.J.G. (2012). The role of Organizational Change in Green IS: Integrating Sustainability in Projects, paper presented at the 5th International Conference on Information Resources Management (Conf-IRM), Vienna.

Dols, T. and Silvius, A.J.G. (2012). Factors influencing Non-Compliance behavior, paper presented at the 5th International Conference on Information Resources Management (Conf-IRM), Vienna.

Silvius, A.J.G. (2012). The Competences of the Project Manager in 2027, paper presented at the IPMA International Expert Seminar: Trends in Project, Programme and Portfolio Management, Swiss Project Management Association, Zurich.

Silvius, A.J.G. and Brink, J. van den (2012). Taking Responsibility: The integration of Sustainability and Project Management, paper presented at the first CARPE networking conference, Proceedings edited by J. Kettunen, U. Hyrkkänen and Anttoni Lehto, Research Reports from Turku University of Applied Sciences 36, Utrecht.

Silvius, A.J.G. and Smit, J. (2011). Maturing Business and IT alignment capability; the Practitioner's view, paper presented at the 44th Annual Hawaii International Conference on System Sciences (HICSS), Kauai (HI).

Silvius, A.J.G. and Waal, B.M.E. de (2010). Assessing Business and IT Alignment in Educational Organizations, paper presented at the International Conference on Computational Intelligence and Software Engineering (CISE), Wuhan.

Silvius, A.J.G., Brink, J. van den, and Köhler, A. (2010). Sustainability in Projects; in Project Managers: A Responsibility of Project Managers?, paper presented at the PMI India Project Management Conference, Mumbai.

Silvius, A.J.G., Brink, J. van den, and Köhler, A. (2010). Sustainability in Project Management; Questions and Responsibilities, paper presented at the International Conference on Sustainability in Business (ICSB), Putrajaya.

Silvius, A.J.G. and Schipper, R. (2010). A Maturity Model for Integrating Sustainability in Projects and Project Management, paper presented at the 24th World Congress of the International Project Management Association (IPMA), Istanbul.

Schipper, R., Rorije, H. and Silvius, A.J.G. (2010). Creating Sustainable Change: A new paradigm in Project Management, paper presented at the 24th World Congess of the International Project Management Association (IPMA), Istanbul.

Silvius, A.J.G., Smit, J. and Driessen, H. (2010). The Relationship between Organizational Culture and the Alignment of Business and IT, paper presented at the 16th Americas Conference on Information Systems (AMCIS), Lima.

Silvius, A.J.G., Brink, J. van den, and Köhler, A. (2010). The impact of sustainability on Project Management, paper presented at the Inaugural Asia Pacific Research Conference on Project Management (APRPM), Melbourne.

Sheombar, A, Smit, J. and Silvius, A.J.G. (2009). The Balancing Act of Optimised Value Creation, paper presented at the BoP conference, Delft.

Smit, J., Sheombar, A. and Silvius, A.J.G. (2009). Cooperation issues in developing the BOP market, paper presented at the 15th Americas Conference on Information Systems (AMCIS), San Francisco (CA).

Silvius, A.J.G. (2009). Exploring the Relationship Between Alignment and Strategy, paper presented at the 15th Americas Conference on Information Systems (AMCIS), San Francisco (CA).

Silvius, A.J.G., Waal, B.M.E. de, and Smit, J. (2009), Business and IT Alignment: Answers and Remaining Questions, paper presented at the 13th Pacific Asia Conference on Information Systems (PACIS), Hyderabad.

Smit, J., Sheombar, A. and Silvius, A.J.G. (2009). The partnership health of ICT projects in developing countries, paper presented at the 13th Pacific Asia Conference on Information Systems (PACIS), Hyderabad.

Smit, J., Sheombar, A. and Silvius, A.J.G. (2009). Towards a Framework of Cooperation Issues in Base of the Pyramid Projects, paper presented at the Conference of the International Federation for Information Processing (IFIP) Working Group 9.4 Social Implications of Computers in Developing Countries, Dubai.

Silvius, A.J.G. (2009). Alignment and strategy; the chicken or the egg?, paper presented at the 2nd International Conference on Information Resources Management (Conf-IRM), Al-Ain.

Silvius, A.J.G. (2009). Business and IT Alignment: What We Know and What We Don't Know, paper presented at the International Conference on Information Management and Engineering (ICIME), Kuala Lumpur.

Silvius, A.J.G., De Haes, S. and Van Grembergen, W. (2009). Exploration of Cultural Influences on Business and IT Alignment, paper presented at the 42nd Annual Hawaii International Conference on System Sciences (HICSS), Waikoloa (HI).

Silvius, A.J.G. and Batenburg, R. (2009). Future development of Project Management competences, paper presented at the 42nd Annual Hawaii International Conference on System Sciences (HICSS) Waikoloa (HI).

Silvius, A.J.G. (2008). The Business Case in IT projects; New insights into an old problem, paper presented at the 22nd World Congress of the International Project Management Association (IPMA), Roma.

Silvius, A.J.G. (2008). Project Management 2027; The Future of Project Management, paper presented at the 22nd World Congress of the International Project Management Association (IPMA), Roma.

Silvius, A.J.G. (2008). Exploring Differences in the Perception of Business & IT Alignment, paper presented at the 9th Conference of the International Business Information Management Association (IBIMA), Information Management in Modern Organizations; Trends & Challenges, Proceedings edited by:K.S. Soliman, Marrakech.

Silvius, A.J.G. (2007). Aligning IT Strategy to Business Strategy in a Multi-Business Company, 13th America's Conference on Information Systems (AMCIS), Denver (CO).

Silvius, A.J.G. (2008). The Business Value of IT; Seeing the Forest through the Trees, European and Mediterranean Conference on Information Systems (EMCIS), Dubai.

Silvius, A.J.G. (2008). Cultural Aspects of Business & IT Alignment, paper presented at the 3rd SIKS/BENAIS Conference on Enterprise Information Systems (EIS 2008), Tilburg.

Silvius, A.J.G. (2007). Business & IT Alignment in a multinational company; issues and approaches, paper presented at the 8th Global Information Technology Management Association conference (GITMA), Napels.

Silvius, A.J.G. (2007). Business & IT Alignment in Theory and Practice, paper presented at the 40th Annual Hawaii International Conference on System Sciences (HICSS), Waikoloa (HI).

Silvius, A.J.G. (2007). Business & IT Alignment in multi business companies, paper presented at the European Conference on Information Management and Evaluation (ECIME), Montpellier.

Silvius, A.J.G. (2006). The Utrecht Academy of Entrepreneurs: A new way of training Entrepreneurs, For Entrepreneurs, By Entrepreneurs, paper presented at the Internationalizing Entrepreneurship Education and Training (IntEnt) Conference, Sao Paulo.

Silvius, A.J.G. (2006). Assessing Business & IT Alignment maturity: Applying Luftman's model in practice, paper presented at the 2nd International Conference on Information Management & Business (IMB), Proceedings edited by Bhuvan Unhelkar, Yi-Chen Lan. pp. 175-179, Sydney.

Silvius, A.J.G. (2005). Business & IT Alignment in theory and practice, paper presented at the 1st International Conference on Information Management & Business (IMB), Taipei.

Silvius, A.J.G. (2004). RoI doesn't matter: Insights in the true business value of IT, paper presented at the European Conference on Information Technology Evaluation (ECITE), Academic Conferences, Amsterdam.

Silvius, A.J.G. (2004). Small Business Management Consulting: Talking to the Deaf?, paper presented at the International Council for Small Business (ICSB) annual conference, Johannesburg.

Silvius, A.J.G. (2003). Improving Small Business productivity with IT; Fortune or fake?, paper presented at the International Small Business Conference (ISBC), Singapore.

Silvius, A.J.G. (2003). Putting knowledge to work; Experiences with integrating real-life assignments in academic curricula, paper presented at the World Conference on Cooperative Education (WACE), Rotterdam.

Smit, T. J. and Silvius, A.J.G. (2001). Dynamic Investment Planning; Valuing intuition in the new economy, paper presented at the European Conference on Software Measurement and ICT Control (Fesma-Dasma), Heidelberg.

SUMMARY

Already for more than two decades, the necessity and desirability of aligning business needs and information technology (IT) capabilities is considered to be one of the key issues in IT management. IT is changing the way companies organize their business processes, communicate with customers and deliver their services, and several studies show that organizations that successfully align their business strategy with their IT strategy outperform those that do not. However, several studies report quite low scores when executives are asked if they have succeeded in achieving alignment and 'IT and business alignment' consistently ranks as one of the top concerns for senior management.

After many years of research on business and IT alignment (BIA), the question "Why haven't we mastered alignment?" remains valid today, both from an academic and from a practical perspective. It is this question that motivates the research of this dissertation.

Despite the fact that BIA is well studied, there is no consensus on the precise definition of BIA. Based upon an analysis of definitions of BIA found in literature, we constructed a broad definition of BIA: Business and IT alignment is the degree to which IT applications, infrastructure and organization enable and shape the business strategy and processes, as well as the process to realize this. In this definition, BIA can express both a state or measurable construct, the degree of alignment, and a process, the activities or methodology to reach a certain state of alignment. The question whether IT aligns to business or the other way around is answered as 'enable and shape'.

The discussion on the definition of alignment also reflects in the different models and frameworks that conceptualize BIA. Many studies on alignment refer to Henderson and Venkatraman's Strategic Alignment Model as the conceptual starting point of alignment. However, the Strategic Alignment Model fails to provide a measurable construct or instrument on how to achieve alignment. Empirical studies on alignment therefore mostly apply models that should be considered extensions of the Strategic Alignment Model. After considering the most influential models of BIA, we adopted Luftman's SAM model as the operationalization of BIA in our studies.

Based upon our analysis of the reasons why alignment continues to be a challenge for many organizations, we concluded that organizational or situational circumstances influence alignment, and that these influences are not adequately addressed in the available models and frameworks of BIA. Several researches therefore call upon the academic community to take a contingency perspective in further studies on alignment. It is for this reason that we take on a contingency perspective on BIA in the studies in this dissertation. In order to explore and understand the influence of situational factors, the main research question (MRQ) of this dissertation is formulated as follows:

MRQ: ***How do situational factors influence business and IT alignment maturity?***

This MRQ is broken down into three research questions (RQs) that also connect the contingency perspective on alignment to the valuation of IT in organizations. The three RQ's are formulated as:

RQ A: ***How does business and IT alignment effect the valuation of IT in organizations?***

RQ B: ***How do variables of business and IT alignment differ in their contribution to an organization's business and IT alignment maturity?***

RQ C: ***How do specific situational factors influence an organization's business and IT alignment maturity?***

These research questions were addressed in the studies reported in chapters 2 to 9 of this dissertation. In these studies, the RQs were answered as follows.

RQ A: ***How does business and IT alignment effect the valuation of IT in organizations?***

> In chapters 2 and 3 we provided an overview of IT valuation methods. From this overview it was concluded that different evaluation and valuation methods reveal different aspects of value and that the value of an IT investment is related to the alignment of business and IT in the organization. Given the variety of characteristics of IT investments and assets, there is a point to be made for aligning the criteria and methods of IT valuation, and the relative weight of these criteria, with the specific characteristics and impacts of the IT investments and assets.

RQ B: ***How do variables of business and IT alignment differ in their contribution to an organization's business and IT alignment maturity?***

> This question was addressed in chapters 4 and 5. The studies aimed to indentify the SAM model variable(s) that contribute most to alignment within an organization. Chapter 4 revealed that business and IT professionals do not experience the contributions of the different variables equally and assign different contribution values to the variables. criteria. The largest contribution to alignment was assigned to the variable Communication, followed (at some distance) by the variables Partnership and Skills. The study reported in chapter 5 presented an empirical study that analyzed the scoring pattern of organizations on the six SAM criteria. This study concluded that the scoring patterns of high and average mature organizations differ substantially and significantly from that of low mature companies. The most striking difference that appeared was that high mature organizations excel on Partnership maturity, whereas low mature organizations 'underperform' on this criterion and 'excel' on Skills maturity. On five of the six SAM criteria, the relative difference in maturity alignment between the high mature organizations and the low mature organizations proved to be significant. The conclusions of the two studies of chapters 4 and 5, both show that the SAM model variables do not equally contribute to alignment.

RQ C: ***How do specific situational factors influence an organization's business and IT alignment maturity?***

> This research question was explored in four coordinate studies (chapters 6 to 9), that each highlighted how a specific situational factor related to alignment. The situational factors we studied were IT outsourcing, strategic orientation, organizational culture and national culture on alignment. Based on these coordinate studies we can now conclude that all of the situational factors studied, showed relationships with BIA maturity. Some factors were studied on an overall level, and for some a more detailed influence on the variables of alignment was analyzed. The situational influences found in our studies, appear to influence the variable Governance most, followed at some distance by Skills maturity and Scope & Architecture. The variables Communications, Partnership and Value measurement appear least frequent in the influences found.

Reflecting on the conclusions of the studies of this research, we can first of all observe that our main research question: ***How do situational factors influence business and IT alignment maturity?*** is a very relevant and justified one: Business and IT alignment is a situational phenomenon. Existing conceptualizations, models and studies provide guiding insights for developing or achieving alignment in specific organizations, but they do not provide a prescriptive recipe for success.

The studies reported in chapter 6 to 9, showed that different situational factors do influence an organization's maturity, and thereby its capability, to align business and IT. In some studies, the

situational factor showed an overall effect on BIA maturity, however, how this influence exactly effected alignment, required a detailed analysis of relationships between the aspects of the situational factor considered, and the variables of BIA maturity. It appeared that different situational factors have different aspects and antecedents, that influence different variables of alignment, thereby creating a complex 'web' of influences and effects.

The studies, however, also showed that not all variables of alignment maturity are effected equally by the situational factors. An overall observation that can be made from the influences that were found in our studies, is that the situational factors seem to effect the 'organizational' variables of alignment maturity most. Organizational variables typically include Governance, Skills and Value measurement. Also the variable Communications partly includes organizable aspects such as structures and processes that liaise between business and IT.

A more intangible or 'softer' variable, most prominently Partnership, but also the 'shared understanding' aspect of the variable Communications, seems to be less directly influenced by situational factors. These 'soft' variables refer to understandings, beliefs and/or visions regarding the role of IT in business, that are largely individual, and appear in the demonstrated leadership with regards to the relationship between business and IT. The observation that the 'softer' variables of alignment maturity seem to be less prone to situational influences, brings us to our second observation: business – IT partnership is key to alignment, in all situational settings.

In addition to the situational influences on alignment that appeared in our studies, a recurring insight was the decisive influence of the leadership, vision and partnership of (senior) business management on alignment. For example, the study reported in chapter 6 showed that the motivation for IT outsourcing has a strong influence on the development of the ITO relationship and that a more developed relationship also corresponds with a higher level of BIA maturity. And in chapter 7 we concluded that a high alignment capability paired with an innovative IT strategy. This innovative IT strategy was defined as a strategy in which IT is considered part of the business proposition of the organization. The study in chapter 8 showed that "specifically three elements of organizational culture need to be fairly strong in order to achieve BIA maturity and that is strong leadership, a good strategy, and coordination". In line with this, the study reported in chapter 4 found that the five sub-variables that are perceived to contribute most to alignment are: The level in which IT is seen as added value by business, The level of understanding of the business by IT, The level of understanding of IT by the business, The level of inter organizational communication between IT and business and The level in which the communication between business and IT is not only limited to IT developments, but also concerns the developments within the business and her environment. Another strong indication for this overall observation was found in the study reported in chapter 5, that concluded that "high mature organizations excel on Partnership maturity" and "low mature organizations 'underperform' on this criterion".

Partnership is probably the most intangible 'pillar' of alignment, as it covers the (shared) visions, perceptions and goals of business and IT executives. Earlier studies confirm that success in business collaboration relies on sharing and exchanging of tacit resources, such as knowledge and life-long personal expertise of employees, that is difficult to formalize, communicate, transfer and imitate, and as such are of intrinsic strategic value to the organization. Partnership touches upon the traditional discussion in alignment research: whether alignment is one-way, Real business – IT partnership requires a truly two-way process of alignment, and an important condition for this is a shared understanding of the role that IT can play in business.

SAMENVATTING

Het afstemmen van de inzet van informatietechnologie (IT) op de strategie en bedrijfsprocessen van een organisatie, wordt al enkele decennia beschouwd als één van de belangrijkste vraagstukken in IT management. Bedrijven die IT succesvol afstemmen op hun organisatie presteren beter dan bedrijven die dit minder goed doen. Voor veel bedrijven is de afstemming tussen 'business' en IT, business and IT alignment (BIA), echter een aanhoudende zorg. Na vele jaren van onderzoek naar BIA kan, zowel vanuit een academisch als vanuit een praktisch perspectief, de vraag gesteld worden waarom BIA nog niet wordt beheerst. Deze vraag vormt de achtergrond van het onderzoek in dit proefschrift.

Ondanks de vele studies naar BIA, is er geen consensus over de exacte definitie ervan. Op basis van een analyse van verschillende in de literatuur gevonden definities, formuleerden wij de volgende definitie: Business en IT alignment is de mate waarin IT applicaties, infrastructuur en organisatie, de bedrijfsstrategie en –processen mogelijk maken, dan wel vormgeven, alsmede het proces om dit te realiseren. In deze definitie kan BIA zowel een staat of meetbaar construct uitdrukken, de mate van afstemming, als een proces, de activiteiten of methodologie om tot een bepaalde staat van afstemming te komen.

Veel studies over BIA nemen het Strategic Alignment Model van Henderson en Venkatraman als conceptueel uitgangspunt. Veel empirische studies maken gebruik van extensies van dit Strategic Alignment Model, die BIA als een meetbaar construct operationaliseren. Voor onze studies maken we gebruik van het Strategic Alignment Maturity (SAM) model van Luftman, dat wordt gezien als de meest invloedrijke operationalisering van het model van Henderson en Venkatraman.

Op basis van een analyse van de redenen waarom BIA een uitdaging blijft voor veel organisaties, concludeerden wij dat de situationele omstandigheden en organisatorische context invloed hebben op BIA, en dat deze invloeden voldoende aan bod komen in de beschikbare modellen en raamwerken van BIA. Verschillende onderzoeken bevelen daarom aan een contingentie perspectief te introduceren in het BIA onderzoek. Om de gesuggereerde invloed van situationele factoren te verkennen en te begrijpen, is de centrale onderzoeksvraag (MRQ) van dit proefschrift als volgt geformuleerd:

MRQ: Hoe beïnvloeden situationele factoren de volwassenheid van business and IT alignment?

Deze onderzoeksvraag is onderverdeeld in drie onderzoeksvragen (RQs):

RQ A: Hoe heeft business and IT alignment effect op de waardering van IT in organisaties?

De hoofdstukken 2 en 3 van dit proefschrift geven een overzicht van methoden om de toepassing in organisaties te waarderen. Uit dit overzicht kan worden geconcludeerd dat de verschillende evaluatie- en waarderingsmethoden, verschillende aspecten van waarde zichtbaar maken. Gezien de verscheidenheid en kenmerken van IT investeringen, dient de toepassing van deze methoden afgestemd te worden op de specifieke kenmerken en effecten van de desbetreffende IT investeringen.

RQ B: Hoe verschillen de variabelen van business and IT alignment in hun bijdrage aan de volwassenheid van BIA?

De hoofdstukken 4 en 5 van dit proefschrift rapporteren studies naar de bijdragen van de afzonderlijke SAM-model variabelen aan de volwassenheid van BIA. Uit hoofdstuk 4 blijkt dat business en IT professionals de grootste bijdrage toewijzen aan de variabele communicatie, gevolgd (op enige afstand) door de variabelen partnership en skills. De studie in hoofdstuk 5 concludeert dat de

scorepatronen van hoogvolwassen en gemiddeld volwassen organisaties wezenlijk en significant verschillen van die van laagvolwassen organisaties. Het meest opvallende verschil is dat hoogvolwassen organisaties excelleren op de variabele partnership, terwijl laagvolwassen organisaties relatief laag scoren op dit criterium en 'excelleren' op skills. Op vijf van de zes SAM model criteria, bleek het relatieve verschil in scorepatroon tussen de hoogvolwassen organisaties en laagvolwassen organisaties significant te zijn. De conclusies van deze twee studies laten zien dat de variabelen van het SAM model niet in gelijke mate bijdragen aan BIA.

RQ C: Hoe hebben specifieke situationele factoren invloed op de volwassenheid van business and IT alignment?

Deze onderzoeksvraag staat centraal in de hoofdstukken 6 tot 9, waarbij in ieder hoofdstuk de invloed van een specifieke situationele factor wordt onderzocht. De situationele factoren die in beschouwing genomen zijn, zijn IT outsourcing, de strategie van de organisatie, de organisatiecultuur en de nationale cultuur. Uit alle studies bleek een invloed van de situationele factor op de volwassenheid van BIA. De situationele factoren, lijken de variabelen governance, skills en scope & architecture het meest te beïnvloeden, en de variabelen communications, partnership en value meting het minst.

Op basis van de bevindingen van de studies in dit proefschrift, kunnen we in de eerste plaats concluderen dat onze centrale onderzoeksvraag, Hoe beïnvloeden situationele factoren de volwassenheid van business and IT alignment?, een zeer relevant en gerechtvaardigde vraag is. Business and IT alignment is een situationeel fenomeen. Bestaande modellen en studies bieden inzichten voor het ontwikkelen, of het bereiken, van BIA, maar ze bieden geen recept voor succes.

De studies in dit proefschrift toonden aan dat verschillende situationele factoren de volwassenheid van BIA binnen een organisatie beïnvloeden, echter hoe deze beïnvloeding precies plaatsvindt, vereist een gedetailleerde analyse. De invloed van de situationele factoren op de variabelen van BIA volwassenheid vormden een complex web van invloeden en effecten.

De studies toonden echter ook aan dat niet alle variabelen beïnvloedt worden door de situationele factoren. De situationele factoren lijken vooral effect te hebben op ‘organisatorische ' variabelen zoals governance, skills en value.. Ook de variabele communicatie omvat organisatorische aspecten zoals structuren en processen voor de afstemming van business en IT. Een meer ongrijpbare, of 'zachtere', variabele als partnership, maar ook het 'gedeeld begrip' aspect van de variabele communications, lijkt minder vatbaar voor de invloed van situationele factoren. Deze constatering brengt ons tot de tweede conclusie: business - IT partnerschap is de sleutel tot BIA.

CURRICULUM VITAE

Gilbert Silvius (1963) is professor at HU University of Applied Sciences Utrecht in the Netherlands and principal consultant at Van Aetsveld, project and change management. He holds a BA degree from the Dutch Royal Military Academy and masters' degrees from Erasmus University Rotterdam and the Catholic University Leuven in Belgium.

Gilbert worked for over 15 years as a consultant and project manager in the field of business and IT, before joining HU University of Applied Sciences Utrecht in December 2002. At HU his work focuses on the fields of information management and project management. He is program director of the Master of Informatics and Master of Project Management programs.

Gilbert is a member of the AIS, IIMA, IPMA and PMI. He has published over 70 peer reviewed papers at conferences and in journals.

Information technology (IT) is changing the way companies organize their business processes, communicate with customers and deliver their services. The rise of internet as a unified connection platform, allowed companies to open up new markets, develop new services or provide new means of developing customer loyalty, thereby innovating the business of an organization.

An important condition for benefitting from this innovative potential, is the alignment between an organization's business strategy and processes, and its IT capabilities. Several studies, however, reported quite low success rates of business and IT alignment (BIA) in organizations. The fact that alignment remains one of the top concerns for IT and business executives, raises the questions Why haven't organizations mastered alignment? and How can organizations master alignment?

This study considers business and IT alignment as a situational phenomenon. The findings show that the situational factors have an effect on alignment. However, not all variables of alignment maturity are effected equally. Organizational variables, such as governance, skills and value measurement are most prone to contextual influences, whereas more intangible or 'softer' variables, such as partnership, are less influenced.

Gilbert Silvius (1963) is professor at HU University of Applied Sciences Utrecht and principal consultant at Van Aetsveld, project and change management. His research interest includes the alignment of business and IT and the integration of the concepts of sustainability in projects and project management.
With this dissertation, he completes his PhD at Utrecht University.

Universiteit Utrecht