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ABSTRACT

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.

Keywords

Organizational culture, Business and IT alignment, alignment maturity, cultural influences

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.

After many years of research into Business and IT Alignment (BIA), Chan and Reich (2007) 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, 2007; Silvius, 2007). 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.

LITERATURE REVIEW

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 2). 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.

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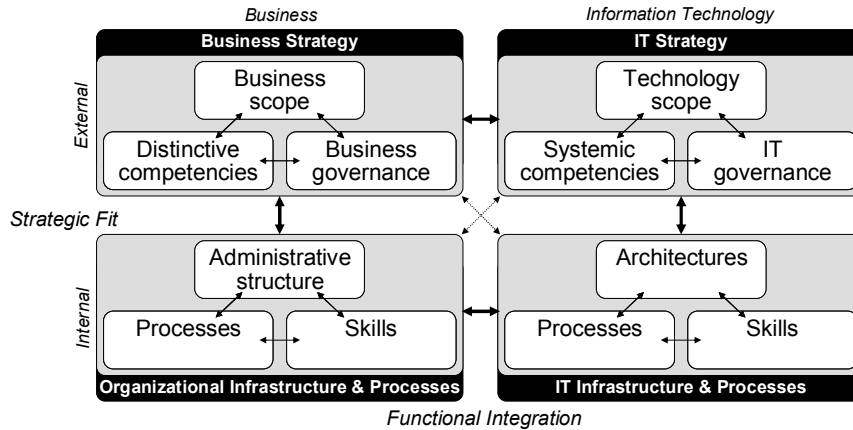
Figure 2. The 'Strategic Alignment Model' (Henderson and Venkatraman, 1993).

Table 2. BIA maturity variables.

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?

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, 2007; 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.

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 & 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 & 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 3.
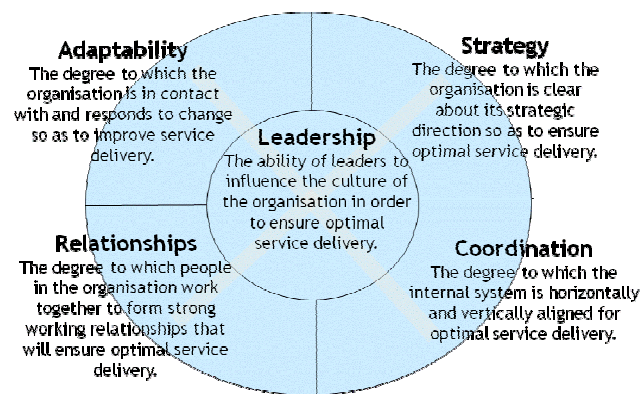

Figure 3. The core elements of the X Model (Smit et al., 2008)

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.

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.

**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 1 provides an overview of relevant literature on this topic.

Table 1. Studies that suggest a relationship between organizational culture and BIA.

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.
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.

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 4. The literature does give some indication of relationships between some of these variables that could be expected.
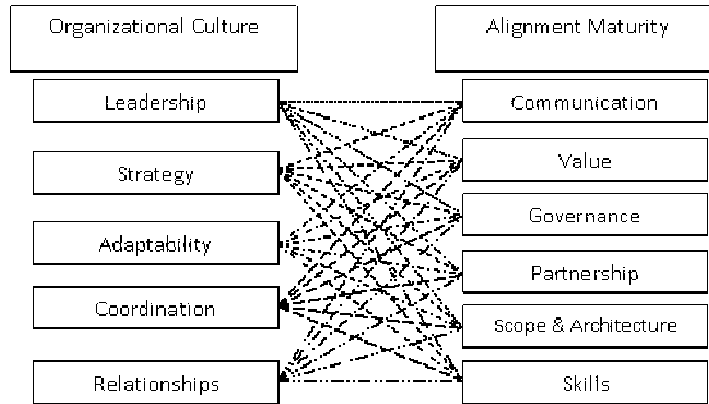
Figure 4. Specified conceptual model of the study

Adaptability

Adaptability is defined as the ability of the organization to understand and respond to the needs of its clients (Kotter & 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, Van der Zee et al. (1999) argues 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 3.

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

		BIA maturity					
		Communication	Value	Governance	Partnership	Scope and Architecture	Skills
Organizational culture	Adaptability	*likely*				*potential*	*likely*
	Strategy			*likely*	*likely*		
	Relationships	*likely*			*likely*		*likely*
	Coordination	*likely*		*likely*			
	Leadership			*likely*	*likely*		*likely*

As can be seen in Table 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 3 therefore essentially represent the hypotheses of the study. The next section describes the methodology for testing these expected relations.

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.

Table 4. Descriptive statistics of the respondents.

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

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.

Results organizational culture

Figure 5 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.
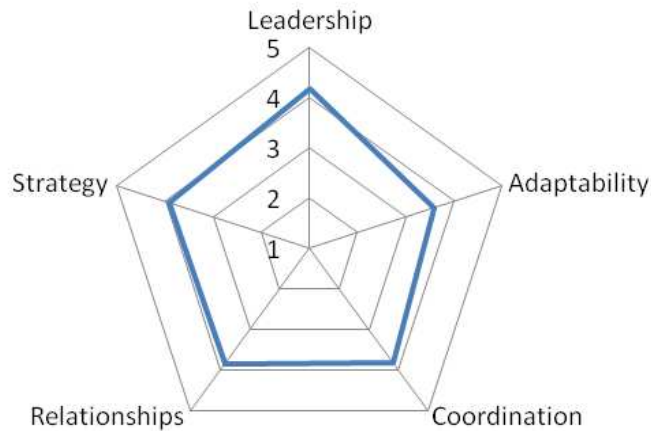
Figure 5. Assessment of CB's organizational culture.

As can be seen in Figure 5 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.

Results alignment maturity

Figure 6 summarizes the results of the assessment of the organizational culture.
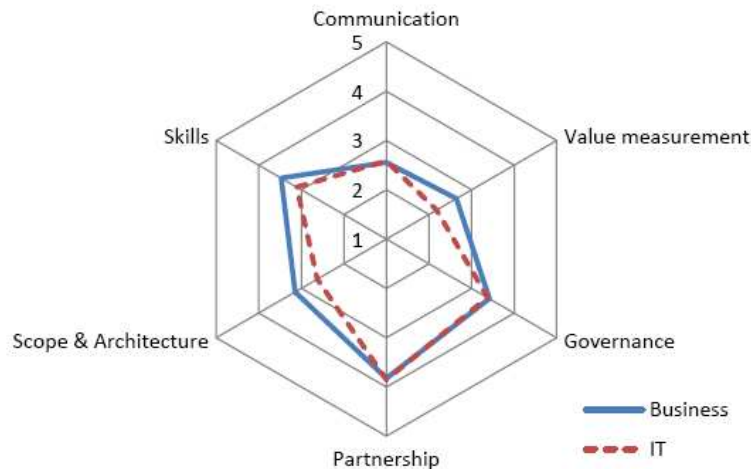
Figure 6. Assessment of CB's alignment maturity.
(business respondents and IT respondents separated)

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.

The relationship between organizational culture and BIA alignment maturity

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

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

		BIA maturity					
		Communication	Value	Governance	Partnership	Scope and Architecture	Skills
Organizational 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).

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.

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.

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