FROM SOCIETAL TO ORGANISATIONAL CULTURE: THE IMPACT ON BUSINESS-IT ALIGNMENT

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ABSTRACT

Business-IT alignment (BITA) has clearly become more important over the last decade. However, considerable difficulties remain when attempting to achieve a mature level of BITA. Therefore, research efforts which have resulted in a number of theoretical models have been able to help in devising and applying supportive tools for assessing different components of BITA. However, most of these efforts have either been produced in Anglo-Saxon countries or have been based on specific experiences in those countries. Consequently, they have tended to ignore a number of factors which differ in nature due to variations in cultural contexts. However, organisational culture has been given little consideration. Societal and organisational cultural aspects of BITA are particularly important because the majority of BITA models tend to focus more on the efficiency and effectiveness of BITA components rather than on trying to create ways in which how BITA can be achieved or maintained in different contexts. Therefore, the purpose of this thesis is to investigate the impact of societal and organisational culture on achieving BITA and influencing its maturity. The main result is an extended BITA model developed originally by Luftman, known as; Luftman’s Strategic Alignment Maturity Model (SAM), which is influenced by the organisational culture perspective. The research method and process advocated by Peffers et al. (2007) is used in the thesis to design the extended-SAM, consisting of six activities. The first of these activities involves identifying specific problems. This is achieved by an extensive literature survey of theories related to BITA, an explorative study of the impact of organisational culture on BITA and a classification of the general limitations of BITA. The second activity concerns the requirement for definitions of the designed artifact. The third activity is then specified in terms of designing the artifact; i.e. an extended-SAM. The design is based on constructed hypotheses of the potential impact of organisational culture elements (based on Smit et al.’s model (2008) on BITA attributes (based on SAM), and followed by an empirical study of 6 multinational organisations, for testing the hypotheses. Following that, in the fourth activity, various processes for extending SAM are demonstrated in different seminars within the IT management group at DSV, in conference papers and in different seminars of the Swedish research School of Management and Information Technology (MIT) (Forskarskolan Management och IT. In the fifth activity, the extended-SAM model is evaluated in 5 multinational organisations to test its practicality and utility. In the last activity, a journal paper (Paper III in the thesis) is presented to summarise all the processes. The communication is also carried out through pre-licentiate and the licentiate seminars. The extended-SAM shows in the result of the thesis that organisational culture is a clear factor that should be considered while assessing and studying BITA maturity. In addition, by considering organisational culture, assessing BITA is clearly shown as being more accurate and as reflecting a more detailed picture of the organisation’s BITA.

Keywords: Business-IT alignment, Organisational culture, Strategic alignment maturity model, Design science research.
The whole process of my study and work is truly the blessing of Allah (Subh’anahu Wataa’ala) trusting me with these responsibilities and supporting me with all my needs to fulfil this route as a further step of my life. All recognitions and gratitude are to Almighty Allah for giving me life, power and determination in this phase.

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Stockholm, November 2012
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To our grandparents, who laboured and dreamed for us.
To grandchildren the world over, for whom we labour and dream.

. . . Stockholm Environment Institute
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<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>BITA</td>
<td>Business-IT Alignment</td>
</tr>
<tr>
<td>IS</td>
<td>Information Systems</td>
</tr>
<tr>
<td>IT</td>
<td>Information Technology</td>
</tr>
<tr>
<td>MIT (English)</td>
<td>Management and Information Technology</td>
</tr>
<tr>
<td>MIT (Swedish)</td>
<td>Forskarskolan Management och IT</td>
</tr>
<tr>
<td>Project GLOBE</td>
<td>Global Leadership and Organisational Behaviour Effectiveness</td>
</tr>
<tr>
<td>SAM</td>
<td>Luftman Strategic Alignment Maturity Model</td>
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<tr>
<td>X-Model</td>
<td>Organisational Culture Model of Smit et al. (2008)</td>
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1.0 INTRODUCTION

This chapter outlines the background to the whole thesis. It begins by adopting a broader scope and progresses towards adopting a narrower focus. Firstly, the background to the research is presented as representing the root of the thesis in the information system domain. Following that, the research problem is described by starting from the general problem field as a culture and business-IT alignment and then focusing on the organisational culture as a specific problem area. The research questions are then presented, followed by a description of the research approach for explaining the flow of studying and answering the research questions. At the end of this chapter, the publications related to this thesis are mentioned and the structure of following chapters in the thesis is also presented.

1.1 Research Background

Information Technology (IT) has become an indispensable part of organisations at every business level, resulting in a transformation in the ways organisations operate. The role of IT has shifted from administrative support to an integrated part of business and has become essential for supporting business strategies (Sim and Koh, 2001). Organisations can only succeed when they leverage IT to provide strategic value to all parts of their business. The importance of IT in companies has spawned research on effective and efficient deployment of IT to gain strategic advantages.

Many organisations still fail to gain value and competitive advantage from huge IT investments. This is partially attributable to lack of business-IT alignment (Luftman, 2004). Henderson and Venkatraman (1993) argue that the effective use of IT to achieve business goals and to gain competitive advantage requires the alignment of the business and IT strategies of organisations. Therefore, both practitioners and researchers have recognized the importance of BITA.

Over the last ten years, the relationship between business and IT has been highlighted as the top success factor for implementing information systems in organisations (Biehl, 2007). In practice, a number of studies have shown that BITA has gained popularity and more importance for organisations around the world (Reich and Benbasat, 2000). From the perspective of top management, BITA has been the top management concern in the annual survey of the Society for Information Management (SIM) from 2003-2009, especially from 2007 to 2009 (Luftman and Ben-Zvi, 2010).

Researchers have emphasised the importance of BITA for several reasons. One of the primary reasons has been identified as the facilitation of developing and implementing different IT applications for improving business processes. This can only be done by developing cohesive organisation and IT strategies (Luftman, 2004). Furthermore, a business-IT partnership is the only way to enable business transformation (Bassellier and Benbasat, 2004).

‘Why alignment is important’ is not the crucial question here. In fact ‘how it can be achieved and matured” is the real concern of business executives today (Choe, 2003). Different efforts have then been introduced for proposing a number of theoretical models that can be applied as supportive tools for assessing and modelling BITA. These models focus on different business areas and components. (Gutierrez et al., 2008; El-Mekawy, 2009). One important finding in the modelling studies is that most of these efforts focus on how BITA components are effective and efficient in organisations and on identifying the level on they are implemented.
However, there has been less focus on how they can be achieved and applied (Luftman, 2009). Therefore, there is an apparent need to study different factors that directly and indirectly impact on business-IT alignment (Chan and Reich, 2007b). These factors are discussed in the following section. In this thesis, BITA components are referred to as different parts (attributes or criteria) of the alignment between business and IT domains that should be addressed in studying the relationships between business and IT domains.

1.2 Problem Formulation

1.2.1 General Problem Field (Culture as an Important Factor in BITA)

Given the fact that BITA focuses on the relationship between business and IT, the complexity of its nature is increased when considering different views of IT perception in organisations and how to utilize them in regard to business objectives and their achievement (Ciborra 1997, Henderson & Venkatraman 1999, Smaczny 2001). Also, different studies in various contexts have resulted in different interpretations of BITA (Chan and Reich, 2007b). The different factors and challenges that influence the achievement of BITA have, therefore, been addressed by different researchers

- From the earliest days of modelling BITA with Henderson and Venkatraman (1993), the first group of factors were defined as the knowledge-related factors. This group includes the factors that are related to the lack of knowledge on BITA benefit or how they can be applied, achieved and matured. This type of factor is identified in studies such as Baets (1992); Henderson & Venkatraman (1993); Baets (1996); Reich and Benbasat (2000); Campbell (2005); and Brown and Motjolopane (2005).

- Another type of factors in literature has been related to the locus-of-power-and IT-status-related factors. These factors are related to how managers take decisions on BITA according to their locus and their locus of power and control (authority for making decision). These factors are identified in studies like Sabherwal et al. (2001); Farrell (2003); Campbell (2005).

- The third type of factors in literature was found to be related to the organisational-change-related factors and include all the factors that are related to different changes in organisations under different conditions. Studies like Henderson and Venkatraman (1993), Van Der Zee and De Jong (1999), Palmer & Markus (2000) and Luftman, (2004) emphasized the type of factors by referring to BITA as a continuing process of organisational change.

As Chan & Reich (2007) explain, the first group of factors (knowledge-related) and the third group (organisational-change-related) have been examined in a large number of studies and researches that have mostly resulted in different methods (Kearns and Lederer, 2000; Chan, 2001), frameworks (Chan, 2002; Bergeron et al., 2001) or even guidelines (Campbell, 2005; Tallon, 2003) for how to deal with these challenges or develop knowledge of how to consider them. The second group has, however, been less studied by researchers.

One of the central factors in the second group is the status of IT within a business unit or an organisation. This factor is addressed by different researchers (e.g. Kaarst-Brown and Robey, 1999; Chan and Reich, 2007b) with regard to cultural and social assumptions about IT which
have not yet received sufficient attention or been studied in depth. Also, Chan and Reich (2007b) argue that although managers know cognitively what is needed to achieve business-IT alignment (i.e. the first group of factors (knowledge-related factors)) in organisational best conditions (i.e. related to the third group of factors (organisational-change-related factors)), the alignment is not always practically feasible. Therefore, cultural and social factors from the second group need to be considered.

Although, a few studies (e.g. Reich and Benbasat, 2000) have addressed the social aspects and cultural dimensions as important factors of how BITA components can be achieved, they focus more on the antecedents along with the current business practices that directly influence alignment. Also, in terms of developing a professional perspective, organisations are increasingly depending on IT for facilitating communications and business processes (Pongatichat and Johnston, 2008). As a result, culture remains one of several factors whose impact on BITA has yet not been studied in great depth (Keen, 1996; Boynton, 1996; Silvius, 2009).

Following the above mentioned arguments, with regard to globalization trends, organisations are increasingly considering information as a ubiquitous asset with a dynamic nature (Campbell et al., 2005). In such an environment, IT is perceived as one of the most important resources for processing knowledge for businesses and organisations. Exploiting IT as an enabler or driver of business transformations therefore requires a careful consideration of the social and cultural aspects of organisations (Ross, 2001; Westrup et al., 2003).

While looking at BITA studies, it is important to consider how the modeling efforts of BITA are developed. A large number of theoretical models exist that can be applied as supportive tools for assessing different components of BITA. Researchers like Avison et al. (2004), Gutierrez et al., (2008), El-Mekawy et al. (2009) and Arab Sorkhi (2010) collected these models in a comprehensive survey and conducted structured evaluations on them. Most of these models were initially developed in the Anglo-Saxon countries or were based on their experiences and business practices. The countries are the five core English-speaking countries (Australia, Canada, New Zealand, the United Kingdom, and the United States) that have a common or similar socio-political heritage (Bennett, 2004). The studies of BITA models show two important results:

a) Varied challenges are faced in different countries when applying BITA models. One of the most important challenges is the cultural aspect which refers to differences in objectives, norms, incentives, perceptions, and professionals’ knowledge of people that are responsible for assessing and achieving BITA (Silvius et al., 2010).

b) Most BITA models focus more on the efficiency and effectiveness of BITA components rather than ways in which BITA can be achieved or maintained in different contexts. Efficiency and effectiveness are required here as the models developed for bringing the attention of practitioners and decision makers to different components of BITA for the purposes of assessment. From one perspective, however, the models do not depict the complexity between BITA components, or identify the reasoning behind each separate component (Reich and Benbasat, 2000; Luftman, 2009). Also, studying culture is found to be an important key player in revealing the complexity of modelling BITA (Maes et al., 2000).
Following these arguments, and considering the scientific contribution being made here, the focus of the thesis is identified in focus-of-power- and IT-status-related factors, specifically related to the culture impact of how business and IT are aligned.

### 1.2.2 Organisational Culture as a Specific Problem Area

Using the general problem field of culture as an overlooked factor in the study of BITA, this section tries to narrow down the scope of the study in order to find a specific problem to be researched with regard to the impact of culture on BITA. Therefore, a literature study was carried to examine what has been researched in the relationship between culture and business-IT alignment.

The relationship between culture and BITA has been studied for more than a decade. The studies can be summarized as follows:

a) Few studies (e.g. Straub, 1994; Livonen et al., 1998; Davidson, 1996; Sabherwal and Chan, 2001) have their focus on national and societal cultural insights on IT management in organisations. These studies focus on how the cultural characteristics impact on the practice of IT in managing for example business processes. In general, they find that the use of IT varies in different contexts, not only because of tangible conditions or the level of development, but also because of cultural aspects.

b) Other studies (e.g. Leidner et al., 1999; Hofstede, 2000; Chan, 2001; Chan and Reich, 2007b) place a focus on the national culture impact on organisations’ perceptions of IT value. These studies examine how cultural differences may influence the perception of management and other employees, especially the decision makers, towards utilizing IT in achieving competitive advantages for their organisations. They found significant differences, predicted by national culture’s profiles and characteristics of business people, in accepting, involving and utilizing information technology (IT) and information systems (IS) in transforming and developing their organisations.

c) The study of national and the effect of societal culture on the maturity of BITA has been found in a few studies (e.g. Boynton, 1996; Silvius, 2008; Silvius et al., 2009). These studies place their focus on how the different cultural profiles of nations and societies may have an impact on business-IT alignment. These studies show that the relationships between business and IT domains in organisations can be anticipated differently according to the profiles of national culture. Also, cultural dimension are shown to have a higher impact on BITA variables that have more human interaction.

d) An extended discussion on the potential relationships between organisational culture and BITA is found in Silvius et al. (2010). This paper is the only paper found to focus on the impact of organisational culture elements and their relationships with BITA. It shows that specific organisational culture variables (based on a recent and comprehensive organisational culture model) in organisations have a clear impact on different variables of BITA. The study is introduced in a form of extended discussion based on a literature review to identify the theoretical relationships between BITA variables and organisational culture variables without going deeply into the causes of the influence by using empirical data.

The above mentioned studies of the cultural impact on BITA show clear limitations in their outcomes. Most of them have at least one of the following limitations:

i) They focus separately on business or IT performance without looking at the relationships between the two domains.
ii) They lack the focus needed for measuring BITA components. ‘BITA components’ here refers to the various attributes or criteria that define the relationships between different aspects of business and IT domains.

iii) The use of Hofstede’s model (Hofstede, 1980) for national culture and its extensions for societal culture. This model, was first developed in 1980 and included four dimensions of a culture; individualism, masculinity, power distance, and uncertainty avoidance. One fifth dimension was added in 1984 by Hofstede and Bond (1984); i.e. long-term orientation. Although the model is one of the most frequently and widely used, it has been criticized by several researchers and practitioners as it is too old (i.e. different dimensions should be added) and it only stereotypes nations (i.e. several sub-cultural profile may exist into one main culture) without giving an accurate image of a specific culture (Ailon, 2008).

iv) The last study by Silvius et al. (2010) that is mentioned in study type (d) is the only study that focuses on the relationships between organisational culture and BITA. However, this study is found to have an abstract level without any deep analysis of BITA and organisational culture components. The study finds that the anticipated relationships between Luftman model’s (Luftman, 2000) include six criteria of BITA and the X-Model’s (Smit et al., 2008) five elements of organisational culture. However, many other relationships between organisational culture and BITA can be found between the 38 attributes (categorized under the six criteria) of BITA presented by Luftman (2000) and the 27 sub-elements (categorized under the five main elements) of the organisational culture model presented by Smit et al. (2008).

Following the above mentioned discussion, the specific problem area that is being researched in this thesis is the impact of organisational culture on BITA. In contrast to the focus of existing studies, the thesis aims to study and analyse this impact at the level of attribution (or a detailed level) with a focus on how BITA can be achieved rather than on the efficiency and effectiveness of its components.

1.2.3 Research Questions

Following the above discussed motivation for the need for organisational-cultural-focused studies, the two research questions in the thesis are then highlighted as:

a) What are the relationships between dimensions of societal culture and the components of business-IT alignment?

b) How can organisational culture be considered in the assessment of business-IT alignment?

By answering these two questions, the study aims to develop an extended BITA model that helps organisations to clearly assess or measure their BITA through a consideration of human and social characteristics that forms their organisational culture.

1.3 The Research Approach

Following the research problems and the research questions, the purpose of the thesis is defined as contributing to the body of knowledge on business-IT alignment area. This is carried out by extending the BITA model to consider organisational culture as one of the most overlooked factors in BITA theories. To fulfil this purpose, two steps are proposed (Figure 1).
The first step is to explore how societal and cultural dimensions influence BITA and its components. This step stands as an exploratory study for the second step by exploring how societal profiles of an organisation influence the achievement and assessment of BITA although the business and IT strategies are to some limit similar. To fulfill this step, case study research is carried out on the Egyptian and the Swedish subsidiaries of the same federated US multinational organisation. Following the federated organisational structure and business model, the headquarter requires all subsidiaries in over 200 countries to follow a set of general business and IT strategies for applying their business strategies, offering their technical support, developing applications and extending business services. However, these strategies are locally implemented in all subsidiaries according to the local conditions, using available resources and capabilities and are influenced by societal and cultural characteristics.

To cope with the nature of the case organisation for studying surrounding factors’ impact on business, specific focus was placed on a socio-cultural model (Project GLOBE – Global Leadership and Organisational Behaviour Effectiveness). Following the explorative study in the first step, the second step aims to analyse the influence of organisational culture on BITA and its components. The first step serves here to provide indications of the more influenced BITA criteria. The second step is fulfilled by extending BITA theories (represented in SAM model) to consider organisational culture in the assessment and analyses of BITA components. First of all, different hypotheses are developed to highlight the potential impact of organisational and cultural elements (based on the X-model of Smit et al., 2008) on BITA attributes (based on SAM model of Luftman, 2000). Following that, an empirical study was carried out in 6 multinational organisations to test the constructed hypotheses in order to identify the limited BITA attributes based on organisational culture context. The organisations are deeply analyzed as having different organisational cultures but as acting in the same societal culture. The limited attributes are further classified for proposing an extended version to the SAM model.

1 The GLOBE Project is a multi-phase and multi-method research programme that has been designed to understand the relationship between culture and business. The project examined national culture to show the influence of organisational and societal culture on accepted leadership and working effectiveness by organisations.
1.4 Publications

This thesis is based on the following published articles, which are referred to in the text by their Roman numbers.

**Paper-I**

**Paper-II**

**Paper-III**

By following Step-1 and Step-2 in the research approach presented above (see Figure 1), the related publications in regard to the research approach can be illustrated (see Figure 2) as follows:

- The objective of Step-1 for exploring the impact of societal and cultural variables on BITA can be partially achieved in the published Paper I. Taking into account these indications, the second paper (Paper II) focuses more on the organisational culture. The second paper is based on the X-Model, which has been developed purely for examining organisational culture. Paper II investigates the three BITA criteria which are highlighted as the most influenced ones by cultural dimensions in Paper I. It can thus be argued that Paper I and Paper II together contribute towards answering the research question (a).

- The objective of Step-2 for extending the BITA model based on the influences of organisational culture is achieved firstly by the contribution of Paper II in splitting the BITA attributes of the three criteria studied. Additionally, Paper III adds a clear investigation of the limitations of BITA and provides an inclusive image of BITA components that are influenced by organisational culture elements. As a result, Paper III also provides a full extension to the BITA model with clear evaluation of its practicality and contributions. It is then argued that Paper II and Paper III together contribute towards answering research question (b).
Related Publications

The authors of the thesis have also been co-authors of the following papers related to the research areas discussed in the thesis.

**Paper-IV**

**Paper-V**

**Paper-VI**
1.5 Research Focus

It is important here to mention that the thesis has a specific focus on the unidirectional impact of organisational culture as regards business-IT alignment. The following two topics could be usefully studied in the future. However, they are currently out of the scope of this thesis:

- There are a number of claims about the influence of business-IT alignment on organisational culture. Different researchers (e.g. Kim and Mauborgne, 2005; Nickels and Janz, 2010) have published work on strategies for changing organisational culture. In this thesis, only the influence of organisational culture on BITA is studied rather than the opposite.

- The thesis does not aim at developing a new model for BITA or a unified BITA model. There are a large number of BITA models. However, the goal is to extend the existing models (represented in the SAM model) on how to be more accurate and representative of BITA in organisations by considering the social and human aspects represented in the organisational culture.

1.6 Relationship to the Research at DSV and MIT

The modern information technology (IT) has, over the past decade, become an increasingly common tool for command and control within and between organisations (Biehl, 2007). This development has resulted in increasingly large investments in hardware and software to use the new technology. Meanwhile, the demands on staff skills regarding IT issues become increasingly higher. Furthermore, IT issues become more strategic (Luftman, 2009). One sign of this is reported in the home page of the research School of Management and Information Technology (MIT) (Forskarskolan Management och IT) as both ABB and Handelsbanken few years ago promoted their IT managers to CEOs. If these two examples are part of a more general pattern is still too early to tell. It may be noted that there could be a further steps in the development. This also conforms to the mission of the Department of Computer and Systems Sciences (DSV) as one can expect that the demand for people with expertise in both management and IT will increase in organisations. Therefore will be a need for both teaching and research in this area to increase.

Linking the above mentioned missions of DSV and MIT brings the answer to a question on how IT is strategically related to business. As we have noticed Business-IT Alignment refers “to applying IT in an appropriate and timely way, in harmony with business strategies, goals
and needs” (Luftman, 2000, p.69). Therefore the ability of IT to support business objectives would be best achieved when business and IT are harmonized and aligned. This requires actions to be managed to ensure agreement between IT and the key business activities (Faltermayer, 1994). Misalignment between business and IT is attached and may lead to poor performance in business (Pongatichat and Johnston, 2008), increasing inefficiencies (Piplani and Fu, 2005) and hindrance of smooth running (Mitchell et al., 2003) of a business. It is therefore important to study the evaluation of alignment in order to assess and analyze its impact on business (Chan and Reich, 2007b).

### 1.7 Structure of the Thesis

The structure of the thesis follows the IMRAD style. This is a common format used for scientific and research papers and is currently considered to be the most relevant and useful way to structure scientific papers (Luciana and Mauricio, 2004; Szklo, 2006). In small scientific papers that do not need to split analysis from results or from discussion, IMRAD is an acronym standing for Introduction, Methods, Results And Discussion. However, another version of IMRAD has ‘Analysis’ instead of ‘And’ for bigger scientific papers, and this has been adopted for this thesis.

The introduction chapter describes the background to the thesis and the general research problem as well as the research question. It includes a summary of the thesis’ results. The second chapter presents the research method, which describes the scientific approach that is followed in the thesis with a clear and detailed explanation of the adopted design for the science research approach. The third chapter represents the theoretical background as an important literature review on different concepts for the business-IT alignment as well as for organisational culture. The fourth chapter represents in detail how the design science approach is undertaken to design the extended-SAM. Finally, the fifth chapter contains concluding remarks, including extra discussions of the results and the extended process of SAM.
2.0 RESEARCH METHOD

To achieve its aim and objectives, the research adopts a deductive approach as the main method for its organisation of the necessary stages. Following that, the thesis adopts an overall design science research methodology for managing its deliverable contribution, in terms of the extended BITA model. This chapter begins with an introduction to research approaches in the information systems discipline, followed by a section describing the research process explaining how the design research is performed in the study. The chapter ends with a section describing the methodological stages of the research, and presenting different parts of the thesis.

2.1 Information Systems Research Approach

The research in the information systems discipline embraces two different settings. These can be recognized as technological and non-technological settings. Consequently, these two settings draw on two different systems, computerized and human-organisations respectively. Also, most of the research in the information systems discipline is characterized into behavioural science and design science paradigms. Therefore, these paradigms and systems call for different research methods (Hevner et al., 2004).

Information systems in the behavioural science, on the one hand, are seen as an extension to social science. They aim at developing and verifying theories that can be used to explain or predict human and organisational behaviour (DeLone and McLean, 1992, 2003). They focus more on the design, implementation, use, analysis and management of information systems. Therefore, the roots of behavioural science are seen as being attached to natural science (Seddon, 1997). On the other hand, in the design science research approach, information systems are seen as technical tools. They aim to extending the capabilities of humans as well as organisations by developing novel and innovative artifacts (Simon, 1996). The roots of design science are seen as being more attached to engineering and the science of artificial. These roots seek for solving problems from defining ideas to final delivery of new products including all the intermediate processes such as guiding practices, comparing alternatives and testing for technical improvements (Denning, 1997; Tsichritzis, 1998).

As the main aim of the thesis is the development of an extended BITA model, and the thesis follows a design science research approach. The main purpose of design science is identified by March (1995) as creating technology-oriented artifacts that are related to human purposes for solving human problems or having outputs that answering questions related to the artifact’s value to users, its practicality and its improvement. According to March (1995), developing an artifact in design science embraces two main purposes. They are: a) building artifacts, which refers to the construction of the artifact and demonstrating that it can be constructed, and b) evaluating artifacts, which refers to the development of different measurement criteria and assessing the artifact performance against those criteria.

There are four types of artifacts that can be developed. March & Smith (1995) identified them as constructs, models, methods and instantiations. They are explained as follows:

- **Constructs**: these are defined as conceptual vocabulary and symbols that refer to a domain language. They are used for providing concepts of definitions and communications to be used for solving problems (Schön, 1983; March, 1995).
• **Models:** these are mainly built based on constructs for representing situations in the real world. They are mainly abstractions and representations of particular set of user requirements for solving real problems (March, 1995; Simon, 1996).

• **Methods:** these are more attached with systematic defined steps that are defined by specific algorithms and practices for solving real world problems. Therefore, it is important for such type of artifacts to provide guidelines about how to search and develop different solutions for a real world problem (March, 1995; Marakas & Elam, 1998; Sinha & Vessey, 1999).

• **Instantiations:** these are used for showing the implementation feasibility of specific construct, modes or methods in a working system. They are mainly defined as implemented systems and prototypes that are used for identifying and explaining solutions for real problems (March, 1995; Weber, 2003).

The goal of this study, as discussed earlier, is to develop an artifact i.e. an extended model for business-IT alignment (BITA). The design of the extended BITA model embraces different processes. These processes start from collecting requirements for the design and end with an evaluation process that is required for testing and improving the model’s accuracy and practicality. These processes, however, provide premises of the design science research. The following subsection explains in detail all the research steps carried out in performing the design science process.

### 2.2 Research Process

The logical approach of research processes is classified by different researchers (e.g. Collis and Hussey, 2003; Neuman, 2007) into two main types; inductive and deductive reasoning. On the one hand, the inductive approach usually starts with detailed observations of the problem world and moves towards a more abstract generalizations and ideas (Neuman, 2007). According to Collis and Hussey (2003), this is then characterized by a movement from individual observation towards statements of general patterns and laws that formulate theories. In other words, in inductive research, observations help researchers to detect patterns that are used to formulate tentative hypotheses that are tested to make a theory, i.e. a theory is created from empirical observation (Trochim, 2006).

On the other hand, deductive research starts from building hypotheses based on well-established theories and then moves towards concrete empirical evidence (Neuman, 2007). It is then known by its top-down nature in which a researcher uses existing theories to build relationships between different concepts that narrow down the scope or focus of the research field. These relationships in the form of hypotheses are then tested by empirical data in the specified field for collecting observations relevant to hypotheses. The theories are then confirmed or modified in a specific field (Trochim, 2006) i.e. particular instances are deduced from general inferences (Collis and Hussey, 2003).

For constructing the extended BITA model, the thesis follows an inductive approach with pure qualitative research method. The above explanation about inductive approach by Collis and Hussey (2003), Trochim (2006) and Neuman (2007) reflects the strong relationship in the thesis between an inductive reasoning approach and qualitative method suggested by researchers like Holloway (1997), Schwandt (1997) and Burney (2008). They summarize the inductive reasoning approach as a reverse waterfall that drives patterns from qualitative data represented in observations which can be generalized using theories.
The choice for qualitative methods is based on several reasons that are clearly linked to different examples of the literature. Firstly, in terms of motivation to use, it is argued by different researchers (e.g. Sapsford and Jupp 2006; Silverman 2006; Yin 2009) that good qualitative research often has the possibilities of proposing new perspectives on issues that are generally accepted as proved. Business-IT alignment models are often accepted in different studies without or with a minimum revision for their suitability and usability in organisations. Also, qualitative research, as founded in an interpretative philosophical stream by Kuhn (1998), allows participants to construct their own world based on the subjective meanings of their experiences (Mannheim, 1997). In the BITA field, practitioners’ experiences, therefore, are seen as an important source for input for research development. The context in which practitioners live and practice is always surrounded by factors, limitations and problems that have clear influences on BITA decisions and choices of achievement. Such context brings support for proving invaluable empirical data that can be qualitatively analyzed as inputs towards examining the impact of organisational cultural on BITA and its practice. This clearly affirms the fit of qualitative research in understanding social and cultural contexts, as claimed by Myers (2009).

Following the above mentioned motivation to the adapted qualitative research method, the design science research approach fits well with the thesis in terms of collecting and analyzing the empirical data and for developing the extended BITA model. In proposing such a model, it is aimed to support both researchers and practitioners in their BITA decisions and assess BITA and its components. Therefore, an evaluation is added as an important input to validate the final extended BITA model.

### 2.3 Design Science as the main Research Approach

Different researchers have contributed towards grouping and definition of design science activities. Takeda et al. (1990) introduced a foundation for the design science research cycle by identifying five activities during the design research process. These activities, which have been consolidated as a starting point for other researchers in the design research field, are awareness of the problem, suggestion, development, evaluation and conclusions. Figure 3 shows the consolidation of these five activities adopted from Hevner et al. (2004) and Vaishnavi & Kuechler (2007).

The five activities have been further developed by different researchers. In this thesis, the approach developed by Peffers et al. (2007-2008) as called a Design Science Research Method (DSRM) is adopted including the following six steps or activities:

1. Problem Identification and Motivation
2. Define the Objectives for a Solution
3. Design and development
4. Demonstration
5. Evaluation
6. Communication
1. Problem Identification and Motivation: The first step in the design science process is to identify a business problem that motivates why the artifact (i.e. in the thesis case is the extended BITA model) needs to be designed and developed.

In the thesis, a business problem consists of a lack of considering organisational culture in the theories and studies of BITA and its components. To identify and motivate the problem, different steps were performed during the thesis. First of all, a literature survey for BITA theories and models was performed to identify the different limitations and challenges of BITA theories. The next step was to find evidence of the impact of organisational culture on BITA. This was done by carrying out case study research on two subsidiaries, the Egyptian and the Swedish, of the same federated US organisation. Following the results from this study, a classification of BITA problems was performed based on a schema collected from the literature as an input to the process.

2. Define the Objectives of a Solution: The second activity defines the objectives of the solution, interpreted in this thesis as the desirable requirement on an artifact. These requirements are based on the identified problem but specify more precisely in which way the artifact solves the problem. These requirements guide the design and development of the artifact and will form the basis for the evaluation.

Requirements are important inputs that help in transforming the problem into demands on proposing the artifact. As stated by Johannesson and Perjons (2012), requirements are mainly defined for the functionality of the artifact. However, they can be divided into the construction of the artifact and the environment in which it is used and practiced. It is also argued that the construction requirements can be referred to the internal properties of the
artifact that describe its structure and design. However, the environmental requirements can be referred to **external properties** and further distinguished into:

i) Usage properties for explaining how the artifact can be used, its practical considerations and how it works in real situations.

ii) Management properties for describing how the artifact can be monitored and controlled over a period of time.

iii) Generic properties for describing the relationships of the artifact to its environment and it are structured influencing/influenced-by its context.

- **Internal properties:**
  - **Coherence**: the degree to which the artifact and its parts are logically, orderly and consistently related (Baskerville et al., 2009; Johannesson and Perjons, 2012). An artifact can be characterized as having low coherence if it includes parts that contradict, in some sense, each other or do not fit with the rest of the artifact.
  - **Modularity**: refers to the level at which the model is divided in different parts or component/modules that can be studied independently (might be separated) as well as dependently (can be combined) (Hevner et al., 2004; Johannesson and Perjons, 2012).
  - **Elegance**: refers to the degree at which the artifact is admired by the users in its appearance, shape and design style (Johannesson and Perjons, 2012).

- **External Properties**
  i) Usage
    - **Learnability and usability**: the learnability refers to the level at which the artifact is easy for users to learn its functionality, and the usability is about how the artifact is practically used in achieving a specific goal (Peffers et al., 2007; Johannesson and Perjons, 2012).
    - **Customizability**: refers to the degree at which an artifact can be adapted to user demands by focusing on local practice or functions (Johannesson and Perjons, 2012).
    - **Traceability**: refers to the ability to trace different parts of the problem solved by the artifact in a logical way (Brathwaite, 2007; Johannesson and Perjons, 2012).
  
  ii) Management

Management properties describe how an artifact is managed over time.

  - **Maintainability**: refers to level of easiness at which an artifact can be maintained in order to correct different defects and meet new requirements or specific changes in the business context (Baskerville et al., 2009; Johannesson and Perjons, 2012).
  - **Flexibility**: refers to the degree in which the model can be used in a flexible way to adapt to different organisational platforms (Peffers et al., 2007; Johannesson and Perjons, 2012).
iii) Generic

- **Completeness**: refers to the level at which the artifact includes all possible components that lead to the achievement of the defined goals (Hevner et al., 2004; Johannesson and Perjons, 2012).

- **Generality**: refers to the degree at which the artifact fits not only for a local but also for a global practice in different business sectors (Peffers et al., 2007; Baskerville et al., 2009).

**Efficiency and Effectiveness**: the degree to which the artifact can be used for achieving the defined goal with optimal use of resources and in minimum time, effort and expense (Baskerville et al., 2009; Johannesson and Perjons, 2012).

3. **Design and Development**: The third activity describes the final artifact, including how it was designed and developed. It aims not only at constructing the artifact as an output, but also at producing the knowledge of how it was constructed to address the refined problem. Additionally, it should take into account the artifact’s objectives, its functionality and architecture.

The design and development process in the thesis embraces a number of different steps. After highlighting different objectives for the extended-SAM model and finding indications for potential relationships between BITA components and organisational culture, a set of hypotheses was developed. These hypotheses are important to investigate the potential influence (i.e. negative or positive) of organisational culture elements on BITA components. For testing the hypotheses, an empirical study on six multinational organisations was carried out. The result from this empirical study was the classified attributes of BITA, which are the inputs to the extended version of the SAM model.

4. **Demonstration**: The fourth activity aims at showing how the artifact can be used in an illustrative or real-life case, thereby proving the feasibility of the artifact. The knowledge of constructing the artifact produced in activity three is a direct input to the demonstration of the artifact. This activity works as an internal validity of the designed artifact as it shows how it deals with the initially identified business problem (i.e. showing the artifact’s ability to solve it, the needs for modifications, or referring to needed iterations going back to the first activity).

In the thesis, the designed artifact (extended BITA model) is demonstrated in the sense of showing the concept of classifying and splitting BITA attributes based on organisational culture impact. The extended BITA model was demonstrated to different researchers in the research team and in different seminars of the Swedish Research School of Management and Information Technology (MIT) (Forskarskolan Management och IT). Additionally, the results of extending the model were demonstrated in the HICSS-45 Conference in the publication Paper-II.
5. Evaluation: The fifth activity determines how well the artifact solves the research problem by evaluating its answer for the research question or achieving the research objective for the identified business problem. The evaluation should take into consideration the solution objectives (i.e. the defined requirements) and knowledge on constructing the artifact.

An empirical study of 5 multinational organisations was carried out to evaluate the extended BITA model. The 5 organisations are a subset of the original 6 organisations used in testing.
the hypotheses. BITA was assessed, as the second time, in all the 5 multinational organisations a comparative analysis is provided between the original BITA assessment and the extended-model-based assessment which shows the artifact’s practicality and benefits.

6. Communication. The sixth activity is to communicate the research that is carried out and its knowledge about the research community and practitioners. This can be done in different forums (e.g. writing a conference or journal papers) or by using different materials (e.g. papers, slides, videos or demos). All previous activities are considered as inputs to this activity. Therefore, the knowledge produced from communicating the artifact can guide the researcher to go back to any of the previous activities in a second, third or later iteration.

First of all, the pre-licentiate seminar was the first step for communicating the final extended BITA to the research community. This process has had invaluable inputs to different earlier activities in the process towards the development of the final artifact. Writing this licentiate thesis and make it public is another way of communicating the designed extended BITA model to a bigger research community and practitioners (if any). Also, a final paper (p-III) was published showing the research contribution to the public research community and practitioners in different organisations. The communicating processes have brought up comments, some of which have been addressed in the current version of the artifact. The rest are left for further future discussions on importance of considerations or future research.

2.4 Validity of the Design Research

Validation of a design science is a debatable issue. Earlier researchers in the design science domain (such as Archer, 1984; Takeda et al., 1990; Eekels and Roozenburg, 1991; Wall et al., 1992; Rossi et al., 2003) focused on the design and proof of its usefulness which is considered as central component of the design purpose. According to them, the validation is an impeded process with the evaluation process in form of confirmatory and testable design process/product hypotheses. Other researchers (such as Nunamaker et al., 1991; Hevner & March, 2003; Hevner et al., 2004 followed by the work of Peffers et al. (2007-2008)) argue, from an information systems perspective, that design science seeks the creation of innovations by creating ideas, practices and technical capabilities in a complete cycle. From this perspective, design science provides the process and the criteria required for constructing and evaluating purposes. As an output, an artifact is designed with proof of its effectiveness and efficiency in a step-by-step process resulting in fundamental (design-oriented) as well as further (behavioural-oriented) researches.

The above discussed stream of research considers design science as an adequate method for carrying out the relevant and rigorous research needed to solve a research problem. However, researchers (such as Gonzalez, 2009; Alturki et al., 2012; Gonzalez and Sol, 2012) strongly argue that the design science method developed until the work of Peffers et al. (2008) yet not does form a complete research methodology in its own right. Therefore, Alturki et al. (2012) successfully developed a roadmap that consists of a structured and detailed methodology for conducting design science research. The roadmap covers the entire lifecycle of a design science research from the beginnings a research problem through to the final publication and generalization of the work.

The following bullet points illustrate the added validation activities that are not included in the Peffers et al. (2007-2008) and how they considered in this thesis:
• **Evaluate the New Solution Feasibility.** Before starting the construction of an artifact, it is important to ask ‘Is it possible to produce a new solution or not?’ In the thesis, this question is answered by means of the first extensive survey over BITA literature. Studying the literature reveals the incompleteness of BITA theories and models (with respect to dynamic studies that are ongoing) for considering different factors including different levels of culture.

• **Resolve Whether The Solution Can Be Found Within the Design Science Paradigm.** After deciding on the feasibility of a solution, it is important to check if the research falls under the design science paradigm. It is not enough to decide from the beginning of the design science methodology and motivate it a research. Baskerville et al. (2010) motivate this activity in order to ensure the intention of doing design science research on the one hand, and of discovering the value of the intended artifact on the other. In the thesis, this activity is fulfilled by the explorative study and the classification of general limitations of BITA. On the one hand, the general limitations conform to existing schema found in the literature, which ensures the intention of having a method for classifying limited attributes. On the other hand, the explorative study resulted in clear evidence on the organisational culture impact on business-IT alignment, which shows potential values for the intended artifact.

• **Resolve Theme (Construction, Evaluation, or Both).** To be considered as a design artifact, it should be fulfilled through construction and evaluation of its usability. These two steps are key decisions for having substantive implications for planning and related activities. In the thesis, the designed artifact (i.e. extended BITA) is in need of both construction and evaluation. Starting from BITA literature and rooted in the original SAM, the extended-SAM is a proven and practical model that is used by researchers and practitioners. In that sense, it is seen clearly related to both construction and evaluation, showing how it can be beneficially applied in organisations.

• **Explore Knowledge-Base for Support for Alternatives.** This activity concerns the study and use of the knowledge-base behind the artifact in order to find theoretical support for the alternative solution. This process is identified by Walls et al. (1992) and Gregor & Jones (2007) as ‘Kernel theory’. It is then defined as the explanatory knowledge that links goals, design, processes and theoretical materials. With regard to the thesis in hand, strong theoretical support is considered in different steps to find an ultimate alternative solution. First of all, the extensive literature survey provides an analytical scan over BITA models and theories. Although there is a large number of BITS models and theories, the literature survey results in finding the general limitations of existing approaches. Also, the classification and grouping of general limitations is based on existing schema found in BITA literature that focus on comparative and analytical studies of BITA approaches. The overall requirements for the designed artifact are supported by a theoretical base that clearly defines each requirement and how it can be applied.
3.0 THEORETICAL BACKGROUND

This chapter provides background information and literature review on topics and concepts that are related to the research problem and in favour of solving the research questions. These concepts and topics are mainly focusing on the business-IT alignment and its modelling, culture and organisational culture with their modelling as well.

3.1 Different Approaches to BITA

Unlike other areas in the IS research, there is no agreement in the literature about the definition of business-IT alignment. Different questions such as ‘why BITA is needed’, ‘how organisations can achieve being aligned’, and ‘how can BITA then be matured’ have made the debate about the BITA literature more complex.

In the literature, BITA is related to different scopes, and it is therefore defined differently. While some definitions focus more on the outcomes from IT (for producing business value) Reich and Benbasat (1996; Sabherwal et al., 2001) and others have focused on harmonizing business and IT domains with their objectives, strategies and decision making processes (Chan, 2002). These two views have affected the way in which BITA is expressed in publications (Silvius, 2009). Publications that have studied the benefits of IT for business look at leveraging/linking (Henderson and Venkatraman, 1993), enabling (Hunt, 1993), transforming (Luftman et al., 1993) and optimizing (Baets and Galliers, 1998) business processes. Others studies focus on the relationship between the domains and refer to BITA as fitting (Porter, 1996; Chan, 1992), integrating (Feeny, 1992), linking (Reich, 1993), matching (Chan et al., 1997), bridging (Van Der Zee and De Jong, 1999), fusion (Smaczny, 2001) and harmonizing (McKeen & Smith, 2003).

Achieving BITA has traditionally been seen as a part of Chief Information Officer’s duties. That typically involved communication and strategy translation at executive levels (Sabherwal et al., 2001). Today, successful BITA, however, entails much more at tactical and operational levels, and focuses on management activities that help in achieving cohesive goals across IT and business operations (Luftman, 2004). Therefore, it requires strong senior manager’s support, appropriate prioritizations, trustful relationships and effective communications.

3.2 BITA Constructs

Given the fact that BITA focuses on the relationship between business and IT, the complexity of its nature is increased when considering different objectives of IT and business levels (Weill & Broadbend 1988, Ciborra 1997, Henderson & Venkatraman 1999, Smaczny 2001). Consequently, different researches attained with their application’s contexts have resulted in different constructors and interpretation of BITA. Researchers like (Smaczny, 2001 and Reich and Benbasat, 1996) argue that IT should be a part of the business strategy and not as a separated part in its own. This explains how they used the term fusion to explain their concept of integrating the IT in business. In that sense, the advantages of IT can be seen at a level equal to business objectives while considering IT conflicts between business and IT as internal IT infrastructure problems.
The role of IT in business has been a driver for understanding the relationship between them in an aligned way. Therefore, different researchers (e.g. Avison et al., 1999a; Papp, 2001; Luftman, 2004) suggest three ways in which IT can benefit the business domain: i) to maximize return on investment of their IT, ii) to achieve fast competitive advantages related to the IT/IS, and/or iii) to effectively exploit new opportunities for business transformation or process flexibility. The alignment questions here are how IT is perceived by the business domain and how the business domain can realize the benefits from IT in order to take the decision to invest in IT. As a result, those researchers highlight the risk of poor investment in IT not leading to the aimed change in new business transformation.

The degree of how much business and IT should be aligned is another issue highlighted and argued in literature. On the one hand, researchers like Jarvenpaa and Ives (1994), King and Teo (2000), Laudon and Laudon (2006) argue that too much alignment between business and IT may reduce strategic flexibility. They claim that it is waste of time to try to align IT with business strategy or the opposite. Instead, a business strategy should be underpinned with truly effective information technology and systems. Also, their idea of there being too tight a fit between business and IT also brings in more centralized decision making as the capacity of processing information is increased. On the other hand, according to Ciborra, (1997 & 2001) with stronger alignment and the right fit between business and IT as well as their external and internal activities, economic performance may be enhanced. Chan et al. (1997) additionally suggest that, only by matching and fitting business and IT in a strong relationship, can critical systems be developed for organisations obtaining more top management support. Luftman et al. (1996) and Papp (2001) support the discussion by suggesting that aligning strategy and infrastructure lead not only to achieving synergetic effects and facilitating better development of business plans. It strongly contributes to the efficiency and effectiveness of IT applications that leverage an organisation’s core competencies, skills and technology scope.

In a different context, where alignment is practiced, management and control of business activities are seen as important dimensions that should be addressed. McKay and Marshall (1999) and Avison et al. (1999a, b) highlight this issue to differentiate between alignment at the different strategic, tactical and operational level. According to Maes (1999) and Ciborra (1997) this may result in an organisation having a high capability to adapt its alignment to external and internal variables that may influence the business activities. Having structured the alignment in such a way, it gives better choices for managing and benefiting from different resources and opportunities emerging at different scales at the strategic, tactical and operational levels. It, hence, gives alignment the nature of modularity (Galliers and Newell, 2003).

The management issue discussed in the previous paragraph is seen as being related to another mechanism in the alignment debate which is emerging. The alignment that facilitates full linkage between business and IT domains requires that both domains have clear plans with internal consistency on their missions. The plans should also be externally validated with balance to the external business and IT contexts (Reich and Benbasat, 1996). Based on the knowledge gained from management feedback, business and IT strategies can be classified into separated constructs that have direct or indirect relationships with each other (Ciborra, 1997). However, various organisations have had many difficulties in measuring these constructs and how they are related to practicing the alignment (Labovitz and Rosansky, 1997; Luftman, 2010)
An important question on alignment that comes from the management perspective also deals with the dynamic nature of alignment. The question is related to whether alignment comes as an outcome of well designed and matched strategies at different levels or a dynamic process that should be practiced throughout the all business activities. The former view is supported by those researchers who focus mainly on the payoff from IT investment and how it plays internally in the organisation for changing business processes (Weill and Broadbent, 1998; Earl, 1996). The latter view is adopted more in recent alignment research as a concept for dealing with organisation’s competencies, capabilities and potential opportunities (Tallon et al., 2000; Venkatraman, 2000; Smaczny, 2001; Avison et al., 2004).

The firm topology by Miles and Snow (1978) – basing organisations’ strategies on addressing three problems; entrepreneurial, engineering (or operational), and administrative problems – has been a base for different researchers to study how business strategies can be influenced by different variables including IT and its strategy. Hirschheim and Sabherwal (2001), for example, examine the influence of Miles and Snow’s topology and its later development in achieving the alignment between business and IT. They suggest three different ways in which intended alignment can be achieved. These are: paradoxical decisions, excessive transformations and uncertain turnarounds. Based on these three concepts, alignment can be achieved better by, for instance, establishing a fit between business and an outsourced IT, through strategic alliances/sourcing, or even by an infusion profile through business leadership. Hirschheim and Sabherwal (2001) also argue that when IT is insourced and decentralized, the alignment through the topology of Miles and Snow can be clearly influenced be inputs from planning and process integration, the transnational nature of the organisation, and knowledge of external forces in the marketplace.

In the alignment debate, researchers argue that even if there is a clear fit between business and IT strategies at different levels, IT should need practical support to achieve the alignment. Building on the research result of Henderson & Venkatraman (1993), Luftman et al. (1999) define six factors in how IT acts and how it is perceived in organisations. They call these factors enablers for aligning business and IT. The enablers are: senior executive support for IT, involvement of IT in strategy development, IT understanding of business, the sense of partnership between business and IT, prioritization of IT projects and IT leadership for managing firms’ resources and workload in the IT initiatives. In contrast to these enablers, Luftman et al. (1999) define six inhibitors to the alignment where the above mentioned enablers are not practiced.

Considering Henderson and Venkatraman (1993) as the founding fathers for modeling business-IT alignment (Avison et al., 2004), researchers have studied different aspects of alignment based on different constructs of the Henderson and Venkatraman model. The views of Henderson and Venkatraman model can be are seen in two types. While looking at the relationship between business and IT domains is defined as a first view of Strategic Integration, the second view is defined as the Strategic Fit between external and internal sub-domains in each business and IT domain. Regarding Strategic Integration, on the one hand, the research efforts (e.g. Chan et al., 1998; Mintzberg, 1998) conduct a central discussion about two types of working strategies towards the intended alignment. The first is the intended strategies defined as the result-of-ongoing-updated strategies for supporting the organisation’s vision of alignment. The second, however, consists of the realized strategies that are implemented with a certain level of alignment achieved. On the other hand, the Strategic Fit view has influenced the research to focus more on either business processes or content between external and internal sub-domains in the business and IT domains. The
research efforts in this area are characterized by a focus on human and technical aspects. They suggest two dimensions for the strategy creation that strongly influence business-IT alignment (Reich and Kaarst-Brown, 2003). The dimensions are: i) the intellectual dimension (by e.g. Cragg et al., 2002; Tan and Gallupe, 2006) for investigating the content of different approaches of planning strategies, and ii) the social dimension (by e.g. Reich and Benbasat, 2000; Galliers, 2004) that focuses more on the people that are able to formulate their strategies and to facilitate the alignment.

Following the social and intellectual paradigms of alignment, the alignment discussed regarding its practice as a process. Different researchers (e.g. Luftman, 2000; Sabherwal et al., 2001) emphasise the dynamic nature of alignment as a process rather than a static concept. They, therefore, define alignment as referring to applying IT in a way that is timely, appropriate and in line with business needs, goals and strategies. They also claim that sustaining business-IT alignment is clearly attached to the understanding of alignment maturity, maximizing enablers and minimizing inhibitors. In order to achieve an intended sustainability, Avison et al., (2004) add that the profile of IS strategic management should include business and IT/IS strategy as well their structures. This is also supported by Benbya and McKelvey (2006), who argue that alignment should be investigated over time using different measuring models and techniques for adapting to the revolutionary changes.

### 3.3 BITA Models and Frameworks

Different models have been developed to supporting BITA and its practice. The modeling in the literature has been based on two streams, descriptive and normative. While a descriptive model focuses on describing how BITA works in reality with its different constructs, a normative model focuses on suggestions for how BITA should be done following a set of assumptions (Gutierrez et al., 2008).

Modeling Business-IT alignment is considered to have begun with the strategic alignment model of Henderson and Venkatraman (1993). Therefore, Avison et al. (2004) argue for using that BITA model as the starting point for modeling BITA in most of the following BITA models after that year. In the following paragraphs, a review on the development of modeling BITA highlighting the main concepts in each model is provided:

**Strategic Alignment Model (Henderson & Venkatraman, 1993).** Henderson and Venkatraman proposed a strategic alignment model in 1993 which became the most famous and discussed one among researchers. This statement was true until the year 2006 when the model of Hu and Huang (2006) was developed and published (Chan and Reich’s, 2007b). The model (Figure 5) has two main domains (business and IT) and four sub-domains (internal and external for each of the main domains). On the one hand, while internal business domain includes administrative structure, processes and people’s skills, the external business domain includes business scope, distinctive competences and business governance. On the other hand, internal IT includes IT architecture, IT process and IT skills. However, external IT includes technology scope, systemic competences and IT governance.
The model of Henderson & Venkatraman (1993) highlights two important strategies in managing the alignment:

- **Strategic fit**, which is the relationship between internal sub-domain and the external sub-domain in each of the main business and IT domains. The fit is argued by the authors to be an internal or operational alignment.
- **Functional integration** as the integrations between business and IT domains. It facilitates the direct relationships between business and IT strategy changes.

**Strategic Alignment Maturity Model (SAM) (Luftman, 2000).** In 1996, Luftman, Papp and Brier did a research based on a 500 organisation survey to find the enablers and inhibitors of alignment in 15 different industry sectors. This empirical research helped Luftman (Luftman, 1996) to continue the research idea of Henderson and Venkatraman (1993) by providing a complete description of the twelve components that were not defined clearly by Henderson and Venkatraman in their model.

**Table 1.** Enablers and Inhibitors of Strategic Alignment (Luftman et al., 1999)

<table>
<thead>
<tr>
<th>ENABLERS</th>
<th>INHIBITORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior executive support for IT</td>
<td>IT business lack close relationships</td>
</tr>
<tr>
<td>IT involved in strategy development</td>
<td>IT does not prioritize well</td>
</tr>
<tr>
<td>IT understands the business</td>
<td>IT fails to meet its commitments</td>
</tr>
<tr>
<td>Business/IT partnership</td>
<td>IT does not understand business</td>
</tr>
<tr>
<td>Well-prioritized IT projects</td>
<td>Senior executives do not support IT</td>
</tr>
<tr>
<td>IT demonstrates leadership</td>
<td>IT management lacks leadership</td>
</tr>
</tbody>
</table>
Under five working years, with increasing recognition of organisations’ challenges in alignment, the idea strategic alignment maturity first appeared in about the year 1999. In 2000, Luftman developed and published his model (Luftman, 2000) that explains six phases that should be followed by organisations for attaining and sustaining BITA based on an understanding of how to increase enabler and decrease the inhibitors. These six phases are:

1. Setting the goals and establishing a team,
2. Understand the business-IT linkage,
3. Analysing and prioritising gaps,
4. Specifying the action and managing projects,
5. Deciding on and assessing success criteria, and
6. Sustaining alignment.

SAM classifies BITA into six criteria: Communications, Competency/Value Measurements, Governance, Partnership, Scope and Architecture, and Skills (Table 2) consisting of 38 attributes (Figure 6) in five maturity levels: Ad Hoc, Committed, Established Focused, Managed, and Optimized Process. This classification provides a clear view of alignment and helps in spotting particular areas in which an organisation needs to improve to maximize the values of IT investments.

Table 2. Criteria of SAM Model

<table>
<thead>
<tr>
<th>SAM Criterion</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communications</strong></td>
<td>Refers to a clear understanding between business and IT communities with an effective exchange and sharing of each ideas, processes and needs.</td>
</tr>
<tr>
<td><strong>Competency/Value Measurements</strong></td>
<td>Concerns about demonstrating IT values in compatible figures with the business community understanding. Therefore, both business and IT have usually different metrics of values they add.</td>
</tr>
<tr>
<td><strong>Governance</strong></td>
<td>Ensures that business and IT communities formally and periodically discuss and review their plans. Different priorities are important to be clearly defined for allocating the required IT resources.</td>
</tr>
<tr>
<td><strong>Partnership</strong></td>
<td>Refers to the relationship between business and IT in having a shared vision of the organisation’s processes in order to facilitate the IT as an enabler or driver for business transformation in processes and strategies.</td>
</tr>
<tr>
<td><strong>Scope and Architecture</strong></td>
<td>Illustrates the involvement of IT in all organisational processes. It defines the IT role in supporting flexible and transparent organisational infrastructure. This, however, facilitates applying technologies effectively and providing customized solutions responding to customer needs.</td>
</tr>
<tr>
<td><strong>Skills</strong></td>
<td>Refers to all human resource aspects that influence (are influenced) by changes. They include factors that enhance organisation’s cultural and social environment as components of organisational effectiveness.</td>
</tr>
</tbody>
</table>

SAM focuses on different areas by its modularity in six BITA criteria. It provides an instrument for understanding business-IT relationships. This helps identify different factors that enable and inhibit the strategic alignment. Since its inception, SAM has been used by several researchers and in number of industries for assessing BITA and its components (Silvius et al., 2010). However, it deals with the efficiency and effectiveness of BITA components without considering ‘how things are done’ (Luftman, 2009).
SAM is found to present strategic alignment as a complete holistic process which encompasses not only an establishing alignment but also its maturity by maximizing alignment enablers and minimizing inhibitors (Avison et al., 2004). The model follows a bottom-up approach by setting goals, understanding the linkage between Business and IT, analyzing and prioritizing gaps, specifying the project management actions, choosing and evaluating success criteria and consequently sustaining alignment by all these processes (Avison et al., 2004).

**Integrated Architecture Framework (IAF) (Maes et al. 2000).** As the name suggests, this model mainly corresponds to supporting the integrated architectural design of business and IT. Based also on the model of Henderson and Venkatraman (1993) in addition to a framework for integrated architectural design that was developed by Goedvolk (1999), Maes et al. (2000) advocated the architectural design of an organisation’s business and IT as a catalyst in aligning business and IT. They also enhanced the model of Henderson and Venkatraman by introducing the architecture of the information / communication / knowledge infrastructure by splitting up a single internal domain into structural and operational levels.
In fact, by representing IAF, Maes et al., (2000) succeeded in improving the model of Henderson and Venkatraman by complementing what was missing, not clearly defined or incomplete. To enhance BITA as a practical tool, the authors of the IAF suggest supportive aspects for designing BITA models or framework. They are as follows:

1. Defining clearly the scope and meaning of BITA
2. Considering the dynamic nature of processing BITA
3. Rather than only strategic levels, implementation aspects should be considered.
4. Considering the assessment and different measures of BITA
5. The appropriate business and technical circumstances should be followed and reconsidered with their feedback.
6. A special concern to the human interaction with their activities should be considered.

Following these points, one column (as information and communication) and one raw (as structure) have been added to the model of Henderson and Venkatraman (2000) (see Figure 7). The model then follows a top down approach for aligning between main architecture areas. Although the framework looks more complete than the model of Henderson and Venkatraman (2000), it seems to be incomplete in one sense. There is still clear need for research efforts on transforming alignment into workable frameworks. One example of such research can be seen as a joint research project between all organisational levels (from strategic to operational) for designing a complete framework. In addition to that, the measurability of alignment and the validity of a designed framework has not yet been considered or discussed empirically (Chan and Reich’s, 2007b).

**Reich and Benbasat Model (2000).** One of the most discussed models in the strategic information systems domain. The authors have developed the model based on an extensive literature study guiding their research to consider different social dimensions in aligning
business and IT. Therefore, the model lays down four factors related to the social dimension that can potentially apprehend alignment between business and IT objectives. These factors (see Figure 8) are ‘shared domain knowledge’, ‘IT implementation success’, ‘communication between business and IT executives’ and ‘connections between business and IT planning’. The model presents two categories of social dimension alignment namely:

- **Short-term alignment**: it considers the shared knowledge on objectives, goals and short plans. It, therefore, focuses on achieving communications by having high success levels of IT implementation within the business domain.
- **Long-term alignment**: it considers the long-term aim and vision of the whole organisation. It, therefore, focuses on the organisation’s position in the marketplace with different competitive advantages. The set of competitive advantages helps in achieving sustainable/long-term alignment.

![Figure 8. Strategic Alignment Model by Reich and Benbasat Model (2000)](image)

The model follows a top-down approach by focusing on the antecedents along with the current practices that directly influence alignment. No doubt, that the two dimensions of strategy creation are the intellectual and the social, but the authors of RBM have selected the social domain as it would scrutinize more people involved in creating the alignment and developing its maturity. Therefore, the model, as much of the literature deals only with the aspect of alignment between business and IT executives without considering the lower levels of an organisation.

**Sabherwal and Chan Alignment Model (2001)**. This model has been mainly developed by being based on the types of business strategy developed by Miles and Snow (1978) who defined the typology of defenders, analyzers and prospectors. They have emphasized the definition of business strategy and IT strategy as the two main domains for the alignment. Further, each domain is divided in terms of attributes and types (see Figure 9).
Although the model focuses on details of the different components of business and IT domains, there are incompleteness aspects to be argued. The model, first of all, highlights business and IS characteristics at an abstract level without deep investigations. In addition to that, the model does not consider the business and IS processes at operational level. Instead, it emphasises the tactical and strategic levels in supporting the alignment. Moreover, the model is validated by four industrial cases. Broader cases and industrial sectors should be studied for the model’s evaluation.

What makes the model unique is its emphasis on strategic content rather than processes and on realized strategies rather than intended strategies. Realized strategies refers to the as-is working strategies that are already implemented when a certain level of business-IT alignment is achieved, whereas the intended strategies refer to the to-be strategies that are newly developed for supporting an organisation’s vision of business-IT alignment. Also, the model focuses on IS strategy rather than IT on information management (IM) strategies which makes it more oriented to system alignment in organisations.

**Hu and Huang Alignment Model (2006).** The aim for developing this model was to create a BITA model that can be used as a managerial tool for supporting the decisions making process. Hu and Huang focused their work on processing BITA as a dynamic process rather than having a static nature. Therefore, they have developed the model of Reich and Benbasat Model (2000) as the first initiative on this track. In developing the social process, Hu and Huang added relationship management as an antecedent along with using the balanced scorecard as a tool to extend the Reich and Benbasat Model (2000) (see Figure 10).
The aim of this extension was to support achieving, managing and sustaining BITA in a way that was based on strong social roots. The authors advocate a top-down approach to create an effective alignment system. Moreover, they have used the balanced scorecard not as a ready-made performance indicator but as a management system (or an IT management tool) by using four different perspectives on an enterprise’s business, namely: an innovation and learning perspective, an internal process perspective, a customer perspective and a financial perspective.

## 3.4 Organisational Culture

### 3.4.1 Background to Culture

While globalization has created numerous opportunities for many companies, it has also posed many challenges; among them is the impact of culture on business. Culture has been defined both theoretically and operationally. Theoretically, the concept of culture is defined as shared motives, values, beliefs, identities, and interpretations or meanings of important actions as a result of shared experiences of members of a community and is handed down from one generation to the next. However, operationally, the culture comprises shared language, belief systems like religion, political beliefs, history and ethnicity (House et al., 2001). Culture is also categorized by Wilson (2001) in two types, visible and deep. The visible level consists of behaviour patterns, languages, and social and physical environment, the deep level comprises basic assumptions and group values that influence the visible characteristics.

Culture has been also defined many contexts at different levels. These include national culture, societal culture and organisational culture (Hofstede, 1991; Deresky, 2010). For almost two decades, the focus in studying culture has been on its national level, led by research of Hofstede (1980) and his further studies. In studying the impact of culture on business, however, a clear criticism has been brought up to highlight the other levels of culture as the national level is claimed to create only a stereotyping without a real picture of a nation that may have several subcultures (Ailon, 2008). Organisational culture is, however, viewed as a subset of national culture; as organisations operate within a given national context with employees from the same national culture (Charles et al., 2001). Organisational culture
then places its focus on how the business is operated in organisations with regard to how people perform their individual and collective tasks.

3.4.2 Definition of Organisational Culture

Organisational culture is simply defined as the culture of an organisation (Mobley et al., 2005). Each organisation is supported and defined by an individual culture. Organisational culture is defined as the common expectations, goals, beliefs, ideas, common understanding and norms of the people in an organisation, which varies from one organisation to another (Deresky, 2010). Therefore, organisational culture is seen as providing guidance for people’s behaviour within an organisation and it strongly influences people’s decision-making.

Organisational culture can be divided into different levels led by the original division by Brown (1995) into three main levels. These levels are:

- Values at the strategic level, which include missions and objectives of the organisation and how people centralize them in their work,
- Beliefs and norms of employees at the tactical level. This level is important for defining how middle management plays a role in bridging the gaps between strategic and operational levels towards building a common understanding and dealing with different people’s backgrounds.
- Aspects of organisational life at an operational level. This level is the daily working environment level where people achieve their individual and collective tasks and functions. Different guidance is usually provided to employees to define how to perform, cooperate and get the rights as well as to taking the responsibility.

What should be highlighted regarding the organisational culture is that it can neither be changed by just switching employees between different units or departments nor by forcing employees to act as we wish (Denison, 2000). Having an effective organisational culture means; for researchers like Mobley et al. (2005) and Deresky (2010); having a complete process for building a common understanding among employees about an organisation’s goals and core values, establishing the appropriate principles for the correct attitude for a working team, defining commitments to achieving goals and objectives, and building an adaptive and innovative environment where employees feel free to work on what they themselves see as adding value to the organisations.

3.4.3 Modelling of Organisational Culture

In order to contribute to research in building organisational culture constructs, different models and theories have been developed and presented. These models are intended to be as frames for addressing and understanding organisational culture and its components. While there is no single explanation for organisational culture or definition of its constructs, commonalities do exist and therefore models have been developed for highlighting different indicators and constructs of organisational culture. Some organisational culture models are summarized below:

Hofstede et al. (1990). Most of the work in culture modeling started by the groundbreaking of Hofstede (1980) based on a large project. However, his work on that project was mainly focused on the national culture. Following that project, Hofstede et al. (1990) did smaller
studies that focused on organisational culture. In this study, the authors have identified dimensions of organisational culture that can be collectively used as a descriptive framework for organisational culture, which are: process-oriented versus results-oriented, job-oriented versus employee-oriented, professional versus parochial, open systems versus closed systems, tight versus loose control and pragmatic (flexible) versus normative (rigid).

The authors of Hofstede et al. (1990) acknowledged their research base was too narrow for generalisation. To credibly argue for universal validation of their six identified dimensions, they suggested deep studies of societies with possibilities to add more dimensions or omit others, especially when studying other types of organisations.

**Deal and Kennedy (1982).** This model is developed based on the consideration of organisational culture as one of the significant success or failure factors in an organisation. This success is led by its aligned culture, which intends to increase the organisation’s adaptability to the fast changing world. Therefore, Deal and Kennedy defined first of all six cultural dimensions as the basis for the culture of an organisation. These dimensions are:

1) **History:** Deals more with the history at which the corporate culture acts. This shows the core values in an organisation and how the people are committed to it.
2) **Values and Beliefs:** There is a context in which culture is created, this context is usually surrounded by shared beliefs and linked to the core values of the organisation.
3) **Rituals and Ceremonies:** Ceremonies explain how the employees follow a routine of daily behaviour.
4) **Stories:** They are usually used for illustrating values of an organisation and they also explain different activities on how the employees use these values. Stories are proofed to increase the learning ability of employees.
5) **Heroic Figures:** They are shown as needed characteristics of good managers and employees to lead their teams. By measuring these actions, they can be motivated to the whole organisation.
6) **The Cultural Network:** They refer to the informal network of employees when they learn important information and exchange it.

By applying these six cultural dimensions and testing them on different organisations, the model of Deal and Kennedy (1982) was developed. The model is based on four distinctive types of cultures (Figure 11) that are based on the interaction between two influencing factors; i) The associated risk with organisation’s main activities, ii) How fast organisations evaluate their actions and strategies. The four distinctive cultures are explained as follows:

a) **Tough-Guy, Macho:** It is a type of culture whose employees are characterised by the wish to take risks and get fast feedbacks. Each individual in such culture works hard and seeks to be a star. A clear example of such culture is a football team. The team work in such culture is not highly motivated. Instead, individual competitions and fast workers are sought. In addition to that, organisations in such culture continuously increase their turnover, but they do not aim at having consistent culture.
b) **Work Hard/Play Hard:** This type can be found in countries that are characterised by their strong sales activities. The employees are not encouraged to act or take risks, but little is accepted with guarantee to get fast responses on their undertaken activities and performance. The high ranked people in such culture are those who can sell more and shown full of energy. People in this context prefer to work in teams for complemented activates and synergic results.

c) **Bet-Your-Company:** The environment in such culture only survive based on taking risks such as medical and oil organisations. However, the results of taking decisions take time and cost a lot of money. Therefore, taking decisions are crucial and only delegated to the trusted and reliable individuals who understand the nature of their decisions on the long-term perspective.

d) **Process:** There is no need in such culture for fast feedback but it is important to be reported to decision makers who take too low risks in organisations such as banks and insurance companies. There is no much to do for each individual on the performance of the organisation fitting in this type of culture. The reason is that most of strategies and their policies are pre-defined for long-term vision without focusing on the value added from each employee.

The model of Deal and Kennedy (1982) has very clear and characteristically distinctive cultures. It helped for many years in supporting decision makers to differentiate between different types of organisations according to their expected behaviour and cultural viewpoints. However, the model is mainly criticized today as it seems to be a passing fad. Many emerging organisational types and businesses today may not fit into the expectations or the four corners of the model.

**Cameron and Quinn (1999).** This model was developed based on the competing values framework. Therefore, it was mainly focused on organisational effectiveness and success. The authors aimed at developing the model as an organisational culture assessment instrument for distinguishing four different culture types. These four organisational culture types (Figure 12) are controlled by the two polarities ‘flexibility versus stability’ and an ‘internal versus external’ focus.
The interaction of the two polarities resulted in four types of organisational culture:

a) **Clan**: The organisation focuses on internal factors and considering their flexibility in a more friendly workplace without clear vertical hierarchy.

b) **Hierarchy**: The organisation focuses on internal factors with strong formal rules and policies. The organisation has a stable and predictable management system.

c) **Adhocracy**: The organisation is characterized by a dynamic workplace with motivated innovation. The organisation focuses more on position in the marketplace with high flexibility for individuals.

d) **Market**: The organisation is performance oriented with command and control style of management and driver leaders who look at external maintenance of their organisation.

This model is considered to have a similar concept of design to the model of Deal and Kennedy (1982). However, the two polarities here are more oriented to practicing work which provides a better image of the characteristics of organisational culture. The weaknesses of this model are highlighted in terms of the two polarities. In general these represent two different values. In organisations, reasoning and more objective evaluation are required for accurate results. Also, in the last two decades, different business models (e.g. IT outsourcing and business alliances) have grown dramatically as a result of globalization. These growing business models are seen not as fitting into a culture model that was developed in 1990.
Denison (2000). This model is a result of over twenty five years of work and research by Denison. The model focuses on two basic components in organisations. These are: the organisational culture and the leadership. In the early 1980s, Denision presented an organisational culture model that included four traits (adaptability, mission, involvement, and consistency) with their characteristics. By 2000, he had developed his work, combined with a consideration of the work of Cameron and Quinn (1999), into a more comprehensive model for defining the behaviour and actions of people in terms of their organisational culture traits.

Figure 13. Organisational Culture Model of Denison (2000)

Figure 13 shows the Denison model (2000) which combines the dimensions of ‘flexibility vs. stability’ and ‘internal vs. external’ with the four traits of (adaptability, mission, involvement, and consistency). This combination provides further division of each trait in three dimensions. The four traits are explained as follows:

a) **Involvement**: In this group attributes, human activities are motivated and the focus of success. Involvement of individuals is measured by their empowerment, their team orientation and their capabilities of developing new innovations.

b) **Consistency**: It focuses more on how individuals work in a cooperative style with internal integration among teams/units. It is therefore influenced by the shared beliefs and the core value of the organisation.

c) **Adaptability**: This part of culture reflects the high ability of an organisation to have an external view by teaching the employees how to adapt changes. These changes should be customer oriented in order to have potentials for competitive advantages.
d) **Mission:** This trait focuses on linking the stability of an organisation with its external view. Therefore, it takes care of defining well formulated vision, objectives and strategic direction of the organisation.

**The X Model by Smit et al. (2008).** This model has contributed to the organisational culture research area by classifying and consolidating different factors that are found in previous models. Furthermore, the authors proposed a new model as a basis for the development of an organisational culture diagnostic tool. They suggest that the organisational culture can be described in terms of five core elements that are placed in ‘X’ shape with ‘Leadership’ element in the centre and other elements have direct connections with it. Each element is further explained by sub-elements that define different views of the element (Figure 14). The core elements are briefly explained in Table 3:

![Figure 14. Smit et al.’s Organisational Culture’s Model (2008)](image)

**Table 3. Definitions of X-Model Elements (Smit et al., 2008)**

<table>
<thead>
<tr>
<th>Organisational Culture Elements</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leadership</strong></td>
<td>Defined as the degree to which leaders are able to influence the culture of the organisation in order to ensure optimal service delivery/results delivery.</td>
</tr>
<tr>
<td><strong>Strategy</strong></td>
<td>Defined as the degree to which an organisation is clear about its strategic direction so as to ensure optimal service delivery.</td>
</tr>
<tr>
<td><strong>Adaptability</strong></td>
<td>Defined as the degree to which the organisation is in contact with and responds to change so as to improve service delivery.</td>
</tr>
<tr>
<td><strong>Coordination</strong></td>
<td>Defined as the degree to which internal system is aligned horizontally and vertically for optimal service delivery.</td>
</tr>
<tr>
<td><strong>Relationship</strong></td>
<td>Defined as the degree to which people in the organisation work together to form strong working relationships that will ensure optimal service delivery.</td>
</tr>
</tbody>
</table>
In this thesis, the Smit et al., (2008) is considered useful for studying the organisational culture impact on business-IT alignment. This is because of the following benefits:

a) Unlike other models, the development of the X-Model is based on a literature survey as well as validation through qualitative research. Most of the other models were developed based on either only literature studies with small case studies (e.g. Cameron and Quinn (1999)) or on pure empirical findings (e.g. Hofstede et al. (1990)).

b) The modularity in a form of elements and sub-elements gives the model (Figure 14) high workable characteristic for studying organisational culture in practical way.

c) Each element of the model consists of sub-elements, which can in turn be regarded as various dimensions of the element. These dimensions offer a multi-perspective analysis of organisational culture.

d) The model is seen comprehensiveness and consistent. This is, in addition to the authors’ argues, achieved by a careful study of most of the previous organisational culture models and consolidating their dimensions.
4.0 EXTENDING A BUSINESS-IT ALIGNMENT MODEL (THE ARTIFACT)

This chapter presents the core of the thesis as it represents and describes how the design science method is applied. The chapter is structured in subsections titled by the same names as the design science activities by Peffers et al. (2007) that are explained in the research method (Section 2.3).

4.1 Problem Identification and Motivation

The business problems addressed in the thesis are the lack of consideration of organisational culture in the theories and studies of BITA and its components. To identify and motivate the problem, different steps were performed during the thesis. These steps are represented in Figure 15 as a part from the research process and are discussed in the following subsections.

4.1.1 Literature Survey on BITA Models

First of all, an extensive literature survey on BITA was performed. Different BITA models were studied and analyzed to investigate their capabilities and to examine different BITA components. Five sources were used to identify the most important BITA models. The first source was Chan and Reich’s (2007a) study in which over 150 studies in the BITA domain is listed and briefly discussed. Then, the following four databases were used: Education Resources Information Center (ERIC), ScienceDirect, Business Source Premier and Academy of Management Learning and Education. To find the relevant articles in the databases, different keywords in titles and abstracts were used such as “Business-IT alignment”, “Alignment of Business and IT” and “Strategic alignment”. The starting point for the search was 1993 when a BITA model by Henderson and Vekatraman (1993) was presented. This is supported by the findings and claims of Avison et al. (2004) as Henderson and Vekatraman are seen as the founding fathers of modeling and assessing BITA through their model (Henderson and Vekatraman, 1993). The final station in the search is November 2011. 481 articles were identified overall. In order to select the more focused and related studies, the number of articles was narrowed down using the following criteria:
a) The article must propose an artifact (e.g. model or method) for BITA assessment.

b) The article should provide an empirical implementation of the proposed artifact in a real organisation.

After applying these two requirements, the following 19 articles were identified. They are ranked according to their research impact (number of citations for each article), see Table 4.

**Table 4. The 19th Targeted BITA Articles with Concrete Constructs and Models**

<table>
<thead>
<tr>
<th>#</th>
<th>Authors (Year)</th>
<th>Title</th>
</tr>
</thead>
</table>
For a more focused perspective on understanding the relationships between business and IT within the assessment process and to consider the most comprehensive models, two more criteria however are added:

c) The article should offer new constructs or an improvement of an existing model to the assessment of BITA.
d) The article should explain the relationship between business and IT domains and how they should be represented in the organisational structure.

The final result shows six concrete models that represent clear constructs on BITA and provide together a comprehensive image of how BITA can be achieved, assessed and maintained. These six models are: Henderson and Venkatraman (1993), Luftman (2000), Maes et al. (2000), Reich and Benbasat (2000), Sabherwal and Chan (2001) and Hu and Huang (2006).

After analyzing all the six models, Luftman (2000) is found to have gained more popularity in practice (Chan and Reich, 2007b). This is related to the following advantages of the model:

- It follows a bottom-up approach by setting goals, understanding linkage between Business and IT, analyzing and prioritizing gaps, choosing and evaluating success criteria, and consequently sustaining alignment by all these processes (Avison et al., 2004).
- It presents strategic alignment as a complete holistic process which encompasses not only establishing alignment but also its maturity by maximizing alignment enablers and minimizing inhibitors (Avison et al., 2004).

Following the above mentioned motivation, a literature survey study followed, in order to affirm the findings of comparative studies of BITA models (e.g. Avison et al., 2004; Bennett, 2004; Gutierrez, 2008; Arab Sorkhi, 2010), to study the relationships between organisational culture and BITA through the Luftman’s strategic alignment maturity model (SAM) model.

As well as resulting in the selection of SAM model, the literature survey resulted in understanding the general limitations of BITA studies and models addressed in different studies.

4.1.2 Explorative Study

The second step in identifying the research problem aims to investigate the potential influence of organisational culture on BITA by studying the differences in how BITA is achieved within two societal cultures. That is done by focusing on two subsidiaries, the Egyptian and the Swedish, of the same federated American organisation. The idea of this step is based on how general similar business and IT strategies are implemented differently while being influenced by the societal culture dimensions in the two subsidiaries.

The research method used in this step is a case study. A case study is usually unique and offers rich details rather than generalizations, and understanding of complex issues rather than explanations. Additionally, case studies allow for the study of difficult issues while retaining the holistic characteristics of real-life events (Yin, 2004). Case research allows for the study of information systems in their natural settings and make it possible to comprehend contextual complexities (Gerring, 2007).
The company is an IT-related with a focus on software development, telecommunication, customized services and application development. In both Egypt and Sweden, each subsidiary has 500-1000 employees. Both subsidiaries have similar general business and IT strategies which are mandatory for them to follow but which have to be implemented according to local conditions. Because of the confidentiality (claimed by the companies) it refers to these companies as Company-A (for the Egyptian subsidiary) and Company-B (for the Swedish subsidiary).

A. Collecting the Data:

The data was collected through a set of semi-structured interviews with managers from business as well as IT domains. The semi-structured interviews were selected, supported by the claims of Myers (2009), as the questions were developed so that interviewees would have limited flexibility for answering and explaining questions in additional ways to the possibilities set out by the interviewers. Additionally, as it is difficult to get the chance to interview busy people and managers, semi-structured interviews serve this process by having control from the interviewer at the same time.

Following the findings of Silva et al. (2007), the interviews were carried out in two sets: one from the business side and the other from the IT side. This helps to involve and to gain insights from both stakeholder groups. The questions were the same for both business and IT managers and each interview followed the same order of questions. The interviews, of 60 to 90 minutes each, were audio recorded and fully transcribed to ensure the validity and traceability of data.

In collecting the data, and during the empirical process, the ethical issues argued by researchers such as Payne and Payne (2004) for the reliability and validity of the data (Myers, 2009) were considered. Therefore, permissions for publishing the data were obtained but the organisations’ names and information that might lead to the organisation being recognized were omitted.

The data was then collected through the semi-structured interviews with people at strategic, tactical and operational level of business and IT domains of the two subsidiaries. The study was conducted in six phases:

- **First-round interviews** (from Jan 2008 to June 2008) with two individuals from each operational, tactical and strategic level in both companies. Interviews aimed mainly at confirming the indications of the Project GLOBE regarding cultural dimensions.
- **Desk analysis** (from June 2008 to Nov 2008) for general findings and definitions of different organisational culture hypotheses.
- **Second-round interviews** (from Nov 2008 to March 2009) with two individuals from each level in both companies. This phase was mainly for discussing the preliminary findings and perceptions. Interviews focused on the impact of organisational culture aspects on the organisation without relating that directly to the criteria of BITA.
- **Second desk-analysis** (from March 2009 to November 2009) for examining the findings on relating cultural dimensions to each other and linking them to organisational effectiveness.
- **Third-round interviews** (from November 2009 to February 2010) with two individuals from only the tactical and strategic level in both companies. This round focused on measuring the maturity of BITA based on the detailed attributes of all
criteria of Luftman model. Our questionnaires linked the hypotheses, preliminary findings and the answers from the two previous rounds.

- **In-depth analysis** (from February 2010 to May 2010) to link all findings and to analyze the potential impact of organisational culture on maturity of BITA.

**B. Developing Hypotheses:**

As it is motivated in Section 1.3, for exploring the impact of organisational culture on BITA, the study relies, for studying culture, and on the GLOBE (*Global Leadership and Organisational Behaviour Effectiveness*) Model as a research project (House et al., 2004). The GLOBE project – which carries the same name of the model – is a multi-phase and multi-method research programme that has been designed to understand the relationship between culture and business. The project examined national culture to show the influence of organisational and societal culture on accepted leadership and working effectiveness by organisations. Based on the work of 170 researchers who have collected data over seven years on culture value and practices and leadership attributes from 18,000 managers in 62 countries, nine cultural dimensions were identified to distinguish one society from another. These have important managerial implications (Gallivan and Srite, 2005). The dimensions are briefly described in Table 2.

**Table 5. Project GLOBE’s Cultural Dimensions (adapted from House et al., 2004)**

<table>
<thead>
<tr>
<th>BITA Criteria</th>
<th>Definition</th>
<th>Expected Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power distance</td>
<td>The degree to which members of a collective expect power to be distributed equally.</td>
<td>Followers should be expected to obey leaders without question.</td>
</tr>
<tr>
<td>Uncertainty Avoidance</td>
<td>The extent to which a society, organisation, or group relies on social norms, rules and procedures to alleviate unpredictability of future events.</td>
<td>Most people should lead highly structured lives with few unexpected events.</td>
</tr>
<tr>
<td>Humane Orientation</td>
<td>The degree to which a collective encourages &amp; rewards individuals for their cooperation.</td>
<td>People should be generally very tolerant of mistakes.</td>
</tr>
<tr>
<td>Institutional Collectivism</td>
<td>The degree to which individuals are integrated into groups within the society.</td>
<td>Group loyalty is encouraged even if individual goals suffer.</td>
</tr>
<tr>
<td>In-Group Collectivism</td>
<td>The degree to which individuals have strong ties to their small immediate groups.</td>
<td>In this society, children live with parents until they get married.</td>
</tr>
<tr>
<td>Assertiveness</td>
<td>The degree to which individuals are assertive, dominant &amp; demanding in their relationships with.</td>
<td>People should be generally dominant.</td>
</tr>
<tr>
<td>Gender Egalitarianism</td>
<td>The degree to which a collective minimizes gender inequality.</td>
<td>Boys are encouraged more than girls to attain a higher education.</td>
</tr>
<tr>
<td>Future Orientation</td>
<td>The extent to which a collective encourages &amp; rewards future-oriented behaviours (delaying gratification, planning &amp; investing in future, etc.)</td>
<td>More people should live for the present than for the future.</td>
</tr>
<tr>
<td>Performance Orientation</td>
<td>The degree to which a collective encourages &amp; rewards group members for performance improvement &amp; excellence.</td>
<td>Individuals should be encouraged to strive for continuously improved performance.</td>
</tr>
</tbody>
</table>

These dimensions were tested theoretically to find their relationships and expected impact on BITA components (represented by the SAM model). Hypothetically, it was expected to find at least one existing reflection of each cultural dimension on each SAM’s criterion. With the help of SAM’s attributes in each criterion, more various interesting relations have been addressed between GLOBE’s dimensions and SAM’s criteria. These relations are discussed in the following points:

**Power Distance (PD).** Based on findings of House et al. (2004), it can be concluded that high PD score indicates that individuals distinguish in their work with other colleagues, including
managers, according to the power and status they have. Individuals are expected to obey superiors. Following the findings of Sørnes et al. (2004), a low PD score indicates close relationships between different hierarchical levels, and surrounds the environment by less formalized and less intensive conditions that are expected to have both higher Communications and Partnership Maturity. However, such environment does not require high level of transparency, value measurement or metrics for IT and business. This affects Competency /Value Measurements Maturity and attaches less formalized Governance processes lowering their Maturity.

In organisations with high PD scores, architecture transparency and changes of procedures are clearly limited with rigid conditions. Additionally, process integration might vary from one project to another based on PD. It is, therefore, expected to relate high PD with less Scope & Architecture Maturity. Low PD score encourages individuals to take initiatives and development steps in pressure-free environment. Thus, it is expected to result in a high Skills Maturity.

H1: ‘Power Distance’ negatively contributes to the maturity of ‘Communications’.

H2: ‘Power Distance’ positively contributes to the maturity of ‘Competency /Value Measurements’.

H3: ‘Power Distance’ positively contributes to the maturity of ‘Governance’.

H4: ‘Power Distance’ negatively contributes to the maturity of ‘Partnership’.

H5: ‘Power Distance’ negatively contributes to the maturity of ‘Scope & Architecture’.

H6: ‘Power Distance’ negatively contributes to the maturity of ‘Skills’.

Uncertainty Avoidance (UA). Following the findings of House et al. (2004), a high UA score may result in high tendency towards certainty. This does not stimulate informal communications or sufficient transparency between business and IT domains (lower Communication and Partnership Maturity). However, it stimulates value and consistency measurements (higher Competency/Value Measurements), and creates structured rules and laws to govern (higher Governance Maturity). According to the findings of Cardon & Marshall (2008), a high score of UA leads to certain and secured system establishment with strong architectures and a slower rate of adopting technology (higher Scope & Architecture Maturity). However, it – at the same time – limits flexibility and functional integrations (lower Maturity). High UA is also expected to have definite command and control management style within IT and business domains. This decreases the motivation of individuals’ towards learning and developing (lower Skills Maturity) as found by Livonen et al. (1998).

H7: ‘Uncertainty Avoidance’ negatively contributes to the maturity of ‘Communication’.

H8: ‘Uncertainty Avoidance’ positively contributes to the maturity of ‘Competency /Value Measurements’.

H9: ‘Uncertainty Avoidance’ positively contributes to the maturity of ‘Governance’.

H10: ‘Uncertainty Avoidance’ negatively contributes to the maturity of ‘Partnership’.

H11: ‘Uncertainty Avoidance’ positively/negatively contributes to the maturity of ‘Scope & Architecture’.

H12: ‘Uncertainty Avoidance’ negatively contributes to the maturity of ‘Skills’.
Humane Orientation (HO). Following the findings of Javidan & Dastmalchian (2009), organisations in humane-oriented societies have a high regard for human relationships, support and sympathy for others which create informal communications and close relationships resulting in higher Communications and Partnership Maturity. Other findings of House et al. (2004) indicate that in such a humane environment, people tend to help others in tasks with the feeling of societal obligation. Governance components in such context are affected and expected to result in lower maturity. Consequently, formal assessments, evaluations and metrics are neither effectively nor accurately used resulting in lower Competency/Value Measurements maturity. Organisations with low HO, however, place more emphasis on self-orientation, development and evaluations. Assessing individuals is important for such organisations to plan for individuals’ careers and rewards. Integrations, transparency and flexibility of architecture are easier in such organisations than humane-oriented ones. It can be expected that a low score of HO will be attached to higher Scope & Architecture as well as Skills Maturity.

H13: ‘Humane Orientation’ positively contributes to the maturity of ‘Communication’.
H14: ‘Humane Orientation’ negatively contributes to the maturity of ‘Competency /Value Measurements’.
H15: ‘Humane Orientation’ negatively contributes to the maturity of ‘Governance’.
H16: ‘Humane Orientation’ positively contributes to the maturity of ‘Partnership’.
H17: ‘Humane Orientation’ negatively contributes to the maturity of ‘Scope & Architecture’.
H18: ‘Humane Orientation’ negatively contributes to the maturity of ‘Skills’.

Institutional Collectivism (In.C). Organisations in collective societies tend to emphasize and encourage group harmony and cooperation (Javidan & Dastmalchian, 2009). Group achievements, collective tasks and strong planning prevail in individual tasks (Veiga, 2001). It is expected that high In.C may result in higher Partnership and Governance Maturity. Collective characters are more likely to bring about success and integration than individual ones. This may result in higher Scope & Architecture Maturity (Silvius et al., 2009). In high individualistic societies, organisations tend to value task-orientated communications and cooperation (higher Communications Maturity), reward individuals’ performance and values (higher Competency/Value Measurements Maturity) (Veiga, 2001). Self-interest and individuals’ freedom, in highly individualistic organisations, results in openness for change and career development that may lead to higher Skills Maturity, and provide highly reported and structured tasks that higher Governance Maturity.

H19: ‘Institutional Collectivism’ negatively contributes to the maturity of ‘Communications’.
H20: ‘Institutional Collectivism’ negatively contributes to the maturity of ‘Competency /Value Measurements’.
H21: ‘Institutional Collectivism’ negatively contributes to the maturity of ‘Governance’.
H22: ‘Institutional Collectivism’ negatively contributes to the maturity of ‘Partnership’.
H23: ‘Institutional Collectivism’ negatively contributes to the maturity of ‘Scope & Architecture’.
H24: ‘Institutional Collectivism’ negatively contributes to the maturity of ‘Skills’.
**In-Group Collectivism (GC).** In organisations belonging to societies with a high GC score, very close relationships with informal protocols are facilitated between members of in-groups. Out-groups are not involved in these processes which is expected to cause lower *Communications* maturity, as found by Javidan and Carl (2005). In *Competency/Value Measurements, Governance and Architecture*, no reflection is found in the literature to indicate how GC impacts on their maturity. According to House et al. (2004), high GC leads to group harmony, as extended families to members, with shared goals, ideas and even risks (higher *Partnerships* Maturity is expected). Spending time together, encouraging each other’s careers and helping in informal education led to increasing affiliation to organisations and cross training (higher *Skills* Maturity).

H25: ‘In-Group Collectivism’ negatively contributes to the maturity of ‘Communications’.

H26: ‘In-Group Collectivism’ positively contributes to the maturity of ‘Partnership’.

H27: ‘In-Group Collectivism’ positively contributes to the maturity of ‘Skills’.

**Assertiveness (ASS).** The findings of Dastmalchian et al. (2001) relate high ASS levels to individuals’ tendency to be more independent and self-confident. This surrounds the environment with competitive components and sympathy for the stronger and the winner. It is therefore suitable for formal assessment, evaluation and performance metrics. It is then expected that high ASS results will follow in high *Skills* and *Competency/Value Measurements* Maturity. In this environment, individuals have a tendency to follow structures, planning, reporting systems and prioritized actions which expected to result in higher *Governance* Maturity. In findings of House et al. (2004), transparency as well as flexibility and integration of *Scope & Architecture* are, however, limited because of assertive behaviour of individuals and lack of cooperative environment lowering the maturity level. Organisations in low ASS societies tend to encourage informal communication and cooperative relationships. Loyalty and harmony are important for a transparent and trustful environment. This is expected to cause higher Maturity for *Communications* and *Partnership*.

H28: ‘Assertiveness’ negatively contributes to the maturity of ‘Communications’.

H29: ‘Assertiveness’ positively contributes to the maturity of ‘Competency/Value Measurements’.

H30: ‘Assertiveness’ positively contributes to the maturity of ‘Governance’.

H31: ‘Assertiveness’ negatively contributes to the maturity of ‘Partnership’.

H32: ‘Assertiveness’ negatively contributes to the maturity of ‘Scope & Architecture’.

H33: ‘Assertiveness’ positively contributes to the maturity of ‘Skills’.

**Gender Egalitarianism (GE).** As Javidan and Carl (2005) explain, organisations that operate in high GE societies tend to be motivated towards a diversity of ideas, individuals and skills which cause higher *Skills* Maturity. Higher *Skills* and *Governance* Maturity may also be expected in male-oriented societies with a high orientation towards work and material success (Hofstede, 1991). With high GE score, it is expected that smoother and two-way communications can be facilitated rather than a one-way style of low GE score (higher *Communications* Maturity). Following the assertiveness findings, with high assertiveness, the focus is oriented more on work and material success. Therefore, organisations in male-oriented societies are expected to have more assessment, evaluation and standards in work, and hence higher *Competency/Value Measurements* maturity (Sørnes et al., 2004). In such
organisations, individual performance and success are appreciated, which is expected to cause lower Scope & Architecture Maturity (Silvius et al., 2009). High GE, however, does not allow people to only seek assertively after their career and individual success which results in higher Partnership maturity.

H34: ‘Gender Egalitarianism’ positively contributes to the maturity of ‘Communications’.

H35: ‘Gender Egalitarianism’ negatively contributes to the maturity of ‘Competency /Value Measurements’.

H36: ‘Gender Egalitarianism’ positively/ negatively contributes to the maturity of ‘Governance’.

H37: ‘Gender Egalitarianism’ positively contributes to the maturity of ‘Partnership’.

H38: ‘Gender Egalitarianism’ positively contributes to the maturity of ‘Scope & Architecture’.

H39: ‘Gender Egalitarianism’ positively/ negatively contributes to the maturity of ‘Skills’.

Future Orientation (FO). Based on the findings of Javidan and Dastmalchian (2009), organisations in societies with a high FO tend to have more structured planning, working style, knowledge sharing and reporting systems. That indicates support for higher Communications and Governance Maturity. To serve their long-term horizons, these organisations tend to develop different metrics for assessing performance and continuous improvements (higher Competency /Value Measurements Maturity). In such organisations, the findings of House et al. (2004) also indicate more involvement of individuals in future-oriented actions and decisions. They tend to base their future on trustful and transparent processes which may result in higher Partnership Maturity. However, future decisions might affect the stability of current Scope & Architecture resulting in lower Maturity. Additionally, with future-oriented vision, individuals are more innovative and motivated for their career development and education. That can result in higher Skills Maturity. At the same time, openness to seeking careers gives less affiliation and trusting environment attached with lower Maturity.

H40: ‘Future Orientation’ positively contributes to the maturity of ‘Communications’.

H41: ‘Future Orientation’ positively contributes to the maturity of ‘Competency /Value Measurements’.

H42: ‘Future Orientation’ positively contributes to the maturity of ‘Governance’.

H43: ‘Future Orientation’ positively contributes to the maturity of ‘Partnership’.

H44: ‘Future Orientation’ negatively contributes to the maturity of ‘Scope & Architecture’.

H45: ‘Future Orientation’ positively contributes to the maturity of ‘Skills’.

Performance Orientation (PO). Organisations in PO oriented societies tend to focus on individuals’ performance rather than establishing good relations between them. Based on the findings of Walls (1993), it can be concluded that formal relationships and separation between business and IT domains are expected in such organisations because managers expect high quality output from individuals, which results in lower Communications Maturity. Insufficient transparency and sharing visions are also attached, which result in lower Partnership Maturity. In such an environment, it is important for managers to have different metrics, benchmarking and formal assessments to ensure high performance and outcomes. Higher
Competency/Value Measurements Maturity are therefore expected. While a high PO score enables organisations to conduct strategic planning, structured reporting and tasks (higher Governance Maturity), it may also lead to structured Architectures and defined Scope (higher Maturity) but in less transparency and flexibility (Lower Maturity) as found by Birgelen et al. (2002). In performance oriented organisations, individuals’ training and development are encouraged, innovations are strongly appreciated which indicate higher Skills Maturity.

H46: ‘Performance Orientation’ negatively contributes to the maturity of ‘Communications’.

H47: ‘Performance Orientation’ positively contributes to the maturity of ‘Competency/Value Measurements’.

H48: ‘Performance Orientation’ positively contributes to the maturity of ‘Governance’.

H49: ‘Performance Orientation’ negatively contributes to the maturity of ‘Partnership’.

H50: ‘Performance Orientation’ positively/negatively contributes to the maturity of ‘Scope & Architecture’.

H51: ‘Performance Orientation’ positively contributes to the maturity of ‘Skills’.

C. Result:

In this section, the results of both subsidiaries, the Egyptian and the Swedish, are presented by the same order of the SAM’s six criteria. The results are mainly based on the GLOBE Project itself with its measured scores and analyses as well as the interviews with individuals from both subsidiaries as described in subsection 4.1.2 (A. Collecting the Data).

Company-A (Egypt):

Communications. As a result of high power distance in the Egyptian style of work, people do not have a close relationship with their hierarchical levels. Additionally, uncertainty avoidance has one of the lowest scores globally, mainly because of uncertain economic and political situations. Thus, communication becomes formalized and less mature. As it is an under developed country, in Egypt IT is seen as the future. Business executives recognize IT as an important partner in their success. However, they dominate all decisions regarding new technologies, solutions or resources. Therefore, the understanding of IT by businesses is higher compared to the understanding of business by IT. Regular meetings between the two business and IT domains are limited at a strategic level. The environment lacks trust, especially at tactical and operational; levels.

There is a noticeable trend in the company towards encouraging a group working style and cooperation as required for synergic results. However, the high performance orientation hinders transparency in sharing knowledge and hence communication maturity is lowered. With moderate future orientation, affected by uncertain conditions and high human orientation, communication is carried out in an unstructured way which decreases communication maturity. Additionally, information is not available for reuse, which affects the overall analysis and evaluation of the company’s business.

Competency/Value Measurements. There is a clear separation between business and IT departments due to the domination of high performance orientation and low uncertainty avoidance within society. IT units are also separated in terms of internal and external services. In such a context, IT metrics provide a concrete analysis of both inbound and outbound
(customer and supplier related issues) performance. Business metrics are, however, useful for evaluating issues like purchasing statistics, customer satisfaction and the importance of IT services.

With regard to performance orientation, there is the possibility of control and review over business metrics without formal feedback over the efficiency of IT metrics. As humanity plays a vital role at organisational level, a clear effect is highlighted by high human orientation as well as high power distance. Therefore, changes and rules are expected to be ordered from bosses related to human aspects. Additionally, benchmarking and formal assessment might not similarly follow from workers to others inside the organisation, which negatively affects the maturity of competency/value measurements.

**Governance.** Characterized by high uncertainty, strategic planning is usually carried out for a maximum two-three years in both business and IT domains. The high power distance makes more formalized, rather than close, relationships at different hierarchical levels. This negatively affects governance maturity. To avoid a high level of uncertainty, there is a clear profile for formalized rules for reporting systems, investment management prioritizing processes and steering committees. However, both high human and performance orientation supports informal relations, especially between close, but not competitive, persons. As a result, governance maturity is balanced.

**Partnership.** The domination of high uncertainty leads to delegating decision power to business executives with full responsibility for driving transformation in the company. IT only enables changes in processes. This situation does not provide a seat for the CIO in the company’s executive board. IT strategies and projects are not prioritized. Future directions and new business areas are explored only by business managers. High power distance, with high performance orientation, clearly reflects insufficient transparency, not only between the two domains of business and IT, but also inside each domain. As a result, IT is seen as a separated supportive unit rather than a partner.

**Scope and Architecture.** IT does not have a leadership position; but it applies standards across an organisation that need to be integrated with organisational structure according to business needs. Therefore, the company achieves sufficient flexibility regarding business plans and goals. High uncertainty, however, does not enable a very flexible architecture even when different scaled changes are required. The adoption of a change is very difficult process as it requires wise pre-thinking and evaluation.

The transparency of the architecture and changes in procedures are clearly affected by high power distance and performance orientation. Rigid conditions on architecture hinder the flexibility that is needed in most of tasks. Additionally, different changes and processes of integration might vary from one project to another based on high power distance and human orientation.

**Skills.** With high human orientation, individuals are appreciated for skills development. High performance orientation forces them to develop their skills and search for more development chances. However, performance orientation is always affected by high power distance and gender differentiation that causes unfair motivation and rewards for individuals.

The possibilities of training and changing are always there and provided by managers in a performance-oriented environment. However, individuals are eager to develop faster and catch as much as they can as they feel uncertain environment and conditions. This not the same in all such situations. Society in general scores one of the highest in-group rates of
collectivism globally. For those who find the company suitable for their life conditions, it is very difficult for them to change and they are seen as being highly affiliated to their jobs and they consider the company as their second home.

**Company-B (Sweden):**

**Communications.** Low future orientation gives more stability to both business and IT domains. Additionally, Sweden owns one of the highest scores in avoiding uncertainty supported by social supportive government. In that sense, people work in a more static environment without uncertainty in their job conditions. That helps in facilitating very clear strategies and in applying feasible standards for sharing knowledge. The company’s goals and objectives are clear for people in both domains. That reflects a very good understanding of business by IT and of IT by business.

The low assertive behaviour of people causes the two units to work effectively towards an inter/intra cooperative context. This creates a supportive learning environment without pressure. Additionally, if supported by low power distance, workers from both business and IT do not find that there is any competition or inconvenient issues to communicate. Instead, they practice informal relationships between top managers and employees, thus, environment is highlighted by very good communications and relationships that make knowledge sharing easier.

Sweden is highlighted globally as one of the highest countries in institutional collectivism. Throughout all of the study phases and interviews, a high encouragement for group cooperation was noticed rather than individual achievements. Communication through internal seminars, project forums and even two daily coffee breaks are encouraged and supported. However, the Swedish relaxed working system, a small number of staff and allowances for long paternity leave meeting times between employees and following up processes.

Communications between business and IT domains at the strategic and tactical levels are organized and performed in a semi-structured way. Therefore, different types of data are utilized for analysis and evaluation.

**Competency/Value Measurements.** Business and IT metrics are developed in the company. However, high uncertainty avoidance, complemented by a relaxed social system and health service, causes low levels of future orientation that consequently cause inefficient use of metrics. However, established IT metrics are used for evaluating the extent of the services provided to different business functions, and business metrics are used to ensure the avoidance of uncertainty in jobs and future careers.

In the IT context, the need for ever changing high quality and processing software is a constant factor as a part of the core business functions. However, in terms of moderate low performance orientation, there is only control and review over business metrics. There is a clear lack of any formal assessment or review over IT metrics or people performance. People work in their individual tasks inside their teams or projects. As soon as a certain iteration or task is completed, it is made visible and communicated to the whole team for the further processes.

**Governance.** During all the interviews, the clear effort of top executives in both domains, for their strategic planning, has been appreciated. However, IT strategic planning is more clear, understood and followed by that of business. Low future orientation of people makes them interested only to finish their tasks as they should be. They are not interested at all in
understanding business strategies. As an IT-related organisation, the company has very developed physical and non-physical infrastructures. People are seen to avoid uncertainty by understanding IT development and strategic planning. With IT people, they all rely on business people for driving the company.

As a federal organisation, the company applies federal organisational structure that allows for flexible strategies. Conforming to low assertiveness and power distance, the company has a clear flat organisational structure. This facilitates a high level of transparency and leads to the accountability of outcomes of IT projects. Thus, clear support for institutional collectivism is also guaranteed.

**Partnership.** The CIO has a seat on the executive board and plays an important role in driving the company towards different transformations in structure and processes. Also, IT top managers stand in leadership positions and accept sharing responsibility with business executives when it is about taking risks. What creates a contradiction is that IT strategies and projects are not prioritized, although IT is seen as a partner rather than a supportive tool. Future directions and new business areas are explored by only business executives.

To avoid uncertainty, business people only take full responsibility for risks as they consider that it is their duty to keep their business going, especially in the current global economic crisis. This provides insufficient transparency for workers. The effort to make a better environment for trust is clear, as humanity is an important character of Swedish business. For that purpose, the lower power distance and high collectivism supports more intensive, closer relations, which are less formalized, and as a result provide richer transparent communication.

**Scope and Architecture.** Due to the importance of avoiding uncertainty, business people dominate the external relations of the company, including those with suppliers and customers. Nevertheless, IT applies standards across the organisation but with no formal integration in the organisational structure. The high uncertainty avoidance highly supports creating a very stable architectural system with high security and wise thinking before changes to new technologies. So, clear understanding to find sufficient/not high flexibility of IT infrastructure with sufficient integration within all business levels. The Swedish CIO says “We need to be more rational and efficient in using IT. We have a deep need to manage our resources, people and organisations”

On the other hand, with a high score in collectivism, there is an informal integration to be applied in the functional processes, especially during important projects. This informal integration, supported by low power distance, allows for exchanging experiences, applying new technologies, improving business processes and providing customized solutions.

**Skills.** The skills of people in the company are highly matured and clearly affected by the low assertiveness and low power distance. This is because people take an initiative in their work in a pressure-free environment. However, the high uncertainty avoidance and low future orientation affects the learning of some employees, especially in the business domain. Additionally, and because of different specializations, cross training is not supported; which affects the affiliation of people.

Moderate high human orientation in a company results in an appreciation of individual skills development. Also, with high score of collectivism, people are eager to share knowledge and experiences. This is supported by the company’s facilitation of training programmes, seminars, and lectures on a virtual campus. The society in general scores low in terms of ingroup collectivism. This makes it easy for people to change their work frequently, which highlights a low level of affiliation and attachment of people to businesses.
D. Comparative Analysis:

In this section, the comparative results and analyses are presented. Table 3 summarises the results of the impact of the nine societal cultural dimensions on the six criteria of BITA maturity. The impact is classified in three different levels, as follows:

**High impact:** This dimension is classified as having a high impact on a BITA criterion when there are direct relationships between the dimension and one or more of attributes in this criterion. A high impact might then be positive or negative.

**Example:** In Company-B, a low score for ‘Assertiveness’ gives direct impact on several attributes of the criterion ‘Communication’. It provides flexibility of work in different conditions that are comfortable for individuals and provides informal ways of communicating which are also direct inputs ‘Understanding of Business by IT’ and ‘Understanding of IT by Business’. Also, the low score for ‘Assertiveness’ reflects a high flexibility of reporting systems, which is considered to be a direct input to the maturity of the attributes ‘Protocol Rigidity’ and ‘Knowledge sharing’.

**Low Impact:** This dimension is classified as having a low impact on a BITA criterion when there are indirect relationships between the dimension and one or more of attributes in this criterion. This indirect relationship can also be established through any business, IT or organisational performance aspect that has an impact on BITA. A low impact might then be positive or negative.

**Example:** In Company-A, a high score for ‘Assertiveness’ gives an indirect impact on several attributes of the criterion ‘Communication’. The bosses try to impose their view on applying strategies and performing policies, functions and tasks. Therefore communications channels and knowledge sharing opportunities are followed in a formal way as pre-designed by bosses. Attributes like ‘Understanding of Business by IT’, ‘Understanding of IT by Business’ and ‘Sharing Knowledge’ are influenced by the view of this as an overall performance.

**No impact:** the dimension is classified to have no impact when there is neither a clear theoretical impact from the literature nor a practical perspective (from interviews or other practical studies) on BITA criteria or its attributes.

Table 3 presents the impact of cultural dimensions in different symbols as follows: ‘+H’ for a high positive impact, ‘–H’ for high negative impact, ‘+L’ for a low positive impact, ‘–L’ for a low negative impact and ‘---’ for no clear impact.

In a few dimensions, the findings show positive and negative impacts at the same time but in different conditions. This can be shown in the discussion above on developing hypotheses (e.g., the impact of ‘Institutional Collectivism’ on ‘Governance’ and the impact of ‘In-Group Collectivism’ on ‘Skills’). For this situation the symbol ‘±’ is given, as shown in Table 3.

Following the above discussion (Section C), Table 6 represents the results of the empirical investigation on the relationships between BITA criteria and the societal cultural dimensions. There are cells that show expected results that confirm the discussion on (Section B) for developing hypotheses. These cells are shaded in white. Other cells that show unexpected results are shaded in grey and are discussed in the sub-sections following Table 3.
**Table 6. Societal Culture Impact on BITA Maturity**

<table>
<thead>
<tr>
<th>BITA Criteria</th>
<th>Company</th>
<th>Societal Cultural Dimensions</th>
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<tr>
<td></td>
<td>ASS</td>
<td>FO</td>
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<td>Communications</td>
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<td>-L</td>
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<td></td>
<td>B</td>
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<tr>
<td>Competency/Value</td>
<td>A</td>
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<tr>
<td>Measurements</td>
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<tr>
<td>Governance</td>
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<td>Partnership</td>
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<tr>
<td>Scope and Architecture</td>
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<td>Skills</td>
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ASS = Assertiveness, FO = Future Orientation, PO = Performance Orientation, HO = Human Orientation, GE = Gender Egalitarianism, UA = Uncertainty Avoidance, PD = Power Distance, Inc.C = Institutional Collectivism, and GC = In-Group Collectivism.

**Communications.** [Power Distance (PD), Institutional Collectivism (In.C), Assertiveness (ASS), and Performance Orientation (PO)]. PD, in Company-A, scores higher than Company-B. However, PD in Company-A has a strong impact on increasing the score of ASS that makes people demand that more of their relationship is on the safe side of their bosses’ blame. Although, In.C scores lower in Company-A, but In.C has a positive impact on communication maturity in both companies. In Company-A, the higher PD makes formal methods and structure for a collective (In.C) working style which provides structured communications. But, with low PD in Company-B supported by low ASS and high In.C, communications are organized and matured smoothly. Other human interaction related dimensions (PO and HO) have a clear impact, especially in Company-A, on communications maturity. It can be then related that to the higher PD which influences the communications style and work structure trying to avoid high uncertain conditions.

**Competency/Value Measurements.** [Uncertainty Avoidance (UA), Power Distance (PD), Future Orientation (FO), and Institutional Collectivism (In.C)]. Company-A is surrounded by uncertain conditions due to economic and political situations. This creates a competitive and uncomfortable environment. People, do not see means for designed values, metrics and measurements of effectiveness as they are unstable to a certain limit. While, the high UA in Company-B gives more stability and confidence on competency, values and metrics. However, with a low score in FO, people do not fully follow these metrics or benefit from them.

The higher PD in Company-A gives more requirements and formality of procedures, tasks, evaluations and reporting systems than in Company-B. It is therefore the maturity of competency/value measurements is negatively affected in latter company by low PD.

**Governance.** [Performance Orientation (PO), Human Orientation (HO), Uncertainty Avoidance (UA), Future Orientation (FO) and Power Distance (PD)]. PD, linked with high uncertainty, has both high positive and a negative impact on governance in Company-A. Although, formal structure and rigid rules by bosses’ design for ways for governance, but they create inflexible hierarchical levels that hinder smooth governance. In Company-B, lower
scores of PD and FO provide a suitable environment of relaxed matured strategic planning, reporting and wise decisions for prioritization.

In both companies, there are opposite impacts of PO and HO. While a high score for PO in Company-A negatively supports a more competitive rather than a cooperative environment, while high HO positively gives potentials for informal governance processes. In Company-B, while a low score of PO negatively affect quality control over planning and reporting, the high HO positively affect on individuals’ governance processes.

**Partnership.** [Future Orientation (FO), Uncertainty Avoidance (UA), and Institutional Collectivism (In.C)]. While the score of FO is clearly higher in Company-A than in Company-B, it has a negative impact on partnership maturity in both companies. Similarly, the UA score is much higher in Company-B than in Company-A. However it has also a negative impact on partnership maturity in both companies. In Company-A, future planning connected with high uncertainty is controlled by business people without transparent processes. That is why IT is not as exploited as it should be. In Company-B, a stable image about the future and a very low effect of uncertain conditions have led to an inactive partnership.

**Scope and Architecture.** [Uncertainty Avoidance (UA) and Power Distance (PD)]. While high uncertainty in Company-A limits flexibility of architecture, very low uncertainty in Company-B is related to a high tendency for secured systems, architectures, and a wise adoption of new technologies. UA is clearly supported in Company-A by the high score of PD for negatively affecting the scope and architecture maturity, whereas a low score of PD support in company-B supports the scope and architecture maturity. On the other hand, individual characteristics in their assertiveness and future orientation positively affect the maturity in Company-A rather than Company-B.

**Skills.** [Uncertainty Avoidance (UA), Future Orientation, Gender Egalitarianism (GE), and In-Group Collectivism (GC)]. The low score of UA in Company-A negatively affects individuals’ plans of learning, training and developing as they do not see a clear motivation for certain conditions and the future. On the other hand, in Company-B, the high UA connected with low FO causes a very slow development for individuals, which also negatively affects the maturity of their skills. GE has a very clear effect on Company-A. Male individuals are motivated and given more chances to develop their careers. The situation is affected by societal conditions that limit the opportunity to travel of females, their work relationships and their future careers. The situation is totally different in Sweden, where female individuals are promoted more than males and have equal chances and rights.

**E. The Study Conclusions:**

Following the above results and comparative analyses, it can be seen that there are clear differences in BITA between both subsidiaries Company-A and Company-B. The biggest differences are shown in the criteria of ‘Communications’, ‘Partnership’ and ‘Skills’. In Communications, the difference is related to the variations in understanding the importance of IT and the benefits of knowledge sharing all over the organisational levels. That is clearly affected by societal cultural dimensions. In partnership, the difference is not related directly to the perception of IT value and its role in strategic business planning. It is, however, more related to facilitating this perception for achieving consensus goals and objectives. In skills, the difference is related to working conditions under clear societal cultural impacts.
The conclusions from this study can be summarized as follows:

1. The research in BITA and its maturity assessment is an ongoing process with different BITA criteria. Different factors that have a clear impact on BITA are not well studied and examined yet. A clear example of these factors are the societal and organisational culture. These factors are shown to have direct relationships with most of the BITA components.

2. The main concern for BITA is how it can be achieved and matured. Therefore, different BITA models that measure its maturity should be clearly adjusted or linked with cultural dimensions when implemented in different cultural contexts.

3. The study shows the biggest differences in the three criteria ‘Communications’, ‘Partnership’ and ‘Skills’. These criteria make up half of the model and are the areas that have the highest level of human interaction. Special consideration should be orientated towards studying their impact. They show that the complexity in analyzing the societal cultural impact on the maturity of BITA is due to the complex relationships that exist between cultural dimensions, on the one side, and different positive/negative impacts from the same cultural dimension at the same time on the other.

4.1.3 General Limitations of BITA

The outputs from the first (Section 4.1.1) and second steps (Section 4.1.2), as discussed above, are important inputs to this step, which deals with the classification of the found general limitations of SAM model. This step focuses on studying literature that has a focus on the inception-based limitations of SAM and which represents different challenges and problems that influence the use of SAM in organisations today. These limitations are important to show a holistic view of the model with clear understanding, how BITA different criteria and attributes are perceived, and how different components are applied and used.

The existing literature is generally focused only on studying the challenges of BITA in general and specifically SAM. They focus on either extensive surveys over existing literature (e.g. Chan & Reich, 2007a; Benbya & McKelvey, 2006) or on empirical approaches (e.g. Chan, 2001; Ezadi Yeganeh, 2001; Johns et.al 2002; Motjolopane and Brown, 2004; Bennett, 2004; Silva et al., 2007; Arab Sorkhi et al., 2010; Silvius et al., 2010). To avoid having vague and redundant nature, the reasoning of all limitations were analyzed and rephrased. In addition to that, similarities and conflicts were omitted. Based on the findings and reasoning of all limitations and following the same categories in the studied literature, the limitations have been classified in three categories as follows:

i) Organisational related limitations: This group of SAM limitation is typical characterised by a theme of ‘not fitting with current organisational functions’. Different studies (e.g. Van Der Zee et al., 1999; Chan & Reich, 2007) have concluded that SAM features organisational-related limitations because it was presented in 2001. It is therefore, no longer adapted to the current business processes and organisational multidimensional contexts. In addition to that, the SAM was used to assess different research projects and cases. Different researchers have then proposed that the model needs to be revised and improved (e.g. Avison et al., 2004; Gutierrez et al., 2008).

In responses to the current world economic crises (started in 2009) and motivated by fast developing technology, the number of organisations that are selecting the outsourcing choice for decreasing their IT costs is increasing (Loh & Venkatraman, 1992; Lacity & Hirschheim, 1993; Lacity, Willcocks, & Feeny, 1995; Shephered, 1999). In that sense, attribute like "career
crossover’, ‘steering committees’, ‘liaison/s effectiveness’, ‘protocol rigidity’ and similar others are seen less important to be applied or meaningless to be achieved. An important reason is highlighted as the business and IT domains in such outsourcing organisations are separated into two or more different business environments. These environments, in most of the cases, are characterised by totally different conditions (e.g. economic conditions, business context, cultures, level of development for the business environment, business models, etc.). The IT employees remaining after outsourcing are usually responsible for running a few functions for controlling and evaluating the outsourced IT operations. However, IT outsourcing is also involved with risk, which might causes unwanted consequences, e.g., expensive adjustment of each contract (Earl, 1996), decreasing the degree of control causing less performance than expected from vendors and the ability of vendors to appeal against the agreed prices (Ngwenyama & Bryson, 1999) and the leaking of business secrets to other competitors (Mojsilovic et al., 2007). Thus, for other organisations instead of firing employees and IT outsourcing, they focus more on solving their problems and mitigating their risks. They also try to gain new technologies by increasing research, enabling knowledge sharing, knowledge management and training their people. These results are affirmed by BITA and SAM studies like Avison et al. (2004), Gutierrez et al. (2008) and Arab Sorkhi et al. (2010).

**ii) Organisational Culture related limitations:** Researchers like Campbell et al. (2005) and Chan and Reich (2007) emphasise other types of limitations that are mainly focused on human aspects that are related to the characteristics of organisational culture. Empirically, two main reasons have been highlighted for these limitations. The first reason is highlighted as ‘the lack of needed decision makers’ knowledge for using SAM assessing and’. Some of the key decision makers (business and IT managers) were found unknowledgeable of alignment models generally and SAM specifically. Applying SAM attributes clearly requires sufficient understanding of strategic and tactical operations in both business and IT domains. The results of Arab Sorkhi et al. (2010) and Benbya & McKelvey (2006) bring the same findings by emphasizing the alignment knowledge as a key factor for successful management in applying BITA components. This is attached to a leadership style that energizes their employees towards various overall goals.

The second identified reason is highlighted as ‘there is lack of perception for the alignment benefit’. Most of the organisations were found to have business dominance over IT for making decisions and developing strategies. Business managers in such organisations are, in most of these cases, pure business people who do not perceive the importance of IT in their organisations. Several business managers believe that IT is only a cost for the organisation. IT according to them can only be a supportive tool for changing and enabling business processes (Chan and Reich, 2007b). However, in few case, IT-familiar managers believe that “IT should be seen as vital and a strategic partner to the business domain”. These two perspectives explain the debate on how business-IT alignment is perceived to add a value to the organization. These findings can be clearly argued to conform to the results of researchers like Ezadi (2006), Johns et al. (2002), and Motjolopane & Brown (2005) who highlight the importance of social characteristics of business and IT managers with regard to the success alignment of IS plans with business plans. These views result from the characteristics of organisational culture.

**iii) Hybrid Limitations:** These limitations are clearly found when there is no border to define the reason/s for a limited attributes in an organisational-related group or an organisational-culture-related group. Therefore, the limited SAM attributes in this group are characterised by their ‘complexity’. This conforms to what is found in researchers’ results like Campbell et al.
(2005), and Benbya & McKelvey (2006). The complexity of SAM attributes can be seen from different perspectives. It is firstly noticed, in some attributes, that the same attribute may have different interpretations by different people and is considered differently in an organisation’s strategy. For example in the Skills criterion, attributes like ‘change readiness’, ‘career crossover’ and ‘creating a trusting environment’ have problematic applications in organisations. These attributes are interpreted by some business managers as employees are not eager to change their positions in the organisation. At the same time, several IT managers believe that the reason is directly attached to business decision makers where employees are not allowed to move between functional units because of financial issues and avoiding risks. They also refer to the lack of trust in IT people’s capabilities for handling organisational and business aspects. Considering the evidence which implies a strong role for organisational as well as non-organisational aspects, other several BITA attributes have such complex view.

On another perspective, there are some BITA attributes that are strongly interconnected with each other or can be clearly divided into organisational aspects and culture aspects. A clear example of such attributes is the ‘protocol rigidity’ in Communications criterion. It has been shown in the empirical study to have totally different implications for managers. On the one hand, some managers understand the rigidity in the attribute as a part of the organisational structure. Therefore, they link to a communication environment, tool or even a platform to be installed in the governance system. On the other hand, other managers consider the rigidity as more related to human and social aspects of the management and leadership in motivating employees to formally and informally communicate with each other and exchange the important knowledge. Researchers like Reich & Benbasat (2000), Galliers (2004) and Silvius et al. (2010) have discussed these points in details in their researches.

4.2 Defining the Objectives of a Solution

This phase, as introduced in the design science activities (Section 2.3), mainly focuses on defining requirements on the designed artifact (see Figure 16 as a part from the research process).

In this thesis, after highlighting different BITA problems and challenges, it was important to define the objectives of the extended BITA model. This has been done by means of an empirical survey targeting BITA practitioners in order to establish a basis for organisational culture problems. Following this, a study of organisational culture theories was an important
input in indicating the potential relationships between BITA components and organisational culture elements and sub-elements.

In this section, a number of requirements are provided that are mainly focused on the way in which the artifact contributes towards solving the research problem in this thesis. Not only are these requirements used for guiding the design and development of an artifact, but also they form a basis for its evaluation.

Different researchers (e.g. Hevner et al., 2004; Peffers et al., 2007; Baskerville et al., 2009; Johannesson and Perjons, 2012) highlight different notions in writing the requirements. However, the work of Johannesson and Perjons (2012), as a primer for the design science research method, encompasses different types of requirements in other works. Therefore, the classification of Johannesson and Perjons (2012) is also followed in classifying the requirements as follows:

**Internal properties:**

- **Coherence:** This is the degree to which the artifact and its parts are logically, orderly and consistently related (Baskerville et al., 2009; Johannesson and Perjons, 2012). An artifact can be characterized as having low coherence if it includes parts that contradict, in some sense, each other or do not fit with the rest of the artifact.

  It refers in the extended-SAM to the degree at which different BITA attributes are logically organized in their criteria having a consistent design. Also it examines how different criteria are consistent on their own, and, having no contradicting attributes between them, are also important (Henderson & Vekatraman, 1993; Maes et al., 2000; Luftman, 2000).

- **Modularity:** This refers to the level at which the model is divided in different parts or component/modules that can be studied independently (might be separated) as well as dependently (can be combined) (Hevner et al., 2004; Johannesson and Perjons, 2012).

  In the extended-SAM, it is required that the model be divided into BITA components which allow the user to develop a focused view on and an independent analysis of each module, as well an overall view of the BITA assessment on the organisation (Chan and Reich, 2007b).

- **Elegance:** This refers to the degree to which the artifact is admired by the users in terms of its appearance, shape and design style (Johannesson and Perjons, 2012).

  This is required for the extended-SAM, compared with the original model, in order to produce an acceptance by the user in its appearance reflecting a clear design, and a well designed process for applying and clear definitions of all attributes (Avison et al., 2004)

**External Properties**

i) **Usage**

- **Learnability and usability:** the learnability refers to the level at which the artifact is easy for users to learn its functionality, and the usability is about how the artifact is practically used in achieving a specific goal (Peffers et al., 2007; Johannesson and Perjons, 2012).

  For the extended-SAM, the designed artifact should have a step-by-step process for applying it (Luftman, 2000). Also, the model should not be complex to use and apply
(Avison et al., 2004; Roger, 2007) in relation to the time needed for learning and applying it (Maes et al., 2000; Sabherwal & Chan, 2001).

- **Customisability**: refers to the degree at which an artifact can be adapted to user demands by focusing on local practice or functions (Johannesson and Perjons, 2012).

  It is required for the extended-SAM to have the ability to be customized to any specific user’s focus on BITA criteria at a reasonable time and having an analytical insights into different specific BITA attributes, reflecting desired organisational needs (Byrd et al., 2005).

- **Traceability**: refers to the ability to trace different parts of the problem solved by the artifact in a logical way (Brathwaite, 2007; Johannesson and Perjons, 2012).

  In the extended-SAM, the proposed model should be able to investigate the attributes and their related classes that form a reason for misalignment (Luftman, 2000; Maes et al., 2000; Sabherwal & Chan, 2001).

ii) **Management**

Management properties describe how an artifact is managed over time.

- **Maintainability**: This refers to level of easiness at which an artifact can be maintained in order to correct different defects and meet new requirements or specific changes in the business context (Baskerville et al., 2009; Johannesson and Perjons, 2012).

  In the extended-SAM, the model is evaluated against the possibility of changing the classification of attributes, according to specific organisational needs (Maes et al., 2000; Luftman, 2000; Smaczny, 2001).

- **Flexibility**: This refers to the degree in which the model can be used in a flexible way to adapt to different organisational platforms (Peffers et al., 2007; Johannesson and Perjons, 2012).

  The flexibility for the extended-SAM refers to the level at which the model is able to assess BITA in a more dynamic environment of changing business and IT (Luftman, 2000; Byrd et al., 2005).

iii) **Generic**

- **Completeness**: This refers to the level at which the artifact includes all possible components that may lead to the achievement of the defined goals (Hevner et al., 2004; Johannesson and Perjons, 2012).

  In the extended-SAM, it refers to the level in which the artifact includes all possible components of BITA with inputs from organisational culture elements and sub-elements to make the assessment complete and accurate (Henderson & Vekatraman, 1993; Maes et al., 2000; Luftman, 2000).

- **Generality**: This refers to the degree at which the artifact fits not only for a local but also for a global practice in different business sectors (Peffers et al., 2007; Baskerville et al., 2009).

  In the extended-SAM, it refers to how the model can be applied in organisations to assess BITA in industries with different conditions (Tan, 1995; Reich & Benbasat, 2000; Chan et al, 2006).


- **Efficiency and Effectiveness**: This refers to the degree to which the artifact can be used to achieve the defined goal with an optimal use of resources and in minimum time, effort and expense (Baskerville et al., 2009; Johannesson and Perjons, 2012).

- The extended-SAM refers to how the model focuses on the effectiveness/efficiency of BITA components and on how BITA components are applied by considering the organisational culture elements/sub-elements (Luftman, 2000; Maes et al., 2000).

## 4.3 Design and Development

This activity in design science describes the process of designing and developing an artifact. In addition to the construction process of the artifact, this activity is concerned with producing knowledge about how the artifact is constructed with regard to solving the research problem addressed in the research. Figure 17 (as a part of the research process) represents different steps that have been undertaken for designing and developing the artifact. The steps are also described in the following sub-sections.

![Figure 17. Steps for Design and Development of the Artifact](image)

### 4.3.1 Developing Hypotheses

Based on an extensive literature survey, the potential impact of organisational culture (using X-Model’s sub-element, see motivation in Section 3.4.3) on BITA attributes (using SAM’s attributes) were addressed as bases for a set of hypotheses in the thesis. This process embraces the following step:

At first, the X-Model was studied i.e. the definitions of its elements and sub-elements referred to its components. For instance, considering the ‘leadership’ as an organisational culture element in the model, it refers, by Smit et al. (2008) to ‘the degree to which leaders have a clear picture for the future of their organisation and how they are active in influencing and guiding their personnel while creating a meaningful context for them’. In the X-Model, a sub-element called ‘energy demonstration’ is considered as one perspective/characteristic that defines the leadership concept. It is described in the X-Model, by Smit et al. (2008) as ‘the ability of leaders to demonstrate energy’ and vision describes ‘the ability of leaders to see the bigger picture and give meaning to it’.
In the second step, the original literature sources of all organisational culture components (elements and sub-elements) as referenced in the X-Model were re-visited. Based on, primarily, these sources in addition to other literature of organisational culture, reflections on the SAM model attributes were collected. The following points explain these steps in details:

- For the case of ‘leadership’ element, the definition and understanding of its sub-element ‘vision’ is referred to the work of Koestenbaum (1996) as one of its original sources.
- Also, it is concluded by Bennis (1989) that better understanding between individuals of an organisation is directly influenced by the leadership’s ability to demonstrate and transfer the bigger picture of overall strategies (business and IT) to the individuals.
- From another perspective, in other literature sources, researchers like Denison (2000) and Wallace et al. (1999) argued on similar findings by highlighting the importance of leadership role in establishing communication channels and relationships for encouraging collaborative work and achieving consensus goals.

These reflections provide ample evidences on the implications of the element ‘leadership’ and the sub-element ‘vision’ on, generally, ‘communications’ as a SAM criterion and, specifically, on ‘understanding between business and IT’ as an attribute of the Communications criteria).

Different reflections that have been collected previously in the second step serve as primarily bases for developing the main hypotheses regarding the impact of organizational culture components on BITA components. The ‘leadership’ case, presented above, can be applied to show the development of the first hypothesis H1 as follows:

H1: ‘Leadership’ positively contributes to the maturity of ‘Understanding of Business by IT’.

(Koestenbaum, 1996; Denison, 2000; Krames, 2005).

In the following paragraphs, the literature bases for reflections of sub-elements of the X-Model on all attributes of the SAM model are presented. They are categorized by the SAM criteria:

**A. Communications:**

**A1. Understanding of Business by IT:** According to Bennis (1989), it can be concluded that the high ability of the organisation to make a bigger picture of business and IT strategies and overall goals causes people to have better understanding in communications regarding their business goals and targets. Also, it is argued by Krames (2005) that leaders have an important role in creating an energetic environment for working and producing effective services. By demonstrating an energetic style of work, leaders are able to lead the personnel towards successful communications and mutual understanding of different business and IT goals.

H1: ‘Leadership’ positively contributes to the maturity of ‘Understanding of Business by IT’.

Based on (Krames, 2005; Koestenbaum, 1996).

Defining clear strategies with long-term directions are important inputs for transparent communications to understand visions and objectives in an organisation (Kotter, 1995; Denison, 2000). Also, the definition of clear strategies, according to Bennis (1989), supported by communicating their meanings to all individuals can be seen as a crucial aspect for
achieving and understanding goals. Additionally, the well two-ways communication channels have the potential to increase, according to Lopez et al. (2004), the co-ordination within and between teams and the transparency of information and decisions according to Burke et al. (1996).

H2: ‘Strategy’ positively contributes to the maturity of ‘Understanding of Business by IT’.
Based on (Kotter, 1995; Denison, 2000; Bennis, 1989).

From another perspective, successful organizational relationships are argued by Denison (2000) and Wallace et al., (1999) to be positively influenced by the ability of individuals to work collaboratively towards understanding and achieving consensus objectives and goals.

H3: ‘Relationship’ positively contributes to the maturity of ‘Understanding of Business by IT’. Based on (Hofstede, 1980; Wallace et al, 1999; Denison, 2000).

A2. Understanding of IT by Business: Based on the same findings for the attribute (A1), the following three hypotheses (H4-H6) can be extracted from the literature.

H4: ‘Leadership’ positively contributes to the maturity of ‘Understanding of IT by Business’.
Based on (Krames, 2005; Koestenbaum, 1996).

H5: ‘Strategy’ positively contributes to the maturity of ‘Understanding of IT by Business’.
Based on (Kotter, 1995; Denison, 2000; Bennis, 1989).

H6: ‘Relationship’ positively contributes to the maturity of ‘Understanding of IT by Business’. Based on (Hofstede, 1980; Wallace et al,1999; Denison, 2000).

A3. Inter/Intra – Organisational Learning: The promotion of organisational education/learning through bonding methods from senior and mid-level management can be facilitated by team orientation (Denison, 2000; Wallace et al, 1999) and co-operation (Hofstede, 1980) towards a collaborative goals in relationships, as well as by leaders who convert energy into actions (Schein, 1991; Koestenbaum, 1996).

H7: ‘Leadership’ positively contributes to the maturity of ‘Inter/Intra-Organisational Learning/Education’. Based on (Schein’s, 1991; Koestenbaum, 1996).

Based on the findings of Bennis (1989), it can be concluded that defining clear strategies and communicating their meanings to all individuals is important for creating understanding and achieving goals. Additionally, co-ordination within and between teams (Lopez et al., 2004) as well as sharing transparent information (Burke et al., 1996) are the results of well formulated two-way communication channels.

H8: ‘Strategy’ positively contributes to the maturity of ‘Inter/Intra-Organisational Learning/Education’. Based on (Bennis, 1989; Burke et al., 1996; Lopez et al., 2004).

In the literature, this attribute is found to be positively well correlated with attributes of adaptability in the organisational sharing of knowledge and experience (Handy 1995; Krames, 2005) and flexibility of policies, regulations and beliefs for learning and changing (Chaharbaghi et al., 2005).

H9: ‘Adaptability’ positively contributes to the maturity of ‘Inter/Intra-Organisational Learning/Education’. Based on (Handy 1995; Chaharbaghi et al., 2005; Krames, 2005).
Above all, Frank & Fahrbach (1999) indicate that aligning internal systems in an organisation provides more communication channels to ensure co-ordination within and between units. This co-ordination, according to Larkin & Larkin (1994), is a result of well-formulated two-way communication channels and helps with the effective sharing of learning from different experiences (Gittell, 2003).

H10: ‘Coordination’ positively contributes to the maturity of ‘Inter/Intra-Organisational Learning/Education’. Based on (Larkin & Larkin, 1994; Frank & Fahrbach, 1999).


A4. Protocol Rigidity: It is concluded by Schein (1991) and Koestenbaum (1996) that learning and education within and between units is usually directed by leaders who convert energy into actions. They play a crucial role in establishing a rigid or flexible protocol of communications towards their intended objectives.


The two-way communication protocol is found to fit with the definition of Bennis (1989) for strategy to make a bigger picture for all, as well as the engagement of people (Denison, 2000). The two-way communication can be informal and relaxed when co-operation between teams, organisational units and levels is facilitated (Hofstede, 1980) and when there is a clear and established communication channel and protocol for this (Frank & Fahrbach, 1999; Larkin & Larkin, 1994)


H14: ‘Coordination’ positively contributes to the maturity of ‘Protocol Rigidity’. Based on (Hofstede, 1980; Frank & Fahrbach, 1999; Larkin & Larkin, 1994).

Denison (2000) emphasizes the importance of relationships in collaborative work within and between teams in understanding and achieving the corporate goals. The same conclusion is highlighted by Hofstede (1980).


A5. Knowledge Sharing: Based on the findings of Bennis (1989), defining clear strategies and communicating their meanings to all individuals are important for understanding and achieving goals. Also, according to Denison, (2000), the ability of an organisation to involve and consult its personnel about strategy formulation defines its ability to lead a transparent organisation with an effective exchange of knowledge within and between teams and units.

H16: ‘Strategy’ positively contributes to the maturity of ‘Knowledge Sharing’. Based on (Bennis, 1989; Denison, 2000).

As stated by Handy (1995) and Krames (2005), the adaptability of organisational culture refers directly to sharing knowledge, information and experience in an effective liaison. Therefore, a direct conclusion can be translated into a clear hypothesis.
H17: ‘Adaptability’ positively contributes to the maturity of ‘Knowledge Sharing’. Based on (Handy, 1995; Krames, 2005).

Frank & Fahrbach (1999) indicate that aligning internal systems in an organisation provides more communication channels to ensure co-ordination within and between units. This co-ordination, according to Larkin & Larkin (1994), is the result of well-formulated two-way communication channels and helps in the effective sharing of experiences (Gittell, 2003).

H18: ‘Coordination’ positively contributes to the maturity of ‘Knowledge Sharing’. Based on (Larkin & Larkin, 1994; Frank & Fahrbach, 1999; Gittell, 2003).

Denison (2000) emphasizes the importance of relationship and collaborative work within and between teams in understanding and achieving the corporate goals. Additionally, team orientation, as indicated by Clinton et al. (2004), plays a crucial role in establishing the communication and exchange of experiences and knowledge. It also helps in managing an effective liaison between different organisational units with transparent knowledge sharing (Gittell, 2003).

H19: ‘Relationship’ positively contributes to the maturity of ‘Knowledge Sharing’. Based on (Denison, 2000; Gittell, 2003; Clinton et al., 2004).

A6. Liaison(s) effectiveness: Based on the same findings for the attribute (A5), the following four hypotheses (H20-H23) can be extracted from the literature.

H20: ‘Strategy’ positively contributes to the maturity of ‘Liaison(s) effectiveness’. Based on (Bennis, 1989; Denison, 2000).

H21: ‘Adaptability’ positively contributes to the maturity of ‘Liaison(s) effectiveness’. Based on (Handy, 1995; Krames, 2005).

H22: ‘Coordination’ positively contributes to the maturity of ‘Liaison(s) effectiveness’. Based on (Larkin & Larkin, 1994; Frank & Fahrbach, 1999; Gittell, 2003).

H23: ‘Relationship’ positively contributes to the maturity of ‘Liaison(s) effectiveness’. Based on (Denison, 2000; Gittell, 2003; Clinton et al., 2004).

B. Competency/ Value Measurements:

B1. IT Metrics: According to the findings of Denision (2000) and (Kouzes & Postner, 2002), it can be concluded that the optimal service delivery for an organisation is directly influenced by the degree to which people work collaboratively to align the organisation’s espoused values with the actual ones. This concept of relationships is expected to impact on technical, financial, operational, and human-related measures with their feedback. Aligning performance management systems with service delivery gives insight on the need for better control over different organisational metrics (Gittell, 2003; Burke et al., 1996). With well formulated benchmarks for this alignment, a more coherent interface to customer and service delivery can be achieved and continues improvements can be applied (Lopez et al., 2004).

H24: ‘Coordination’ positively contributes to the maturity of ‘IT Metrics’. Based on (Kouzes & Postner, 2002; Gittell, 2003; Lopez et al., 2004).

Based on the findings of Denision (2000), developing different organisational measures is directly influenced by the degree to which an organisation is able to align the espoused values with actual ones. In that sense, accurate assessments can be done (Kouzes & Postner, 2002).
B2. Business Metrics: Based on the same findings for the attribute (B1), the following two hypotheses (H26-H27) can be extracted from the literature.

H26: ‘Coordination’ positively contributes to the maturity of ‘Business Metrics’. Based on (Kouzes & Postner, 2002; Gittell, 2003; Lopez et al., 2004).


B3. Balanced Metrics: Following the findings of Denison (2000) and Kouzes & Postner (2002), it is expected that their definition of relationships in organisations for aligning espoused values with actual values would have an impact on integrated metrics in the organisation. Additionally, this could be influenced by the leadership style (Hersey & Blanchard, 1982) in defining how leaders imply balanced styles in using measurement feedback, taking actions and extending them to external partners.

H28: ‘Leadership’ positively contributes to the maturity of ‘Balanced Metrics’. Based on (Hersey & Blanchard, 1982).

H29: ‘Relationship’ positively contributes to the maturity of ‘Balanced Metrics’. Based on (Denison, 2000; Kouzes & Postner, 2002).

B4. Service Level Agreements (SLA): It has been noticed in the literature that SLAs can be influenced by different human aspects. According to the findings of Denison (2000) and Bennis (1989), defining clear strategies with long-term vision and communicating their meanings to all individuals has a clear role in ensuring service delivery by describing these features clearly and agreeing upon them.

H30: ‘Strategy’ positively contributes to the maturity of ‘Service Level Agreements’. Based on (Denison, 2000; Bennis, 1989).

Also, understanding and responding to the needs of clients (Kotter & Heskitt, 1992; Saunders, 1995) and providing flexibility of policies and regulations to facilitate required changes (Chaharbaghi et al., 2005) can have a great influence on achieving clear service delivery with high customer satisfaction.

H31: ‘Adaptability’ positively contributes to the maturity of ‘Service Level Agreements’. Based on (Kotter & Heskitt, 1992; Saunders, 1995; Chaharbaghi et al., 2005).

SLAs are found to be positively correlated with organisational aspects when the organisation is able to align its organisational structure, systems and processes (Burke et al., 1996) with their service delivery and client needs in addition to aligning their communication channels to ensure co-ordination (Frank & Fahrbach, 1999; Larkin & Larkin, 1994).

H32: ‘Coordination’ positively contributes to the maturity of ‘Service Level Agreements’. Based on (Burke et al., 1996; Frank & Fahrbach, 1999; Larkin & Larkin, 1994).

Above all, it is strongly argued by different researchers (e.g. Hofstede, 1980; Gittell, 2003; Clinton et al., 2004) that the optimal service delivery is clearly influenced by the degree to which people in the organisation work together to form strong working relationships.
H33: ‘Relationship’ positively contributes to the maturity of ‘Service Level Agreements’. Based on (Hofstede, 1980; Gittell, 2003; Clinton et al., 2004).

B5. Benchmarking: Burke et al. (1996) and Lopez et al. (2004) define a well coordinated organisation as one that has high ability to continuously align its performance with service delivery outputs. That is expected to result in higher maturity of benchmarking by providing insights on the need for better control over different organisational metrics.

H34: ‘Coordination’ positively contributes to the maturity of ‘Benchmarking’. Based on (Burke et al., 1996; Lopez et al., 2004).

B6. Formal Assessments/Reviews: In the literature of organisational culture, assessing and reviewing organisational performance and changes are clearly influenced by adapting new knowledge (Kotter, 1995; Senge, 1999) and by the flexibility of policies needed to extend this knowledge to external partners that are involved in the process (Chaharbaghi et al., 2005).

H35: ‘Adaptability’ positively contributes to the maturity of ‘Formal Assessments/Reviews’. Based on (Kotter, 1995; Senge, 1999; Chaharbaghi et al., 2005).

Also, based on the findings of Denision (2000) and Kouzes & Postner (2002), ways of developing different organisational measures and accurate assessments can be directly influenced by the degree to which an organisation is able to align the espoused values with actual ones.


B7. Continuous Improvement: It is argued by Koestenbaum (1996) that the ability of leaders in an organisation to see the bigger picture of their organisation and transfer it to the individuals can be one of the key roles in developing towards the future. This can be expected to align with intended improvements and future vision.

H37: ‘Leadership’ positively contributes to the maturity of ‘Continuous Improvement’. Based on (Koestenbaum, 1996).

Based on the same findings for the attribute (B6), the following two hypotheses (H38-H39) can be extracted from the literature.

H38: ‘Adaptability’ positively contributes to the maturity of ‘Continuous Improvement’. Based on (Denison, 2000; Kouzes & Postner, 2002).

H39: ‘Relationship’ positively contributes to the maturity of ‘Continuous Improvement’. Based on (Koestenbaum, 1996).

C. Governance:

C1. Business Strategic Planning: Koestenbaum (1996) argues that matured leadership in an organisation has the characteristics of having a well formulated vision and a bigger picture of the future. Also, matured leaders should have the ability to face reality and make tough decisions. These decisions should be reflected in strategic planning of the organisation.

Following the findings of Kotter (1995) and Denison (2000), the importance of strategy in organisational culture is related to its ability to create long-term direction and meaning, to concretize vision into tangible goals, to involve and to consult personnel in strategy formulation. These implications are expected to result in higher maturity of strategic planning of functional units and across the enterprise.

H41: ‘Strategy’ positively contributes to the maturity of ‘Business Strategic Planning’. Based on (Kotter, 1995; Denison, 2000).

Also, it is argued by Baden-Fuller & Stopford (1992) and Chaharbaghi et al., (2005) that organisations with flexibility in policies, rules and regulations attached with high ability to respond to needed changes are characterized by matured governance. Governance in that sense means formal and periodic reviews of plans to have the appropriate prioritization over different functions (Denision 2000).

H42: ‘Adaptability’ positively contributes to the maturity of ‘Business Strategic Planning’. Based on (Baden-Fuller & Stopford, 1992; Chaharbaghi et al., 2005, Denision, 2000).

The notion of relationships between people and formal structural units in the organisation has been however related to cultural organisational. While Burke et al. (1996) define this relationship as the alignment maturity between the organisational structure, systems and processes and clients’ needs in the organisational vision and planning, Lopez et al. (2004) add the performance management systems and how they impact in increasing the maturity of strategic planning in an organisation.

H43: ‘Coordination’ positively contributes to the maturity of ‘Business Strategic Planning’. Based on (Burke et al., 1996; Lopez et al., 2004).

C2. IT Strategic Planning: Based on the same findings for the attribute (C1), the following four hypotheses (H44-H47) can be extracted from the literature.

H44: ‘Leadership’ positively contributes to the maturity of ‘IT Strategic Planning’. Based on (Koestenbaum, 1996).

H45: ‘Strategy’ positively contributes to the maturity of ‘IT Strategic Planning’. Based on (Kotter, 1995; Denison, 2000).

H46: ‘Adaptability’ positively contributes to the maturity of ‘IT Strategic Planning’. Based on (Baden-Fuller & Stopford, 1992; Chaharbaghi et al., 2005, Denision, 2000).

H47: ‘Coordination’ positively contributes to the maturity of ‘IT Strategic Planning’. Based on (Burke et al., 1996; Lopez et al., 2004).

C3. Organisation Structure/Reporting: This attribute has a strong relationship with the internal structure of the organisation. Therefore, it is expected that an organisation with an adaptive culture will have a high ability to promote useful change (Kotter & Heskett, 1992) and may strongly influence the maturity level of this attribute. This can be achieved by adopting flexible policies, regulations and beliefs in a way that enables change (Chaharbaghi et al., 2005). Also, aligning communication channels to ensure co-ordination is highlighted by Frank & Fahrbach (1999) so as to have an impact on the method of organizing the formal and informal reporting systems and structures.
H48: ‘Adaptability’ positively contributes to the maturity of ‘Organisation Structure/Reporting’. Based on (Kotter & Heskett, 1992; Chaharbaghi et al., 2005).

H49: ‘Coordination’ positively contributes to the maturity of ‘Organisation Structure/Reporting’. Based on (Frank & Fahrbach, 1999).

C4. Budgetary Control (IT): This attribute is crucial for showing how IT investments are perceived and facilitated. Following the findings of (Kotter & Heskett, 1992), the adaptability of organisational culture for the needed changes towards beneficial IT applications can have a positive correlation with the maturity of IT investment and control of its budget. This can be positively supported by flexibility of policies, rules and beliefs (Chaharbaghi et al., 2005).

H50: ‘Adaptability’ positively contributes to the maturity of ‘Budgetary Control (IT)’. Based on (Kotter & Heskett, 1992; Chaharbaghi et al., 2005).

C5. IT Investment Management: Based on the same findings for the attribute (C4), the following hypothesis (H51) can be extracted from the literature.

H51: ‘Adaptability’ positively contributes to the maturity of ‘IT Investment Management’. Based on (Kotter & Heskett, 1992; Chaharbaghi et al., 2005).

However, in the IT investments, the success history of IT performance for service delivery is said by Lopez et al. (2004) to influence the management process of future investment.

H52: ‘Coordination’ positively contributes to the maturity of ‘IT Investment Management’. Based on (Lopez et al., 2004).

C6. Steering Committee(s): The way of steering the organisation with formal and regular meetings for demonstrating decision-making responsibilities is expected to have a considerable impact on various different views in the leadership element of organisational culture. The ability of leaders to demonstrate energy and energize others can result in the higher maturity of steering committee (Krames, 2005). Also, the way of integrating people, building trust between them (Kouzes & Postner, 2002), facing emerging problems and making tough decisions (Koestenbaum, 1996) are also expected to cause higher maturity of steering committee.

H53: ‘Leadership’ positively contributes to the maturity of ‘Steering Committee(s)’. Based on (Krames, 2005; Kouzes & Postner, 2002; Koestenbaum, 1996).

As the findings of Smit et al. (2008) suggest, the strategies of an organisation are strongly attached to the degree to which an organisation is clear about strategic direction that supports the achievement of optimal service delivery. It is argued by Denison (2000) that this strategy includes how an organisation involves and consults the personnel in terms of strategy formulation. How an organisation makes decisions is influenced by the individuals’ inputs and their engagement.

H54: ‘Strategy’ positively contributes to the maturity of ‘Steering Committee(s)’. Based on (Smit et al., 2008; Denison, 2000).

The adaptability of an organisation to different changes in responding to the demands of improving service delivery is one of the key aspects of organisational culture (Smit et al., 2008). Baden-Fuller & Stopford (1992) and Denison (2000) argue that this adaptability is
influenced by policies, rules, regulations and beliefs that are used for enabling needed changes. Chaharbaghi et al. (2005) argue that such changes are needed for developing formal and periodic reviews of plans and making appropriate decisions in the steering committees.

H55: ‘Adaptability’ positively contributes to the maturity of ‘Steering Committee(s)’. Based on (Smit et al., 2008; Baden-Fuller & Stopford, 1992; Denision, 2000; Chaharbaghi et al., 2005).

C7. Prioritization Process: This attribute defines how IT projects are prioritized in a mutual view between senior and the mid-level IT and business management and need to be carried out by considering the different priorities of business partners. Therefore, it is expected that this prioritization is positively correlated with responding to client needs in a short-term focus (Saunders, 1995) and to long-term strategic direction and meaning (Kotter, 1995; Denison, 2000).

Following these arguments and based on the same findings for the attribute (C6), the following three hypotheses (H56-H58) can be extracted from the literature.


H57: ‘Strategy’ positively contributes to the maturity of ‘Prioritization Process’. Based on (Smit et al., 2008; Denison, 2000).

H58: ‘Adaptability’ positively contributes to the maturity of ‘Prioritization Process’. Based on (Smit et al., 2008; Baden-Fuller & Stopford, 1992; Denison, 2000; Chaharbaghi et al., 2005).

It is also expected that when the organisation has a higher ability to align its organisational structure, systems and processes (Burke et al., 1996) as well as its performance management with needs of its clients (Lopez et al., 2004), then a more matured decision about prioritization can be facilitated.

H59: ‘Coordination’ positively contributes to the maturity of ‘Prioritization Process’. Based on (Burke et al., 1996; Lopez et al., 2004).

D. Partnership:

D1. Business Perception of IT Value: This attribute and the next attribute (D2) together define how IT can be seen as a close partner to business and how it can co-adapt with business to enable/ drive strategic objectives. They are therefore expected to be positively influenced by the importance of strategy in the organisational culture with the strategy definition of Denison (2000) as the organisation’s ability to consult different people in strategy formulation and of Bennis (1989) for its ability to communicate the bigger picture for all units and at different levels. Additionally, the leaders’ motivation for ensuring the vision picture and its meaning to all Koestenbaum (1996) is expected to result in the higher maturity of above mentioned two BITA attributes.


D2. Role of IT in Strategic Business Planning: Based on the same findings for the attribute (D1), the following two hypotheses (H62-H62) can be extracted from the literature.


H63: ‘Strategy’ positively contributes to the maturity of ‘Role of IT in Strategic Business Planning’. Based on (Denison, 2000).

In addition to the above mentioned arguments, it is emphasized by (Baden-Fuller & Stopford, 1992; Chaharbaghi et al., 2005; Denison 2000) that in order to achieve successful organisational changes, there is a need for flexible policies, rules and regulations that ensure distributing responsibilities and involve different individuals in decision making processes.

H64: ‘Adaptability’ positively contributes to the maturity of ‘Role of IT in Strategic Business Planning’. Based on (Baden-Fuller & Stopford, 1992; Chaharbaghi et al., 2005; Denison 2000).

D3. Shared Goals, Risk, Rewards/Penalties: As defined by Smit et al. (2008), the leadership in an organisation refers to the ability to which leaders are able to influence their environment in order to ensure optimal service delivery. Leaders, in that sense, play a crucial role in transferring the bigger picture of vision, goals and exchanging their experiences in the threats that may be faced. In such a context, Hersey & Blanchard (1982) emphasize the need for different management styles for different conditions and Koestenbaum (1996) emphasizes the need to make tough decisions, so converting energy into actions

H65: ‘Leadership’ positively contributes to the maturity of ‘Shared Goals, Risk, Rewards/Penalties’. Based on (Smit et al., 2008; Hersey & Blanchard, 1982; Koestenbaum, 1996).

The importance of strategy in organisational culture is clear in engaging and consulting people for strategy formulation and consensus decisions about future directions (Denison, 2000). In such a culture, teams, organisational units and levels should work together towards a common goal which increases the maturity of everyone’s feeling in terms of accepting risks as well as rewards (Hofstede, 1980). This can bring about higher maturity in formal management programmes related to the relationship.

H66: ‘Strategy’ positively contributes to the maturity of ‘Shared Goals, Risk, Rewards/Penalties’. Based on (Denison, 2000; Hofstede, 1980).

According to the findings of Baden-Fuller & Stopford (1992) and Chaharbaghi et al. (2005), adapting successful organisational changes requires flexible policies, rules and regulations that ensure a balanced distribution of responsibilities and involving people.

H67: ‘Adaptability’ positively contributes to the maturity of ‘Role of IT in Strategic Business Planning’. Based on (Baden-Fuller & Stopfordm, 1992; Chaharbaghi et al., 2005).

D4. IT Proogramme Management: Based on the same findings for the attribute (D3), the following two hypotheses (H68-H69) can be extracted from the literature.

H68: ‘Leadership’ positively contributes to the maturity of ‘IT Proogramme Management’. Based on (Smit et al., 2008; Hersey & Blanchard, 1982; Koestenbaum, 1996).

D5. Relationship/Trust Style: There are several elements in organisational culture that show an expected impact on the trust and close relationship illustrated in this attribute and the next attribute (D6) between business and IT domains. The two attributes are expected to be matured by increasing the ability of different personnel to work together in trust as a collective towards a common goal (Denison, 2000; Wallace et al., 1999) which is emphasized in the leadership’s definition by Koestenbaum (1996) and Kouzes & Postner, (2002).

H70: ‘Leadership’ positively contributes to the maturity of ‘Relationship/Trust Style’. Based on (Denison, 2000; Wallace et al., 1999; Koestenbaum, 1996; Kouzes & Postner, 2002).

A higher maturity of the desired partnership is also expected to be achieved in an organisation with a positional power that is used for coordinating (Lopez et al., 2004; Gittell, 2003) and embracing difference as an organisational strength (Schein, 1991; Wilson, 2001).

H71: ‘Coordination’ positively contributes to the maturity of ‘Relationship/Trust Style’. Based on (Lopez et al., 2004; Gittell, 2003; Schein, 1991; Wilson, 2001).

According to the findings of Smit et al. (2008), in order to ensure optimal service delivery, the organisation needs to work together in forming strong working relationships. The notion of strong relationships is explained by Gittell (2003) and it is not only emphasized in terms of individuals working together. It is more related to people who are different from each other in their business scope and focus.

H72: ‘Relationship’ positively contributes to the maturity of ‘Relationship/Trust Style’. Based on (Smit et al., 2008; Gittell, 2003).

D6. Business Sponsor/Champion: Based on the same findings for the attribute (D5), the following three hypotheses (H73-H74) can be extracted from the literature.


H74: ‘Coordination’ positively contributes to the maturity of ‘Business Sponsor/Champion’. Based on (Lopez et al., 2004; Gittell, 2003; Schein, 1991; Wilson, 2001).

H75: ‘Relationship’ positively contributes to the maturity of ‘Business Sponsor/Champion’. Based on (Smit et al., 2008; Gittell, 2003).

E. Scope and Architecture:

E1. Traditional, Enabler/Driver, External: This attribute defines the IT role and how it should act as an extended strong influence on the decision making process. Therefore, it is argued by Koestenbaum (1996) and Smit et al. (2008) that an organisation’s leaders can play an important role in motivating how IT should be involved in organisational structure and extend that to the potential possibilities regarding clients and suppliers.

H76: ‘Leadership’ positively contributes to the maturity of ‘Traditional, Enabler/Driver, External’. Based on (Koestenbaum, 1996; Smit et al., 2008).

For such a process, Bennis (1989) and Denison (2000) argue for the importance of clear strategic direction and the transparency of how business and IT should enable/drive changes in an organisation or at an extended level regarding the supply chain management parts.

Also, the role of IT systems in an organisation is seen by Kotter (1995) and Senge (1999) as a part of adapted new knowledge for performing important changes. Moreover, the flexibility of policies, rules and regulations attached with high ability to respond to a client’s required changes can have a clear impact on the appropriate prioritization over different functions (Baden-Fuller & Stopford, 1992; Chaharbaghi et al., 2005; Denison 2000).

H78: ‘Adaptability’ positively contributes to the maturity of ‘Traditional, Enabler/Driver, External’. Based on (Kotter, 1995; Senge, 1999; Baden-Fuller & Stopford, 1992; Chaharbaghi et al., 2005; Denison, 2000).

E2. Standards Articulation: This attribute and the next attribute (E3) deal more with how different standards are applied and how integrations in the architecture are carried out across functional units and with joint coordination among strategic business partners. From organisational culture point of view, a well coordinated organisation is the one that achieve higher quality at lower costs because the internal systems are aligned and standards are applied (Gittell, 2003). This integration and standardization are expected to be matured when individual jobs in business and IT domains are considered in strategic directions (Denison, 2000).


Also, Baden-Fuller & Stopford (1992) and Chaharbaghi et al. (2005) argue for the need of a level of flexible policies, rules, regulations and beliefs in a way that can enable changes that are needed for dynamic marketplace where the organisation acts.

H80: ‘Adaptability’ positively contributes to the maturity of ‘Standards Articulation’. Based on (Baden-Fuller & Stopford, 1992; Chaharbaghi et al., 2005).

Above all, Burke et al. (1996) and Gittell (2003) emphasize the importance of aligning these integrations and standardizations with aligned organisational structures, systems and processes with regard to the needs of clients and external partners (Burke et al., 1996).

H81: ‘Coordination’ positively contributes to the maturity of ‘Standards Articulation’. Based on (Burke et al., 1996; Gittell, 2003; Burke et al., 1996).

E3. Architectural Integration: Based on the same findings for the attribute (E2), the following three hypotheses (H82-H84) can be extracted from the literature.


H83: ‘Adaptability’ positively contributes to the maturity of ‘Architectural Integration’. Based on (Baden-Fuller & Stopford, 1992; Chaharbaghi et al., 2005).

H84: ‘Coordination’ positively contributes to the maturity of ‘Architectural Integration’. Based on (Burke et al., 1996; Gittell, 2003; Burke et al., 1996).

E4. Architectural Transparency: While leadership is defined in an organisational culture context by Smit et al. (2008) as the ability of leaders to lead and influence towards optimal
service delivery, a clear vision should be interpreted and transferred to all individuals. It is emphasized by Koestenbaum (1996) and Kouzes & Postner (2002) that this vision should be delivered in a transparent way to demonstrate integrity and build trust.

H85: ‘Leadership’ positively contributes to the maturity of ‘Architectural Transparency’. Based on (Smit et al., 2008; Koestenbaum, 1996; Kouzes & Postner, 2002).

Defining clear strategies, communicating their meanings and engaging individuals with them are important inputs for achieving consensus decisions on adapting changes and setting standards (Bennis, 1989). Denison (2000) also highlights that consensus decisions should be done in a transparent way to link individual jobs and the strategic direction of the organisation.


Following the findings of Denison (2000), an organisation with an adaptive culture should have the ability to improve service delivery through responding to the different changes needed in the relationships and structure of different units and at a functional level supported by policies and regulations as well as beliefs in the organisation (Chaharbaghi et al., 2005). This may have a direct impact on the flexibility and transparency of the organisation architecture and how to deal with emerging technologies.

H87: ‘Adaptability’ positively contributes to the maturity of ‘Architectural Transparency’. Based on (Denison, 2000; Chaharbaghi et al., 2005).

E5. Flexibility Managing Emerging Technology: Based on the same findings for the attribute (E4), the following two hypotheses (H90-H89) can be extracted from the literature.

H88: ‘Leadership’ positively contributes to the maturity of ‘Flexibility Managing Emerging Technology’. Based on (Smit et al., 2008; Koestenbaum, 1996; Kouzes & Postner, 2002).

H89: ‘Adaptability’ positively contributes to the maturity of ‘Flexibility Managing Emerging Technology’. Based on (Denison, 2000; Chaharbaghi et al., 2005).

F. Skills:

For this criterion, it was decided to organize the literature indications based on a discussion from the organisational culture elements and sub-elements side. The reason is that most of the organisational culture sub-elements show a potential relationship with one or more attributes from BITA components. So it would be confusing to organize this as the above discussed criteria (A – F).

Leadership: Smit et al. (2008) define leadership as a cultural antecedent according to the ability of leaders to influence organisational culture for achieving optimal service delivery. In that sense, it demonstrates energizing others (Krames, 2005) and connecting them to the organisation’s vision (Koestenbaum, 1996). These characteristics are expected to correlate positively with the attributes of ‘Innovation, Entrepreneurship’, ‘Management Style’, ‘Career Crossover, Education Training’ and ‘Hiring & Retaining’. Leadership also implies the ability of leaders for integrating and building trust (Kouzes & Postner, 2002), and using their authority for facing reality and making crucial decisions (Koestenbaum, 1996). These characteristics are most likely to correlate positively with ‘Social, Political, Trusting Environment’ and ‘Locus of Power’ respectively.
H90: ‘Leadership’ positively contributes to the maturity of ‘Innovation, Entrepreneurship’. Based on (Smit et al., 2008).
H94: ‘Leadership’ positively contributes to the maturity of ‘Cultural Locus of Power’. Based on (Koestenbaum, 1996; Kouzes & Postner, 2002).
H98: ‘Leadership’ positively contributes to the maturity of ‘Management Style’. Based on (Koestenbaum, 1996; Krames, 2005).
H101: ‘Leadership’ positively contributes to the maturity of ‘Change Readiness’. Based on (Krames, 2005; Smit et al., 2008).
H105: ‘Leadership’ positively contributes to the maturity of ‘Career Crossover Training’. Based on (Koestenbaum, 1996; Smit et al., 2008).
H114: ‘Leadership’ positively contributes to the maturity of ‘Hiring and Retaining’. Based on (Koestenbaum, 1996; Krames, 2005).

Strategy: in a cultural context, strategy is defined as the degree to which the organisation is clear about its strategic direction for ensuring optimal service delivery by involving personnel in strategy formulation (Denison, 2000). This can be expected to cause higher maturity in the attributes ‘Innovation, Entrepreneurship’, ‘Locus of Power’. Strategy also implies long-term direction and meaning (Kotter, 1995) which fits with the attributes of ‘Change Readiness’ and ‘Hiring and Retaining’. Additionally, strategy entails communicating the bigger picture to all (Bennis, 1989). That is most likely to correlate positively with ‘Social, Political, Trusting Environment’.
H95: ‘Strategy’ positively contributes to the maturity of ‘Cultural Locus of Power’. Based on (Denison, 2000).
H102: ‘Strategy’ positively contributes to the maturity of ‘Change Readiness’. Based on (Kotter, 1995).
H110: ‘Strategy’ positively contributes to the maturity of ‘Social, Political, Trusting Interpersonal Environment’. Based on (Bennis, 1989).
H115: ‘Strategy’ positively contributes to the maturity of ‘Hiring and Retaining’. Based on (Kotter, 1995).

Adaptability: This refers to the ability of the organisations to adapt changes based on new knowledge gained (Kotter, 1995; Senge, 1999), and on organisational learning by sharing information and experience (Handy 1995; Krames, 2005). These characteristics are most likely to correlate positively with BITA the attributes ‘Management Style – according to its BITA definition’, ‘Education Training’ and ‘Trusting Environment’. Adaptability also implies the ability to tap into an individual’s creativity and innovativeness (Denison, 2000) with anticipated support from policies, regulations and beliefs for useful change (Chaharbaghi et al., 2005). These are expected to cause a higher maturity in the attributes of ‘Innovation, Entrepreneurship’, ‘Change Readiness’ and ‘Career crossover’
H92: ‘Adaptability’ positively contributes to the maturity of ‘Innovation, Entrepreneurship’. Based on (Denison, 2000; Chaharbaghi et al., 2005).

H96: ‘Adaptability’ positively contributes to the maturity of ‘Cultural Locus of Power’. Based on (Denison, 2000).

H99: ‘Adaptability’ positively contributes to the maturity of ‘Management Style’. Based on (Kotter, 1995; Senge, 1999; Krames, 2005).

H103: ‘Adaptability’ positively contributes to the maturity of ‘Change Readiness’. Based on (Denison, 2000; Chaharbaghi et al., 2005).

H107: ‘Adaptability’ positively contributes to the maturity of ‘Career Crossover Training’. Based on (Handy 1995; Senge, 1999; Krames, 2005; Chaharbaghi et al., 2005).


Coordination: This refers to the ability of the organisation to align its organisational structure, systems and processes with the emerging needs of the client (Burke et al., 1996). It is therefore expected to correlate positively with the ‘Change Readiness’ attribute. Additionally, coordination implies how the organisation should use positional power to coordinate service delivery (Lopez et al., 2004; Gittell, 2003) which is seen as an attribute for Locus of Power in BITA to be positively correlated with.

H97: ‘Coordination’ positively contributes to the maturity of ‘Cultural Locus of Power’. Based on (Lopez et al., 2004; Gittell, 2003).

H104: ‘Coordination’ positively contributes to the maturity of ‘Change Readiness’. Based on (Burke et al., 1996).

H112: ‘Coordination’ positively contributes to the maturity of ‘Social, Political, Trusting Interpersonal Environment’. Based on (Lopez et al., 2004).

Relationships: as culture antecedent, Denision (2000) and Kouzes & Postner (2002) define these relationships as indicating the ability of the organisation to align the espoused values with its actual values. This may result in higher maturity of ‘Trusting Environment’ and ‘Management Style’ BITA attributes. Relationships also entail the ability to attract, place, develop and retain talent (knowledge, skills, and experience) that is needed for optimal service delivery through training and development (Clinton et al, 2004). These characteristics are most likely to correlate positively with the attributes of ‘Innovation, Entrepreneurship’, ‘Career Crossover, Education Training’ and ‘Hiring and Retaining’.

H93: ‘Relationship’ positively contributes to the maturity of ‘Innovation, Entrepreneurship’. Based on (Clinton et al, 2004).

H100: ‘Relationship’ positively contributes to the maturity of ‘Management Style’. Based on (Denison, 2000; Kouzes & Postner, 2002).


H113: ‘Relationship’ positively contributes to the maturity of ‘Social, Political, Trusting Interpersonal Environment’. Based on (Denison, 2000; Kouzes & Postner, 2002).

H116: ‘Relationship’ positively contributes to the maturity of ‘Hiring and Retaining’. Based on (Clinton et al, 2004).

All the above discussed hypotheses are summarized in Table 7.
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4.3.2 Empirical Study for Testing the Hypotheses

The aim of this study is to test the designed hypotheses in Section 4.3.2. Although the analysis is qualitative, a number of case studies are studied in depth in order to get indications of limited SAM attributes in these organisations. In the case study method there is no ideal number of cases. However, according to Eisenhardt (1989, p.545) “a number between 4 and 10 cases usually works well”.

The Study Sample:

The initial sample of the empirical study was originally composed for 8 organisations. These organisations were targeted to be among the organisations of the OMX-Stockholm Large Cap and the OMX-Stockholm Medium Cap for at least the last 5 years in different business sectors. The condition of 5 years membership in the Cap is important as an indication for stability of the organisations. During the processing of the empirical study, different problems emerged that had clear influences on the decision to include some organisations and the data obtained about them. This is considered, as argued by Payne and Payne (2004), as relating to ethical issues about the reliability and validity of the data (Myers, 2009). These problems can be summarised as follows:

i) Incompleteness of data. In some interviews it was really difficult to get answers to all the required questions. With some interviewees, it was really a big effort to push them towards talking and answering the required questions especially when they do not fully feel comfortable in talking about their business. For such cases, where the incomplete answers were not complemented by other indirect questions (intentionally prepared), the organisation was not considered for the study.

ii) Irrelevant answers. Another type of problems is related to the quality of answers. For some cases, it was difficult to keep the focus on the core questions of the study domain. A very specific business aspect may take the interview towards different direction out of the study scope. Examples of these aspects are: the organisation is going for bankrupt and interviewees are willing to talk about the failure experience not anything else; due to sickness or business mission, the assigned interviewee was replaced by another person who was not prepared at all. For such cases, the data was also not considered in the study.

iii) The business is not stable. In some cases, the business growth and turnover had not been stable over the last 5 years in the organisation. In such cases, the answer is representative just for the current situation, or it could be that the organisation is without indications of how it can be in the future. In such cases, the organisation was not also considered.

iv) No balance between business and IT data. In some cases, the data collected from one domain (business or IT) was more detailed and rich in such a way that influences the judgment over the organisation. The main reason for this imbalance was the interviewee’s lack of involvement at strategic level. In other cases, it was related to one of the above mentioned reasons i, ii and iii.

After the consideration of these problems and data-collection limitations, data collected from 6 organisations was considered in the empirical study. Out of these 6 organisations, 4 organisations are members of the OMX-Stockholm Large Cap and 2 of the Medium Cap (for at least the last 5 years), where OMX-Stockholm describes the common offering from NASDAQ OMX exchanges in Sweden. For reason of confidentiality, the name of the
organisations remains unrevealed. However, these organisations were selected from different industry segments which were: Beverage Industry, Financial and Investment Services, Hospitality Industry, Telecommunication, Infrastructure and services, Wholesale and Retail, Construction Industry.

**Selection of Participants/Interviewees**

To maximize the benefit from the empirical study and get accurate results considering the reliability and validity of the data as an ethical issue (Payne and Payne, 2004), a set of conditions were considered while choosing the participants. These conditions were:

i) All participants should be at an organisational level that ensures their awareness of organisation’s different strategies. The condition is the same for business and IT participants.

ii) In each of the studies of 6 organisations at least two key persons, one from each business and each IT domain, should be interviewed. The data from both domains should be balanced in its richness, providing sufficient details about the study’s aims.

iii) All the interviewees should have at least 5 years working experiences in the same organisation with some involvement in different projects.

In analyzing and publishing the data, it is however important to be consider ethical issues. As argued by Payne and Payne (2004) in order to gain permission to publish the data, the question of maintaining the confidentiality of the data was addressed in depth in the study (Myers, 2009). Regarding the information about organisations, the size of each organisation including the number of employees and the yearly turnover is not important information for the study. Therefore, this was not emphasized in all the interviews, which gave the interviewees indications about the study’s pure academic interest. However, it was required for all the interviewees to have access to the recorded audio files and a copy of the transcribed interview. These issues were maintained totally in addition to an offer for signing a formal contract by the researcher for confidentiality of data.

Finally, from the studied 6 organisations, 16 interviewees, in which exactly 8 business interviewees and 8 IT interviewees were valid as inputs to analyze BITA components and selecting the evaluation criteria for BITA models. Table 2 represents a summary of the participants in this study.

**Table 8. Number and Position of Participants in the Study**

<table>
<thead>
<tr>
<th>Business Participants</th>
<th>IT Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 CEO</td>
<td>2 CIO</td>
</tr>
<tr>
<td>1 General Manager</td>
<td>1 Information Manager</td>
</tr>
<tr>
<td>2 Business Project Manager</td>
<td>1 IT Functional Manager</td>
</tr>
<tr>
<td>2 Business Sector Manager</td>
<td>1 CTO</td>
</tr>
<tr>
<td>2 Business Consultant Manager</td>
<td>1 IT/IS Sector Manager</td>
</tr>
<tr>
<td></td>
<td>1 IT Architect</td>
</tr>
<tr>
<td></td>
<td>1 IT Project Manager</td>
</tr>
</tbody>
</table>
The Empirical Study Design

Empirical study data was collected through a set of semi-structured interviews with managers from both business and IT domains. Five groups of questions were used for the study:

- Firstly, background information about the interviewees, their organisations, roles and responsibilities and their involvement in different projects was gathered.
- The second set of questions focused on the main business, IT and organisational strategies. These questions are important for information about organisational strategies and implementation.
- The third set of questions focused on investigating the strategic role of IT, how IT is perceived in the organisation and how it is positioned in decision-making processes.
- The fourth set of questions concerned SAM, its assessment with specific questions about all attributes as well as questions concerned the hypothesis about the relationships between SAM’s attributes and X-model organisational culture characteristics and how these relationships impact on every SAM’s attribute.

The first three groups of questions were useful to select data for assessing BITA maturity and implications of SAM attributes. Furthermore, they helped for investigating organisational factors and events that influence alignment. The fourth group of questions was useful to identify limited attributes of SAM (Section 4.3.3) in the empirical study sample organisations. Although some existing studies (Arab Sorkhi et al., 2010; El-Makawy et al., 2009) have already identified some limitations of SAM, there is no well-accepted theory at the attribution level of the social aspect boundaries of alignment (Rich & Banbasat, 2000; Silvius, 2009a).

Following the findings of Silva et al. (2007), the interviews were carried out in two sets; one from the business domain and another from IT domain. This helped to involve and gain insights from both stakeholder groups. The questions were the same for both domains and each interview followed the same order of questions. The interviews, of 60 to 90 minutes each, were audio recorded.

Limited Attributes

The limited attributes are based on the assessment of SAM in the 6 empirical study organisations. The purpose was to find the attributes which were not fully applied, and which had challenges or limitations because of their relationship with organisational culture characteristics. In the thesis, they are referred to as ‘limited attributes’. These limited attributes were extracted by deeply analyzing the interviews and were sorted by the number of organisations. Figure 18 shows the number of empirical study organisations that had been found for each SAM model limited attributes. This chart was drawn using Microsoft Excel software. It has been found that among 38 attributes of SAM, 30 of them were limited in at least 1 and at most 5 organisations.
4.3.3 Extending SAM Model

In this section, the limited attributes are firstly classified and then the classified attributes are used to propose an extension to the SAM.

Classification of Limited Attributes

The 30 limited attributes are classified by employing the classification scheme of the general limitations presented in Section 4.1.3. By classifying the limited attributes, the aim was to distinguish between the limited attributes that are only affected by organisational culture and the hybrid ones that are affected by both organisational culture and organisational aspects. Table 9 shows the limited attributes, types of limited attribute and the reasoning behind the type (‘OC’ refers to organisational culture and ‘HB’ to the hybrid)
<table>
<thead>
<tr>
<th>Limited Attributes</th>
<th>Type</th>
<th>Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1: Understanding of Business by IT</td>
<td>OC</td>
<td>The two attributes are found in all the sample organisations to be dependent on human aspects and organisational culture characteristics. The leaders are found to be important actors for transferring the business vision with its meaning to IT and vice versa. This is also an important aspect for achieving consensus goals and higher maturity in understanding the implementation tools. Planners and decision makers have the responsibility for creating clear strategies and long-term directions that are understood and agreed on at all strategic, tactical, and operational levels. Also, team orientation, imposed by managers and leaders in different cases, plays a crucial role in establishing communication skills, and channels for relationships and collaborative work within and between teams, which in turn helps with better understanding and in achieving corporate goals.</td>
</tr>
<tr>
<td>A2: Understanding of IT by Business</td>
<td>HB</td>
<td>On the one hand, one group in the sample organisations are found to have an inter-intra-organisational information system, creating a platform and formal protocols for people to have their own programmes and agenda for learning and for educating others to transfer mutual knowledge. In such organisations, there is minimum involvement of human interaction that is claimed to give more freedom for individuals to communicate in the overall frame of the organisational structure. On the other hand, the other group of organisations emphasises the human aspects of learning and educating others. Managers and leaders are responsible for establishing communication skills and channels within and between business and IT domains and evaluating individuals' plans.</td>
</tr>
<tr>
<td>A3: Inter/Intra-Organisational Learning Education</td>
<td>HB</td>
<td>This is found, on the one hand, to be dependent on organisational aspects as organisations apply different frameworks or ERP platforms that facilitate the communications between employees as well as functional units. There might then be formal rules and policies for communications to be followed by everyone. On the other hand, protocol rigidity is seen as being dependent on aspects of organisational culture in different formal meetings between team members and organisational units to communicate about sharing goals, achievements and improvements at all levels.</td>
</tr>
<tr>
<td>A4: Protocol Rigidity</td>
<td>HB</td>
<td>On the one hand, different architectural systems, frameworks, and tools are examples of organisational aspects that are based on rules and policies for knowledge sharing. On the other hand, sharing information, experiences and knowledge are dependent on organisational culture for communicating the strategic picture to all employees, partners/Alliances as well as cooperating between team members. In several organisations, organisational culture characteristics are however considered to be inhibitors for knowledge sharing where people relate sharing to losing their own competitive advantages.</td>
</tr>
<tr>
<td>A5: Knowledge Sharing</td>
<td>HB</td>
<td>Liaison is defined in some organisations as a team that acts physically as a facilitator between IT and other business functions. This liaison is seen as a strong link and an opportunity to manage the communications not only between business and IT domains, but also to include business partners and service providers. In other organisations, this liaison is implemented as a business process liaison in a specific organisational platform. This platform acts as a formal communication and reporting intermediate level for storing and managing all projects and technical functions. With this platform, no direct reports are made from individuals to their direct unit managers or business line managers. Different managers and individuals can access this platform with different privileges, navigating or downloading their required report.</td>
</tr>
<tr>
<td>B4: Service Level Agreements</td>
<td>HB</td>
<td>On the one hand this is dependent on organisational aspects such as Service Level Agreements (SLAs). In this case, SLAs are applied to a platform that links all the IT and business metrics to their performance. This also refers to the contracted delivery time or performance based on other metrics and customers’ feedback. On the other hand, SLAs include a variety of human interactions characteristics that are defined by the organisational culture. In this case SLAs are implemented by a liaison team that physically facilitates enterprise-wide agreements and extend them even to include customers, suppliers and external partners.</td>
</tr>
<tr>
<td>B6: Formal Assessments / Reviews</td>
<td>HB</td>
<td>Both attributes are found to be dependent on organisational aspects where they are linked to metrics and benchmarks. Formal assessments are then conducted and continuous improvements are formulated using different tools and techniques based on different formal policies. However, when applying assessments and improvements, characteristics of organisational culture play a vital role in understanding, using and acting on them, based on individuals’ background, experiences and communicated knowledge.</td>
</tr>
<tr>
<td>B7: Continuous Improvement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C1: Business Strategic Planning</td>
<td>OC</td>
<td>This attribute is found to be dependent on human aspects and characteristics of organisational culture. The business strategic planning includes long-term directions as defined by business decision makers. Strategic planning is dominated by business objectives for managers identify the way they should be achieved. Its direct relation to organisational culture makes the business strategic planning unique in each organisation.</td>
</tr>
<tr>
<td>C4: Budgetary Control</td>
<td>OC</td>
<td>Although there should be a formal way to control the IT budget, it has surprisingly been found that this budget is mostly controlled by business people because they consider IT people to be unskilled in financial and investment aspects.</td>
</tr>
<tr>
<td>C5: IT Investment Management</td>
<td>HB</td>
<td>In all the sample organisations, there are clear profiles and formalised rules for managing and controlling IT investments. On the other hand, with social orientations there are always informal relations between individual and managers that play a crucial role in understanding strengths and weaknesses of the technologies in question and the corporate-wide implications. Integrating IT into organisation’s strategies is then dependent on both organisational and organisational culture aspects.</td>
</tr>
<tr>
<td>C6: Steering Committees</td>
<td>OC</td>
<td>This is defined in the majority of cases by business decision makers. However, whether there is clear business domination or business-IT partnership, this attribute is found in all cases to be purely dependent on decisions of only the involved people.</td>
</tr>
<tr>
<td>C7: Prioritization Process</td>
<td>OC</td>
<td>It is found that IT projects are prioritized because of different reasons determined mutually between senior and mid level business and IT managers with a consideration of the priorities of business partners/alliances. The prioritization process is however seen in most of the cases designed, decided and controlled by managers at the top level reflecting high dependency on organisational culture and human interactions. Different styles and visions of leaders are also found to highly influence the prioritization processes and cause them to be unique in each organisation. Responding fast to the needs of clients is also seen to force organisations to enable changes and re-prioritize.</td>
</tr>
<tr>
<td>D1: Business Perception of IT Value</td>
<td>OC</td>
<td>In most cases, even if there is any form of business-IT partnership or organisational policies to follow, the attribute is found to be totally subjective where every decision maker defines the IT values according to his/her perception and based on own background, experiences, communications and knowledge.</td>
</tr>
<tr>
<td>D2: Role of IT in strategic Business Planning</td>
<td>OC</td>
<td>IT is found to be used differently in organisations. In some cases, it is only found to be a tool that facilitates and enables the business functions and processes. In others, it is either considered as a driver or enabler for strategic objectives by co-adaptation with business. Top level management team usually specifies organisational policies, strategies and plans to identify the role of IT in strategic business planning. The role of IT is usually determined by human rather than organisational aspects. Therefore, the importance of aspects of organisational culture is found to be obvious in the cases studied for consulting different people in strategy formulation and communicating the bigger picture for all units and at different levels. Additionally, leaders play a crucial role in motivating IT personnel for ensuring the vision picture and its meaning to all and highlighting the role of IT in business strategic planning.</td>
</tr>
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</tr>
<tr>
<td>D3: Shared Goals, Risks, Rewards/ Penalties</td>
<td>HB</td>
<td>The sharing is surprisingly found to be stated by formal roles and profiles in most of the sample organisations. In such organisations, there are formal implemented compensation and reward systems in place that induce managers to take risks. These systems are able to re-plan the over budget as the business requirements change. Additionally, in about 73% of the sample organisations, there are crisis management plans that are integrated in the organisational structures of both business and IT domains. However, the situation is opposite to what is practiced. In the majority of cases, there are no shared risks between business and IT domains because, according to business managers, only the business will fail. But, surprisingly, they share the rewards. For bringing IT projects in and for showing the IT values, IT managers with their teams in some cases take their own responsibility in carrying out the project.</td>
</tr>
<tr>
<td>D4: IT Programme Management</td>
<td>HB</td>
<td>This attribute is found to be without any indication of organisational culture impact. However, it is interesting to find its hybrid in the sample as being 57% organisationally related and 43% related to organisational culture. In 57% of organisations, the decisions about the IT budget and IT projects are made based on pre-defined strategies, policies and rules. Also, almost half of the organisations in this group have outsourced their IT functions and have long-term contracts for IT budgets without human interactions in their decisions. In the other 43% of the organisations, the human aspects clearly influence decisions about the IT budget based on the top management's knowledge, skills, and experience. In most of cases, these decisions are controlled by business people.</td>
</tr>
<tr>
<td>D5: Relationships / Trust style</td>
<td>OC</td>
<td>Regardless of the existence of organisational profiles for bringing business and IT domains in a partnership, building trustful work relationships is found to be based on experiences from the inter-personal characteristics of leaders and managers within and across teams and units.</td>
</tr>
<tr>
<td>D6: Business Sponsor/Champion</td>
<td>OC</td>
<td>A strong trend is found in all the sample organisations for organisational culture's trends for this attribute. External partners are found to be well integrated in business and IT planning in those organisations in terms of having the ability to work smoothly across units and functions based on the cultural characteristics of leaders and individuals. Engaging individuals in planning aspects gives more possibilities for integrating with others.</td>
</tr>
<tr>
<td>E1: Traditional, Enabler/Driver, External</td>
<td>HB</td>
<td>Regarding organisational aspects, IT is found in the sample organisations to have different integration levels in the organisational structures, systems and processes. IT is seen as a traditional tool for e-mails and accounting, and as a transaction tool, a business processing tool can be extended to all parts of the supply chain to include also clients and suppliers. However, in order to define the IT role and where it should act is seen as being strongly influenced by decision makers' perception and leaders' organisational culture characteristics in transferring the bigger picture to all.</td>
</tr>
<tr>
<td>E4: Architectural Transparency, Agility and Flexibility</td>
<td>HB</td>
<td>Regarding organisational aspects, the transparency and flexibility of IT architecture is usually implemented through the application of well designed formal IT standards across the organisational structure. This helps in evaluating and applying emerging technologies effectively. It is, however, found in sample organisations that different informal integrations of the functional processes exist, especially during important projects. This informal integration is purely a feature of organisational culture and allows for exchanging experiences, applying new technologies, improving business processes and providing customized solutions.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>F1: Innovation, Entrepreneurship</td>
<td>OC</td>
<td>It is found to be totally dependent on the organisational culture characteristics. In all the organisations that have an application of this attribute, decision makers are found to be responsible persons for facilitating the process of establishing an innovation, entrepreneurship-related environment. With clear strategies and future directions, individuals are able to dynamically change, adapt themselves and be creative. Also, tapping into individuals’ creativity and innovativeness is the only way in which leaders are able to achieve optimal service delivery.</td>
</tr>
<tr>
<td>F2: Locus of Power</td>
<td>OC</td>
<td>It is found as a subjective attribute which is decided by business or/and IT decision makers. There is no formal protocol or policies in any of the sample organisations.</td>
</tr>
<tr>
<td>F3: Management Style</td>
<td>HB</td>
<td>Although the management style is theoretically defined and related to organisational culture characteristics, it is also found in 35% of organisations to be related to only organisational aspects. In the organisational aspects, the management style is found to be attached and dependent on the organisational structure and infrastructure. For example, the vertical organisational structure is found to be attached to a more department-oriented command and control management style for achieving values. However, the horizontal organisational structure is more attached to a relationship-based management style.</td>
</tr>
<tr>
<td>F4: Change Readiness</td>
<td>HB</td>
<td>The level at which the organisation is willing to change is found to be related to organisational aspects as changes is decided according to the alignment of internal organisational structures, systems and processes with external emerging events (e.g. customer needs, economic crisis). On the other hand, the readiness for change is also found to be dependent on the ability of the organisation to adapt to changes based on new information, knowledge and experiences gained by individuals, which influences their willingness to accept or reject the new conditions.</td>
</tr>
<tr>
<td>F5: Career Crossover</td>
<td>HB</td>
<td>In some organisations, applying this attribute is totally unapplicable because of organisational structure where business and IT domains are totally separated (e.g. in total outsourcing) and functionally unrelated with different infrastructures. In other organisations, job transfer is defined in the company’s infrastructure but is not implemented because of human aspects such as the unwillingness of business people who have the power to cooperate directly with IT, and hence, business decision makers consider IT people as not being skilled enough to participate in business functions. Another type of resistance comes from IT people who do not like to be involved in business processes and prefer to focus on their jobs to increase their professionalism.</td>
</tr>
<tr>
<td>F6: Social, political, Trusting environment</td>
<td>OC</td>
<td>This attribute is pertained to interpersonal interactions such as trust, confidence, cultural, social and political environment. It is found to be at different levels ranging from minimum interaction between business and IT units to maximum extended trust and confidence with customers and partners. Demonstrating integrity and building trust are seen as the duties of leaders which help in increasing the level of trust and sociality in organisations. Moreover, enabling organisational learning and increasing communications among personnel is found to bring trust and increase sociality in all organisations. Interpersonal interaction elements are purely human related where organisational aspects don’t have any specific role in enabling or disabling them.</td>
</tr>
<tr>
<td>F7: Hiring and Retaining</td>
<td>HB</td>
<td>The attribute is purely applied by human interactions and decisions on attracting and retaining individuals. However, it is also found to be related to organisational aspects as organisations define processes, policies and regulations that are integrated in their structure and imposed by unions and governmental authorities.</td>
</tr>
</tbody>
</table>
The Proposed SAM Model

Based on the classification of limited attributes, an extension to SAM (Luftman, 2000) is proposed by classifying attributes of each criterion (Figure 17). By explicitly classifying these attributes, it may be possible to consider the context (organisational or organisational culture) in which the alignment should be measured, and consequently make the assessment more explicit. Additionally, this may contribute towards resolving complexity of using SAM in assessing alignment maturity. This is done by splitting complex attributes that are found limited from other attributes. The classification of the attributes is as follows:

i) **Organisational related:** The attributes that are implemented in organisations according to their functions without/with-minor human interactions. In Figure 17 these attributes are presented as a separate group, labelled as ‘Organisational’. These attributes are the 8 remaining attributes that were not limited because of their relationship with organisational culture. It means that the hypotheses about their relationships with organisational culture characteristics could not be validated through the empirical study.

![Figure 17. The Proposed Extension of SAM Model (Adapted from Luftman, 2000)](image)

**ii) Organisational Culture related:** The attributes that are only dependent on human interactions i.e. they are implemented according to people’s organisational cultural characteristics. In Figure 17, these attributes are presented as a separated group called ‘Organisational Culture’.

![Figure 18. The Proposed Extension of SAM Model (Adapted from Luftman, 2000)](image)
iii) **Hybrid attributes**: The attributes are influenced by both organisational functions and people’s organisational cultural characteristics. In Figure 17, hybrid attributes are presented as a separated group between organisational and organisational culture group. It is labeled as ‘Hybrid’.

### 4.4 Demonstration

The aim of this phase is to show how the designed artifact can be used in an illustrative or real-life case. This process (See Figure 20) provides a testing proof before the final artifact for the feasibility of the output product. The demonstration activity works in terms of the internal validity of the designed artifact as it shows how it deals with the initially identified business problem (i.e. showing the artifact’s ability to solve it, the needs for modifications, or referring to needed iterations going back to the first activity).

![Figure 20. Demonstration of the Artifact](image)

In the thesis, Paper II was an important input in the demonstration. The designed artifact (the extended-SAM) was shown to be presenting the concept of classifying and splitting BITA attributes based on three groups organisational related, organisational cultural related and hybrid. In Paper II, only three criteria (*Communications, Partnership and Skills*) were demonstrated in HICSS-45 Conference. The extended BITA on the three criteria was shown to work in assessing real organisations. After receiving the feedback on Paper II, the complete model with all the six criteria was demonstrated in Paper III.

Also, the extending processes of SAM were demonstrated to different researchers in the research team and in different seminars of the Swedish research School of Management and Information Technology (MIT) (Forskarskolan Management och IT).

### 4.5 Evaluation

Following the design science principles by Hevner et al. (2004) and Peffers et al. (2007), based on the nature of the research problem and the designed artifact, evaluation may take many forms. It may vary between Observational (e.g. Case Study and Field Study), Analytical (e.g. Static Analysis, Architecture Analysis, Optimization, Dynamic Analysis), Experimental (e.g. Controlled Experiment, Simulation), Testing (e.g. Functional, Structural) and Descriptive (e.g. Informed Argument, Scenarios). The thesis adapts the following evaluation methods:
Case Study: the artifact has been studied in depth in a case study of Norrtälje Hospital to evaluate its utility.

Informed Argument: The artifact has been evaluated by presenting convincing arguments over its utility. These arguments are referenced from the knowledge base of the artifact’s implementation environment.

The next two sub-sections discuss the two different evaluation methods:

4.5.1 Evaluation Using Case Studies

The Evaluation Sample
A case study approach was applied to evaluate the extended-SAM within six Swedish multinational organisations. Out of these, four are members of Large Cap (2010) and two are members of Medium Cap (2010). Following the same ethical principles of research by Payne and Payne (2004) and Myers (2009), the name of these five organisations kept unrevealed due to the confidentiality, however they are selected from different five industry segments (i.e. IT services, building and construction, education, Telecommunication Infrastructure and services, Wholesale and Retail).

The Evaluation Design
To evaluate the extended-SAM, an empirical study was developed based on the above sample of organisations. The empirical study included 66 questions in a multiple-choice format. The first 4 questions are about the structure of the organisation and the participant’s role in the organisation. Following that, 24 questions are to measure the maturity level of hybrid attributes (16 in total) and non-limited attributes (8 in total) from the original SAM perspective. These questions are adopted from Luftman’s tool (Luftman, 2011). The other 38 questions measure the maturity level of limited attributes from organisational culture perspective (including organisational culture related and hybrid). Business and IT managers in each organisation were targeted to fulfill the questionnaire.

The 66 questions were asked during semi-structured interviews having a space for comments in the end of each question. Each question was carefully designed and designed to measure the level of each BITA attribute. Each multiple-choice question measures the BITA maturity score from 0 to 5. To calculate the BITA maturity score for each hybrid attribute, the mean value of both organisational approach and organisational culture perspective is considered as the overall attribute score. For example, if we assume the BITA maturity score of the hybrid attribute A4 to indicate ‘protocol rigidity’ from the organisational approach as 4, and its score from an organisational culture perspective is 1; 2.5 (the mean of 4 and 1) and is considered as the modified BITA maturity score of the attribute A4. For other attributes, the BITA maturity score was measured directly from the questionnaire.

The Evaluation Results
The business-IT alignment was assessed using both the original and extended-SAM by investigating, through the interviews, all the 38 attributes of SAM (for all questions, see Appendix III). This comparison is an important input to show how the organisational culture is a clear factor that should be considered while assessing and studying BITA maturity. The results from the assessment of BITA in the five organisations show the following three different results:
a) In three of the sample organisations, lower BITA maturity scores can be observed from an organisational culture perspective rather than an organisational approach with regard to hybrid attributes (Figure 18 represents an example). Also, a lower average of BITA maturity scores is also noticeable in the extended-SAM’s criteria than original SAM. When the hybrid attributes are divided in both organisational culture and organisational aspects, the investigation of BITA in these three organisations shows that organisations have problem/s in applying or understanding the human interaction activities which are related to organisational culture variables. As the focus here is not on analysing the organisations themselves, examples of these activities (without specifying the organisation) include: people in the organisation who do not focus on important goals and objectives, conflicts between people, lack of learning and exchanging experience, high staff turnover, employees who are not involved in the decision making process, employers and managers who are not open to change.)

![Figure 21](image)

**Figure 21.** Comparing BITA Maturity Score at the criteria Level using Original SAM and the Extended-SAM

b) In one case, the BITA maturity scores are shown as being almost the same from the perspective of organisational culture and organisational approach for hybrid attributes and similar average BITA maturity score in the criteria level from the assessment of extended-SAM and original SAM. The focus in this organisation is shown as being well distributed in terms of both organisational functionality and understanding/applying organisational culture variables within business and IT domains.

c) In a third type of result, one case shows a visibly higher BITA maturity score from an organisational culture perspective rather than an organisational approach for hybrid attributes as well as higher average BITA maturity score in a criteria level from the assessment of extended-SAM than from the original SAM. Opposite to the type (a), when the hybrid attributes are divided in both organisational culture and organisational aspects, the investigation of BITA in this organisation shows that the organisation has problem/s in understanding and applying organisational functionality. Examples of the investigated problems (without analysis) are: weak definitions of processes, policies and regulations, lack of risk management systems, absence of formalized rules for managing and controlling business and IT investment, problems in organisational structure, etc.)
4.5.2 Evaluation Using Informed Arguments

The empirical study is considered as the main input to the second part of the evaluation result considering the designed requirements in Section 4.1. In the following points, ways in which the extended-SAM fulfills these requirements are discussed. This is supported by the principles of design science research methods (Peffers et al., 2007; Baskerville et al., 2009; Johannesson and Perjons, 2012) and is based on a common line of reasoning (informed arguments). The discussion follows the same order of requirements as provided in Section 4.1.

- **Internal properties:**
  - **Coherence:** In the proposed extended-SAM, it is important to consider this property, as the original SAM model has been used for a long time and has achieved a high level of acceptance as an assessment BITA model by researchers and practitioners (Avison et al., 2004; Chan and Reich, 2007b). As it was already based on previous models and work, it is characterized by a high level of coherence for its parts. It is therefore important that the extension to this model should also retain a similar level of coherence.
  - **Modularity:** The extended-SAM keeps first of all the same six criteria as designed originally. However, at the level of attribution, each criterion is divided in three classes (i.e. organisational, organisational culture and hybrid). These classes further organize the model’s components into different modules that can be assessed independently (in the case of organisational and organisational culture attributes) and dependently (in the case of hybrid attributes).
  - **Elegance:** By categorizing SAM criteria and their attributes, the evaluation has shown a high level of acceptance for the representation. Some comments were mainly oriented towards the complexity of the model’s appearance with several boxes. However, shading the boxes, colouring them and giving proper names for classes added to the elegancy of the model.

- **External Properties**
  - **Usage**
    - **Learnability and usability:** By categorizing SAM criteria and their attributes, the evaluation has shown a high level of acceptance for the representation. Some comments were mainly oriented towards the complexity of the model’s appearance with several boxes. However, shading the boxes, colouring them and giving proper names for classes added to the elegance of the model.
    - **Customizability:** As the extended-SAM focuses on organisational culture, the customizability is shown in our paper at the extension purpose i.e. the influence of organisational culture on BITA maturity. The extended model can be customized to assess organisational related attributes or organisational culture related attributes independently according to the practitioner’s demands and compare their results and reasoning.
    - **Traceability:** It is possible for users in the extended-SAM to investigate the misalignment reasoning regarding the functional aspects that are related to organisational aspects as well as human interaction related to organisational culture.
characteristics. This also provides a tool for identifying and tracing the problematic criteria in which a manager or practitioners needs more care or focused assessment.

ii) Management

Management properties describe how an artifact is managed over time.

- **Maintainability**: In the proposed extended-SAM, some of the attributes show the potential for needed splitting to adapt to a specific change. For example the attribute ‘prioritizing process’ in the extended-SAM is classified in the organisational culture class. However, in one organisation, it is found that the organisation has an automated platform that helps managers and decisions makers decide on their prioritization. Therefore, during the assessment, the attribute was moved to the hybrid class in which it was divided into aspects of organisational culture.

- **Flexibility**: It was found during our evaluation that, before assessing the model, practitioners could assess BITA in different organisational contexts by changing the classification of BITA attributes according to business and IT conditions.

iii) Generic

- **Completeness**: During the evaluation, different interpretations of BITA attributes versus organisational culture elements were tested. All the different reflections were found to be parts of our originally proposed hypothesis and theoretical indications which were the base for our proposed extension. There was no request to change the model. However, in some cases (as mentioned in the maintainability and flexibility), some attributes have been reclassified during the assessment according to how the organisation works.

- **Generality**: The extended-SAM during the evaluation shows suitability for assessing BITA in different cases with various industry sectors (i.e. IT services, building and construction, education, Telecommunication Infrastructure and services, Wholesale and Retail). Also, the extended-SAM shows suitability for different business conditions (e.g. some of these organisations have a full outsourced IT to other countries, some are not purely Swedish but acting in Sweden, and 4 are large organisations and 2 are medium).

- **Efficiency and Effectiveness**: Comparing the assessment results of the original and the extended-SAM, it is shown that extended-SAM does not assess the BITA maturity with only efficiency and effectiveness. However, it can measure the BITA maturity by considering how BITA attributes are applied influenced by organisational culture characteristics (i.e. how things are done).
5.0 CONCLUSIONS

This chapter presents a final discussion of the outputs from the research in the thesis, starting with some final remarks on the research. Following that, the knowledge contribution regarding bridging the knowledge gap in the research area is discussed as is the research impact on theory and practice. The chapter ends by suggested lined for the potential future continuation of the research in this area.

5.1 Final Discussion

In this thesis, a design science research approach is undertaken in order to design an extended business-IT alignment model (BITA). The extended BITA is represented in Luftman Strategic Alignment Maturity Model (SAM), with clear motivation, considering the impact of organisational culture.

The design process embraced three main steps. The first was the ‘Developing Hypotheses’ step. This was mainly based on the deep study of BITA attributes (based on SAM) and organisational culture elements and sub-elements (based on the Smite et al., (2008) Model, the X-Model).

In the second step, an empirical study was carried out on 6 large and medium multinational organisations acting in Sweden. Based on the classification of limited attributes, an extension to the SAM was proposed by classifying the attributes of each criterion in three groups as; Organisational related attributes, Organisational Culture related attributes and Hybrid attributes. By explicitly classifying these attributes, it is necessary to make it possible to consider the context (organisational or organisational culture) in which the alignment should be measured, and consequently make the assessment more explicit. Additionally, this may contribute towards resolving the complexity of using SAM in assessing alignment maturity. It has been learned from this study that organisational culture has a clear impact on different limited attributes such as ‘Understanding of Business by IT (A1)’, ‘Understanding of IT by Business (A2)’, ‘Relationship/Trust Style (D5)’, ‘Locus of Power (F2)’ and ‘Education, Cross-Training (F6)’. This is due to the fact that all the inputs of these attributes are subject to characteristics of human behaviour and organisational culture. Also, the importance/weight of each attribute may vary from one organisation to another, depending on the way the attribute is perceived.

At the third step, an empirical study was used to evaluate the extended-SAM within different 6 large and medium multinational organisations acting in Sweden. The results showed clear BITA maturity scores in differences between the assessment using the original and the extended-SAM. These differences validated the strong impact of organisational culture characteristics/elements on BITA maturity. Also, the evaluation of the extended-SAM confirmed that by incorporating business and IT domains with organisational culture perspectives, the BITA maturity level would be enhanced, stabilized or changed. In all cases, the BITA assessment has become more accurate by considering organisational culture. In other words, organisational culture was found to change the way business and IT are perceived and managed. Therefore, the management of business and IT can benefit from taking organisational culture seriously. From another perspective, the extended-SAM showed a fulfilment of the designed requirements. By rooting those requirements in general as well as
5.2 Knowledge Contributions

In the background and literature studies, the thesis shows that there is a knowledge gap in business-IT alignment in how the alignment components are implemented or achieved in an organisation. Organisational culture is, therefore, proven to be one of the factors that plays an important role in BITA. By extending the BITA represented in SAM, the knowledge contribution of the thesis is seen in three main results:

- Identifying the relationships between elements of organisational culture and BITA components. This contribution is indicated at two levels. On the first level, Paper I investigates the theoretical indications of the relationships between all nine dimensions of the GLOBE project and the BITA criteria in the SAM model. Also, these indications are tested on the case organisation of Paper I, which provides clear evidence of the proposed indications. At the second level, Paper II and Paper III complement the organisational culture impact by examining the relationships between organisational culture elements and sub-elements of the X-Model on BITA criteria and attributes of SAM model. Since the X-Model is the most comprehensive model for organisational culture, this contribution is seen as being invaluable in covering the maximum level of indications for organisational culture’s theoretical impact on BITA.

- Restructuring BITA Components. This result has made an invaluable contribution in presenting BITA components in a way that illustrates how each component is related to other components and is influenced by elements of organisational culture. The three categories are: i) organisationally related, ii) organisational culture related, and iii) hybrid.

- Proposing a new way of assessing BITA maturity using Luftman model. This result shows clear differences in ways of assessing the same organisations within the extended model compared to the original model. In the proposed model, it becomes easier for managers and professionals to focus on one aspect of each BITA attribute, considering its category (organisational related or organisational culture related) when assessing the situation. Although the process adds complexity to using the model, it clearly provides a more accurate assessment for BITA components.

5.3 The Research Impact (from practice and theory)

The results of this thesis may have a clear impact on the research field of Business-IT alignment. This potential impact can be seen on both theoretical and practical levels.

On a theoretical level, the extended-SAM contributes to resolving a great part of the complexity that is attached to defining and understanding BITA components and attributes. By splitting the attributes that have different influences from organisational as well organisational culture characteristics, it would be easy for researchers and teachers in the business-IT alignment area to find dependency between related attributes from one side, and to understand the strong influences from organisational culture from the other. Also, the splitting process provides a new structure for the model which organizes BITA criteria and their attributes in three groups (Organisational, Organisational Culture and Hybrid).
On a practical level, the extended-SAM model proposes a new way for business and IT managers, consultants and decision makers to assess BITA maturity using the Strategic Alignment Maturity Model (SAM). Ways of finding the high level barriers in organisations’ processes related to organisational, organisational culture or hybrid aspects that cause misalignment between business and IT domains are demonstrated. The results in our study show clear differences in assessing the same organisations compared with the original model. Although the process is claimed by a few interviewees to add complexity by using the extended-SAM model, the process clearly provides a more accurate assessment of BITA maturity by helping decision makers gain a clear picture of their organisation.

It can be finally argued that the extended-SAM, unlike the original SAM, has succeeded to focusing on the ‘how things are done’ question in analyzing the reasons behind each BITA attribute. Therefore, the extended-SAM model can be used not only for assessing the BITA maturity level in an organisation, but also to highlights the business areas in which organisational culture impacts on the level of BITA maturity.

### 5.4 Further Research

Considering the research done in the thesis, the following different orientations can be seen as possibilities for further future research

- Investigating other BITA models. The findings on organisational culture impact on BITA in the thesis are based on studying the X-Model (Smit et al., 2008). The study can therefore be seen as being more comprehensive from the organisational culture side, as the X-Model clearly consolidates most of the previous models that are compared to it. However, on the BITA side, different models are claimed to be better than the others by various practitioners or researchers. The impact of organisational culture can be then studied by using comprehensive models of BITA such as Maes et al. (2000) or Hu and Huang (2006).

- An extensive study of BITA from theory to practice has been conducted here. The current thesis has contributed towards the study of the different factors that influence the business-IT alignment. Therefore, an interesting trend for the continuation of this research might be extensive literature/theoretical studies followed by deep empirical studies of different factors that impact on this alignment. The study of such factors will extend the specific area of impact on the practice of achieving, assessing and maintaining alignment.
REFERENCES


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Appendix I

First-round Interview

1. How much working experience do you have?

2. How long you have been working in the organisation?

3. How do you evaluate ‘Power Distance’ in your organisation (i.e. the degree to which members of a collective expect power to be distributed equally)? Do you have any ideas about similar organisations in your marketplace?

4. How do you evaluate ‘Uncertainty Avoidance’ in your organisation (i.e. the extent to which a society, organisation, or group relies on social norms, rules and procedures to alleviate unpredictability of future events)? Do you have any ideas about similar organisations in your marketplace?

5. How do you evaluate ‘Human Orientation’ in your organisation (i.e. the degree to which a collective encourages & rewards individuals for their cooperation)? Do you have any ideas about similar organisations in your marketplace?

6. How do you evaluate ‘Institutional Collectivism’ in your organisation (i.e. the degree to which individuals are integrated into groups within the society)? Do you have any ideas about similar organisations in your marketplace?

7. How do you evaluate ‘In-Group Collectivism’ in your organisation (i.e. the degree to which individuals have strong ties to their small immediate groups)? Do you have any ideas about similar organisations in your marketplace?

8. How do you evaluate ‘Assertiveness’ in your organisation (i.e. the degree to which individuals are assertive, dominant & demanding in their relationships with)? Do you have any ideas about similar organisations in your marketplace?

9. How do you evaluate ‘Gender Egalitarianism’ in your organisation (i.e. the degree to which a collective minimizes gender inequality)? Do you have any ideas about similar organisations in your marketplace?

10. How do you evaluate ‘Future Orientation’ in your organisation (i.e. the extent to which a collective encourages & rewards future-oriented behaviours (delaying gratification, planning & investing in future, etc.))? Do you have any ideas about similar organisations in your marketplace?

11. How do you evaluate ‘Performance Orientation’ in your organisation (i.e. the degree to which a collective encourages & rewards group members for performance improvement & excellence)? Do you have any ideas about similar organisations in your marketplace?

Second-round Interview

12. Where can you see the most impact of ‘Power Distance’ on the performance of your organisation? What are the reasons?

13. Where can you see the most impact of ‘Uncertainty Avoidance’ on the performance of your organisation? What are the reasons?
14. Where can you see the most impact of ‘Humane Orientation’ on the performance of your organisation? What are the reasons?

15. Where can you see the most impact of ‘Institutional Collectivism’ on the performance of your organisation? What are the reasons?

16. Where can you see the most impact of ‘In-Group Collectivism’ on the performance of your organisation? What are the reasons?

17. Where can you see the most impact of ‘Assertiveness’ on the performance of your organisation? What are the reasons?

18. Where can you see the most impact of ‘Gender Egalitarianism’ on the performance of your organisation? What are the reasons?

19. Where can you see the most impact of ‘Future Orientation’ on the performance of your organisation? What are the reasons?

20. Where can you see the most impact of ‘Performance Orientation’ on the performance of your organisation? What are the reasons?

Third-round Interview (adopted from Luftman’s tool (Luftman, 2011))

Based on the Luftman’s Strategic Alignment Maturity Model (SAM), the following questions focus on measuring the business-IT alignment in your organisation and how it is influenced by the societal culture dimensions. Please select one answer for each of the following questions:

Regarding the criterion ‘Communications’ (i.e. refers to clear understanding between business and IT communities with an effective exchange and sharing of each ideas, processes and needs), please answer the following six questions:

21. A1-To what extent does IT understand the organisation’s business environment (e.g., its customers, competitors, processes, partners/alliances):

   - Senior and mid-level IT managers do not understand the business.
   - Senior and mid-level IT managers have a limited understanding of the business.
   - Senior and mid-level IT managers have a good understanding of the business.
   - Understanding of the business by all IT members is encouraged and promoted by senior managers.
   - Understanding of the business is required (e.g., tied to performance appraisals) throughout the IT function.

22. A2- To what extent do the business organisations understand the IT environment (e.g., its current and potential capabilities, systems, services, processes):

   - Senior and mid-level business managers do not understand IT.
   - Senior and mid-level business managers have a limited understanding of IT.
   - Senior and mid-level business managers have a good understanding of IT.
Understanding of IT by all employees is encouraged and promoted by senior management.

Understanding of IT is required (e.g., tied to performance appraisals) throughout the business.

N/A or don't know.

23. A3-The following statements pertain to methods (e.g., intranets, bulletin boards, education, meetings, e-mail) in place to promote organisational education/learning (e.g., of experiences, problems, objectives, critical success factors). Organisational learning occurs primarily through:

- Ad-hoc/casual methods (employee observation, anecdote sharing, peer meetings, etc.)
- Informal methods (newsletters, bulletin board notices, computer reports, group e-mail, fax, etc.)
- Regular, clear methods (training, e-mail, phone-mail, intranet, department meetings, etc.) from mid-level management
- Formal, unifying, bonding methods from senior and mid-level management
- Formal, unifying, bonding methods from senior and mid-level management, with feedback measures to monitor and promote effectiveness of learning

N/A or don't know.

24. A4-The following question pertain to communications protocol. The IT and business communication style (e.g., ease of access, familiarity of stakeholders) tends to be:

- One-way, from the business; formal and inflexible
- One-way, from the business; moderately informal and moderately flexible
- Two-way; formal and inflexible
- Two-way; moderately informal and moderately flexible
- Two-way; informal and flexible

N/A or don't know.

25. A5-The following statements pertain to the extent to which there is knowledge sharing (intellectual understanding and appreciation of the problems/opportunities, tasks, roles, objectives, priorities, goals, direction, etc.) between IT and business:

- Knowledge sharing is on an ad-hoc basis.
Knowledge sharing is somewhat structured and/or structure is beginning to be created.

There is structured sharing around key functional unit processes.

There is formal sharing at the functional unit level and at the corporate level.

There is formal sharing at the functional unit level, at the corporate level, and with business partners/alliances.

N/A or don't know.

26. A6-The following statements pertain to the role and effectiveness of IT and business liaisons:

- We do not use liaisons, or if we do, we do so on an ad-hoc, as needed basis.
- We regularly use liaisons to transfer IT knowledge to the business and business knowledge to IT. They are the primary contact point for interactions between IT and the business. Liaisons are not usually used to facilitate relationship development.
- We regularly use liaisons to transfer IT knowledge to the business and business knowledge to IT. They occasionally facilitate relationship development.
- We regularly use liaisons to facilitate the transfer of IT knowledge to the business and business knowledge to IT. Their primary objective is to facilitate internal relationship development.
- We regularly use liaisons to facilitate the transfer of IT knowledge to the business and external partners and business knowledge to IT. Their primary objective is to facilitate relationship development across the business and its external partners.
- N/A or don't know.

Regarding the criterion ‘Competency/Value Measurements’ (i.e. concerns about demonstrating IT values in compatible figures with the business community understanding. Therefore, both business and IT have usually different metrics of values they add), please answer the following seven questions:

27. B1-The following statements pertain to the metrics and processes used to measure IT’s contribution to the business.

- The metrics and processes we have in place to measure IT are primarily technical (e.g., system availability, response time).
- We are equally concerned with technical and cost efficiency measures. We have limited or no formal feedback processes in place to review and take action based on the results of our measures.
- We formally assess technical and cost efficiency using traditional financial measures, such as return on investment (ROI) and activity-based costing (ABC). We are starting to put formal feedback processes in place to review and take action based on the results of our measures.

- We formally assess technical elements, cost efficiency, and cost effectiveness using traditional financial measures (e.g., ROI, ABC). We have formal feedback processes in place to review and take action based on the results of our measures.

- We use a multi-dimensional approach with appropriate weights given to technical, financial, operational, and human-related measures. We have formal feedback processes in place to review and take action based on the results of our measures. These measures are extended to our external partners (e.g., vendors, outsourcers, customers).

- N/A or don’t know.

28. B2-The following statements pertain to the use of business metrics to measure contribution to the business.

- We do not measure the value of our business investments, or do so on an ad-hoc basis.

- We are concerned with cost efficiency measures at the functional organisation level only. We have limited or no formal feedback processes in place to review and take action based on the results of our measures.

- We formally use traditional financial measures, such as return on investment (ROI) and activity-based costing (ABC), across functional organisations. We are starting to have formal feedback processes in place to review and take action based on the results of our measures.

- We formally measure value based on the contribution to our customers. We have formal feedback processes in place to review and take action based on the results of our measures and to assess contributions across functional organisations.

- We use a multi-dimensional approach with appropriate weights given to technical, financial, operational, and human-related measures. We have formal feedback processes in place to review and take action based on the results of our measures. These measures are extended to our external partners (e.g., vendors, outsourcers, customers).

- N/A or don’t know
29. B3-The following statements pertain to the use of integrated IT and business metrics to measure IT's contribution to the business.

○ We do not measure the value of our IT business investments, or do so on an ad-hoc basis.

○ The value measurements for IT and business are not linked. We have limited or no formal feedback processes in place to review and take action based on the results of our measures.

○ The value measurements for IT and business are starting to be linked and formalized. We are also starting to have formal feedback processes in place to review and take action based on the results of our measures.

○ We formally link the value measurements of IT and business. We have formal feedback processes in place to review and take action based on the results of our measures and to assess contributions across functional organisations.

○ We use a multi-dimensional approach with appropriate weighting given to IT and business measures. We have formal feedback processes in place to review and take action based on the results of our measures. These measures are extended to our external partners (e.g., vendors, outsourcers, customers).

○ N/A or don’t know

30. B4-The following statements pertain to the use of service level agreements (SLAs):

○ We do not use SLAs or do so sporadically.

○ We have SLAs which are primarily technically oriented (response time, length of computer downtime, etc.), between the IT and functional organisations.

○ We have SLAs which are both technically oriented and relationship-oriented (user/customer satisfaction, IT’s commitment to the business, etc.) that are between the IT and functional organisations and also emerging across the enterprise.

○ We have SLAs which are both technically-oriented and relationship-oriented, between the IT and functional organisations as well as enterprise wide.

○ We have SLAs which are both technically-oriented and relationship-oriented, between the IT and functional organisations as well as at enterprise wide and with our external partners/alliances.

○ N/A or don’t know.

31. B5- The following statements pertain to benchmarking practices. Informal practices are such things as informal interviews, literature searches, company visits, etc., while formal practices are such things as environmental scanning, data gathering and analysis, determining best practices, etc.

○ We seldom or never perform either informal or formal benchmarks.
We occasionally or routinely perform informal benchmarks.

We occasionally perform formal benchmarks and seldom take action based on the findings.

We routinely perform formal benchmarks and usually take action based on the findings.

We routinely perform formal benchmarks and have a regulated process in place to take action and measure the changes.

N/A or don’t know

32. B6- The following statements pertain to the extent of assessment and review of IT investments.

We do not formally assess and/or review.

We assess and/or review only after we have a business or IT problem (i.e., failed IT project, market share loss).

Assessments and/or reviews are becoming routine occurrences.

We routinely assess and/or review and have a formal process in place to make changes based on the results.

We routinely assess and/or review and have a formal process in place to make changes based on the results and measure the changes. Our external partners are included in the process.

N/A or don’t know

33. B7- The following statements pertain to the extent to which IT-business continuous improvement practices (e.g., quality circles, quality reviews) and effectiveness measures are in place.

We do not have any continuous improvement practices in place.

We have a few continuous improvement practices in place, but no effectiveness measures are in place.

We have a few continuous improvement practices in place and the use of effectiveness measures is emerging.

We have many continuous improvement practices in place and we frequently measure their effectiveness.

We have well-established continuous improvement practices and effectiveness measures in place.

N/A or don’t know.
Regarding the criterion ‘Governance’ (i.e. ensures that business and IT communities formally and periodically discuss and review their plans. Different priorities are important to be clearly defined for allocating the needed IT resources). Please answer the following seven questions:

34. C1-The following statements pertain to strategic business planning with IT participation.
   - We carry out no formal strategic business planning or, if it is done, it is done on an as-needed basis.
   - We carry out formal strategic business planning at the functional unit level with slight IT participation.
   - We carry out formal strategic business planning at the functional unit levels with some IT participation. There is some inter-organisational planning.
   - We carry out formal strategic business planning at the functional unit and across the enterprise with IT participation.
   - We carry out formal strategic business planning at the functional unit, across the enterprise, and with our business partners/alliances with IT participation.
   - N/A or don't know

35. C2- The following statements pertain to strategic IT planning with business participation.
   - We carry out no formal strategic IT planning or, if it is done, it is done on an as-needed basis.
   - We carry out formal strategic IT planning at the functional unit level with slight business participation.
   - We formally use traditional financial measures, such as return on investment (ROI) and activity-based costing (ABC), across functional organisations. We are starting to have formal feedback processes in place to review and take action based on the results of our measures. We carry out formal strategic IT planning at the functional unit levels with some business participation. There is some inter-organisational planning.
   - We carry out formal strategic IT planning at the functional unit and across the enterprise with the business.
   - We carry out formal strategic business planning at the functional unit, across the enterprise, and with our business partners/alliances.
   - N/A or don't know

36. C3-The ability of the IT function to react/respond quickly to the organisation’s changing business needs is:
   - Very weak
   - Somewhat weak
109

- Neither weak nor strong
- Somewhat strong
- Very strong
- N/A or don’t know

37. C4-The following statements pertain to IT budgeting. Our IT function is budgeted as a:

- Cost center, with erratic/inconsistent/irregular/changeable spending, decided by business managers.
- Cost center, by functional organisation decided by business managers with consulting by IT managers.
- Cost center with some projects treated as investments decided by IT managers.
- Investment center decided by business and IT managers together.
- Profit center, where IT generates revenues decided by board including business, IT managers, founders, partners and/or alliances.
- N/A or don’t know.

38. C5-The following statements pertain to IT investment decisions. Our IT investment decisions are primarily based on IT’s ability to:

- Reduce costs.
- Increase productivity and efficiency as the focus.
- Traditional financial reviews. IT is seen as a process enabler.
- Business effectiveness is the focus. IT is seen as a process driver or business strategy enabler.
- Create competitive advantage and increase profit. Our business partners see value.
- N/A or don’t know

39. C6-The following statements pertain to IT steering committee(s) with senior level IT and business management participation.

- We do not have formal/regular steering committee(s).
- We have committee(s) which meet informally on an as-needed basis.
We have formal committees, which meet regularly and have emerging effectiveness.

We have formal, regular committee meetings with demonstrated effectiveness.

We have formal, regular committee meetings with demonstrated effectiveness that include strategic business partners sharing decision-making responsibilities.

N/A or don’t know.

40. C7-The following statements pertain to how IT projects are prioritized. Our IT project prioritization process is usually:

In reaction to a business or an IT need.

Determined by an IT function.

Determined by a business function.

Mutually determined between senior and mid-level IT and business management.

Mutually determined between senior and mid-level IT and business management and with consideration of the priorities of any business partners/alliances.

N/A or don’t know.

Regarding the criterion ‘Partnership’ (i.e. refers to the relationship between business and IT in having shared vision of the organisation’s processes in order to facilitate the IT as an enabler or driver for business transformation in processes and strategies), please answer the following six questions:

41. D1-IT is perceived by the business as:

A cost of doing business

Emerging as an asset

A fundamental enabler of future business activity

A fundamental driver of future business activity

A partner with the business that co-adapts/improvises in bringing value to the firm

N/A or don’t know

42. D2-The following statements pertain to the role of IT in strategic business planning.

IT does not have a role.

IT is used to enable business processes.
○ IT is used to drive business processes.
○ IT is used to enable or drive business strategy.
○ IT co-adapts with the business to enable/drive strategic objectives.
○ N/A or don’t know.

43. D3- The following statements pertain to the sharing (by IT and business management) of the risks and rewards (e.g., bonuses) associated with IT-based initiatives (i.e., a project is late and over budget because of business requirement changes).

○ IT takes all the risks and does not receive any of the rewards.
○ IT takes most of the risks with little reward.
○ Sharing of risks and rewards is emerging.
○ Risks and rewards are always shared.
○ Risks and rewards are always shared and we have formal compensation and reward systems in place that induce managers to take risks.
○ N/A or don’t know.

44. D4- The following statements pertain to formally managing the IT/business relationship. To what extent are there formal processes in place that focus on enhancing the partnership relationships that exist between IT and business? (e.g., cross-functional teams, training, risk/reward sharing):

○ We don’t manage our relationships.
○ We manage our relationships on an ad-hoc basis.
○ We have defined programmes to manage our relationships, but IT or the business does not always comply with them. Conflict is seen as creative rather than disruptive.
○ We have defined programmes to manage our relationships and both IT and the business comply with them.
○ We have defined programmes to manage our relationships, both IT and the business comply with them, and we are continuously improving them.
○ N/A or don’t know

45. D5- The following statements pertain to IT and business relationship and trust.

○ There is a sense of conflict and mistrust between IT and the business.
○ The association is primarily an “arm’s length” transactional style of relationship.
● IT is emerging as a valued service provider.
● The association is primarily a long-term partnership style of relationship.
● The association is a long-term partnership and valued service provider.
● N/A or don’t know.

46. D6-The following statements pertain to business sponsors/champions. Our IT-based initiatives:
● Do not usually have a senior level IT or business sponsor/champion.
● Often have a senior level IT sponsor/champion only.
● Often have a senior level IT and business sponsor/champion at the functional unit level.
● Often have a senior level IT and business sponsor/champion at the corporate level.
● Often have a senior level IT and the CEO as the business/sponsor champion.
● N/A or don’t know.

Regarding the criterion ‘Scope and Architecture’ (i.e. illustrates the involvement of IT in all organisational processes. It defines the IT role in supporting flexible and transparent organisational infrastructure. This, however, facilitates applying technologies effectively and providing customized solutions responding to customer needs), please answer the following five questions:

47. E1-The following statements pertain to the scope of your IT systems. Our primary systems are:
● Traditional office support (e.g., e-mail, accounting, word processing, legacy systems)
● Transaction-oriented (e.g., back office support)
● Business process enablers (IT supports business process change)
● Business process drivers (IT is a catalyst for business process change)
● Business strategy enablers/drivers (IT is a catalyst for changes in the business strategy)
● N/A or don’t know.

48. E2-The following statements pertain to the articulation of and compliance with IT standards. Our IT standards are:
● Non-existent or not enforced
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☐ Defined and enforced at the functional unit level but not across different
functional units

☐ Defined and enforced at the functional unit level with emerging coordination
across functional units

☐ Defined and enforced across functional units

☐ Defined and enforced across functional units, and with joint coordination among
our strategic business partners/alliances

☐ N/A or don’t know.

49. E3- The following statements pertain to the scope of architectural integration. The
components of our IT infrastructure are:

☐ Not well integrated

☐ Integrated at the functional unit with emerging integration across functional units

☐ Integrated across functional units

☐ Integrated across functional units and our strategic business partners/alliances

☐ Evolving with our business partners

☐ N/A or don’t know

50. E4- The following statements pertain to the level of disruption caused by business and IT
changes (e.g., implementation of a new technology, business process, merger/acquisition). Most of the time, a business or IT change is:

☐ Not readily transparent (very disruptive)

☐ Transparent at the functional level only

☐ Transparent at the functional level and emerging across all remote, branch, and
mobile locations

☐ Transparent across the entire organisation

☐ Transparent across the organisation and to our business partners/alliances

☐ N/A or don’t know.

51. E5-The following statements pertain to the scope of IT infrastructure flexibility to
business and technology changes. Our IT infrastructure is viewed as:

☐ A utility providing the basic IT services at minimum cost

☐ Emerging as driven by the requirements of the current business strategy
- Driven by the requirements of the current business strategy
- Emerging as a resource to enable fast response to changes in the marketplace
- A resource to enable and drive fast response to changes in the marketplace.
- N/A or don’t know.

Regarding the criterion ‘Skills’ (i.e. refers to all human resource aspects that influence/(are influenced) by changes. They include factors that enhance organisation’s cultural and social environment as components of organisational effectiveness), please answer the following seven questions:

52. F1-The following statements pertain to the extent the organisation fosters an innovative entrepreneurial environment. Entrepreneurship is:

- Discouraged
- Moderately encouraged at the functional unit level
- Strongly encouraged at the functional unit level
- Strongly encouraged at the functional unit and corporate levels
- Strongly encouraged at the functional unit, corporate level, and with business partners/alliances
- N/A or don’t know.

53. F2-The following statements pertain to the cultural locus of power in making IT-based decisions. Our important IT decisions are made by:

- Top business management or IT management at the corporate level only
- Top business or IT management at corporate level with emerging functional unit level influence
- Top business management at corporate and functional unit levels, with emerging shared influence from IT management
- Top management (business and IT) across the organisation and emerging influence from our business partners/alliances.
- Top management across the organisation with equal influence from our business partners/alliances.
- N/A or don’t know.
54. F3-The following statements pertain to employee opportunities to learn about and support services outside the employee’s functional unit (e.g., proigrammemers trained in product/service production functions, customer service trained in systems analysis) using proogrammes such as cross training and job rotation. The organisation:

- Does not provide opportunities to learn about support services outside the employee’s functional unit.
- Opportunities are dependent on the functional unit.
- Formal proogrammes are practiced by all functional units.
- Formal proogrammes are practiced by all functional units and across the enterprise.
- Opportunities are formally available across the enterprise and with business partners/alliances.
- N/A or don’t know.

55. F4-The following statements pertain to your organisation’s readiness for change.

- We tend to resist change.
- We recognize the need for change and change readiness proogrammes are emerging.
- Change readiness proogrammes providing training and necessary skills to implement change are in place at the functional unit level.
- Change readiness proogrammes are in place at the corporate level.
- Change readiness proogrammes are in place at the corporate level and we are proactive and anticipate change.
- N/A or don’t know.

56. F5-The following statements pertain to career crossover opportunities among IT and business personnel.

- Job transfers rarely or never occur.
- Job transfers occasionally occur within the functional organisation.
- Job transfers regularly occur for management level positions usually at the functional level.
- Job transfers regularly occur for all position levels and within the functional units.
- Job transfers regularly occur for all position levels, within the functional units, and at the corporate level.
- N/A or don’t know.
57. The following statements pertain to the interpersonal interaction (e.g., trust, confidence, cultural, social, and political environment) that exists across IT and business units in our organisation.

- There is minimum interaction between IT and business units.
- The association is primarily an “arm’s length” transactional style of relationship.
- Trust and confidence among IT and business is emerging.
- Trust and confidence among IT and business is achieved.
- Trust and confidence is extended to external customers and partners.
- N/A or don’t know.

58. The following statements pertain to the IT organisation’s ability to attract and retain the best business and technical professionals.

- There is no formal proogramme to retain IT professionals. Recruiting demands are filled ineffectively.
- IT hiring is focused on technical expertise.
- IT hiring is focused equally on technical and business expertise. Retention programmes are in place.
- Formal programmes are in place to attract and retain the best IT professionals with both technical and business skills.
- Effective programmes are in place to attract and retain the best IT professionals with both technical and business skills.
- N/A or don’t know
Appendix II

First Group
1. Tell us briefly about your organisation.
2. How many employees are there in the organisation (both in business and IT domains)?
3. What is your role in the organisation?
4. What are your organisation’s goals from a 5-10 year perspective?
5. How would you describe your organisational culture?
6. Who are the key people in your organisation?

Second Group

- Regarding business strategies:
7. What are the business strategies in the organisation?
8. Who is responsible for developing these strategies?
9. Who is in charge of creating the business strategy?
10. What are the main business processes at your organisation?
11. Is the business strategy a standalone or is it created in relation to the IT strategy?
12. Does IT play a role in the business strategy development?
13. What is the organisational structure in the organisation?
14. What is the reporting method used within the organisation?

- Regarding business strategies:
15. Could you describe the organisational structure/decision rights structure in the organisation?
16. How did you best structure and organize to be able to deliver strategy?
17. What capabilities do you need to improve upon or to add in order to deliver strategy?
18. How do you build a high performance/high commitment workforce good enough to deliver strategy?
19. How do you create an operating environment suitable to deliver strategy?
20. How do you sharpen the competitive edge and best leverage the capabilities to deliver intended values?
21. How do you assure synergy of operation and action?
22. Can you describe the culture of work in the organisation (Goal/value/belief/distinct characteristics, etc.)? What characteristics the employees need to possess?
23. How does reporting work within the organisation, and between subsidiaries?
- **Regarding IT strategies**

24. Could you describe IT architecture at your organisation?
25. How many people are there purely dedicated to the IT department?
26. Does the IT department tend to develop internally or outsource more?
27. How does IT support organisational processes?
28. How does IT support business strategy?
29. Does the organisation develop its own applications or you buy and develop?
30. What IT projects are you carrying out right now, both internal and outsourced? How they currently influencing/future plans on business performance?

**Third Group**

31. Any recent IT initiatives or projects carried out in the organisation, which do not involve management or business executives?
32. Is there any initiative you can think of that does not impact on the overall business goals of the organisation?
33. Are there any IT initiatives or investments in technology at the organisation which are not defined, implemented or managed at the top levels of the corporation? (or in the boardroom!)
34. How much impact does the CIO and IT have on strategic projects and managerial decisions? Do you think IT is the core enabler and determinant of your organisation’s core business strategy?
35. Where would you put the IT projects & operations that are carried on the organisation? Do they have a greater role in the daily business processes or are they of a wider, more crucial impact?
36. What is the impact of IT on the mundane business operations in the organisation? Are there any projects/investments or processes in your organisation which do not require IT? Any business operations which are not affected by IT? Any recent IT initiatives or projects carried out in the organisation, which did not involve management or business executives at all? Is there any initiative you can think of that doesn't impact the overall business goal of the organisation?
37. Any IT initiatives or investments in technology at the organisation which are not defined, implemented or managed at the top levels of the corporation?
38. How much impact does the CIO and IT have on the strategic projects and managerial decisions? Do you think IT is the core enabler and determinant of your organisation’s core business strategy?
39. How would you rate the impact of IT and latest software innovations on the organisation?

**Fourth Group**

40. How are IT specialists informed about the current business strategy and their role in support of this strategy?
41. How often are meetings between business and IT people held? What is discussed and who usually participates in these meetings?

42. How do you encourage contact between people from different departments, such as IT and business, to share ideas? Are there any specific contact persons?

43. Did it happen that IT specialists proposed some ideas to business that were implemented? How can a business specialist check if his/her ideas are technically implementable?

44. What business and IT metrics and assessment models do you use? Are they documented well? How do you measure the risk of IT investments? Do you use benchmarking?

45. How do you react to measurements results, and what actions do you perform to make IT more valuable for business?

46. How is the IT strategy structured? How large a part of the budget is spent on the IT? What is the management structure for IT investment?

47. What is the IT value of the company, what role does IT play in the company? Does the IT department have equal goals compared to the business? Are there any risks/rewards/penalties involved in the IT department?

48. How is the IT department managed (does it have any particular strategy)? How does IT evaluate and apply emerging technology? Does IT assume a role supporting a flexible infrastructure? Is (and if so how) IT transparent to all business partners and customers? Does IT enable or drive the business process and strategies as a true standard?
Appendix III

Luftman’s Strategic Alignment Maturity Model (SAM) is a framework to measure the alignment between business and IT in different organisations. It provides both a descriptive assessment tool as a prescriptive insight in how to achieve a higher level of alignment.

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

<table>
<thead>
<tr>
<th>BITA Criterion</th>
<th>Definition and Questions Attached</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications</td>
<td>Refers to clear understanding between business and IT communities with an effective exchange and sharing of each ideas, processes and needs.</td>
</tr>
<tr>
<td>Competency/Value Measures</td>
<td>Address concerns about demonstrating IT values in comparable figures with the business community understanding. Therefore, both business and IT have usually different metrics of values they add.</td>
</tr>
<tr>
<td>Governance</td>
<td>Ensures that business and IT communities formally and periodically discuss and review their plans. Different priorities need to be clearly defined for allocating the needed IT resources.</td>
</tr>
<tr>
<td>Partnership</td>
<td>Refers to the relationship between business and IT in having shared vision of the organisation’s processes in order to facilitate the IT as an enabler or driver for business transformation in processes and strategies.</td>
</tr>
<tr>
<td>Scope and Architecture</td>
<td>Illustrates the involvement of IT in all organisational processes. It defines the IT role in supporting flexible and transparent organisational infrastructure. Thus, however, facilitates applying technologies effectively and providing customized solutions responding to customer needs.</td>
</tr>
<tr>
<td>Skills</td>
<td>Refers to all human resource aspects that influence (are influenced) by changes. They include factors that enhance organisation’s cultural and social environment as components of organisational effectiveness.</td>
</tr>
</tbody>
</table>

The criteria are further detailed in 38 sub-criteria which are showed in the following figure (Luftman, 2000). In the concept of business IT alignment (BITA) maturity, the level of maturity indicates an organisation’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
Different studies over the years have shown a clear impact of organisational culture on business performance. Others have studied its impact on how IT is perceived and practiced in different contexts. As BITA has a direct relation with business and IT strategies, the impact of organisational culture on BITA is then apparent.

Based on our research over 15 companies in the Swedish market, we proposed a classification of Luftman Maturity Model’s attributes. The classification of the attributes is as follows:

i) purely organisational-related attributes that are implemented in organisations according to their functions without/with-minor human interactions,

ii) hybrid attributes that are jointly related to both organisational functions and human interactions

iii) purely human-related attributes that are highly dependent on human interactions according to people’s organisational culture characteristics.

By explicitly classifying these attributes, it may be possible to consider the context (organisational or human) in which the alignment can be measured, consequently making the assessment more explicit. Also, the classification may contribute towards resolving the complexity of using SAM in assessing the alignment maturity. This is done by splitting the complex attributes that were found to be limited from other attributes. The following Figure shows the extended-SAM (adapted from Luftman, 2000), which classifies different SAM attributes. The purely organisational-related and purely human-related attributes are separated whereas the attributed hybrid is shown in the middle.
In the following section, questions have been designed to measure the BITA maturity level according to original SAM and extended-SAM.

1) Your organisation’s revenues last year were -------

2) IT’s budget as a percent of revenues was:
   - □ < 1%
   - □ 1-2%
   - □ 3-4%
   - □ 5-6%
   - □ 7-8%
   - □ >9%

3) Does your CIO (highest IT Executive) report to:
   - □ CEO, President, Chairman
   - □ CFO (Chief Financial Officer)
   - □ COO (Chief Operating Officer)
   - □ Business Unit Executive
   - □ Other

4) How is IT organized in your company?
   - □ Centralized
   - □ Decentralized
   - □ Matrix
   - □ Networked
   - □ Federated/Hybrid
   - □ Other

5) AI-To what extent does IT understand the organisation's business environment (e.g., its customers, competitors, processes, partners/alliances):
   - □ Senior and mid-level IT managers do not understand the business.
   - □ Senior and mid-level IT managers have a limited understanding of the business.
Senior and mid-level IT managers have a good understanding of the business.

Understanding of the business by all IT members is encouraged and promoted by senior managers.

Understanding of the business is required (e.g., tied to performance appraisals) throughout the IT function.

6) A2- To what extent do the business organisations understand the IT environment (e.g., its current and potential capabilities, systems, services, processes):

- Senior and mid-level business managers do not understand IT.
- Senior and mid-level business managers have a limited understanding of IT.
- Senior and mid-level business managers have a good understanding of IT.
- Understanding of IT by all employees is encouraged and promoted by senior management.
- Understanding of IT is required (e.g., tied to performance appraisals) throughout the business.
- N/A or don't know.

7) A3- The following statements pertain to methods (e.g., intranets, bulletin boards, education, meetings, e-mail) in place to promote organisational education/learning (e.g., of experiences, problems, objectives, critical success factors). Organisational learning occurs primarily through:

- Ad-hoc/casual methods (employee observation, anecdote sharing, peer meetings, etc.)
- Informal methods (newsletters, bulletin board notices, computer reports, group e-mail, fax, etc.)
- Regular, clear methods (training, e-mail, phone-mail, intranet, department meetings, etc.) from mid-level management
- Formal, unifying, bonding methods from senior and mid-level management
- Formal, unifying, bonding methods from senior and mid-level management, with feedback measures to monitor and promote effectiveness of learning
- N/A or don't know.

8) A4- The following question pertains to communications protocol. The IT and business communication style (e.g., ease of access, familiarity of stakeholders) tends to be:

- One-way, from the business; formal and inflexible
- One-way, from the business; moderately informal and moderately flexible
9) A5-The following statements pertain to the extent in which there is knowledge sharing (intellectual understanding and appreciation of the problems/opportunities, tasks, roles, objectives, priorities, goals, direction, etc.) between IT and business:

- Knowledge sharing is on an ad-hoc basis.
- Knowledge sharing is somewhat structured and/or structure is beginning to be created.
- There is structured sharing around key functional unit processes.
- There is formal sharing at the functional unit level and at the corporate level.
- There is formal sharing at the functional unit level, at the corporate level, and with business partners/alliances.
- N/A or don't know.

10) A6-The following statements pertain to the role and effectiveness of IT and business liaisons:

- We do not use liaisons, or if we do, we do so on an ad-hoc, as needed basis.
- We regularly use liaisons to transfer IT knowledge to the business and business knowledge to IT. They are the primary contact point for interactions between IT and the business. Liaisons are not usually used to facilitate relationship development.
- We regularly use liaisons to transfer IT knowledge to the business and business knowledge to IT. They occasionally facilitate relationship development.
- We regularly use liaisons to facilitate the transfer of IT knowledge to the business and business knowledge to IT. Their primary objective is to facilitate internal relationship development.
We regularly use liaisons to facilitate the transfer of IT knowledge to the business and external partners and business knowledge to IT. Their primary objective is to facilitate relationship development across the business and its external partners.

N/A or don't know.

11) B1-The following statements pertain to the metrics and processes used to measure IT’s contribution to the business.

The metrics and processes we have in place to measure IT are primarily technical (e.g., system availability, response time).

We are equally concerned with technical and cost efficiency measures. We have limited or no formal feedback processes in place to review and take action based on the results of our measures.

We formally assess technical and cost efficiency using traditional financial measures, such as return on investment (ROI) and activity-based costing (ABC). We are starting to put formal feedback processes in place to review and take action based on the results of our measures.

We formally assess technical, cost efficiency, and cost effectiveness using traditional financial measures (e.g., ROI, ABC). We have formal feedback processes in place to review and take action based on the results of our measures. These measures are extended to our external partners (e.g., vendors, outsourcers, customers).

N/A or don’t know.

12) B2-The following statements pertain to the use of business metrics to measure contribution to the business.

We do not measure the value of our business investments, or do so on an ad-hoc basis.

We are concerned with cost efficiency measures at the functional organisation level only. We have limited or no formal feedback processes in place to review and take action based on the results of our measures.

We formally use traditional financial measures, such as return on investment (ROI) and activity-based costing (ABC), across functional organisations. We are starting to have formal feedback processes in place to review and take action based on the results of our measures.

We formally measure value based on the contribution to our customers. We have formal feedback processes in place to review and take action based on the results of our measures and to assess contributions across functional organisations.
We use a multi-dimensional approach with appropriate weight given to technical, financial, operational, and human-related measures. We have formal feedback processes in place to review and take action based on the results of our measures. These measures are extended to our external partners (e.g., vendors, outsourcers, customers).

N/A or don’t know

13) B3-The following statements pertain to the use of integrated IT and business metrics to measure IT’s contribution to the business.

We do not measure the value of our IT business investments, or do so on an ad-hoc basis.

The value measurements for IT and business are not linked. We have limited or no formal feedback processes in place to review and take action based on the results of our measures.

The value measurements for IT and business are beginning to be linked and formalized. We are also starting to have formal feedback processes in place to review and take action based on the results of our measures.

We formally link the value measurements of IT and business. We have formal feedback processes in place to review and take action based on the results of our measures and to assess contributions across functional organisations.

We use a multi-dimensional approach with appropriate weight given to IT and business measures. We have formal feedback processes in place to review and take action based on the results of our measures. These measures are extended to our external partners (e.g., vendors, outsourcers, customers).

N/A or don’t know

14) B4-The following statements pertain to the use of service level agreements (SLAs):

We do not use SLAs or do so sporadically.

We have SLAs which are primarily technically oriented (response time, length of computer downtime, etc.), between the IT and functional organisations.

We have SLAs which are both technically oriented and relationship-oriented (user/customer satisfaction, IT's commitment to the business, etc.) that are between the IT and functional organisations and also emerging across the enterprise.

We have SLAs which are both technically-oriented and relationship-oriented, between the IT and functional organisations as well as enterprise wide.

We have SLAs which are both technically-oriented and relationship-oriented, between the IT and functional organisations as well as at enterprise wide and with our external partners/alliances.

N/A or don’t know.
15) B5- The following statements pertain to benchmarking practices. Informal practices are such things as informal interviews, literature searches, company visits, etc., while formal practices are such things as environmental scanning, data gathering and analysis, determining best practices, etc.

- We seldom or never perform either informal or formal benchmarks.
- We occasionally or routinely perform informal benchmarks.
- We occasionally perform formal benchmarks and seldom take action based on the findings.
- We routinely perform formal benchmarks and usually take action based on the findings.
- We routinely perform formal benchmarks and have a regulated process in place to take action and measure the changes.
- N/A or don’t know

16) B6-The following statements pertain to the extent of assessment and review of IT investments.

- We do not formally assess and/or review.
- We assess and/or review only after we have a business or IT problem (i.e., failed IT project, market share loss).
- Assessments and/or reviews are becoming routine occurrences.
- We routinely assess and/or review and have a formal process in place to make changes based on the results.
- We routinely assess and/or review and have a formal process in place to make changes based on the results and measure the changes. Our external partners are included in the process.
- N/A or don’t know

17) B7- The following statements pertain to the extent to which IT-business continuous improvement practices (e.g., quality circles, quality reviews) and effectiveness measures are in place.

- We do not have any continuous improvement practices in place.
- We have a few continuous improvement practices in place, but no effectiveness measures are in place.
- We have a few continuous improvement practices in place and the use of effectiveness measures is emerging.
- We have many continuous improvement practices in place and we frequently measure their effectiveness.
- We have well-established continuous improvement practices and effectiveness measures in place.
18) C1-The following statements pertain to strategic business planning with IT participation.

- We do no formal strategic business planning or, if it is done, it is done on an as-needed basis.
- We do formal strategic business planning at the functional unit level with slight IT participation.
- We do formal strategic business planning at the functional unit levels with some IT participation. There is some inter-organisational planning.
- We do formal strategic business planning at the functional unit and across the enterprise with IT participation.
- We do formal strategic business planning at the functional unit, across the enterprise, and with our business partners/alliances with IT participation.
- N/A or don't know

19) C2- The following statements pertain to strategic IT planning with business participation.

- We do no formal strategic IT planning or, if it is done, it is done on an as-needed basis.
- We do formal strategic IT planning at the functional unit level with slight business participation.
- We formally use traditional financial measures, such as return on investment (ROI) and activity-based costing (ABC), across functional organisations. We are starting to have formal feedback processes in place to review and take action based on the results of our measures. We do formal strategic IT planning at the functional unit levels with some business participation. There is some inter-organisational planning.
- We do formal strategic IT planning at the functional unit and across the enterprise with the business.
- We do formal strategic business planning at the functional unit, across the enterprise, and with our business partners/alliances.
- N/A or don't know

20) C3-The ability of the IT function to react/respond quickly to the organisation’s changing business needs is:

- Very weak
- Somewhat weak
- Neither weak nor strong
21) C4-The following statements pertain to IT budgeting. Our IT function is budgeted as a:

- Somewhat strong
- Very strong
- N/A or don’t know

- Cost center, with erratic/inconsistent/irregular/changeable spending, decided by business managers.
- Cost center, by functional organisation decided by business managers with consulting by IT managers.
- Cost center with some projects treated as investments decided by IT managers.
- Investment center decided by business and IT managers together.
- Profit center, where IT generates revenues decided by board including business, IT managers, founders, partners and/or alliances.
- N/A or don’t know.

22) C5-The following statements pertain to IT investment decisions. Our IT investment decisions are primarily based on IT’s ability to:

- Reduce costs.
- Increase productivity and efficiency as the focus.
- Traditional financial reviews. IT is seen as a process enabler.
- Business effectiveness is the focus. IT is seen as a process driver or business strategy enabler.
- Create competitive advantage and increase profit. Our business partners see value.
- N/A or don’t know

23) C6-The following statements pertain to IT steering committee(s) with senior level IT and business management participation.

- We do not have formal/regular steering committee(s).
- We have committee(s) which meet informally on an as-needed basis.
- We have formal committees, which meet regularly and have emerging effectiveness.
- We have formal, regular committee meetings with demonstrated effectiveness.
- We have formal, regular committee meetings with demonstrated effectiveness that include strategic business partners sharing decision-making responsibilities.
- N/A or don’t know.

24) C7-The following statements pertain to how IT projects are prioritized. Our IT project prioritization process is usually:

- In reaction to a business or IT need.
- Determined by the IT function.
- Determined by the business function.
- Mutually determined between senior and mid-level IT and business management.
- Mutually determined between senior and mid-level IT and business management and with consideration of the priorities of any business partners/alliances.
- N/A or don’t know.

25) D1-IT is perceived by the business as:

- A cost of doing business
- Emerging as an asset
- A fundamental enabler of future business activity
- A fundamental driver of future business activity
- A partner with the business that co-adapts/improvises in bringing value to the firm
- N/A or don’t know

26) D2-The following statements pertain to the role of IT in strategic business planning.

- IT does not have a role.
- IT is used to enable business processes.
- IT is used to drive business processes.
- IT is used to enable or drive business strategy.
- IT co-adapts with the business to enable/drive strategic objectives.
- N/A or don’t know.
27) D3- The following statements pertain to the sharing (by IT and business management) of the risks and rewards (e.g., bonuses) associated with IT-based initiatives (i.e., a project is late and over budget because of business requirement changes).

- IT takes all the risks and does not receive any of the rewards.
- IT takes most of the risks with little reward.
- Sharing of risks and rewards is emerging.
- Risks and rewards are always shared.
- Risks and rewards are always shared and we have formal compensation and reward systems in place that induce managers to take risks.
- N/A or don’t know.

28) D4- The following statements pertain to formally managing the IT/business relationship. To what extent are there formal processes in place that focus on enhancing the partnership relationships that exist between IT and business (e.g., cross-functional teams, training, risk/reward sharing):

- We don’t manage our relationships.
- We manage our relationships on an ad-hoc basis.
- We have defined programmes to manage our relationships, but IT or the business does not always comply with them. Conflict is seen as creative rather than disruptive.
- We have defined programmes to manage our relationships and both IT and the business comply with them.
- We have defined programmes to manage our relationships, both IT and the business comply with them, and we are continuously improving them.
- N/A or don’t know.

29) D5- The following statements pertain to IT and business relationship and trust.

- There is a sense of conflict and mistrust between IT and the business.
- The association is primarily an ‘arm’s length’ transactional style of relationship.
- IT is emerging as a valued service provider.
- The association is primarily a long-term partnership style of relationship.
- The association is a long-term partnership and valued service provider.
- 6 N/A or don’t know.
30) D6-The following statements pertain to business sponsors/champions. Our IT-based initiatives:
   ○ Do not usually have a senior level IT or business sponsor/champion.
   ○ Often have a senior level IT sponsor/champion only.
   ○ Often have a senior level IT and business sponsor/champion at the functional unit level.
   ○ Often have a senior level IT and business sponsor/champion at the corporate level.
   ○ Often have a senior level IT and the CEO as the business/sponsor champion.
   ○ N/A or don’t know.

31) E1-The following statements pertain to the scope of your IT systems. Our primary systems are:
   ○ Traditional office support (e.g., e-mail, accounting, word processing, legacy systems)
   ○ Transaction-oriented (e.g., back office support)
   ○ Business process enablers (IT supports business process change)
   ○ Business process drivers (IT is a catalyst for business process change)
   ○ Business strategy enablers/drivers (IT is a catalyst for changes in the business strategy)
   ○ N/A or don’t know.

32) E2-The following statements pertain to the articulation of and compliance with IT standards. Our IT standards are:
   ○ Non-existent or not enforced
   ○ Defined and enforced at the functional unit level but not across different functional units
   ○ Defined and enforced at the functional unit level with emerging coordination across functional units
   ○ Defined and enforced across functional units
   ○ Defined and enforced across functional units, and with joint coordination among our strategic business partners/alliances
   ○ N/A or don’t know.

33) E3- The following statements pertain to the scope of architectural integration. The components of our IT infrastructure are:
   ○ Not well integrated
   ○ Integrated at the functional unit with emerging integration across functional units
34) E4- The following statements pertain to the level of disruption caused by business and IT changes (e.g., implementation of a new technology, business process, merger/acquisition). Most of the time, a business or IT change is:

- Not readily transparent (very disruptive)
- Transparent at the functional level only
- Transparent at the functional level and emerging across all remote, branch, and mobile locations
- Transparent across the entire organisation
- Transparent across the organisation and to our business partners/alliances
- N/A or don’t know.

35) E5-The following statements pertain to the scope of IT infrastructure flexibility to business and technology changes. Our IT infrastructure is viewed as:

- A utility providing the basic IT services at minimum cost
- Emerging as driven by the requirements of the current business strategy
- Driven by the requirements of the current business strategy
- Emerging as a resource to enable fast response to changes in the marketplace
- A resource to enable and drive fast response to changes in the marketplace.
- N/A or don’t know.

36) F1-The following statements pertain to the extent the organisation fosters an innovative entrepreneurial environment. Entrepreneurship is:

- Discouraged
- Moderately encouraged at the functional unit level
- Strongly encouraged at the functional unit level
- Strongly encouraged at the functional unit and corporate levels
37) F2-The following statements pertain to the cultural locus of power in making IT-based decisions. Our important IT decisions are made by:

- Strongly encouraged at the functional unit, corporate level, and with business partners/alliances
- N/A or don’t know.

- Top business management or IT management at the corporate level only
- Top business or IT management at corporate level with emerging functional unit level influence
- Top business management at corporate and functional unit levels, with emerging shared influence from IT management
- Top management (business and IT) across the organisation and emerging influence from our business partners/alliances.
- Top management across the organisation with equal influence from our business partners/alliances.
- N/A or don’t know.

38) F3-The following statements pertain to employee opportunities to learn about and support services outside the employee’s functional unit (e.g., programmers trained in product/service production functions, customer service trained in systems analysis) using programmes such as cross training and job rotation. The organisation:

- Does not provide opportunities to learn about support services outside the employee’s functional unit.
- Opportunities are dependent on the functional unit.
- Formal programmes are practiced by all functional units.
- Formal programmes are practiced by all functional units and across the enterprise.
- Opportunities are formally available across the enterprise and with business partners/alliances.
- N/A or don’t know.

39) F4-The following statements pertain to your organisation’s readiness for change.

- We tend to resist change.
- We recognize the need for change and change readiness programmes are emerging.
- Change readiness programmes to provide the training and skills necessary to implement change which are in place at the functional unit level.
○ Change readiness programmes are in place at the corporate level.

○ Change readiness programmes are in place at the corporate level and we are proactive and anticipate change.

○ N/A or don’t know.

40) F5-The following statements pertain to career crossover opportunities among IT and business personnel.

○ Job transfers rarely or never occur.

○ Job transfers occasionally occur within the functional organisation.

○ Job transfers regularly occur for management level positions usually at the functional level.

○ Job transfers regularly occur for all position levels and within the functional units.

○ Job transfers regularly occur for all position levels, within the functional units, and at the corporate level.

○ N/A or don’t know.

41) F6-The following statements pertain to the interpersonal interaction (e.g., trust, confidence, cultural, social, and political environment) that exists across IT and business units in our organisation.

○ There is minimum interaction between IT and business units.

○ The association is primarily an “arm’s length” transactional style of relationship.

○ Trust and confidence among IT and business is emerging.

○ Trust and confidence among IT and business is achieved.

○ Trust and confidence is extended to external customers and partners.

○ N/A or don’t know.

42) F7- The following statements pertain to the IT organisation’s ability to attract and retain the best business and technical professionals.

○ There is no formal programme to retain IT professionals. Recruiting demands are filled ineffectively.

○ IT hiring is focused on technical expertise.

○ IT hiring is focused equally on technical and business expertise. Retention programmes are in place.
Formal programmes are in place to attract and retain the best IT professionals with both technical and business skills.

Effective programmes are in place to attract and retain the best IT professionals with both technical and business skills.

N/A or don’t know

Questions on Extended-SAM

43) A3-The following statements pertain to how and in which level organisational education/learning (e.g., of experiences, problems, objectives, critical success factors) perform in your organisation?

Individual Level- Employees view problems in their work and report it to leaders to find their feedback to learn. They discuss mistakes between each other in order to learn by the leaders’ allowance.

Individual Level- Employees openly discuss their works, mistakes and their jobs with each other to get feedback and learn.

Team or group level- Team leader define tasks for each member within the team and he is responsible to report the results and recommendations. Team members discuss their tasks with each other to get feedback.

Team or group level- Group members are equal regardless of their rank. They adapt their goals as needed and they focus both on group’s task together and on how well the group is working by discussion and self-evaluation.

Organisational Level – Organisation makes its lessons learned available to all employees by developing an online system that all can contribute to their works and their organisation’s vision. Leaders support learning and share up to date information with employees about competitors, industry trends, and organisational directions.

N/A or don’t know

44) A4-The following question pertains to what style and how communications between IT and business is performed

Ad-hoc/casual methods (employee observation, meetings, etc.)

Informal methods (newsletters, bulletin board notices, computer reports, group e-mail, fax, etc.)

Regular, clear methods (training, e-mail, phone-mail, intranet, department meetings, etc.) between business and IT mid-level management

Formal, unifying, bonding styles between IT and business mid-level management

Formal, unifying, bonding styles between senior and mid-level management of IT and business

N/A or don’t know.
45) A5-The following statements pertain to how knowledge sharing (intellectual understanding and appreciation of the problems/opportunities, tasks, roles, objectives, priorities, goals, direction, etc.) is performed between IT and business:

- Individual informal - Employees in business and IT share their knowledge informally during break or open discussion.
- Individual formal - Employees in business and IT share their knowledge formally by special reports, emails, bulletin, computer reports, fax, etc.
- Team informal - team members discuss their jobs by open discussion between each other and share their knowledge during work.
- Team formal - team members discuss their jobs and problems and share their knowledge formally during the daily or special meetings. These meeting are fully documented for any future use.
- Organisational - strategic picture of organisation is share to all employees, partners/alliances as well as close cooperating between business and IT departments.
- N/A or don’t know.

46) A6-The following statements pertain to how physically the relationship between IT and business functions (liaisons) are facilitated?

- We do not use liaisons, or if we do, we do so on an ad-hoc, as needed basis by employees in IT and business departments, individually and informally.
- We regularly use employees in IT and business departments to transfer IT knowledge to the business and business knowledge to IT. However, they are not usually used to facilitate relationship development.
- We regularly use employees in both departments to transfer IT knowledge to the business and business knowledge to IT. They occasionally facilitate relationship development.
- We regularly use team working between IT and business departments to facilitate the transfer of IT knowledge to the business and business knowledge to IT. Their primary objective is to facilitate internal relationship development within team.
- We regularly use contact between IT and business departments to facilitate the transfer of IT knowledge to the business and external partners and business knowledge to IT. Their primary objective is to facilitate relationship development across the business, IT and their external partners.
- N/A or don’t know.

47) B4-The following statements pertain to how service level agreements are applied between IT and business (SLAs):

- We do not use SLAs or do so sporadically.
We have SLAs which are primarily technically oriented (response time, length of computer downtime, etc.), between the IT and functional organisations which are applied by the control and monitoring of IT or business leaders.

We have SLAs which are both technically oriented and relationship-oriented (user/customer satisfaction, IT’s commitment to the business, etc.) that are between the IT and functional organisations which are applied by the control and monitoring of IT or business leaders.

We have SLAs which are both technically oriented and relationship-oriented between the IT and functional organisations as well as enterprise wide. SLAs are applied by the control and monitoring by the cooperation of both IT and business leaders.

We have a special role for it. A SLA manager establishes, defines, controls, monitors and manages the process between business and IT departments and plays a key role when negotiating both technically-oriented and relationship-oriented situations, between the IT and functional organisations as well as at an enterprise wide level and with our external partners/alliances.

N/A or don’t know.

48) B6- The following statements pertain to how the extent of assessment and review of IT investments is performed

- Assess and/or review only after we have a business or IT problem (i.e., failed IT project, market share loss) by top business managers.
- Assess and/or review only after we have a business or IT problem (i.e., failed IT project, market share loss) by top business managers by consulting with IT managers.
- Assessments and/or reviews are becoming routine occurrences by the top IT and business managers together.
- Assessments and/or review routinely by having a formal process and participating top IT and business managers to make changes based on the results.
- Assessments and/or review routinely by having a formal process in place to make changes based on the results and measure the changes in the board. Including top IT and business managers, external partners, stakeholders and customers.

N/A or don’t know

49) B7- The following statements pertain to the extent to how IT-business continuous improvement practices (e.g., quality circles, quality reviews) and effectiveness measures are decided to perform?

- There are no continuous improvement practices in place.
- Top business managers decide on putting continuous improvement practices in place and how they should apply.
- Top IT and business managers individually decide on continuous improvement practices and how to use of measures of effectiveness in their departments.
Top IT and business managers decide together on putting continuous improvement practices in place and how to use effectiveness measures in both IT and business departments.

The board of the organisation (including IT manager) decide which continuous improvement practices are put in place and how frequently they measure their effectiveness to evaluate the organisation as a whole.

N/A or don’t know

50) C1-The following statements pertain to strategic business planning with IT participation.

- We carry out no formal strategic business planning or, if it is done, it is done on an as-needed basis.
- We carry out formal strategic business planning at the functional unit level by business managers and with slight IT participation.
- We carry out formal strategic business planning at the functional by business unit levels with some IT participation. There is some inter-organisational planning.
- We carry out formal strategic business planning at the functional unit and across the enterprise with business and IT participation.
- We carry out formal strategic business planning at the functional unit, across the enterprise, and with our business unit, partners/alliances with IT participation.

N/A or don’t know.

51) C2- The following statements pertain to strategic IT planning with business participation.

- We carry out no formal strategic IT planning or, if it is done, it is done on an as-needed basis.
- We carry out formal strategic IT planning at the functional unit level by business managers with slight business participation.
- We formally use traditional financial measures, such as return on investment (ROI) and activity-based costing (ABC), across functional organisations. We are starting to have formal feedback processes in place to review and take action based on the results of our measures. We carry out formal strategic IT planning at the functional unit levels with some business participation. There is some inter-organisational planning.
- We carry out formal strategic IT planning at the functional unit and across the enterprise with both business and IT participation.
- We carry out formal strategic business planning at the functional unit, across the enterprise, and with our business unit, partners/alliances with IT participation.

N/A or don’t know.
52) C4-The following statements pertain to IT budgeting. Our IT function is budgeted as a:

- Cost center, with erratic/inconsistent/irregular/changeable spending, decided by business managers.
- Cost center, by functional organisation decided by business managers with consulting by IT managers.
- Cost center with some projects treated as investments decided by IT managers.
- Investment center decided by business and IT managers together.
- Profit center, where IT generates revenues decided by board including business, IT managers, founders, partners and/or alliances.
- N/A or don't know.

53) C5-The following statements pertain to how and for what purposes, IT investments are decided?

- Business managers decide IT investments due to decrease the cost.
- Business managers due to traditional financial reviews decide IT investments. IT is seen as a process enabler
- Business managers due to usage of IT as a process driver for business or as business strategy enabler.
- Business, IT managers and partners due to usage of IT as a strategy driver.
- Formal committee (board including IT top manager, business managers, business partners and stakeholders and etc.) decide IT investments due to usage of IT as a competitive advantages creator and a driver to increase profit.
- N/A or don’t know

54) C6-The following statements pertain to IT steering committee(s).

- We do not have formal/regular steering committee(s) with IT senior level and business management participation.
- We have committee(s) which meet informally on an as-needed basis with IT senior level and business management participation. However, IT senior level managers decide for any changes.
- We have formal committees, which meet regularly and have emerging effectiveness with IT senior level and business management participation. However, business senior level managers decide on any changes.
- We have formal, regular committee meetings with demonstrated effectiveness with IT senior level and business management participation. Business and IT senior level managers decide for any changes.
We have formal, regular committee meetings with demonstrated effectiveness that include with senior level IT and business management participation and strategic business partners sharing decision-making responsibilities.

N/A or don’t know.

55) C7-The following statements pertain to how IT projects are prioritized. Our IT project prioritization process is usually:

- In reaction to a business or IT need which are decided by IT domain managers.
- Determined by the IT functions which are decided by business domain managers.
- Determined by the business functions which are decided by business and/or IT domain managers.
- Mutually determined between senior and mid-level IT and business management.
- Mutually determined between senior and mid-level IT and business management and with consideration of the priorities of any business partners/alignances.

N/A or don’t know.

56) D3- The following statements pertain to sharing risks and rewards (e.g., bonuses) between IT and business top managers:

- IT top managers take all the risks and the rewards.
- Business top managers take all the risks and the rewards
- Both Business and IT top managers take risks, but only business department take the rewards
- Both Business and IT top managers take risks, and awards will be divided equally between business and IT departments.
- Risks and rewards are always shared between business and IT top managers. However, there is a formal compensation and reward systems in place that divide risks between IT and business managers regarding their involvement in each project.

N/A or don’t know.

57) D4-The following statements pertain to how formally the managing IT/business relationship is performed between business and IT people/ departments:

- There is no managing relationship in the organisation.
- Managing the relationship on an ad-hoc basis by business department.
Managing the relationship by special programmes but IT or the business people does not always comply with it. Conflict between business and IT people is seen as disruptive rather than creative.

Managing the relationship by special programmes so that both IT and business people comply with it.

Managing the relationship by special programmes so that both IT and business people comply with it. They also continuously give feedback to their managers to improve the programme's efficiency and effectiveness.

N/A or don't know

58) E1- Do the following categories pertain to who is responsible to define the scope and the role of IT systems in addition to the place that IT should act?

Business top managers

IT top managers

Business top managers consult with IT top managers but business managers decide

Business top managers and IT top managers decide together

The board including business top managers, IT top managers, business partners, stakeholders and etc., define the scope and role of IT systematically and formally depending on the involvement of IT in each project.

N/A or don't know

59) E4- the following statements pertain to the people involve in business and IT decision making for applying changes (e.g., implementation of a new technology, business process, merger/acquisition).

Business top managers

IT top managers

Business top managers consult with IT top managers but business managers decide

Business top managers and IT top managers decide together

The board including business top managers, IT top managers, business partners, stakeholders and etc., define the scope of changes by considering competitive advantages, disadvantages, enabler, inhibitors, other competitors and etc. in a systematic and formal way.

N/A or don't know
60) F1-The following statements pertain to the extent the organisation fosters an innovative entrepreneurial environment. Entrepreneurship is:

- Discouraged
- Moderately encouraged at the functional unit level by business or IT top managers.
- Strongly encouraged individuals at the functional unit level by business and top IT managers.
- Strongly encouraged individuals and at the functional unit and corporate levels of business and IT people.
- Strongly encouraged individuals, in team working and at the functional unit, corporate level, and with business partners/alliances
- N/A or don’t know.

61) F2-The following statements pertain to the cultural locus of power in making IT-based decisions. Our important IT decisions are made by:

- Top business management or IT management at the corporate level only
- Top business or IT management at the corporate level with emerging functional unit level influence
- Top business management at corporate and functional unit levels, with emerging shared influence of IT management
- Top management (business and IT) across the organisation and emerging influence from our business partners/alliances.
- Top management across the organisation with equal influence from our business partners/alliances.
- N/A or don’t know.

62) F3-The following statements pertain the management style give IT and business employee opportunities to learn about and support services outside the employee’s functional unit (e.g., programmers trained in product/service production functions, customer service trained in systems analysis) using programmes such as cross training and job rotation. This management style is defined by:

- This kind of management style is not available in our organisation.
- IT top managers or business top managers decide for all employees.
- Business top managers decide for business related employees and IT top managers decide separately for IT related employees.
- Business top managers and IT top managers decide together for employees.
The board including business top managers, IT top managers, partners and employees’ representative decide the scope of employee’s’ learning, which programpmes are appropriate and how special job training and rotation should be applied.

N/A or don't know

63) F4-The following statements pertain to how be the willingness for change in your organisation.

- Top business or IT managers tend to resist change.
- Top business managers recognize the need for change and they ask IT departments to prepare change readiness programmes.
- Top business managers recognize the need for change and they prepare change readiness programmes in place at the corporate level between business and IT.
- Top business and IT managers recognize the need for change and they prepare change readiness programmes in place at the corporate level in addition to increase the willingness of employees to accept new conditions.
- Change readiness programpmes are in place at the corporate level between business and IT. The organization is proactive and anticipates change in order to facilitate the change adaption base regarding new information, knowledge and experience gained by employees individually.
- N/A or don't know.

64) F5-The following statements pertain to how career crossover are performed between IT and business personnel.

- Job transfers rarely or never occur because of IT employees’ resistance.
- Job transfers rarely or never occur because of business employees’ resistance
- Job transfers occasionally occur only for selected employees’ position levels at the functional level, which are defined and controlled by top managers.
- Job transfers occasionally occur for all employees but only within the functional level.
- Job transfers regularly occur for all employees’ position levels and within the corporation level between IT and business.
- N/A or don't know.
65) F6- The following statements pertain to the interpersonal interaction (e.g., trust, confidence, cultural, social, and political environment) that exists across IT and business units in our organisation.

- There is minimum interaction between IT and business units.
- The association is primarily an ‘arm’s length’ transactional style of relationship which is decided by business people.
- Trust and confidence among IT and business is emerging by resistance to business people.
- Trust and confidence among IT and business is achieved and applied between business and IT units and people who work in the organisation.
- Trust and confidence is not only applied to business and IT domains but are also extended to external customers and partners.
- N/A or don’t know.

66) F7- The following statements pertain to how organisations attract and retain the best business and technical professionals.

- There is no formal procedure to hire or retain IT professionals.
- IT or business top managers individually evaluate and select best business and technical professionals.
- Business and IT top managers evaluate business and technical professionals but business top managers select the best ones.
- Business and IT top managers evaluate business and technical professionals individually and they select the best ones together.
- There is a special system for retaining and hiring professional that evaluates and compares their CV with others. This will help business and IT top managers select the best business and technical professionals.
- N/A or don’t know
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