

The Department of Computer and Systems Sciences (DSV) Report Series

FROM THEORY TO PRACTICE OF BUSINESS-IT ALIGNMENT:

Barriers, an Evaluation Framework and Relationships with Organisational Culture

No. 16-006



FROM THEORY TO PRACTICE OF BUSINESS-IT ALIGNMENT

Barriers, an Evaluation Framework and Relationships
with Organisational Culture

Mohamed Sobih Aly El-Mekawy

©Mohamed Sobih Aly El-Mekawy, Stockholm University 2016

ISSN XXXX- 1101-8526
ISBN 978-91-7649-433-2

Printed in Sweden by by Holmbergs, Malmö 2016
Distributor: Department of Computer and Systems Sciences, Stockholm University

*dedicated to the memory of my Mother and my Father ...
to my wife Fatiha ...
to my children ... Omar, Selim, Amir, Noor and Fatima ...
to my siblings ... Hosam, Hanan, Fathia and Ahmed ...*

ABSTRACT

Business-IT alignment (BITA) continues to be a top management concern. It generally refers to a preferred condition in which the relationship between business and IT is optimised to maximise the business value of IT. Early approaches in both research and practice have focused on the role of IT in supporting business strategies. Today, a more extended approach of BITA has been embraced that recognises soft factors that are related to people and culture issues at both tactical and operational levels of organisations. ‘*Why alignment is important*’ is not the crucial question today. In fact ‘*how it can be achieved and matured*’ is the real concern of business executives. There exists a number of theoretical models for conceptualising BITA, however, they have different focuses and contain different BITA components. Therefore, there is a need for a means of supporting practitioners for selecting an appropriate model.

Furthermore, there is a need for a more practice-oriented research that target higher maturity of BITA by understanding the organisational context, including barriers that hinders BITA and the mutual relationships between organisational culture and BITA. Thus, the overall problem addressed in the thesis is the following: *In spite of extensive literature on business-IT alignment, there is still limited maturity of business-IT alignment in practice due to the limited knowledge on barriers that hinder BITA achievement from practitioners’ perspective, on the means for supporting the selection of an appropriate model for assessing BITA, and on mutual relationships between BITA and organisational culture.*

Based on this research problem, five research objectives were developed. The first two objectives corresponded to barriers to achieving BITA and supporting the selection of BITA model respectively. The remaining three objectives corresponded to the two unidirectional influences between BITA and organisational culture (OC) and to the mutual relationships between them respectively. Different research methodologies and strategies were applied to achieve the research objectives, including qualitative and quantitative studies as well as design science.

The results presented in the thesis, each corresponding to an objective, are the following:

- A list of barriers that practitioners can use as a basis for better achievement of BITA, a better focus on strategic vs. tactical barriers, and their relationships to BITA components.
- An evaluation framework that supports practitioners in selecting appropriate BITA models for assessing and modelling BITA.
- An extended version of the strategic alignment model (SAM) of Luftman (2000), which considers organisational culture.
- An analysis of the impact of BITA components on organisational culture profiles.
- A BITA-organisational culture integrated view that supports decision-makers in facilitating decisions regarding both BITA and organisational culture.

The results of the research provide both theoretical and empirical contributions to the business-IT alignment research and practice.

Keywords: *business-IT alignment, organisational culture, strategic alignment, barriers to business-IT alignment, business-IT alignment evaluation framework, business-IT alignment-organisational culture integrated view.*

ABSTRAKT

Samstämmighet mellan verksamhet och IT (SVIT) (eng. Business-IT alignment) fortsätter att vara en central anslagenhet för högsta ledningen i organisationer. SVIT brukar definieras som ett tillstånd där relationen mellan verksamhet och IT är optimerad för att maximera affärsnyttan av IT. Tidigare angreppssätt inom både forskning och praktik inom SVIT har fokuserat på IT:s roll för att stödja affärsstrategier. Numera betonas också angreppssätt som lyfter fram mjuka faktorer relaterade till människor och kultur på både taktisk och operationell nivå i organisationer. "*Varför är samstämmighet mellan verksamhet och IT viktigt?*" är inte den avgörande frågan i dag. Istället ligger fokus på frågan "*Hur ska samstämmighet mellan verksamheter och IT uppnås och bli mer mogen?*". Det finns ett flertal teoretiska modeller som konceptualiserar SVIT. De har dock olika fokus och innehåller olika komponenter. Därför finns det ett behov av att stödja verksamhetens praktiker att välja en lämplig SVIT-modell. Dessutom finns det ett behov av en mer praktiskt inriktad forskning kring hur man uppnår högre SVIT-mognad genom att bättre förstå organisationers kontext, såsom hinder som försvårar SVIT och ömsesidiga relationer mellan organisationskultur och SVIT. Därför är det övergripande problemet som adresseras i avhandlingen följande: *Trots omfattande litteratur kring SVIT så finns det fortfarande begränsad kunskap om de hinder som försvårar SVIT, om medel som stödjer val av en lämplig modell för att bedöma SVIT i en organisation och om de ömsesidiga relationer som finns mellan SVIT och organisationskultur.*

Baserat på detta forskningsproblem har fem forskningsmål formulerats. De två första målen avser hinder för att uppnå SVIT respektive medel för att stödja valet av SVIT-modell. Följande tre mål motsvarade dels de två enkelriktade relationerna mellan SVIT och organisationskultur, dels den ömsesidiga relationen mellan dem. Olika forskningsstrategier och forskningsmetoder har tillämpats för att uppnå forskningsmålen, inklusive kvalitativa och kvantitativa studier samt designvetenskap.

Resultaten som presenteras i avhandlingen och som motsvarar respektive forskningsmål är följande:

- En lista över de hinder som verksamhetens praktiker kan använda som en grund för att bättre uppnå SVIT, för att bättre fokusera på strategiska kontra taktiska hinder, och för att underlätta deras relation till SVIT-komponenter.
- En utvärderingsramverk som stödjer verksamhets praktiker i att välja lämpliga SVIT-modeller för att bedöma och modellera SVIT.
- En utökad version av Luftmans strategic alignment model (SAM) så att den omfattar även organisationskultur.
- En analys av olika SVIT-komponenter effekter på olika organisationskulturprofiler.
- En SVIT och organisationskultur integrerad vy som stöder beslutsfattare att fatta beslut om både SVIT och organisationskultur.

Resultaten av den forskning som presenteras i avhandlingen ger både teoretiska och empiriska bidrag till SVIT-inriktad forskning och praktik.

ACKNOWLEDGEMENTS

﴿ الْحَمْدُ لِلَّهِ الَّذِي لَهُ مَا فِي السَّمَاوَاتِ وَمَا فِي الْأَرْضِ وَلَهُ الْحَمْدُ فِي الْآخِرَةِ وَهُوَ الْحَكِيمُ الْخَبِيرُ ﴾

All praise is due to Allah, the Lord of the Worlds ... The Beneficent, the Merciful. The whole process of my study and work is truly the blessing of Allah The Almighty ... trusting me with these responsibilities, and supporting me with all of my needs to fulfil this route as a further step of my life. All recognitions and gratitude are to Allah The Almighty for giving me life, power and determination in this phase.

This thesis is a partial fulfilment of the Degree of Doctor of Philosophy in Computer and Systems Sciences at Stockholm University. It was only completed with the encouragement, guidance, assistance and support from several contributors along the whole process. Therefore, I wish to acknowledge the contribution of many people who have given their assistance in different shares and manners.

I am heartily thankful to my main supervisor, **Professor Lazar Rusu**, and co-supervisor, **Associate Professor Erik Perjons**, whose encouragement, guidance, valuable advices and support from the initial to the final step enabled me for understanding and developing the subject, formulating research problems, and scientific writing. Working with them has always been in a warm friendship style providing valuable feedback, bringing fruitful discussions and structuring the whole process.

I am very grateful to my department (DSV) and the Swedish Research School of Management and Information Technology (MIT) for their funds and support of the PhD study.

I was lucky to be among many wonderful friends, who supported me by offering an excellent environment at DSV. They are; the PhD fellows, teachers, researchers and the administration team. They are many and some of them have already left the department, so I do not want to forget any of them. Thanks a lot to all of them and I wish the best for them in their life and in the hereafter.

Finally, I am indebted to those who are in my heart, my parents Mrs. Amal and Mr. Sobih. No words can express my love and appreciation to them. They support me emotionally, morally and physically in every step in my life with all of what they own. Their love and prayers are always the enlightening of my path. May Allah The Almighty bless them and reward them with the highest dignity in paradise. I am also grateful to my wife Fatiha for her support, motivation, patience and encouragement in the whole process. All the love for my sons in law Omar, Selim and Amir, and my daughters Noor-Azahraa and Fatima-Azahraa. They give me the energy and future's insight with all the love and happiness. There is a big place in my heart for my siblings: Hosam, Hanan, Fathia and Ahmed. They always support, encourage and assist me in every matter that I need, with all the love, to see the completion of this work. *To all of my family members ... I wish success and happiness in all of their life and in the hereafter.*

*Mohamed Sobih Aly El-Mekawy
Stockholm, June 2016*

محمد صبيح علي المكاوي

TABLE OF CONTENTS

1.0 INTRODUCTION	1
1.1 Research Background	1
1.2 Research Motivation	2
<i>1.2.1 Motivation for Studying the Barriers to Achieving BITA</i>	<i>3</i>
<i>1.2.2 Motivation for an Evaluation Framework of BITA Models</i>	<i>4</i>
<i>1.2.3 Motivation for Studying the Relationships between BITA and Organisational Culture</i>	<i>6</i>
1.3 Research Problem, Aim and Objectives	8
1.4 Publications.....	9
1.5 Relationships to the Research at Department of Computer and Systems Sciences and Swedish Research School of Management and Information Technology .	14
1.6 Structure of the Thesis	15
2.0 THEORETICAL BACKGROUND	16
2.1 Business-IT Alignment (BITA).....	16
<i>2.1.1 Different Approaches to BITA.....</i>	<i>16</i>
<i>2.1.2 BITA Constructs.....</i>	<i>16</i>
<i>2.1.3 BITA Models and Frameworks</i>	<i>19</i>
2.2 Organisational Culture	26
<i>2.2.1 Definition of Culture</i>	<i>26</i>
<i>2.2.2 Definition of Organisational Culture</i>	<i>27</i>
<i>2.2.3 Models of Organisational Culture</i>	<i>28</i>
2.3 BITA and OC Models in the Thesis	34
<i>2.3.1 Strategic Alignment Maturity Model (Luftman, 2000) for BITA</i>	<i>34</i>
<i>2.3.2 Organisational Culture Assessment Instrument (Cameron & Quinn, 1999, 2006) for OC</i>	<i>35</i>
3.0 RESEARCH METHOD	36
3.1 IS Research Philosophy	36
<i>3.1.1 Positivist Approach.....</i>	<i>37</i>
<i>3.1.2 Interpretive Approach</i>	<i>38</i>
<i>3.1.3 Critical Approach</i>	<i>39</i>

3.2 IS Research Methodology	39
3.2.1 <i>Qualitative vs. Quantitative</i>	40
3.2.2 <i>Empirical vs. Non-Empirical</i>	40
3.2.3 <i>Design Science vs. Behavioural Science</i>	41
3.3 IS Research Method/Strategy	46
3.4 Methodological Choices in the Thesis	50
4.0 Results	51
4.1 Results of Research Objective 1 (Barriers to BITA) ...	51
4.2 Results of Research Objective 2 (An Evaluation Framework).....	52
4.3 Results of Research Objective 3 (Extending BITA Models by Considering OC)	53
4.4 Results of Research Objective 4 (The Influence of BITA on Organisational Culture)	55
4.5 Results of Research Objective 5 (BITA-Organisational Culture Integrated View)	55
5.0 Scientific Contributions, Limitations and Future Research	58
5.1 Scientific Contributions	58
5.2 Limitations	63
5.3 Suggestions for Future Research.....	64
REFERENCES	66
APPENDIXES	75

To our grandparents, who laboured and dreamed for us.

To grandchildren the world over, for whom we labour and dream.

... *Stockholm Environment Institute*

LIST OF TABLES

Table 1. Enablers and Inhibitors of Strategic Alignment (Adapted from Luftman et al (1999))...21	21
Table 2. Criteria of SAM Model (Adapted from Luftman (2000)).....22	22
Table 3. Definitions of X-Model Elements (Adapted from Smit et al (2008)).....34	34
Table 4. Summary of the Main Research Methods/Strategies in IS47	47
Table 5. The Choices of Research Methodologies and Methods/Strategies in the Thesis.....50	50

LIST OF FIGURES

Figure 1. Publications' Structure in Relation to their Deliverable Outcomes.....	12
Figure 2. Strategic Alignment Model (Adapted from Henderson & Venkatraman (1993))	20
Figure 3. Strategic Alignment Maturity Model (Adapted from Luftman (2000))	22
Figure 4. Integrated Architecture Framework (IAF) (Adapted from Maes et al (2000)).....	23
Figure 5. Strategic Alignment Model (Adapted from Reich & Benbasat (2000)).....	24
Figure 6. Sabherwal and Chan Alignment Model (Adapted from Sabherwal & Chan (2001)).....	25
Figure 7. Hu and Huang Alignment Model (Adapted from Hu & Huang (2006))	26
Figure 8. Organisational Culture's Model by Deal and Kennedy (Adapted from Deal & Kennedy (1982)).....	29
Figure 9. Organisational Culture's Model by Cameron and Quinn (Adapted from Cameron & Quinn (1999)).....	30
Figure 10. Organisational Culture Model by Denison (Adapted from Denison (2000))	32
Figure 11. Organisational Culture's Model by Smit et al (Adapted from Smit et al (2008))	33
Figure 12. Five Main Research Activities in Design Science.....	42
Figure 13. A Template of Design Science Research Process (TDSRP) (Adapted from Johannesson & Perjons (2012)).....	43

LIST OF ABBREVIATIONS

BITA	Business-IT Alignment
BITA-OC	Business-IT-Alignment-Organisational Culture Model
DS	Design Science
DSR	Design Science Research
IS	Information Systems
IT	Information Technology
MIT (English)	Swedish Research School of Management and Information Technology
MIT (Swedish)	Forskarskolan Management och IT
OC	Organisational Culture
OCAI	Organisational Culture Assessment Instrument
Project GLOBE	Global Leadership and Organisational Behaviour Effectiveness
SAM	Luftman Strategic Alignment Maturity Model
TDSRP	Template of Design Science Research Process
X-Model	Organisational Culture Model of Smit et al (2008)

1.0 INTRODUCTION

This chapter outlines the background to the thesis. First, it provide a broader scope and background of the research area in focus. Second, the research motivation is presented by focusing on presenting research gaps in existing studies: 1) barriers to business-IT alignment, 2) the support for selecting a business-IT alignment model for an organisation, and 3) the relationships between business-IT alignment and organisational culture. Third, the research problem, aim and objectives are presented. Fourth, the publications related to this thesis are listed. Fifth, the thesis' relationships to the research at DSV and MIT are presented. Finally, a structure of the following chapters in the thesis is 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 being an administrative support in business towards becoming an essential means for supporting business strategies (Leonard & Seddon, 2012). However, 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 et al, 2011). Tallon and Venkatraman (2011) argue that the effective use of IT to achieve business goals and to gain competitive advantage requires the alignment of business and IT strategies of organisations. Therefore, both practitioners and researchers have recognized the importance of business-IT alignment.

Business-IT alignment (BITA) was first mentioned as a concept in the late 1970s, and since that time different researchers and practitioners have contributed to the scientific development of the BITA concept (Aversano et al, 2012). According to the 'key issues for IT executives' published by the Society for Information Management (SIM), BITA was among the top 10 management concerns for almost a quarter of a century from 1980, and has continued to be the top management concern since 2003 with the exceptions of the years 2007 (second), 2009 (second), 2010 (third) and 2012 (second) (Luftman & Ben-Zvi, 2010; Kappelman et al, 2016).

BITA generally refers to a preferred condition in which the relationship between business and IT is optimised to maximise the business value of IT (Irani, 2002; Schwarz et al, 2010). Early approaches in both research and practice have focused on the role of IT in supporting BITA (Tallon & Pinsonneault, 2011), but a more holistic understanding of BITA has been embraced since then that recognises the strategic and governance elements of BITA (Chan & Reich, 2007). BITA can support an analysis of the potential role of IT in an organisation (Bergeron et al, 2004; Tallon & Pinsonneault, 2011) and can enable the identification of emergent IT solutions in the IT marketplace that can provide the opportunity for an organisation to change its business strategy and business infrastructure (Hu & Huang, 2006) or to achieve competitive advantage(s) (Tallon &

Pinsonneault, 2011). Moreover, BITA can also be used to identify the gap between business and IT activities in order to determine where the improvements might be made (Luftman, 2004). Today, the interest in soft factors, such as people and culture issues, has also increased (Chan & Reich, 2007).

‘Why alignment is important’ is not the crucial question today. In fact, *‘how it can be achieved and matured’* is the real concern of business executives (Gutierrez & Lycett, 2011; Leonard & Seddon, 2012). Different efforts have thus 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). 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 which they are implemented. However, there has been less focus on how they can be achieved and applied (Luftman et al, 2011). Therefore, there is an apparent need to study different factors that impact on business-IT alignment and its achievement in both direct and indirect ways (Chan & Reich, 2007).

In addition to that, recent publications on the trends of BITA (e.g. Preston, 2014; Karpovsky & Galliers, 2015) have emphasised the disparity between managerial perceptions combined with the theoretical conceptualisation of BITA and the practice of BITA. In their editorial article entitled *‘Strategic IT alignment: twenty-five years on’*, Coltman et al (2015) drew on the need for more practice-oriented research that targets higher maturity of BITA by understanding the organisational context.

1.2 Research Motivation

When focusing on factors that influence the achievement of BITA, different research efforts have been highlighted for having a focus on studying and categorising these factors. In general, two approaches are found in literature for studying these factors. The first approach focuses on hard factors and components that deal with examining strategies, structures, planning methodologies and platforms in organisations (e.g. Chan et al, 1997; Henderson & Sifonis, 1988; Tallon et al, 2000; Zviran, 1990). However, the second approach focuses more on the soft components that deal with people around BITA, i.e. actors in organisations, examining their values, the communications between them and the understanding of each other’s objectives and domains (e.g. Doherty, 1992; Nelson & Coopriider, 1996; Subramani et al, 1999; Reich & Benbasat, 2000).

A third type of approach embraces more recent studies that tried to consolidate a comprehensive view on these factors. Examples of these studies include: Chan and Reich (2007), Gutierrez et al (2009), Salim and Abu Seman (2013) and Leonard and Seddon (2012). However, a shared point on these studies can be highlighted as the limitation of practical perspectives on factors. Therefore, the thesis focuses, in the first place, on **studying the barriers to achieving BITA from a practical perspective of organisations’ practitioners.**

Following that, Leonard and Seddon (2012) in their research highlighted that achieving BITA is greatly influenced by the decision-makers' experiences and knowledge on the subject, which is in most cases limited. According to Leonard and Seddon (2012), decision-makers need to follow a structured method for explaining their needs and applying systematic steps that can be followed by their teams. Thus, there is a need to understand the nature and focus of different BITA theories. Therefore, the **evaluation of existing BITA models in order to select an appropriate one** was considered an important objective in the thesis.

In addition to that, Chan and Reich (2007) classified the factors that influence the achievement of BITA into three groups. The first group is the knowledge-related factors (i.e. those that focus more on the lack of knowledge on BITA and how it can be developed). The second group is the locus-of-power- and IT-status-related factors (i.e. related to the authority of decision-makers in leading and applying changes in their organisations). The third group is organisational-change-related factors (i.e. related to the dynamic nature and changes in organisational business that influence how BITA is changing). Chan and Reich (2007) explain that relatively, the second group (i.e. locus-of-power- and IT-status-related factors) has received very limited attention, especially in dealing with the status of IT within a business unit or an organisation. They further argue that even if managers and decision-makers have the knowledge to achieve BITA and the organisational changes are clearly structured and organised, the alignment is mostly unfeasible in practice. This is partially attributed to the lack of knowledge on how various cultural concepts or conceptualisations of culture intervene in BITA components (concepts/constructs) (Chan & Reich, 2007). Therefore, **culture was selected as a third focus of the thesis to be studied in relation to BITA maturity**. The focus was set initially on the unidirectional influence of culture on BITA; however, during the study the influence was found from both directions, which led to the study focusing on the bidirectional influence between BITA and culture.

1.2.1 Motivation for Studying the Barriers to Achieving BITA

Many previous studies have tended to concentrate on either defining alignment or developing models to be used for conceptualising alignment (Henderson & Venkatraman, 1993; Luftman, 2000; Maes et al, 2000; Hu & Huang, 2006). Despite strong evidence of the importance of business-IT alignment in order to successfully achieve business goals, previous researchers have concluded that business-IT alignment is difficult to achieve and sustain (Luftman et al, 2011). A better awareness of barriers that hinder this could potentially help practitioners to address poor alignment within their organisation.

When aiming to align business and IT, one has to know the factors that influence alignment. Some of these factors are drivers for achieving and/or sustaining alignment, while others hinder. Luftman et al (2011:p.2) point out that 'achieving and sustaining alignment demands focusing on maximizing the enablers and minimizing the inhibitors that cultivate alignment'. Barriers not only hinder when aiming to achieve alignment but also when sustaining. Without a clear image of

barriers that exist between an aligned and misaligned state, practitioners will find it difficult to address alignment within their organisations. Studies on factors that hinder the achieving and sustaining of BITA have not yet to a sufficient extent been studied empirically, especially within the Swedish market (Chan & Reich, 2007; Leonard & Seddon, 2012).

In research, many barriers to BITA are presented based on different theoretical frameworks. However, these barriers are studied either from a pure theoretical perspective or with limited empirical-practical scope (Gutierrez et al, 2009; Leonard & Seddon, 2012). This consequently hinders the achievement of BITA in organisations. The need for a complete list of barriers from practitioners' perspective is not only academically rooted but also comes from practitioners who aim to apply BITA concepts in their organisations. This need has been identified during interviews (in students' group projects in master programme courses) with more than 250 different large and medium-sized organisations as part of the teaching activities in IT management courses in the Department of Computer and Systems Sciences (DSV), Stockholm University for the last ten years in a row. During the interviews with Chief Information Officer's (CIO's) and key alignment managers in these organisations, the lack of knowledge on BITA and its challenges has proved to be one of the top concerns. Above all, achieving BITA has traditionally been seen as part of CIO's duties. Those typically involved communication and strategy translation/implementation at executive levels (Luftman, 2004; Hu & Huang, 2006). 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 (Jentsch & Beimborn, 2014). Therefore, the barriers compiled years ago in BITA are strongly argued not to be the same as today.

A research sub-problem is therefore formulated as: *the limited knowledge on barriers that hinder the achievement of BITA from the perspective of business and IT practitioners.*

The following research question is thus proposed on this research problem:

- a) What are the barriers to achieving and sustaining business-IT alignment from the perspective of business and IT practitioners?*

1.2.2 Motivation for an Evaluation Framework of BITA Models

The initial analysis of literature on BITA revealed that several theoretical BITA models have been developed. These models, however, emphasise different components (i.e. concepts/aspects) of BITA, such as alignment level, governance, organisational structure and IT architecture (e.g. Gutierrez et al, 2008; Leonard & Seddon, 2012). In addition to that, these BITA models represent different theoretical perspectives and purposes (e.g. Arab Sorkhi et al, 2010; McLaren et al, 2011). This makes it difficult and complicated for a practitioner to choose an appropriate BITA model for a specific organisation (Coltman et al, 2015). Furthermore, there are only a few studies that compare different BITA approaches, and these studies either lack a complete framework for making a comparison or are too theoretical for practitioners to apply in their organisations (Gutierrez et al, 2008).

In literature, several efforts are identified that are aimed at evaluating or comparing BITA models. These efforts are mainly in the form of comparison frameworks for existing BITA models, extended theoretical discussions on the development of BITA models, or evaluation studies of specific BITA models using case studies.

First, a comparison framework found in Chan et al (2006) provides a set of requirements on criteria for comparing different BITA models. Gutierrez et al (2008) is another example of studying BITA models with their underlying theoretical/empirical concepts. They introduce a benchmarking taxonomy that compares different concepts for existing BITA approaches. Arab Sorkhi et al (2010) introduced a conceptual model for assessing the readiness of organisations in settling BITA. They evaluated various models and approaches of BITA based mainly on criteria from literature. These three frameworks are mainly based on theoretical investigations of BITA models without empirical studies that support the selected comparison criteria. In the approach of the thesis, both theoretical and empirical evidence is used.

Second, extended theoretical discussions on the development path of BITA models are found in studies such as Reich and Benbasat (2000) and Chan and Reich (2007). While these efforts have limited support for practitioners, the approach of the thesis focuses on supporting practitioners for comparing BITA approaches versus their needs.

Third, evaluation studies found in literature such as Goedvolk et al (1997), Avison et al (2004) and Sledgianowski et al (2006) focused on empirical evaluation of specific BITA models serving their research purpose. They provide useful comparisons and evaluation criteria that help researchers and practitioners in comparing BITA models. While these studies have a limited scope, such as a specific business domain, organisational size and application type, the research of the thesis aims for a complete evaluation of BITA models using their concepts.

The need for a framework that brings a comprehensive comparison between BITA models is therefore apparent. However, the need is not only academically rooted but also comes from practitioners who aim to apply BITA models in their organisations. This need was identified during the same interviews, as mentioned above in Section 1.2.1, with practitioners in more than 250 different large and medium-sized organisations. During the interviews in these organisations, students identified the practitioners' need for a structured framework to assist in selecting an appropriate BITA model. In addition, the empirical demand among practitioners for support in selecting an appropriate BITA model, such as a comparison framework, can be found in the annual survey conducted by SIM (Luftman et al, 2013).

A research subproblem is therefore formulated as: *the existence of a vast number of BITA models with different purposes, perspectives and components makes it difficult for practitioners to choose an appropriate BITA model for a certain organisation.*

A research question is thus proposed on this research problem as follows:

b) How can business/IT practitioners and decision-makers in organisations choose a business-IT alignment model(s) that supports their needs and desired development?

1.2.3 Motivation for Studying the Relationships between BITA and Organisational Culture

Earlier research about the notion of BITA-culture relationship (e.g. Schwartz & Davis, 1981; Arogyaswamy & Byles, 1987; Vestal et al, 1997; Higgins & Allater, 2004) discussed how the domains of BITA and OC practice can be put into a strategic fit of an organisation. This was done by focusing on the business objectives or on achieving competitive advantages by aligning concepts such as business strategy, organisational culture and leadership (Demir, 2015). However, the literature is characterised by the lack of knowledge on how various cultural concepts or conceptualisations of culture intervene in BITA projects more precisely. One possible reason for this dearth is the lack of appropriate operationalisation of culture. In order to carry out empirical studies of cultural settings and their influence on BITA and its maturity, reliable and valid measurement models and instruments are required. Such models and instruments would also provide practitioners with an analysis and benchmarking tools that could be used to examine the extent to which OC facilitates BITA approaches.

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

a) A few studies (e.g. Livonen et al, 1998; Davidson, 1996; Sabherwal & Chan, 2001) have their focus on national and societal cultural insights into IT management in organisations. These studies focus on how the cultural characteristics influence the practice of IT in managing business processes. 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. Hofstede, 2000; Chan, 2001; Chan & Reich, 2007) place a focus on the national culture's impact on organisations' perceptions of IT value. These studies examined how cultural differences may influence the perception of managers and decision-makers towards utilizing IT to achieve competitive advantages for their organisations. They found significant differences, predicted by national culture profiles and the characteristics of business people, in accepting, involving and utilizing information technology (IT) and information systems (IS) for transforming and developing their organisations.

c) Research on the impact of national and societal culture on the maturity of BITA has been found in a few studies (e.g. Silviu, 2008; Silviu et al, 2009; El-Mekawy & Rusu, 2011). These studies focus on how different cultural profiles of nations and societies may have an impact on BITA. The studies show that the relationships between business and IT domains in organisations can be

anticipated differently according to the profiles of the national culture. In addition to that, the studies indicate that cultural dimensions are shown to have a higher impact on the BITA variables that have more human interaction.

d) An extended discussion on the potential relationships between BITA and OC is found in Silvius et al (2010) and El-Mekawy et al (2012a and 2012b). These research efforts focus on the impact of OC elements and their relationships with BITA. They show that specific OC variables (based on a recent and comprehensive organisational culture model) in organisations have a clear impact on different variables of BITA. The studies were introduced in the form of extended discussion based on a literature review to identify the theoretical relationships between BITA variables and OC variables without going deeply into the causes of the influence by using empirical data.

e) An extended theoretical discussion on the impact of BITA on OC is found in the study of El-Mekawy et al (2014). This paper is the only paper found to focus on the impact of BITA on OC. It shows, through an in-depth case study approach, that BITA components have potential impacts on how the cultural profile of an organisation might change due to changes in BITA and its components.

The above-mentioned studies on the mutual influence between BITA and OC show clear limitations in their outcomes. All of them can be argued to have at least one of the following limitations:

i) The separate focus on business or IT performance without looking at the relationships between the two domains. They either focus on the influence of culture on business performance and the transformation process (e.g. Davidson, 1996) or on how culture influences the adoption of IT processes (Livonen et al, 1998; Sabherwal & Chan, 2001).

ii) The lack of the required focus for measuring/assessing BITA components (e.g. Silvius, 2008; Silvius et al, 2009; El-Mekawy & Rusu, 2011). ‘BITA components’ refers here to various attributes or criteria that define the relationships between different aspects of business and IT domains. They focus more on the efficiency and effectiveness of BITA components rather than on how they can be achieved and applied in specific settings of an organisational culture.

iii) The use of Hofstede’s model (Hofstede, 1980) for national culture and its extensions for societal culture (e.g. Hofstede & Bond, 1984; Hofstede, 2000; Silvius, 2008). This model was first developed in 1980 and included four culture dimensions: individualism, masculinity, power distance and uncertainty avoidance. A 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 criticised by several researchers and practitioners as it might be outdated and limited (i.e. different dimensions should be added) and it only stereotypes nations (i.e. several

subcultural profiles may exist in one main culture) without giving an accurate image of a specific culture (Ailon, 2008).

iv) The abstract level of relationships between BITA and OC without any deep analysis of their components (e.g. Silvius et al, 2010; El-Mekawy et al, 2014). The studies identify the anticipated relationships between Luftman's model (Luftman, 2000), which includes 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 among the 38 attributes (categorised under the six criteria) of BITA presented by Luftman (2000) and the 27 subelements (categorised under the five main elements) of the organisational culture model presented by Smit et al (2008).

v) The adoption of a unidirectional rather than a bidirectional approach. This is not highlighted in specific studies; however, most of the above-mentioned studies on the limitations (from i to iv) have a unidirectional approach to supporting practitioners in their understanding of the BITA and OC domains of practice and the relationships between them.

In light of the above-mentioned discussion, a research sub-problem is thus formulated as: *the lack of sufficient research on the mutual influence between business-IT alignment (BITA) and organisational culture (OC)*.

Therefore, and in contrast to the focus of existing studies, the thesis aims to study and analyse the mutual influence at the level of attribution (or a detailed level), and with a focus on '*how BITA can be achieved*' rather than only on '*the efficiency and effectiveness of its components*'. Three research questions are thus proposed on this research problem. Questions (c) and (d) concern the unidirectional influence between BITA and OC. However, question (e) focuses on the bidirectional relationships between BITA and OC.

c) How does organisational culture influence business-IT alignment and the assessment of its maturity?

d) How does business-IT alignment influence organisational culture?

e) What are the relationships between the maturity of BITA components and organisational culture profiles?

1.3 Research Problem, Aim and Objectives

Prior to this point, the research background and its further focus have shown limitations in research concerning a detailed level of explaining how BITA can be achieved in organisations, and how decision-makers can monitor BITA components to answer the question '*How are things done?*'.

The research problem is formulated as:

‘In spite of extensive literature on business-IT alignment, there is still limited maturity of business-IT alignment in practice due to the limited knowledge on barriers that hinder BITA achievement from practitioners’ perspective, on the means for supporting the selection of an appropriate model for assessing BITA, and on mutual relationships between BITA and organisational culture’.

The aim of the research performed in the thesis is to contribute to the theory and practice of business-IT alignment related to its achievement, sustaining and assessment in organisations.

Considering the overall aim, the research problem and the research questions (identified in Sections 1.2.1, 1.2.2, and 1.2.3), five research objectives are formulated as follows:

Objective 1: To identify the barriers to achieving and sustaining business-IT alignment from the perspective of business and IT practitioners.

Objective 2: To develop an evaluation framework for supporting practitioners in choosing appropriate business-IT alignment models.

Objective 3: To develop an extended business-IT alignment model for considering organisational culture, and for improving the assessment of business-IT alignment maturity.

Objective 4: To analyse the influence of business-IT alignment on organisational culture.

Objective 5: To analyse the mutual relationships between business-IT alignment components and organisational culture profiles and to develop an integrated view.

1.4 Publications

This thesis consists of ten peer-reviewed articles in scientific journals and proceedings of various well established conferences. They are referred to in the section by their Roman numbers.

The author of the PhD, Mohamed El-Mekawy, is the main author of all these publications. He has made the main contributions in conceptualising the ideas and writing. The main supervisor (Professor Lazar Rusu) and the co-supervisor (Associate Professor Erik Perjons) have provided support in terms of ideas, conceptual thinking and processing for all the papers. Therefore, in most of the papers, they have been added as the second and third co-author, respectively. Beyond the third author, some master and bachelor students (who were supervised by Mohamed El-Mekawy) were added as fourth and fifth co-authors in some of the papers. Their contribution was mainly in collecting data needed for some research processes.

The papers are presented below. The relationships between the publications and the thesis contributions, which are discussed in Section 1.2, are presented in Figure 1.

Paper-I (IJITBAG 2015)

Mohamed El-Mekawy, Lazar Rusu, Erik Perjons, Karl-Johan Sedvall, and Murat Ekici (2015). Strategic and Tactical Business-IT Alignment Barriers in Organizations Acting in Sweden. *International Journal of IT/Business Alignment and Governance (IJITBAG)*, Vol. 6, No. 2. pp. 31-55.

Paper-II (HICSS 2015)

Mohamed El-Mekawy, Lazar Rusu and Erik Perjons (2015). From Theory to Practice: Barriers to Business-IT Alignment in Organisations Acting in Sweden, In: *Proceedings of the 48th Hawaii International Conference on System Sciences (HICSS-48)*, IEEE Computer Society, Hawaii, USA (Nominated for the Best Paper Award).

Paper-III (CHB 2015)

Mohamed El-Mekawy, Lazar Rusu and Erik Perjons (2015). An Evaluation Framework for Comparing Business-IT Alignment Models: A Tool for Supporting Collaborative Learning in Organizations. *Computers in Human Behavior*, Vol. 51, Part B, pp. 1229-1247

Paper-IV (AMCIS 2013)

Mohamed El-Mekawy, Erik Perjons and Lazar Rusu (2013). A Framework to Support Practitioners in Evaluating Business-IT Alignment Models. In: *Proceedings of the Americas Conference on Information Systems (AMCIS)*, Association for Information Systems, Chicago, USA.

Paper-V (HICSS 2011)

Mohamed El-Mekawy and Lazar Rusu (2011). Organizational Culture Impact on Business-IT Alignment: A Case Study of a Multinational Organization. In: *Proceedings of the 44th Hawaii International Conference on System Sciences (HICSS-44)*, IEEE Computer Society, Hawaii, USA.

Paper-VI (HICSS 2012)

Mohamed El-Mekawy, Ehsan Kaboudvand and Lazar Rusu (2012). Extending BITA Maturity Model from Organizational Culture Perspective. In: *Proceedings of the 45th Hawaii International Conference on System Sciences (HICSS-45)*, IEEE Computer Society, Hawaii, USA.

Paper-VII (IJITBAG 2012)

Mohamed El-Mekawy, Ehsan Kaboudvand and Lazar Rusu (2012). An Organizational Culture Perspective in Business-IT Alignment. *International Journal of IT/Business Alignment and Governance (IJITBAG)*, Vol. 3, No. 1, pp 1-26.

Paper-VIII (PACIS 2014)

Mohamed El-Mekawy, Lazar Rusu and Erik Perjons (2014). The Impact of Business-IT Alignment on Organizational Culture. In: *Proceedings of the 18th Pacific Asia Conference on Information Systems*. Association for Information Systems, Chengdu, China.

Paper-IX (ECIS 2016)

Mohamed El-Mekawy, Lazar Rusu and Erik Perjons (2016). Business-IT Alignment and Organisational Culture Relationships: Towards an Integrated View. In: *Proceedings of the European Conference on Information Systems (ECIS 2016)*, Association for Information Systems, Istanbul, Turkey, Accepted to the European Conference on Information Systems (ECIS, 2016).

***** The publications (I-IX) are attached to the thesis in Appendix A.**

Research Publication

Research Output

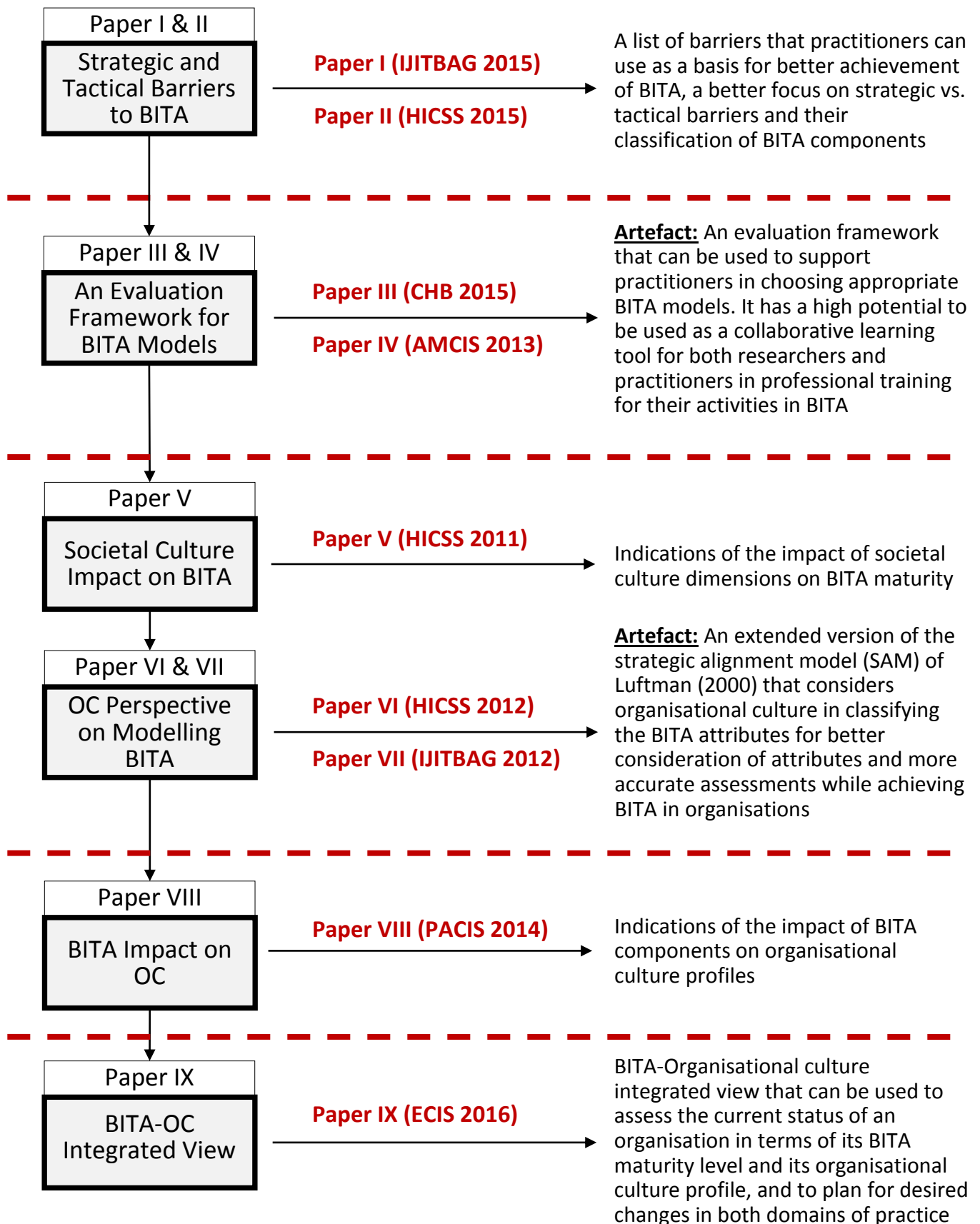


Figure 1. Publications' Structure in Relation to their Deliverable Outcomes

Other Related Publications:

The author of the thesis has also co-authored a number of publications that are not part of this thesis. However, they are related to the research area discussed in thesis. The most important among these publications are listed below:

Paper-X

Mohamed El-Mekawy, Bilal AlSabbagh and Stewart Kowalski (2014). The Impact of Business-IT Alignment on Information Security Process. In: *Proceedings of the 16th International Conference on Human-Computer Interaction*, Crete, Greece.

Paper-XI

Lazar Rusu and **Mohamed El-Mekawy** (2011). Strategic Role of Information Technology in a Multinational Company: A Case of an Organisation with Subsidiaries in Egypt and Sweden. In El-Khazindar Business Research and Case Center (Eds.) *Cases on Businesses in the MENA Region: New Trends and Opportunities*. pp. 135-155, IGI Global.

Paper-XII

Godfried Adaba, Lazar Rusu and **Mohamed El-Mekawy** (2010). *Strategic Business-IT Alignment in Trade Facilitation: A Case Study from Ghana*, (The 3rd World Summit on the Knowledge Society, WSKS). *Communications in Computer and Information Science*, 112, pp. 146-154, Springer -Verlag, Berlin Heidelberg.

Paper-XIII

Mohamed El-Mekawy, Lazar Rusu and Nabeel Ahmed (2009). Business-IT Alignment: An Evaluation of Strategic Alignment Models. *Communications in Computer and Information Science*, 49, pp.447-455, Springer-Verlag, Berlin Heidelberg.

Paper-XIV

Lazar Rusu, **Mohamed El-Mekawy** and Georg Hodosi (2009). Information Technology Leadership in Swedish Leading Multinational Corporations. *Lecture Notes in Artificial Intelligence*, 5736, pp.511-522, Springer-Verlag, Berlin Heidelberg.

Paper-XV

Lazar Rusu and **Mohamed El-Mekawy** (2009). The Strategic Role of IT: A Case Study in Two Swedish Retail Companies. In A. D'Atri and D. Saccà (Eds.). *Information Systems: People, Organisations, Institutions, and Technologies*, pp. 559-567, ISBN: 978-3-7908-2149-9, Springer Physica-Verlag HD.

Paper-XVI

Lazar Rusu and **Mohamed El-Mekawy** (2006). Managing Cultural Profiles towards Sustainable Development in Cross-National Information Systems Cooperation. In: *Proceedings of the Mediterranean Conference on Information Systems - MCIS'06*, pp. 249-259, University of Trento, Venice, Italy.

1.5 Relationships to the Research at Department of Computer and Systems Sciences and Swedish Research School of Management and Information Technology

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 in order to use the new technology. Meanwhile, the demands on staff skills regarding IT issues have become increasingly higher. Furthermore, IT issues have become more strategic (Luftman et al, 2013). One sign of this is reported on the home page of the research Swedish Research School of Management and Information Technology (MIT) (sv. Forskarskolan Management och IT). An example was given on the home page that both ABB and Handelsbanken promoted their IT managers to CEOs a few years ago. *Whether these two examples are part of a more general pattern* is still too early to tell. It should be noted that there could be 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 there will be a need for both teaching and research in this area to increase.

Linking the above-mentioned missions of DSV and MIT provides the answer to the questions of how IT is strategically related to business, and how this can be influenced by/influence the organisational culture of an organisation. While BITA refers ‘to applying IT in an appropriate and timely way, in harmony with business strategies, goals and needs’ (Luftman, 2000:p.69), organisational culture in its wider concept is perfectly explained as ‘how organisations do things’ (Ngwenyama & Nielsen, 2003). Therefore the ability of IT to support business objectives would be best achieved when business and IT are harmonized and aligned. At the same time the way we do things in our organisations today is strongly attached to achieving the different goals of the organisation. This requires actions to be managed to ensure agreement between IT and the key business activities and goals (Van Grembergen & De Haes, 2010). Misalignment between business and IT is attached and may lead to poor performance in business (Pongatichat & Johnston, 2008), increasing inefficiencies (Piplani & Fu, 2005) and hindrance to smooth running (Mitchell et al, 2003) of a business. It is therefore important to study and evaluate different factors and aspects that influence the achievement of BITA as well as the relationships between BITA and organisational culture for analysing the development of an organisation’s business. This can be a view of how the governance of IT is related to business performance towards achieving goals and desired changes in studies such as Silvius et al (2010), De Haes et al (2012) and Rowlands et al (2014).

1.6 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 reports. It is currently considered to be the most relevant and useful way to structure scientific papers (Sollaci & Pereira, 2004; George, 2012). 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 aim and objectives. The second chapter presents the theoretical background as an important basis for the thesis. It presents different concepts of the business-IT alignment (BITA) as well as organisational culture (OC) within literature. The third chapter presents the research method, which describes the scientific approach that is followed in the thesis. It starts by presenting different information systems research approaches, methodologies and methods, and then it presents the methodological choices in the thesis. The fourth chapter presents the results of all the research objective. The fifth chapter presents general discussions and conclusions on the five research objectives, highlighting their theoretical as well as empirical scientific contributions. The chapter ends by discussing the limitations of the research performed in the thesis and presenting suggestions for future research.

2.0 THEORETICAL BACKGROUND

This chapter provides background information and a 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 focused on the business-IT alignment and its modelling, culture and organisational culture along with their modelling as well.

2.1 Business-IT Alignment (BITA)

2.1.1 Different Approaches to BITA

Unlike other areas in 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 BITA can 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 (2000), Sabherwal and Chan (2001) and others focused on harmonising 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 et al, 2009). Publications that have studied the benefits of IT for business look at leveraging/linking (Henderson & Venkatraman, 1993), enabling (Wallace et al, 1999), transforming (Luftman, 1996) and optimising (Baets & Galliers, 1998) business processes. Other studies focus on the relationship between the domains and refer to BITA as fitting (Porter, 1996; Chan, 1992), integrating (Feeny et al, 1992), linking (Reich, 1993), matching (Chan et al, 1997), bridging (Van Der Zee & De Jong, 1999), fusing (Smaczny, 2001) and harmonising (McKeen & Smith, 2003).

Achieving BITA has traditionally been seen as part of a Chief Information Officer’s duties. Those typically involved communication and strategy translation at executive levels (Sabherwal & Chan, 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 support, appropriate prioritisations, trustful relationships and effective communications.

2.1.2 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 & Broadbent, 1988; Ciborra, 1997; Henderson & Venkatraman, 1993; Smaczny, 2001). Consequently, different researches along with their application’s contexts have resulted in different constructors and interpretations of BITA. Researchers such as Smaczny (2001) and Reich and Benbasat (1996) argue that IT should be a part of the business strategy and not a

separate part on its own. This explains why they used the term 'fusion' to explain their concept of integrating IT in business. In that sense, the advantages of IT can be seen at a level equal to business objectives while viewing 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 business and IT in an aligned way. Therefore, different researchers (e.g. Avison et al, 2004; Papp, 1999; Luftman, 2004) suggest three ways in which IT can benefit the business domain: i) by maximising return on investment of their IT, ii) by achieving fast competitive advantages related to the IT/IS, and/or iii) by effectively exploiting 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 realise 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 extent to which business and IT should be aligned is another issue highlighted and argued in literature. On the one hand, researchers such as Jarvenpaa and Ives (1994), Teo and Ang (1999) and Laudon and Laudon (2006) argue that too much alignment between business and IT may reduce strategic flexibility. They claim that it is a waste of time to try to align IT with business strategy or vice versa. Instead, a business strategy should be underpinned by truly effective information technology and systems. In addition, their idea of there being too tight a fit between business and IT also brings in more centralized decision-making as the capacity for processing information is increased. On the other hand, according to Ciborra (1997), 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 critical systems can be developed for organisations to obtain more top management support. Luftman (1996) and Papp (1999) support the discussion by suggesting that aligning strategy and infrastructure does not only lead to achieving synergic 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 practised, management and control of business activities are seen as important dimensions that should be addressed. McKay and Marshall (1999) and Avison et al (2004) highlight this issue to differentiate between alignment at the different strategic, tactical and operational levels. 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 therefore gives alignment the nature of modularity (Galliers & 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 in their missions. The plans should also be externally validated with balance in relation to the external business and IT contexts (Reich & Benbasat, 1996). Based on the knowledge gained from management feedback, business and IT strategies can be classified into separate 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 practising the alignment (Labovitz & Rosansky, 1997; Luftman et al, 2011).

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 practised throughout all business activities. The former view is supported by those researchers who focus mainly on the pay-off from IT investment and how it plays internally in the organisation for changing business processes (Weill & Broadbent, 1998; Earl, 1996). The latter view is adopted more in recent alignment research as a concept for dealing with organisations' 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 basis 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 the intended alignment can be achieved. These are: paradoxical decisions, excessive transformations and uncertain turnarounds. Based on these three concepts, alignment can be achieved better, for instance, by 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 decentralised, the alignment through the topology of Miles and Snow can be clearly influenced by 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 and Venkatraman (1993), Luftman et al (1999) define six factors in relation to 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, prioritisation 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 practised.

Considering Henderson and Venkatraman (1993) as the founding fathers for modelling 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 the Henderson and Venkatraman model are of 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 subdomains in each business and IT domain. With regard to strategic integration, on the one hand, the research efforts (e.g. Chan et al, 1998) include 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 realised 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 subdomains in the business and IT domains. The research efforts in this area are characterised by a focus on human and technical aspects. They suggest two dimensions for the strategy creation that strongly influence business-IT alignment (Reich & Kaarst-Brown, 2003). The dimensions are: i) the intellectual dimension (by, for example, Cragg et al, 2002; Tan & Gallupe, 2006) for investigating the content of different planning strategy approaches, and ii) the social dimension (by, for example, Reich & Benbasat, 2000; Galliers, 2004) that focuses more on the people that are able to formulate their strategies and facilitate the alignment.

Different researchers (e.g. Luftman, 2000; Sabherwal & Chan, 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, maximising enablers and minimising 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 changes.

2.1.3 BITA Models and Frameworks

Different models have been developed to support BITA and its practice. The modelling in the literature is 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).

Modelling Business-IT alignment is considered to have begun with the strategic alignment model of Henderson and Vekatraman (1993). Therefore, Avison et al (2004) argue in favour of using that BITA model as the starting point for modelling BITA in most of the BITA models

that ensued after that year. In the following paragraphs, a review of the development of modelling 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 that became the most famous and widely discussed among researchers. This statement was true until the year 2006 when the model of Hu and Huang (2006) was developed and published (Chan & Reich, 2007). The model (Figure 2) has two main domains (business and IT) and four subdomains (internal and external for each of the main domains). On the one hand, while the 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.

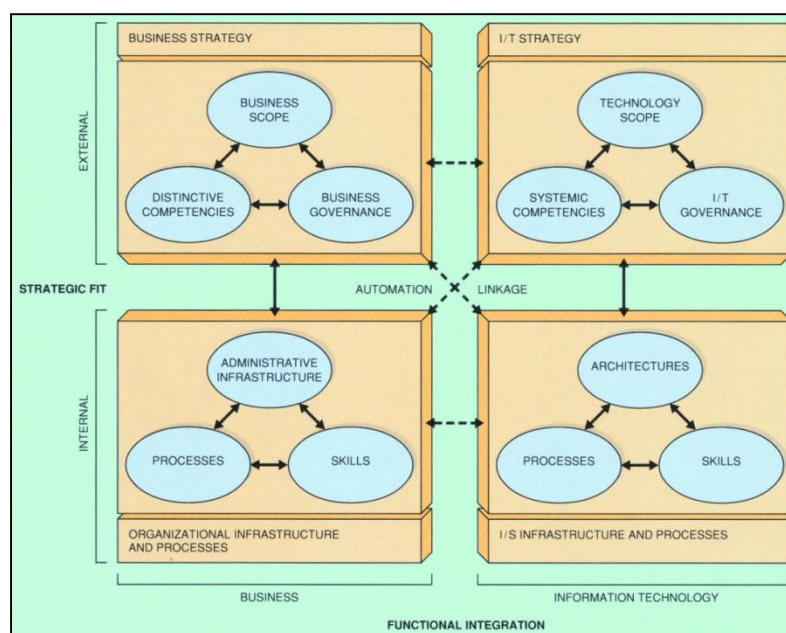


Figure 2. Strategic Alignment Model (Adapted from Henderson & Venkatraman (1993))

The model of Henderson and 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, which is the integrations between the business and IT domains. It facilitates the direct relationships between business and IT strategy changes.

Strategic Alignment Maturity Model (SAM) (Luftman, 2000). In 1996, Papp, Luftman and Brier conducted a research based on a survey of 500 organisations 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 12 components that were not defined clearly by Henderson and Venkatraman in their model (Table 1).

In under five working years, with increasing recognition of organisations’ challenges in relation to alignment, the idea of strategic alignment maturity first appeared in about 1999. In 2000, Luftman developed and published his model (Luftman, 2000) that explains six phases that should be followed by organisations to attain and sustain BITA based on an understanding of how to increase the enablers and decrease the inhibitors. These six phases are:

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

Table 1. Enablers and Inhibitors of Strategic Alignment (Adapted from Luftman et al (1999))

ENABLERS	INHIBITORS
Senior executive support for IT	IT/business lack close relationships
IT involved in strategy development	IT does not prioritize well
IT understands the business	IT fails to meet its commitments
Business/IT partnership	IT does not understand business
Well-prioritized IT projects	Senior executives do not support IT
IT demonstrates leadership	IT management lacks leadership

SAM classifies BITA into six criteria – Communications, Competency/Value Measurements, Governance, Partnership, Scope and Architecture, and Skills (Table 2) – consisting of 38 attributes (Figure 3) in five maturity levels: Ad Hoc, Committed, Established Focused, Managed, and Optimised Process. This classification provides a clear view of alignment and helps in spotting particular areas in which an organisation needs to improve to maximise the values of IT investments.

SAM focuses on different areas through 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 a 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 et al, 2010).

Table 2. Criteria of SAM Model (Adapted from Luftman (2000))

SAM Criterion	Definition
<i>Communications</i>	Refers to a clear understanding between business and IT communities with an effective exchange and sharing of each ideas, processes and needs.
<i>Competency/ Value Measurements</i>	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.
<i>Governance</i>	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.
<i>Partnership</i>	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.
<i>Scope and Architecture</i>	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.
<i>Skills</i>	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.

SAM is found to present strategic alignment as a complete holistic process that encompasses not only an establishing alignment but also its maturity by maximising alignment enablers and minimising inhibitors (Avison et al, 2004). The model follows a bottom-up approach by setting goals, understanding the linkage between business and IT, analysing and prioritising gaps, specifying the project management actions, choosing and evaluating success criteria and consequently sustaining alignment through all these processes (Avison et al, 2004).

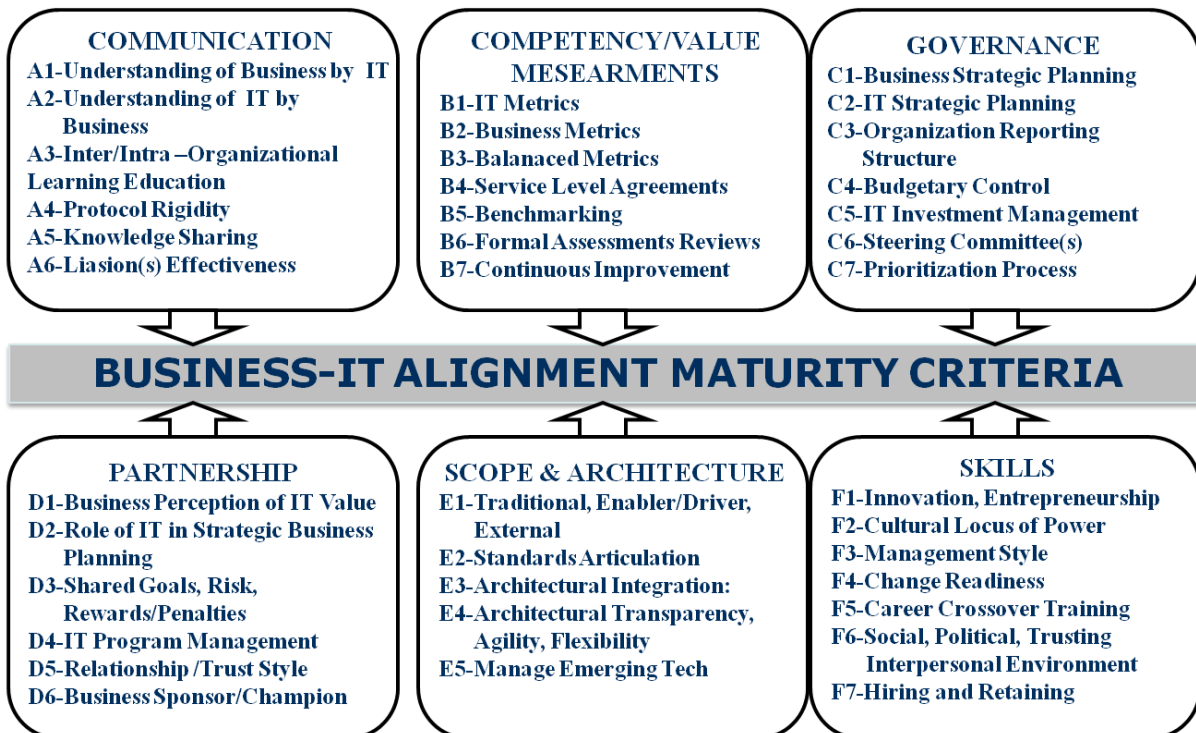


Figure 3. Strategic Alignment Maturity Model (Adapted from Luftman (2000))

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 et al (1997), 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.

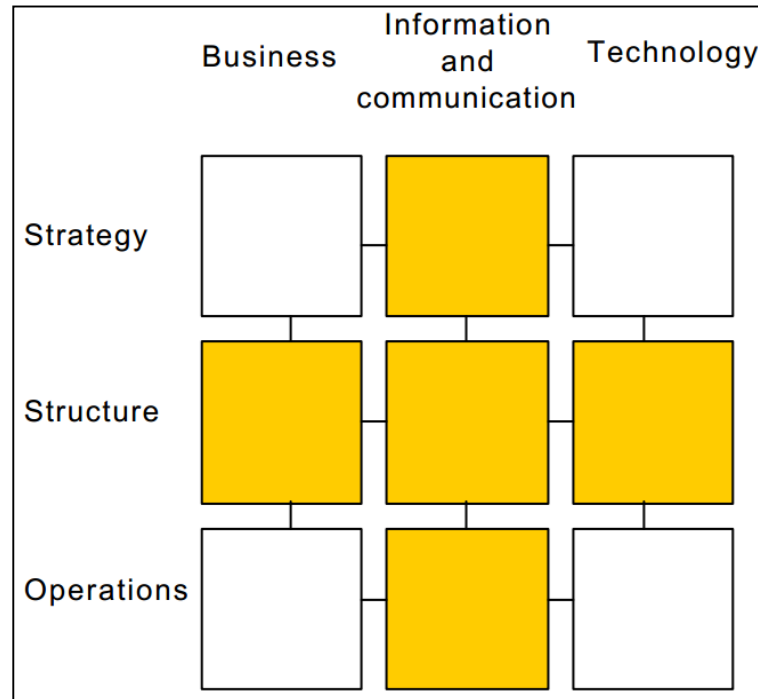


Figure 4. Integrated Architecture Framework (IAF) (Adapted from Maes et al (2000))

In fact, by representing the 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 frameworks. 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 for humans’ interaction with their activities should be considered.

In light of these points, one column (information and communication) and one row (structure) have been added to the model of Henderson and Venkatraman (1993) (see Figure 4). The model therefore follows a top-down approach for aligning between main architecture areas. Although

the framework looks more complete than the model of Henderson and Venkatraman (1993), it seems to be incomplete in one sense. There is still a 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 have not yet been considered or discussed empirically (Chan & Reich, 2007).

Reich and Benbasat Model (2000). One of the most widely discussed models in the strategic information systems domain. The authors 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 5) 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: this 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: this 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.

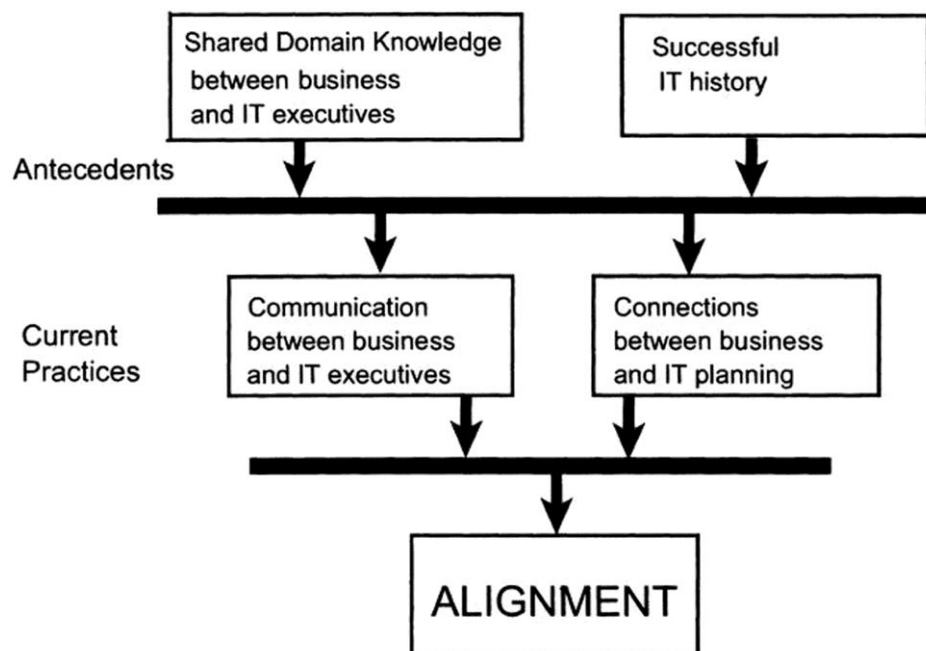


Figure 5. Strategic Alignment Model (Adapted from Reich & Benbasat (2000))

The model follows a top-down approach by focusing on the antecedents along with the current practices that directly influence alignment. No doubt the two dimensions of strategy creation are the intellectual and the social, but the authors of the RBM have selected the social domain as it would scrutinise more people involved in creating the alignment and developing its maturity. Therefore, the model, like 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 was mainly developed by being based on the types of business strategy developed by Miles and Snow (1978), who defined the typology of defenders, analysers and prospectors. They emphasised 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 6).

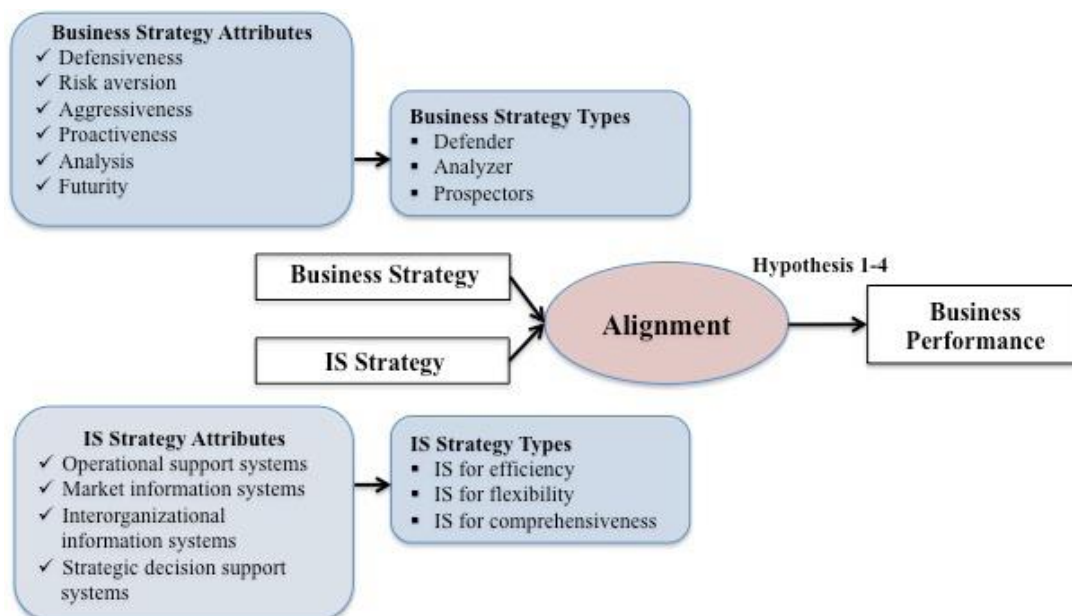


Figure 6. Sabherwal and Chan Alignment Model (Adapted from Sabherwal & Chan (2001))

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 investigation. 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 realised 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 intended strategies refers 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 in information management (IM) strategies, which makes it more oriented to system alignment in organisations.

Hu and Huang Alignment Model (2006). The aim in developing this model was to create a BITA model that can be used as a managerial tool for supporting the decision-making process. Hu and Huang focused their work on processing BITA as a dynamic process rather than having a static nature. Therefore, they developed the model of Reich and Benbasat (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 7).

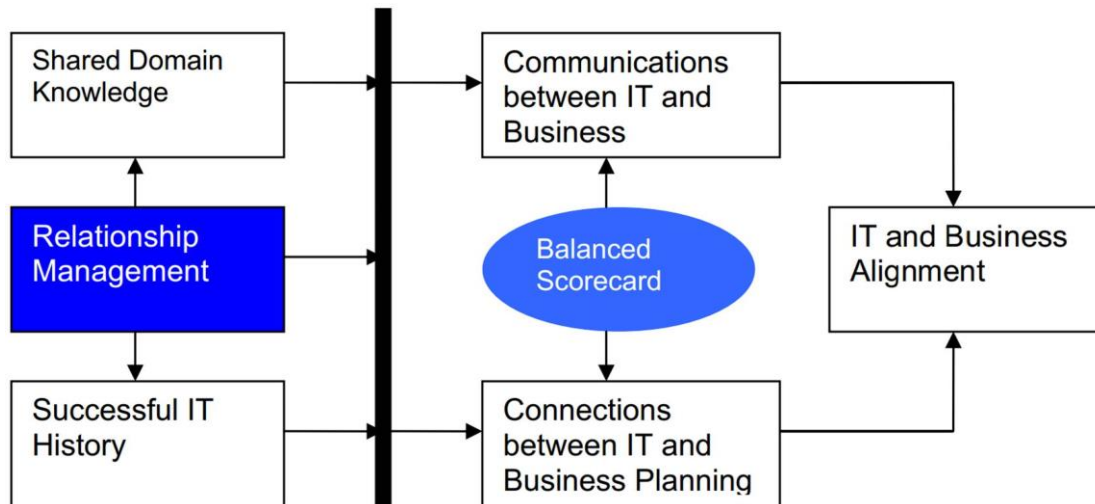


Figure 7. Hu and Huang Alignment Model (Adapted from Hu & Huang (2006))

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 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.

2.2 Organisational Culture

2.2.1 Definition of Culture

While globalisation has created numerous opportunities for many companies, it has also posed many challenges, among them 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 (Deresky, 2011). However, operationally, culture comprises shared language, belief systems like religion, political beliefs, history and ethnicity (House et al, 2001). Culture is also categorised by Wilson (2001) into 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 also been defined in many contexts at different levels. These include national culture, societal culture and organisational culture (Hofstede, 1991; Deresky, 2011). For almost two decades, the focus in studying culture has been on its national level, led by the research of Hofstede (1980) and his further studies. In studying the impact of culture on business, however, a clear criticism has been made 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 therefore places its focus on how business is operated in organisations with regard to how people perform their individual and collective tasks.

2.2.2 Definition of Organisational Culture

Organisational culture (OC) is simply defined as the culture of an organisation (Mobley et al, 2005). Each organisation is supported and defined by an individual culture. OC 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, 2011). Therefore, OC is seen as providing guidance for people's behaviour within an organisation and it strongly influences people's decision-making.

OC 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 the missions and objectives of the organisation and how people centralise 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 obtain their rights as well as take responsibility.

What should be highlighted regarding organisational culture is that it cannot be changed either by just switching employees between different units or departments or 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 (2011), 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 organisation.

2.2.3 Models of Organisational Culture

In order to contribute to research into building organisational culture constructs, different models and theories have been developed and presented. These models are intended to be 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 of the organisational culture models are summarised below:

Hofstede et al (1990). Most of the work in culture modelling started with the groundbreaking research 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) conducted a smaller study that focused on organisational culture. In this study, the authors identified dimensions of organisational culture that can be collectively used as a descriptive framework for organisational culture. These 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 that their research base was too narrow for generalisation. To credibly argue for universal validation of their six identified dimensions, they suggested in-depth studies of societies with the possibility of adding more dimensions or omitting others, especially when studying other types of organisations.

Deal and Kennedy (1982). This model was 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 is intended 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 in 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 regarding how the employees use these values. Stories have been proved to increase the learning ability of employees.
- 5) **Heroic Figures:** They are shown as the characteristics required of good managers and employees in order to lead their teams. By measuring these actions, they can be motivated to act on the whole organisation.

- 6) **The Cultural Network:** This refers 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 8) that are based on the interaction between two influencing factors: i) the risk associated with an 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:** in such culture type, the employees are willing to take risks and they are looking for fast feedback on their actions. In addition to that there are looking for their individual achievements by working hard in own initiatives. Therefore, the team is characterised by tough competitions and the lack of informal cooperation. Organisations in such culture focus more on performance achievements in the turnover without a focus on having consistent culture.



Figure 8. Organisational Culture's Model by Deal and Kennedy (Adapted from Deal & Kennedy (1982))

- b) **Work Hard/Play Hard:** such a type of culture is explained to fit in organisations with a focus on sales activities. In such organisations, employees are not willing neither they are encouraged to take risks. However, they are might be pushed to take a little risk when is needed. Employees in such a culture are evaluated based on their performance i.e. mainly in getting signed sales contracts. In addition to that, people in such a culture prefer to work in teams for achieving mutual benefits and synergic results.
- c) **Bet-Your-Company:** this type of culture is characterised by its high risk nature, and typical examples of organisations in such a culture are the organisations in medical and oil industries. Decision making is a sensitive and costly process in such organisations. Therefore, decision making body is often rigid hierarchical in its structure and looking for long-term perspectives.

- d) **Process:** this type of culture is characterised by high security with low risk acceptance. Typical examples of organisations in such a culture are banks and insurance organisations. There are usually strict pre-defined strategies and policies for long-term vision of the organisations. Therefore, there is neither much focus on individual performance nor on their added value to the organisation.

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 criticised 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 to develop the model as an organisational culture assessment instrument for distinguishing four different culture types. These four organisational culture types (Figure 9) are controlled by the two polarities ‘flexibility versus stability’ and an ‘internal versus external’ focus.

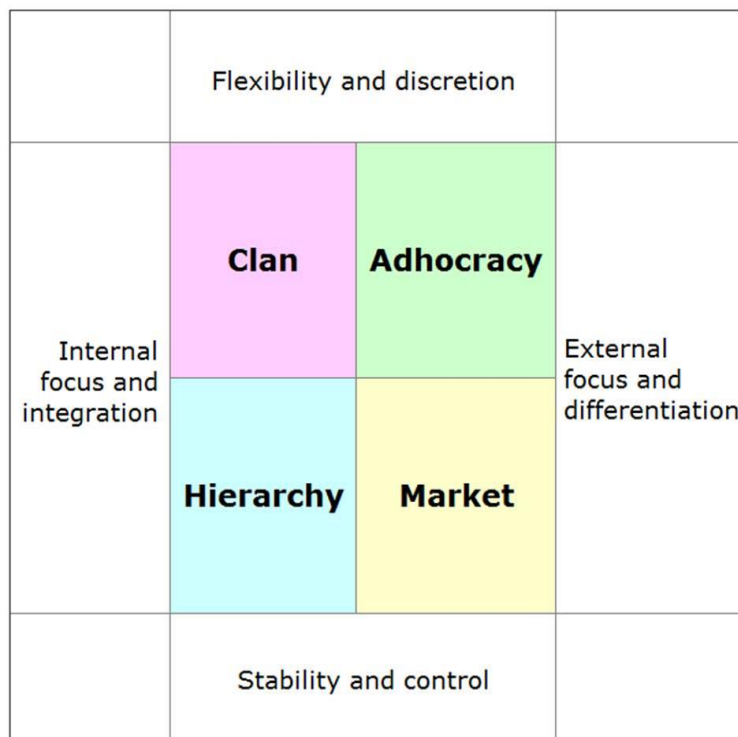


Figure 9. Organisational Culture’s Model by Cameron and Quinn (Adapted from Cameron & Quinn (1999))

The interaction of the two polarities resulted in four types of OC:

- a) **Clan:** The organisation focuses on internal factors and considers their flexibility in a friendlier 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 characterised 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 a command and control style of management and driver leaders who look at the 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 practising 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 globalisation. These growing business models are seen not to fit into a culture model that was developed in 1990.

Denison (2000). This model is the result of over 25 years of work and research by Denison. The model focuses on two basic components in organisations: the organisational culture and the leadership. In the early 1980s, Denison 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 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.

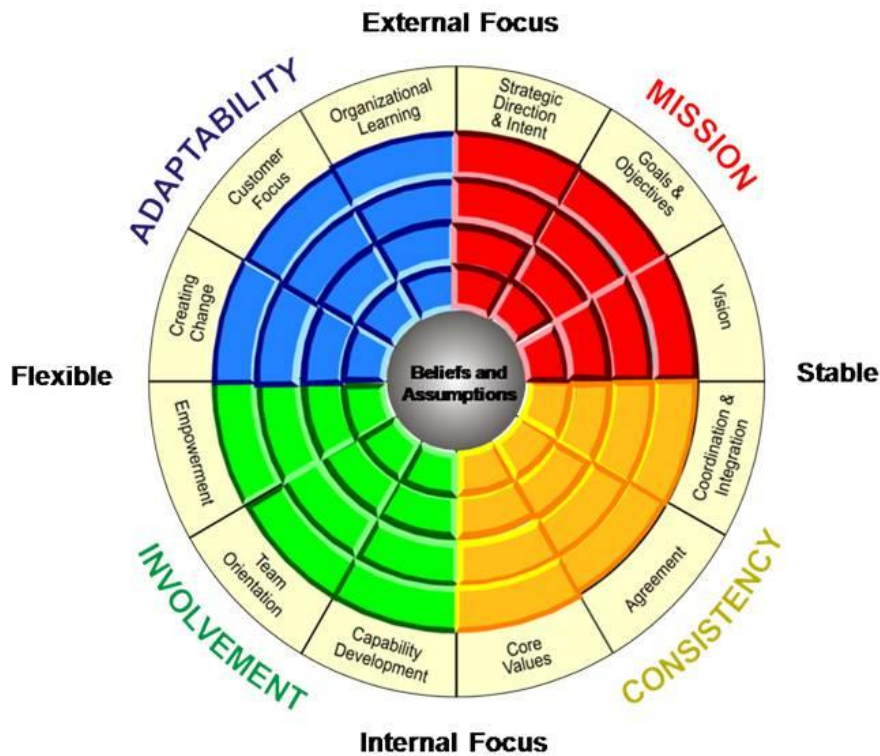


Figure 10. Organisational Culture Model by Denison (Adapted from Denison (2000))

Figure 10 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 a further division of each trait into three dimensions. The four traits are explained as follows:

- a) **Involvement:** In this group’s attributes, human activities are motivated and the focus of success. The involvement of individuals is measured by their empowerment, their team orientation and their abilities to develop new innovations.
- b) **Consistency:** This 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 to changes. These changes should be customer oriented in order to have the potential for competitive advantages.
- d) **Mission:** This trait focuses on linking the stability of an organisation with its external view. Therefore, it deals with defining a well-formulated vision, the objectives and the 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 organisational culture can be described in terms of five core elements that are placed in an ‘X’ shape with the ‘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 11). The core elements are briefly explained in Table 3.

Smit et al (2008) is considered to be the most comprehensive OC model because it consolidates all components from previous models and develops them further. The model has the following advantages over other OC models:

- 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 & Quinn (1999)) or on pure empirical findings (e.g. Hofstede et al (1990)).
- b) The modularity in the form of elements and sub-elements gives the model (Figure 11) a highly workable characteristic for studying organisational culture in a 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 OC.
- d) The model is seen as comprehensive and consistent. This is achieved, in addition to the authors' arguments, through a careful study of most of the previous organisational culture models and by consolidating their dimensions.

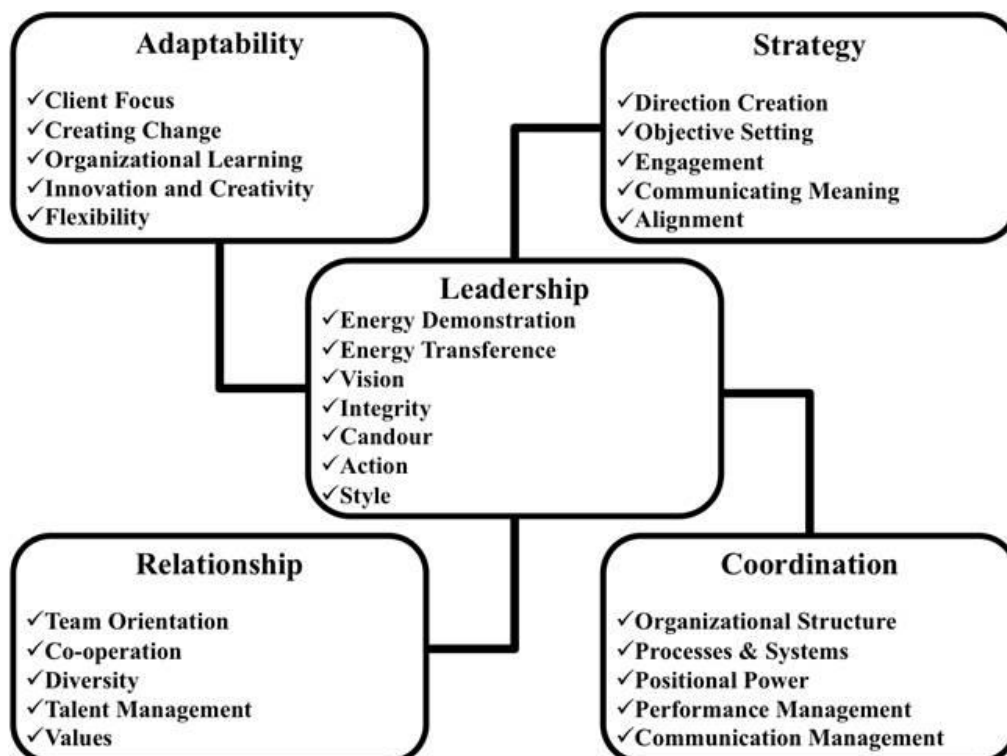


Figure 11. Organisational Culture's Model by Smit et al (Adapted from Smit et al (2008))

Table 3. Definitions of X-Model Elements (Adapted from Smit et al (2008))

Organisational Culture Elements	Definition
<i>Leadership</i>	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.
<i>Strategy</i>	Defined as the degree to which an organisation is clear about its strategic direction so as to ensure optimal service delivery.
<i>Adaptability</i>	Defined as the degree to which the organisation is in contact with and responds to change so as to improve service delivery.
<i>Coordination</i>	Defined as the degree to which internal system is aligned horizontally and vertically for optimal service delivery.
<i>Relationship</i>	Defined as the degree to which people in the organisation work together to form strong working relationships that will ensure optimal service delivery.

2.3 BITA and OC Models in the Thesis

2.3.1 Strategic Alignment Maturity Model (Luftman, 2000) for BITA

A dynamic multidimensional set of alignment components is visible in every organisation when going from business strategy to IT governance (Hu & Huang, 2006). As presented above in Section 3.1.3, different efforts have been oriented towards assessing BITA by proposing theoretical models that can be applied as supportive tools for addressing different BITA components. Although Henderson and Venkatraman are seen as the founding fathers of BITA modelling (Avison et al, 2004), Luftman's Strategic Alignment Maturity (SAM) model (Luftman, 2000) has gained more popularity in practice (Chan & Reich, 2007).

The benefits of SAM over other BITA models are summarised below:

a) SAM follows a bottom-up approach by providing a linkage between business and IT at operational, tactical and strategic levels of an organisation. It also provides an approach for an organisation to set its goals, analyse and prioritise gaps, choose and evaluate success criteria, and consequently sustain the alignment.

b) SAM presents strategic alignment as a complete holistic process that encompasses not only establishing alignment but also its maturity by maximising alignment enablers and minimising inhibitors (Avison et al, 2004).

c) SAM focuses on different areas through the modularity of six BITA criteria (see Table 2 in Section 2.1.3) and 38 attributes (see Figure 3 in Section 2.1.3) that are assessed on five maturity levels: Ad Hoc Process, Committed Process, Established Focused Process, Improved/Managed Process and Optimised Process. This classification gives a clear view of BITA maturity and helps in spotting particular areas where an organisation needs to improve, and in maximising the value of IT investments.

d) SAM has been used by several researchers and in a number of industries for assessing BITA and its components.

In light of these motivations, SAM is selected to be used in this study for assessing BITA maturity and analysing the relationships with OC.

2.3.2 Organisational Culture Assessment Instrument (Cameron & Quinn, 1999, 2006) for OC

OC is comprehensively explained by Cameron and Quinn (1999) as referring to the taken-for-granted values, and underlying assumptions, expectations and definitions present in an organisation. Therefore, it is considered to strongly comprise values and behaviours that contribute to the unique social and psychological environment of an organisation (Deresky, 2011). In Section 3.2.3, a number of models and theories such as Hofstede (1980), Deal and Kennedy (1982), Cameron and Quinn (1999), House et al (2001, 2004) and Smit et al (2008) have been presented as reference frameworks for understanding national and organisational cultures and their components. Although Smit et al (2008) is considered to be the most recent, comprehensive and consolidating of all previous models, the Organisational Culture Assessment Instrument (OCAI) proposed by Cameron and Quinn (1999, 2006) is used. The OCAI was developed by Cameron and Quinn (2006) based on the Competing Values Framework initiated by Quinn and Rohrbaugh (1983) and further developed by Kimberly and Quinn (1984) and Cameron and Quinn (1999). The selection of the OCAI framework is motivated by the following reasons:

- a) The OCAI is a validated method to examine organisational culture and was originally empirically derived.
- b) The OCAI has shown both theoretical and empirical validation that integrate many of the dimensions derived from organisational culture research.
- c) The results of the OCAI provide a means by which organisations can navigate organisational change successfully. The framework was developed based on 39 effectiveness criteria identified and analysed by Quinn and Rohrbaugh (1983). Those 39 indicators of effectiveness were statistically analysed and two major dimensions emerged that organised the indicators into four main clusters (Cameron & Quinn, 2011). In the one dimension, the effectiveness criteria that stress flexibility, discretion and agility are differentiated from criteria that stress stability, order and control. In the second dimension, the criteria that emphasise an internal orientation, integration and unity are differentiated from criteria that emphasise an external orientation, differentiation and competition. Thus, 'each dimension as a continuum highlights a core value that is opposite to the value on the other end of the continuum flexibility versus stability, internal versus external' (Cameron & Quinn, 2011). Together these two dimensions form four quadrants (Hierarchy, Market, Clan and Adhocracy) that represent a type of organisation each with a distinct set of organisational effectiveness attributes (Figure 9).

3.0 RESEARCH METHOD

Since the beginning of the 1980s, the question of research approach in information systems (IS) has been the focus of concern and discussion among different researchers. One of the main fundamental reasons for this is that the IS field itself is broad and multidisciplinary (Mingers, 2001; Choudrie & Dwivedi, 2005). Since that time, several attempts have been made to try to study, analyse and classify research approaches in the IS discipline (e.g. Galliers & Land, 1987; Orlikowski & Baroudi, 1991; Galliers, 1992; Walsham, 1995; Mingers, 2001; Nandhakumar & Jones, 1997).

IS is seen by most researchers as a social science or a socio-technical discipline (Goles & Hirschheim, 2000). Other related disciplines (e.g. management, computer science, psychology, business process modelling, computer-human interaction, sociology) are considered to be different channels for practising and researching in the IS field (Checkland & Holwell, 1998). Some researchers (e.g. Walsham, 2005) emphasise the use of information and communication technology (ICT) as organisationally embedded systems for explaining how technology should be used to contribute to the development of societies.

For understanding the roots of IS in research and how different methods were applied during the PhD research, the following subsections provide a set of concepts related to IS research as different categories.

3.1 IS Research Philosophy

For all research, philosophy is considered to be the ideological base and reasoning for the research methodology. Originally, philosophy was important to provide clear explanations of ontology and epistemology as its main components (Nandhakumar & Jones, 1997). On some occasions, researchers have added ethics and axiology as important aspects (Mingers, 2001). However, the latter two have neither been widely discussed nor considered in information systems research (Gonzalez & Dahanayake, 2007). Ontology, on the one hand, refers to the study of the nature of being, how things exist, their becoming, their categories and their relationships (Nandhakumar & Jones, 1997; Griswold, 2001). Epistemology, on the other hand, refers to the theory of knowledge, what constitutes reality and how we can understand existence (Hirschheim & Lyytinen, 1996).

In light of the definitions of ontology, two dominating determinants have been proposed for studying and understanding ontology, realism and idealism. Realism has been further divided into:

- Internal realism, which refers to an intersubjective nature of understanding reality and agreed-on concepts among individuals when studying things (Nandhakumar & Jones, 1997).

- External realism, which refers to an independent existence of reality from individuals, their relationships and their role in representing reality (Hirschheim & Lyytinen, 1996; Nandhakumar & Jones, 1997; Dobson, 2001).
- Critical realism, which refers to the importance of science as a process for explanation and enlightenment of reality and the studied phenomena. In that sense, the derivation of predictive laws is not seen in the core of sciences, instead it focuses on different structures and systems that are identified indirectly in the studied phenomenon through their effects (Dobson, 2001).

The other determinant, idealism, refers to a view of science from a central role of the ideal or the spiritual sense to interpret different experiences in the studied phenomena (Hirschheim, 1992). That is why it also concerns the subjective views of individuals on the studied phenomena, and considers reality as a construction of individuals (Nandhakumar & Jones, 1997).

Researchers have tried to classify the IS research by developing different taxonomies. One of the earliest efforts is the taxonomies provided by Galliers (1992) and Wynn (2001) for supporting researchers in selecting suitable research approach. They have used a binary classification (empirical-interpretivist and quantitative-qualitative) in which they showed how to apply the taxonomy for investigating a range of subjects within IS related to organisations, people, technology and methodology. One of the important critics that this taxonomy has received is that it is less focused on technology adoption and household consumers (Mingers, 2001). Other researchers (e.g. Orlikowski & Baroudi, 1991; Klein & Myers, 1999) have used a threefold classification (positivist, interpretive, critical) which has been used until today especially with the increasingly accepted interpretive IS research approach (Gonzalez & Dahanayake, 2007).

It is important here to mention that several researchers (e.g. Glass et al, 2004, Lee et al, 2004, Gregor, 2006) consider the design science as a different research philosophy/approach than positivist and interpretive research in terms of ontology and epistemology. This consequently affects the methodology used for conducting design research. Puroo (2002) considers this difference as design science is more evolutionary and complementary rather than considering the truth of single reality in positivist research or analytical study of history and causality in interpretive. In this thesis, design science is considered to fit more as a research methodology that represents an overall strategy of conceptualizing and conducting an inquiry, and constructing scientific knowledge (Hevner & March, 2003). Therefore, it is explained in more details in the IS methodology section.

3.1.1 Positivist Approach

Positivism as a philosophical theory emphasises the role of science in creating knowledge as the only method to reach truth. In such a role, the social world is described by different organisations acting in a law-like context with a collection of natural phenomena (Nandhakumar & Jones, 1997; Chen & Hirschheim, 2004). The main aim in applying a positivism approach is to verify and falsify theories (Chen & Hirschheim, 2004). Positivist

research is mainly based on causality and strong relationships between things, and it therefore relies on a quantitative-empirical methodological approach (Hirschheim, 1992; Nandhakumar & Jones, 1997). The research process in a positivist nature is characterised by constructing propositions, hypotheses, quantitative variables, models and statistics (Klein & Myers, 1999).

When practising positivism in research, different researchers have tried to simplify its application into clear components. Among those researcher is Hirschheim (1992) who proposed five pillars for positivism, namely: unity of the scientific method, search for causal relationships (through reductionism), empiricism, value-free science, and the logical and mathematical foundations of science. In such five pillars, positivism advocates realism as the ontology. The world is then seen as made of immutable and independent objects (Chen & Hirschheim, 2004). Following that, Wynn (2001) explains the positivism process as rooted in an assumption of existence of truth that can be reached by the methods of science.

In the IS discipline's positivism research, technology is considered as a neutral aspect that is controlled by rational management. In addition to that, relationships and conflicts between different people are ignored or receive minor attention. Organisations are also considered as individuals or closed entities, which act in a marketplace. This marketplace is considered in positivism as a business environment (Mitev, 2000). A number of researchers (e.g. Checkland & Holwell, 1998; Hirschheim, 1992) have criticised this process as it is considered to be appropriate for natural science but not fitting for the social ones. It is therefore considered that the IS discipline is social by nature, which explains why many researchers argue for the inadequacy of positivism in IS research. However, Chen and Hirschheim (2004) explain that positivism, in spite of all the criticism, is still the dominant epistemology in the IS discipline.

3.1.2 Interpretive Approach

In interpretivism, both researchers and human actors are considered to be stakeholders who are responsible for interpreting the situation in a studied phenomenon (Nandhakumar & Jones, 1997). Therefore, interpretivism aims at an in-depth understanding of the studied phenomenon rather than its generalisation. This explains why interpretivism is the most appropriate approach for field studies when researchers are engaged in the studied phenomenon (Chen & Hirschheim, 2004). In interpretivism research, there is always a clear need for information to be analysed against contextual circumstances and organisational culture. The primary source of this information is the participants' perspectives, experiences and knowledge (Klein & Myers, 1999; Chen & Hirschheim, 2004). Therefore, related to the classification of IS as social science relying on qualitative data, many researchers advocate IS intervention for using interpretivism research (Checkland & Holwell, 1998; Chen & Hirschheim, 2004).

Organisations in interpretivism research are seen as social processes (conversational), which represent particular ways of explaining the world around us. These particular ways generate shared actions to establish organisational culture with shared norms, attitudes and code of actions (Chen & Hirschheim, 2004). For applying an interpretive approach in the IS discipline, IS should be studied in its context and how different actors draw on it. In addition to that, how different elements of the IS context are interpreted is another important aspect that helps in

understanding the practice of IS and in answering the question of its generalisability (Mitev, 2000). Given these characteristics, one can understand the strong root of action research and ethnography in interpretivism research in which the IS context is extremely important in order to understand, design and develop solutions for an organisation.

3.1.3 Critical Approach

The critical approach to research aims to take neutral approach for reaching the truth between creating the needed knowledge (from positivist) and understanding a studied phenomenon with its context (from interpretive). It emphasises that truth can be produced in different ways and no one has the monopoly of it (Cecez-Kecmanovic, 2001). However, humans in the critical approach become isolated from their context by dominant economic, political and cultural authority. Social and organisational context is produced by humans, but these humans have developed their knowledge and experiences through interactions within the context. So it can be considered to be a two-way influence (Klein & Myers, 1999).

The clear similarity between interpretivist and critical researchers is that both groups recognise the importance of research value to the society. However, critical researchers set some goals from their research that should be actively challenged to change the society (Panagiotidis & Edwards, 2001). This brings a first criticism to critical research for its support for political agendas. However, those who defend critical research argue that the politics and studies are interconnected with the aim of changing people's lives for the better. This is why the critical approach to research is also known as the transformative paradigm (Creswell, 2003). Another criticism of the critical approach is that it still lacks sufficient clarity and interconnection between theory and practice, and it is therefore not widely embraced in research, especially in IS (McGrath, 2005).

3.2 IS Research Methodology

It is important, before highlighting different types and classifications of methodology, to define what is meant by methodology as a term. This need is apparent when trying to distinguish it from what is meant by research method or approach. Researchers such as Wynekoop and Russo (1997) explain research methodology as a systematic approach that involves guidelines, techniques, activities and tools for performing scientific research in a similar way in similar contexts. However, this definition has been criticised by several other researchers, such as Mingers (2001) and Gonzalez and Dahanayake (2007), as being more associated with method than methodology. In this thesis, the definition of research methodology is taken from an abstract concept that relates methodology either to the study of methods or to a more generic perspective approach than a method (Mingers, 2001; Gonzalez & Dahanayake, 2007). For a more precise and complete definition the following definition is adopted:

Methodology is understood here in its philosophical sense as an overall strategy of conceptualising and conducting an inquiry, and constructing scientific knowledge. Methodology, therefore, refers not only to research methods or techniques (such as case study or interview), but also to the epistemological assumptions of methods and how they are linked to a particular theory. (Cecez-Kecmanovic, 2001:p.142)

A methodology in IS research can be, on top of its philosophical foundation, qualitative or quantitative, empirical or non-empirical, design science or behavioural science (Hevner & March, 2003). It is also important to mention that a pluralist approach is common in IS research when more than one methodology is combined in the same study for validation of results.

3.2.1 Qualitative vs. Quantitative

Bryman (2012) states that a qualitative research acknowledges social reality as constantly shifting. Only through studying its participants can you understand the social world (Bryman, 2012). One of the critiques that are aimed toward qualitative researches, though, is that they are too subjective and that they cannot be replicated by others (Bryman, 2012). Quantitative researches have the advantage that collected data can be analysed to detect fine differences between people regarding certain characteristics. Quantitative techniques can also provide variables that can be used as consistent tools, which can be utilised over time or by other researchers (Bryman, 2012). An example of a disadvantage with a quantitative research is that its measurement processes can be perceived as artificial and create a static view of the social reality they are intended to measure (Bryman, 2012).

Quantitative research has for a long time been associated with positivism through its chasing of accurate measurements and statistics and searching for truth (Chen & Hirschheim, 2004). Qualitative research has, however, emerged in IS with recognition that it is rooted in social science where it focuses on people's understanding and experiences rather than numerical measurement. In addition to that, qualitative research is usually associated with an interpretive approach in seeking a better understanding of social nature (Wynn, 2001).

The truth in qualitative research is assumed to be approximate and it is guided by the shift of using IS for supporting social processes (Wynn, 2001). It is therefore the associations, quantitative-positivism and qualitative-interpretivism, are not immediate or permanent. Surveys and questionnaires, which are quantitative by nature, can be used in interpretive research for widening the scope of a studied phenomenon, getting grouping results or understanding different patterns in collected data (Nandhakumar & Jones, 1997). Although qualitative research is rising today in IS, quantitative research has tended to be dominant in the field (Chen & Hirschheim, 2004).

3.2.2 Empirical vs. Non-Empirical

Based on the nature of the activities conducted during a study, research is classified into empirical and non-empirical. Empirical research is usually based on the observations and experiences of actors that are involved in the studied phenomenon. It is thus used to denote direct observations and records of the actions of the researchers. This type of study is typically considered as scientific because it is regarded as replicated/repeatable, refutable, objective and rigorous. Non-empirical research seeks different interpretations of social phenomena, and it recognises the influences of actors, including scientists themselves, over the studied phenomena. It is therefore considered to be more closely associated with the interpretive research approach (Galliers, 1992).

According to a number of researchers, the term ‘empirical research’ refers to its root or the use of empirical data. However, non-empirical research is not usually based on specific types of data; it is more based on theoretical foundations and intangible aspects. This, therefore, is why some researchers argue for the link between positivist and non-empirical research for generating knowledge through conceptual or quantitative methodology. Empirical is thus found to fit more easily with interpretive research and qualitative methodology in observing events and actions. However, it has been seen how different mixed approaches, from the social sciences, have increasingly been used in IS research (Goodwin, 2005).

3.2.3 Design Science vs. Behavioural Science

The research into the information systems discipline embraces two different settings. They can be recognised as technological and non-technological settings. These two settings, consequently, draw on two different systems, computerised and human-organisation, respectively. Also, most of the research in the information systems discipline is characterised 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, is seen as an extension of social science. They aim at developing and verifying theories, which can be used to explain or predict human and organisational behaviour (DeLone & 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 are aimed at extending the capabilities of humans as well as organisations by developing novel and innovative artefacts (Simon, 1996). The roots of design science are seen as being more attached to engineering and the science of artificial things. These roots seek to solve problems by defining ideas to achieve final delivery of new products including all the intermediate processes such as guiding practices, comparing alternatives and testing for technical improvements (Denning, 1997; Tschritzis, 1998).

Design science is followed in the thesis in several phases. Therefore the following texts add detailed discussion on it. The main purpose of design science is identified by March and Smith (1995) as creating technology-oriented artefacts that are related to human purposes for solving human problems or having outputs that answer questions related to the artefacts’ value to users, their practicality and their improvement. According to March and Smith (1995), developing an artefact in design science embraces two main purposes. These are: a) building artefacts, which refers to the construction of the artefact and demonstrating that it can be constructed, and b) evaluating artefacts, which refers to the development of different measurement criteria and assessing the artefact’s performance against those criteria.

There are four types of artefacts, according to March and Smith (1995) and Hevner et al (2004). They are identified and explained in research as follows:

- **Construct** – is defined as terms, notations, definitions, and concepts. Constructs are used for providing concepts of definitions and communications to be used for solving problems (Schön, 1983; March & Smith, 1995).
- **Model** – is built based on constructs for representing situations in the real world. Models are mainly abstractions and representations of particular set of user requirements for solving real problems (March & Smith, 1995; Simon, 1996).
- **Method** – is 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 artefacts to provide guidelines about how to search and develop different solutions for a real world problem (March & Smith, 1995; Marakas & Elam, 1998; Sinha & Vessey, 1999).
- **Instantiation** – is used for showing the implementation feasibility of specific construct, models 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 & Smith, 1995; Weber, 2003).

Different researchers have contributed towards grouping and defining 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 12 shows the consolidation of these five activities adopted from Hevner et al (2004) and Vaishnavi and Kuechler (2007).

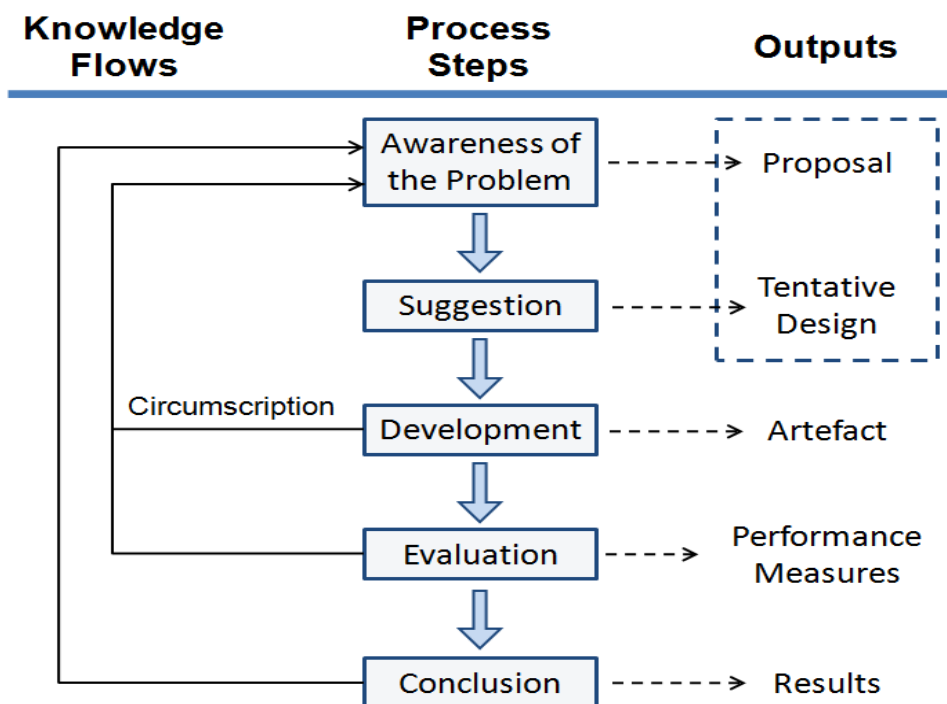


Figure 12. Five Main Research Activities in Design Science
Source: Adapted from Vaishnavi and Kuechler (2007)

The five activities were further developed by different researchers. Peffers et al (2007) proposed a Design Science Research Method (DSRM) including the following six steps that are named activities:

1. Problem Identification and Motivation
2. Definition of the Objectives for a Solution
3. Design and development
4. Demonstration
5. Evaluation
6. Communication

Following the work of Peffers et al (2007), Johannesson and Perjons (2012) developed these six activities into a template of a design science research process (TDSRP). Although the TDSRP is an amendment of the design science research process proposed by Peffers et al (2007), it is administered by research methods as controls, and it uses knowledge foundation as mechanisms. Similarly the TDSRP decomposes the research process into six activities (Figure 13), namely: explicate problem, outline artefact and define requirements, design and develop artefact, demonstrate artefact, evaluate artefact and communicate artefact knowledge. It is considered in the template that a research process takes the initial research problem to be solved as the input, and the artefact and its knowledge are produced as the outputs (Johannesson & Perjons, 2012).

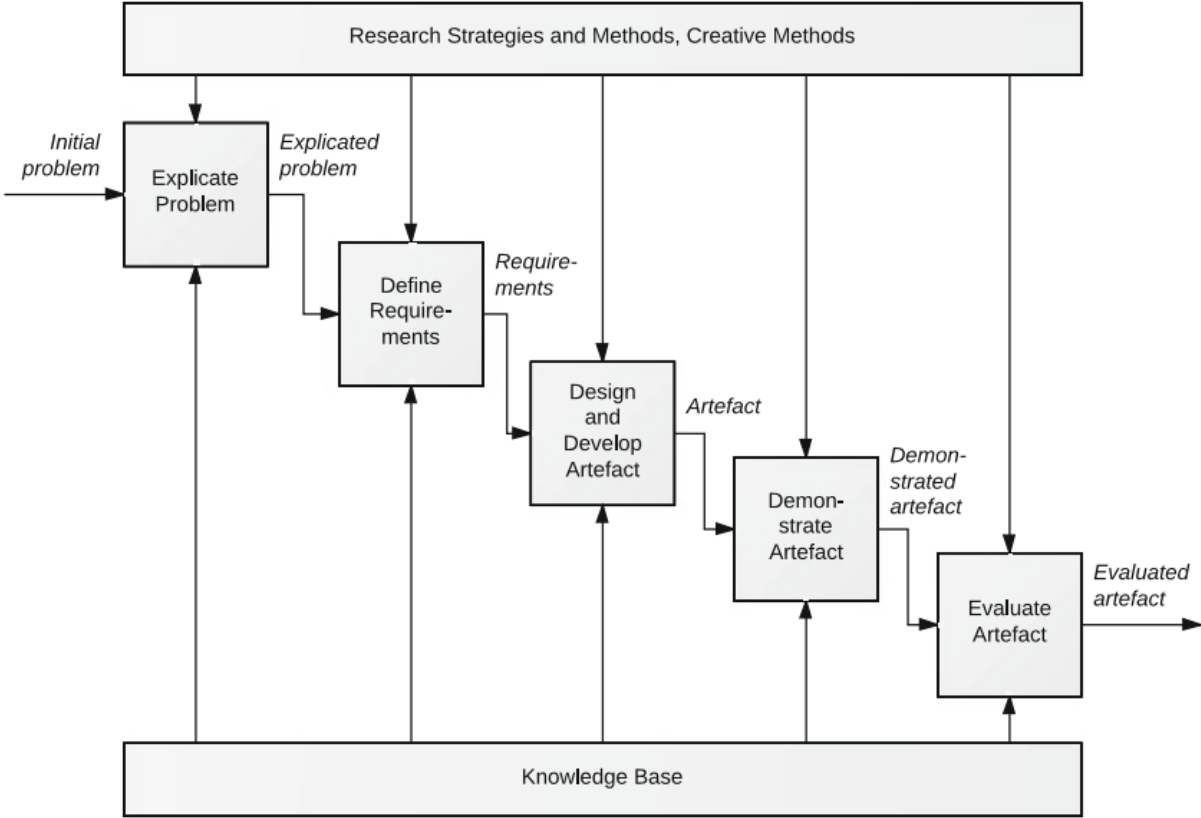


Figure 13. A Template of Design Science Research Process (TDSRP) (Adapted from Johannesson & Perjons (2012))

The six steps of the Template of Design Science Research Process (TDSRP) are the following:

1. Explicate Problem. The first step in the design science process is to identify a business problem that motivates why the artefact needs to be designed and developed. The initial problem is taken as an input from asking ‘What is the problem experienced by some stakeholders and why is it important?’ (Johannesson & Perjons, 2012). This problem is thus explicated and clearly defined, motivated and contextualised as a formulated research problem.

2. Outline Artefact and Define Requirements. The second activity in the design science process defines the objectives of the solution, interpreted in this thesis as the desirable requirement on an artefact. These requirements, based on the explicated problem, specify more precisely the way in which the artefact solves the problem. These requirements guide the design and development of the artefact and will form the basis for the evaluation. In this activity, the explicated research problem is taken as an input from asking ‘What artefact can be a solution to the explicated problem and which requirements of this artefact are important to the stakeholders?’ (Johannesson & Perjons, 2012). The answer to this question is used to produce an output as an outlined artefact with clear requirements for how it should serve in achieving the research objectives.

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

- i) Usage properties - for explaining how the artefact can be used, its practical considerations and how it works in real situations.
- ii) Management properties - for describing how the artefact can be monitored and controlled over a period of time.
- iii) Generic properties - for describing the relationships of the artefact to its environment and how does its structure influence/influenced-by the context.

- **Internal properties:**

- ***Coherence:*** the degree to which the artefact and its parts are logically, orderly and consistently related (Baskerville et al, 2009; Johannesson & Perjons, 2012). An artefact can be characterised as having low coherence if it includes parts that contradict, in some sense, each other or do not fit with the rest of the artefact.
- ***Modularity:*** refers to the level at which the model is divided into different parts or components/modules that can be studied independently (might be separated) as well as dependently (can be combined) (Hevner et al, 2004; Johannesson & Perjons, 2012).

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

- **External Properties**

- i) **Usage**

- **Learnability and usability:** the learnability refers to the level at which it is easy for users to learn the artefact's functionality, and the usability is about how the artefact is practically used in achieving a specific goal (Peppers et al, 2007; Johannesson & Perjons, 2012).
 - **Customisability:** refers to the degree to which an artefact can be adapted to user demands by focusing on local practice or functions (Johannesson & Perjons, 2012).
 - **Traceability:** refers to the ability to trace different parts of the problem solved by the artefact in a logical way (Johannesson & Perjons, 2012).

- ii) **Management**

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

- iii) **Generic**

- **Completeness** - refers to the level at which the artefact includes all possible components that lead to the achievement of the defined goals (Hevner et al, 2004; Johannesson & Perjons, 2012).
 - **Generality:** refers to the degree to which the artefact fits not only for local but also for global practice in different business sectors (Peppers et al, 2007; Baskerville et al., 2009).
 - **Efficiency and Effectiveness:** the degree to which the artefact can be used for achieving the defined goal with optimal use of resources and with minimum time, effort and expense (Baskerville et al, 2009; Johannesson & Perjons, 2012).

3. Design and Develop Artefact. The third activity describes the final artefact, including how it was designed and developed. This activity takes the explicated problem and the outlined artefact with its defined requirements as inputs. It is aimed not only at constructing the artefact as an output, but also at producing the knowledge of how it was constructed to address the refined research problem. Additionally, it should take into account the artefact's objectives, its functionality and architecture.

4. Demonstrate Artefact. The fourth activity is aimed at showing how the artefact can be used in an illustrative or real-life case, thereby proving the feasibility of the artefact. The knowledge

of constructing the artefact produced in the third activity is a direct input to the demonstration of the artefact. This activity works as an internal validity of the designed artefact as it shows how it deals with the initially identified business problem (i.e. showing the artefact's ability to solve it, the need for modifications, or referring to needed iterations going back to the first activity).

5. Evaluate Artefact. The fifth activity determines how well the artefact solves the research problem. The evaluation should take into consideration the defined requirements on the artefact. The artefact is taken as an input in this activity, and an evaluated artefact is produced with information on how well it works and why.

6. Communicate Artefact Knowledge. The sixth activity is to communicate the artefact as a final proposed solution to the explicated research problem with its knowledge to the related research community and practitioners. This can be done in different forums (e.g. writing conference papers or journal articles) or by using different materials (e.g. papers, slides, videos or demos). All the previous five activities in this step are considered as inputs to this activity. Therefore, the knowledge produced from communicating the artefact can guide the researcher to go back to any of the previous activities in a second, third or later iteration.

3.3 IS Research Method/Strategy

As it is illustrated above in the methodology section, a research strategy or research method is more specific and focused than a research methodology. The research method/strategy can be defined as a systematic approach that advocates skills, assumptions and practices as bridges that facilitate to transform a methodology into actual actions and a design of the research (Neuman, 2000). From this, it can be understood that the research method/strategy acts as a framework for defining the duration, scope and type of actions in the research (Checkland, 2000). Therefore, the research method/strategy can be classified into different classifications. Note, that this section does not make the distinction between research strategy and research method done by, for example, Johannesson and Perjons (2012), where a research strategy is seen an overall plan that guides a researcher in a research study. The research strategy makes use of research methods for data collection and data analysis work. Examples of research strategies in this meaning are experiments, surveys, case studies, and action research, and examples of research methods for data collections are interviews, questionnaires, and observations, and a research method for data analysis is content analysis.

The research method/strategy has been classified by Chen and Hirschheim (2004) according to its duration in the research process. Four types of research method were defined: longitudinal (evolves over an uninterrupted period of time with a focus on the research process), cross-sectional (evolves in the data collection in one spot and at a particular point in time), multiple snapshots (evolves in more than one data collection point in cross-sectional form) and repeated measure design (evolves in various time periods for examining the evolution of the studied phenomenon).

Another type of classification, which focuses on the researcher-subject distance, was developed by Nandhakumar and Jones (1997). They refer in their classification to the distance of interaction between researchers and subjects/participants in their study. In other words, it can refer to the level at which the participants of the study are involved in the research process, i.e. close or loose relationships with the researchers. On the one hand, a closer distance (e.g. observations, lab experiment, action research and consultancy) indicates the need for gaining the most insights and study within the context. On the other hand, a wider distance (e.g. textual analysis, survey, content analysis) indicates that the analysis of data is independent from its context.

A third type of classification for the research method was proposed based on the research design. These different designs can be performed differently but under the same methodology. For example, case study and action research can be conducted qualitatively or quantitatively (Gonzalez & Dahanayake, 2007). The most common methods in the IS discipline are explained in Table 4:

Table 4. Summary of the Main Research Methods/Strategies in IS

IS Method/Strategy	Definition	Main Pros	Main Cons
Subjective/Argumentative Research (Idea generation or normative writing)	Used mainly for expressing the opinions and speculation of researchers towards the studied phenomenon. It is theoretical grounded and it is useful for building a theory that can be tested (Wynekoop & Russo, 1997).	It motivates the creation of new insights and ideas, and it concerns building theories.	It is unstructured and subjective in nature, and can be surrounded by biased interruptions.
Laboratory Experiments	Used for studying a small number of variables intensively within a designed and controlled environment. They usually use quantitative analytical techniques and they consider the generalisation of results (Chen & Hirschheim, 2004).	There is high control over a small number of variables, which inspires the intensity and focus of the study.	The big number of variables and factors that are found in the real world are not studied together. This might question the validity of the study, especially if there is oversimplification.
Field Experiments	Explained as the extension of the laboratory experiment into real-life situations, which can be an organisation and/or the society (Chen & Hirschheim, 2004).	Greater realism for the studied phenomenon in its context.	The realism might cause insufficient control, which is needed for replication. It is also not an easy task to find an organisation prepared to be experimented on.

Surveys	Considered as a time-stamped sample from which implications are made on a studied phenomenon. They usually use quantitative analytical techniques (Yin, 2009).	<ul style="list-style-type: none"> - A greater number of variables can be studied together. - Attached to real-life situations and data. - Bigger surveys are appropriate for generalisations. 	<ul style="list-style-type: none"> - Unrecognised variables cannot be questioned or analysed. - Possible biases might result from respondents or researchers. - Causes and processes behind the studied phenomenon are not obtained. - When used in a project, results must be rechecked against general behaviours.
Case Study	This is an empirical type of study that investigates an ongoing phenomenon in a real-life context. The fusion between the phenomenon and its context makes the case study different from field studies (Darke et al, 1998; Yin, 2009).	An accurate and detailed focus on the local situation with respect to more variables than possible in surveys.	<ul style="list-style-type: none"> - Generalisation of results is difficult. - Variables are difficult to control. - Different interpretations from researchers and respondents. - Biases might easily happen unintentionally.
Grounded Theory	This is a method that does not start from a theory, but from an area of study by looking for patterns in collected situational data (Suddaby, 2006).	<ul style="list-style-type: none"> - Unexpected patterns are discovered. - Validity of results comes from a large amount of data rather than individuals. 	The accuracy of results is influenced more by the quality of data rather than the thoroughness and skills of researchers.
Action Research	Concerns the study of a phenomenon, planned changes and the production of theory in the process. It is an ongoing cycle in which the practice and development of systems provide feedback on theory (Avison et al, 2001).	<ul style="list-style-type: none"> - Better fit and adaptation of proposed solutions. - Improves the practical experiences of researchers as well as practitioners. 	<ul style="list-style-type: none"> - Restricted to a single project. - Biases might accumulate. - Should be developed in a complete cycle without interruption.
Descriptive Research	This is an interpretive research, which studies the historical development of a phenomenon from its related literature, past research or events (Wynekoop & Russo, 1997). It has another related method called 'Practice Descriptions' that focuses on describing practitioners in terms of their actions without research intent.	<ul style="list-style-type: none"> - It presents an opportunity to use both qualitative and quantitative data as a means to understand the 'What is?' question of a studied phenomenon. - Can be used in educational research. 	<ul style="list-style-type: none"> - Does not make accurate predictions. - Does not determine or focus on causes and effects. - Is dependent on other instrumentation for measurement and observation.

Consultancy	Although this is considered as an input source to the studied phenomenon, it is strongly related to research when conducted by university staff or researchers (Freestone & Wood, 2006).	<ul style="list-style-type: none"> - Focuses on the outcomes, real development or solutions for ongoing problems. - Accuracy of solutions is high. 	<ul style="list-style-type: none"> - Is costly for organisations. - Is still highly regarded only by the management field.
Simulation	This is used for assuming the inherent complexity of organisational systems or a given phenomenon. It concerns answering the question ‘What if?’ based on the given data. It is usually used for seven different purposes: prediction, performance, training, entertainment, education, proof and theory discovery (Galliers , 1992)	<ul style="list-style-type: none"> - It is a cheaper solution before real study or implementation. - As a computerised solution, it has a high level of detailed relationships and analyses. 	<ul style="list-style-type: none"> - Needs great care ... incorrect inputs have the potential to alter all the results. - For some decision makers it is still considered as simulations and not a real life setting.
Ethnography	Originates from anthropology, and refers to the study of people and the studied phenomenon in their own context with techniques like observations and face-to-interviews (Myers, 2009). It is becoming increasingly used in IS as being deeper than case study, and simpler than action research (Gonzalez & Dahanayake, 2007).	<ul style="list-style-type: none"> - It is useful for examining complex culture phenomena. - Behavioural and emotional aspects can be recorded and analysed. - It provides rich sources of visual data. 	<ul style="list-style-type: none"> - It difficult to check the reliability of results as the research often works alone. - It is a time-consuming method. - It is difficult to get access to a particular group or culture.
Combinations: Longitudinal Research	Uses single data collection method over different iterations, or uses multiple data collection methods to reveal ongoing patterns or discover new patterns (Gonzalez & Dahanayake, 2007).	<ul style="list-style-type: none"> - Increased reliability based on re-examination of data in different iterations. - Richness of collected data particularly with reference to time. 	<ul style="list-style-type: none"> - Careful analysis of data in each iteration. - Complexity in applying different methods or taking the inputs from each iteration.
Combinations: Collaborative Practice Research (Triangulation)	Uses multiple methods or approaches in a combined way over time. These different methods are used to check the results of the same studied phenomenon from more than one standpoint (Gonzalez & Dahanayake, 2007).	<ul style="list-style-type: none"> - Different methods can complement each other’s weaknesses. - Research practices are improved. - Results’ accuracy is increased. 	<ul style="list-style-type: none"> - Effective triangulation needs a lot of effort for coordination and collaboration. - Time-consuming.

3.4 Methodological Choices in the Thesis

In this thesis, positivist, interpretive and design approaches are used and a number of methodological choices have been made (see Table 5). While a combination of positivist and interpretive approaches is used for research objectives 1 and 5, a pure interpretive approach is used for research objective 4. For research objectives 2 and 3 a design approach is used. The reason for applying different research approaches is that for objectives 1 and 5 the aim was set on investigating the empirical research problems and thus was purely oriented to discover the truth statistically. For research objective 4, the investigation of the influence of BITA on organisational culture was based on empirical data. However, for research objectives 2 and 3 the aim was purely set on designing an artefact to solve empirical research problems.

Table 5. The Choices of Research Methodologies and Methods/Strategies in the Thesis

Research Objectives and their Related Research Papers	Research Philosophy/ Approach	Research Methodology	Research Method/Strategy
1. To identify the barriers for achieving and sustaining business-IT alignment from the perspective of business and IT practitioners. <i>(Paper I and Paper II)</i>	Interpretive, Positivist	Qualitative (empirical), Quantitative	Descriptive Research, Case Study, Survey, Combination (Triangulation)
2. To develop an evaluation framework for supporting practitioners in choosing appropriate business-IT alignment models. <i>(Paper III and Paper IV)</i>	Design	Design science, Qualitative (empirical)	Descriptive Research, Case Study, Combination (Triangulation)
3. To develop an extended business-IT alignment model for considering organisational culture, and for improving the effectiveness and accuracy of assessing the maturity of business-IT alignment. <i>(Paper V, Paper VI and Paper VII)</i>	Design	Design Science, Qualitative (empirical)	Descriptive Research, Case Study, Combination (Triangulation)
4. To analyse the influence of business-IT alignment on organisational culture. <i>(Paper VIII)</i>	Interpretive	Qualitative (empirical)	Descriptive Research, Case Study
5. To analyse the mutual relationships between business-IT alignment components and an organisational culture profiles and to develop an integrated view. <i>(Paper IX)</i>	Interpretive, Positivist	Qualitative (empirical), Quantitative	Descriptive Research, Case Study, Survey, Combination (Triangulation)

4.0 Results

This chapter presents a summary of the main results from the research presented in the publications of this thesis. The results in this chapter are presented for each of the five research objectives.

4.1 Results of Research Objective 1 (Barriers to BITA)

The first research objective was *to identify the barriers for achieving and sustaining business-IT alignment from the perspective of business and IT practitioners*. The result of this research objective was presented in two research articles, Paper-I and Paper-II. Paper-II is a conference paper which was extended to a journal article in Paper-I.

Two research approaches were applied, interpretive and positivist. The research for achieving the first objective presented above was performed in a multi-stages process. First, a literature study was carried out to derive barriers from literature. Then, three in-depth case studies (for the interview questions see Appendix B-1) on multinational organisations acting in Sweden along with two focused group discussions of researchers were conducted to identify barriers from practitioners' perspective. Following that, a survey (for the survey questionnaire see Appendix B-2) on 74 large and medium-sized organisations on the Swedish market was performed to collect barriers from a larger sample of practitioners.

The result of the research was a total number of 45 barriers. These barriers were categorised based on the SAM's six criteria (Luftman, 2000). Initially, all suggestions from respondents were gathered. Then, the conflicting statements were omitted and similar statements were grouped and rephrased in such a way that redundancy could be avoided.

The top-ten barriers, based on the number of highlights by respondents, have been identified. Out of these top-ten barriers, six barriers were highlighted in the hard criteria of alignment of BITA (i.e. Competency/ Value Measurements, Governance, Scope & Architecture¹). Four were highlighted from the soft criteria (i.e. Communications, Partnership, Skills²). Among the top-five barriers, only one barrier from the soft criteria was highlighted.

When comparing the barriers identified in this research with the barriers found in literature, it can be seen that most of the barriers were on a tactical level in the organisation rather than on the strategic level. It can also be seen that the strategic barriers are more related to the hard criteria of BITA while tactical barriers are more related to the soft criteria.

This research result indicates that the tactical level in an organisation is an important transferring link between strategic and operational levels of business. The view of managers at

¹ The hard criteria were identified by Luftman (2000) as being more associated with the systems, structures and procedures in an organisation.

² The soft criteria were identified by Luftman (2000) as being more associated with the human and social aspects.

tactical levels helps not only in understanding the reality that business and IT personnel face daily during the operation and implementation, but also in collecting bottom-up reflections from the operation levels. It should thus be recognised that delivering business value is only guaranteed when the gap between strategy formulation and strategy implementation is reduced.

4.2 Results of Research Objective 2 (An Evaluation Framework)

The second research objective was *to develop a structured evaluation framework for supporting practitioners in choosing appropriate business-IT alignment models*. The result of the research was presented in two research articles, Paper-III and Paper-IV. Paper-IV is a conference paper which was extended to a journal article in Paper-III.

The research methodology used for developing the framework was design science (DS).

The result of the research was an evaluation framework for BITA models to enable decision makers in organisations to compare, assess and select appropriate BITA model/s. The proposed framework consists of 25 criteria categorised into four groups, namely: Design-Related, Organisational-Related, Analysis-Related, and Usability-Related.

The design of the framework was done in four different iterations:

Iteration 1: The main design process in this iteration was based on an extensive literature survey on BITA models, which resulted in a total of 20 existing BITA models. The result from this iteration was a tentative model collecting all the criteria that were found in the background articles of the 20 BITA models.

Iteration 2: The tentative model from Iteration 1 was taken as an input to this iteration. To support the practical relevance of the framework, an empirical study and an evaluation of the tentative model were performed based on 16 interviews with business and IT managers in six multinational organisations that act in Swedish market. This empirical study contributed to developing an understanding of how BITA was practised in organisations and to refining the tentative framework.

Iteration 3: Framework Version 1 (V-1), which resulted from Iteration 2, was taken as an input to this iteration. Framework V-1 was demonstrated to the research community in different forums (i.e. two seminars (in the MIT research school formed by 16 Swedish universities arranged in a two–three-day conference form) separated by a period of at least four months in 2012/2013, one workshop in 2013 and one international conference in 2013). In these forums researchers participated in interactive discussions locally, nationally and internationally. The framework was demonstrated in the form of criteria attached to their definitions and reflections from literature.

Iteration 4: Framework Version 2 (V-2) was further taken as an input in this iteration to a final evaluation process. This evaluation was performed through interviews with five business consultants and seven IT managers from large Swedish organisations (for the interview

questions see Appendix C). The business consultants were in the area of enterprise architecture (EA), BITA and governance while the IT managers were four CIOs, two chief technology officers (CTOs) and one global IT manager.

The evaluation was aimed at showing how the artefact can solve the stated problem and fulfil the requirements of the artefact. The evaluation activities were mainly focused on the four objectives (i.e. requirements) of the artefact (i.e. framework): coherence, usability, completeness and efficiency. Based on the evaluators' contribution, the framework was slightly changed to improve its understandability by using objective values and more business-like language. There was also an 'informed argument' presented regarding the completeness of the framework. An extended literature review and an empirical study were used as the argument. The final version of the framework was proposed based on changes resulting from the evaluation.

4.3 Results of Research Objective 3 (Extending BITA Models by Considering OC)

The third research objective was *to develop an extended business-IT alignment model for considering organisational culture, and for improving the assessment of the maturity of business-IT alignment*. The result of the research was presented in three research articles, Paper-V, Paper-VI and Paper-VII. Paper-V and Paper-VI are conference papers while Paper-VII was extended based on Paper-VI to a journal article.

The research methodology used for developing the model was design science (DS).

The final result for this research objective is an extended-BITA model that was designed for considering organisational culture, and for improving the effectiveness and accuracy of assessing the maturity of business-IT alignment.

The design process of the extended-BITA model embraced six different research steps.

1. Problem Identification and Motivation (*Explicate Problem*):

A literature review was performed on existing BITA models to identify their limitations. An existing schema for the classification of these limitation was also sought and taken as an input in this activity. The relationship between the found limitation and OC was confirmed results from literature in this research phase. In addition to that, the X-Model of OC (based on Smit et al, 2008) and the Strategic Alignment Maturity Model (SAM) of Luftman (2000) were selected as a base for referring organisation culture's limitations.

2. Outline Artefact and Define Requirements (*Define the Objectives for a Solution*):

In this activity, a group of desired internal and external requirements was defined as a basis for the development of the artefact (i.e. the extended-BITA model).

3. Design and Develop Artefact:

In this phase, a set of hypotheses was developed based on the study of SAM and the X-Model and their background literature. An empirical case study carried out in six multinational organisations was then performed to test the proposed hypotheses and to confirm the limitations of SAM. Following that, the existing schema of SAM's limitations (highlighted in the first activity) was taken as an input for the development of the extended-SAM.

4. Demonstrate Artefact:

The extended SAM was demonstrated to the research community in different sessions with the aim of illustrating its usability. The concept of splitting and classifying BITA attributes based on the organisational culture impact was demonstrated first of all to different researchers in the research team at DSV. Following that, it was demonstrated to different researchers in two seminars at the MIT research school (formed by 16 Swedish universities arranged in a two-three-day conference form) separated by a period of at least four months in 2012/2013. In addition to that, the extended SAM was partially presented through a published conference paper (Paper VI) (i.e. only three SAM criteria were presented) before its final evaluation. In these forums researchers participated in interactive discussions locally, nationally and internationally (for the interview questions see Appendix D-2).

5. Evaluate Artefact:

Based on constructive feedback from researchers as well as practitioners in the demonstration phase, the extended SAM was further developed and completed. Following the changes and development of a complete set of the six SAM criteria, the extended SAM was then evaluated by performing empirical case studies in five multinational organisations. The five organisations are a subset of the original six organisations used in testing the hypotheses (for the interview questions on testing the hypotheses see Appendix D-2, and for the evaluation of the extended SAM see Appendix D-3).

In addition to that, BITA was assessed, for the second time, in all the six organisations and a comparative analysis was provided between the original SAM assessment and the extended-SAM-based assessment, which showed the artefact's practicality and fulfilment of its designed requirements.

6. Communicate Artefact Knowledge:

First of all, the MIT seminar was the first step for communicating the final extended SAM to the research community. This process was considered to be an invaluable input to different activities in the process towards the development of the final artefact. Writing two research papers and making them public was another way of communicating the designed extended SAM to a bigger research community and practitioners as well. The communicating processes led to some comments, some of which were clarified during the discussions while others were left for further future discussions or research (see future research section).

4.4 Results of Research Objective 4 (The Influence of BITA on Organisational Culture)

The fourth objective was *to investigate the influence of business-IT alignment on organisational culture for confirmed impact*. The result of the research objective was presented in one research paper, Paper-VIII. Paper-VIII is a conference paper.

This research analysed the relationship and the influence of BITA on OC. Therefore an interpretive approach was applied using a qualitative and empirical methodology.

The result of this research shows an interrelation in the theories of both BITA and organisational culture, and indications of the influence of BITA on organisational culture and its change. The findings may help both practitioners and researchers to understand the insights into the relationships between BITA and organisational culture components and provide a roadmap for improvements or desired changes in organisational culture with highlighted target business areas.

The research process embraced first of all a literature survey that aimed to investigate the theoretical influences of BITA components on OC. The BITA model SAM (Luftman, 2000) was selected as a reference for BITA and its components (for the interview questions on SAM see Appendix E-1). For the OC the Organisational Culture Assessment Instrument (OCAI) developed by Cameron and Quinn (2006) was used (for the interview questions on OCAI see Appendix E-2). A clear advantage of the OCAI compared to other organisational culture models is that it shows clear changes in the organisational culture profiles through quantitative measurements.

Following the literature survey phase, an in-depth case study was performed to confirm the theoretical indications found in literature. BITA and organisational culture were measured in the organisation in two different phases before and after a fundamental IT-enabled change and structuring. The aim was not to generalise the results, but rather to show the knowledge gap in how BITA influences OC.

4.5 Results of Research Objective 5 (BITA-Organisational Culture Integrated View)

The fifth objective was *to identify the relationships between the components of business-IT alignment and organisational cultural profiles towards proposing an integrated view of both BITA and organisational culture*. The result of the research objective was presented in one research paper, Paper-IX. The paper is a conference paper.

Two research approaches were applied, interpretive and positivist. The research on this objective was performed in a multistage process. Theories in both BITA and organisational cultural domains of practice originate from empirical studies and are empirical in nature. Myers (2009) suggested that a research in such a context is to be performed in a multistage approach

for increasing its validity and reliability and thus the use of an inductive reasoning research approach would be more appropriate in order to proceed with this research. To develop the proposed BITA-OC integrated view we therefore employed a mixed-method approach. The choice of a mixed method was motivated by two of the seven purposes that were defined by Venkatesh et al (2013) and previous work (e.g. Creswell, 2003; Greene et al, 1989; Tashakkori & Teddlie, 2003, 2008). The two purposes were: developmental (i.e. questions for one strand emerging from the inferences of a previous one (sequential mixed methods), or one strand provides hypotheses to be tested in the next one), and corroboration/confirmation (i.e. mixed methods are used in order to assess the credibility of inferences obtained from one approach (strand)).

The research embraced three phases, namely: literature survey, case studies, and survey. The literature survey resulted in a set of hypotheses for the correlations between BITA components (i.e. criteria and attributes in the SAM) and OC profiles based on the OCAI. Following that, a research study was conducted in three case organisations for empirical investigation of relationships and for refining the hypotheses (for the interview questions on the SAM see Appendix E-1, and for the interview questions on the OCAI see Appendix E-2). To test the research hypotheses, an extended quantitative test was performed by carry out a survey on 117 business and IT practitioners (for the survey questionnaire see Appendix F-1).

The final results from the research on this objective are represented by an integrated view of BITA and OC. The integrated view is proposed as a form of supportive tool for practitioners to reach desired changes in BITA or OC in connection with related components from them. In addition to the direct results from the statistical analysis on the significant correlations between BITA and OC components, different statistical functions were also performed for answering important questions for the decision-makers. These questions and their answers are presented below:

1. What types of organisational culture exist with higher maturity of alignment?

In order to answer this question, a series of descriptive statistics were conducted illustrating the means and standard deviations of clan, adhocracy, market, and hierarchy on the basis of the six BITA criteria. The results of these statistics are presented in Appendix F-2.

First, with regard to communications, higher maturity of alignment was found to be generally associated with higher scores in both clan and adhocracy, and lower scores with regard to market and hierarchy. Next, with regard to competency value, higher scores in this measure were found to be associated with lower scores in clan and adhocracy, and higher scores in market and hierarchy. Following this, governance was focused upon. Here, higher scores in this measure were generally found to be associated with lower scores in clan and adhocracy, as well as higher scores in market and hierarchy. With respect to partnership, higher scores in this measure were found to be associated with lower scores in clan, market and hierarchy, and higher scores in adhocracy. Next, with regard to IT architecture, higher scores in this measure were found to be associated with lower scores in clan and market, and higher scores in hierarchy, while scores in adhocracy did not change substantially. Finally, with regard to skills, higher

scores in this measure were found to be associated with lower scores in clan and hierarchy, along with higher scores in adhocracy and market.

2. If companies want to improve or have very high alignment maturity, it is argued that they should change their organisational culture or their cultural profile

In order to explore this relationship in further detail, a series of six ordinal logistic regressions were conducted with the six BITA criteria consisting of the dependent variables, and the four OC profiles consisting of the independent variables. These results (represented in Appendix F-3) show the extent to which changes in organisational culture or cultural profile relate to high alignment maturity. As shown, no significant results were found with respect to the first four models conducted. Next, with regard to IT architecture, statistical significance was found with respect to hierarchy, with high IT architecture found to be associated with higher scores in hierarchy. Additionally, no significant results were found in the final model, focusing upon skills as the outcome.

3. If you have a certain type of alignment maturity in your organisation, what profile of organisational culture can you expect?

A series of additional regression analyses were conducted in order to answer this question. This analysis consisted of a series of four linear regressions that focused upon the four OC profiles as the outcome measures, and the six BITA criteria as the independent variables. These analyses focused upon the extent to which alignment maturity impacts on predicted organisational culture. Statistical significance was indicated with respect to all four models. First, with regard to clan, this organisational culture would be expected in cases with high communications scores, and low scores in competency value, governance, IT architecture and skills. Next, adhocracy would be expected in cases with high partnership, IT architecture, and skills and low governance. With respect to market, this would be expected in cases of high competency value and skills, and low communications and IT architecture. Finally, with regard to hierarchy, this would be expected in cases of high governance and IT architecture, and low communications and skills. The full statistical results are presented in Appendix F-4.

5.0 Scientific Contributions, Limitations and Future Research

This chapter presents the scientific contributions from the research for each of the five research objectives as well as different research limitations and suggestions for future research.

5.1 Scientific Contributions

This section represents the scientific contributions of the research presented in this thesis. The contributions are presented for each of the five research objectives.

Research Objective 1: to identify the barriers for achieving and sustaining business-IT alignment from the perspective of business and IT practitioners.

This study on barriers regarding business-IT alignment (BITA) contributes to the knowledge base on BITA and the understanding of factors that hinders the achieving of BITA at both the strategic level and the tactical level. The study result in both theoretical contributions and practical contributions.

Theoretical contributions:

- The study contributes first to advancing the research on business-IT alignment by gaining insights into how to plan for achieving BITA at both the strategic and tactical level of organisations by better understanding factors and barriers to BITA. By studying barriers at the tactical level, the study contributes to resolving a great part of the complexity that is attached to the definition and understanding of the components of BITA and their practice in organisations.
- The study has focused on studying BITA at a detailed level, i.e. the attributes in each criterion of the SAM model (Luftman, 2000). Such a detailed study makes it possible for researchers to find the dependencies and relationships between related attributes, and to have a better understanding of the BITA in an organisation.

Practical contributions:

- The study proposes a new way for business and IT managers, consultants and decision-makers to achieve BITA by better understanding the barriers that hinder BITA. It extends the focus on business-IT alignment to the tactical level, and shows that it is important not only to look at the strategic level for aligning strategies and how they are designed. It is important to analyse how the strategies are implemented through policies at the tactical level as well as reflections from the operational levels on which people act and daily face. Although the process is claimed by a few interviewees to add complexity in considering different levels of barriers, it clearly provides better accuracy in the assessment of BITA maturity by helping business and IT decision-makers to gain clear pictures about the issues to address in order to achieve BITA in their organisations.

- From the case studies in this research and the survey done in medium and large organisations acting in Sweden, organisations have been recognised as having different ways of achieving BITA. However, it has been found that the factors that are relevant to achieve BITA seem to be similar in all organisations. In fact, most of the BITA models are claimed to be designed for analysing different types of organisations and the applied SAM model of Luftman (2000) has proved to be suitable for a detailed study of the BITA barriers in different organisations. This provides practitioners with important information for achieving BITA.

Research Objective 2: to develop an evaluation framework for supporting practitioners in choosing appropriate business-IT alignment models.

The proposed evaluation framework consists of 25 criteria categorised into four groups. The framework is based on an existing research, extends that knowledge and provides practitioners with a tool for selecting a BITA model appropriate for an organisation. The results of the research provide both theoretical and empirical scientific contributions.

Theoretical contributions:

- The framework contributes to the advancement of BITA research by providing insights into different comparative criteria of BITA models and theories. The framework offers a strong link and careful justification of its components (i.e. groups and criteria) and different BITA theories. This is also provided in a traceable image from the first literature review to the last evaluation.
- Hevner et al (2004) expand the notion of the contribution of an artefact by proposing seven guidelines for designing and evaluating design science research. The framework has been evaluated using these guidelines, thereby contributing to design science research.

Practical contributions:

- The design process of the framework, including its multi-stage demonstration and evaluation, shows that it is developed through an interactive process between the research community, practitioners and users, which provides corroborated results on the basis of which action can be taken compared to existing approaches.
- The framework is argued to be potentially used as a collaborative learning tool on requirement of BITA between practitioners from both business and IT domain.

Research Objective 3: to develop an extended business-IT alignment model for considering organisational culture, and for improving the assessment of business-IT alignment maturity.

In this objective, a design science research approach was undertaken in order to design an extended business-IT alignment model (BITA). The extended BITA is represented in Luftman's Strategic Alignment Maturity Model (SAM), with clear motivation, taking into consideration the impact of OC.

In the background and literature studies, the objective 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 play an important role in BITA. By extending the BITA represented in the SAM, the knowledge contribution of the thesis is argued to be on both theoretical and empirical levels.

Theoretical contributions:

- 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/components that have different influences from organisational as well as organisational culture characteristics, it would be easier for researchers as well as teachers in the business-IT alignment area to find dependencies between related attributes from each side, i.e. BITA and OC, and to understand the influences from OC on BITA. Also, the splitting process provides a new structure for the model that organises BITA criteria and their attributes into three groups (Organisational, Organisational Culture and Hybrid).
- Identifying the relationships between elements of OC and BITA components. This contribution is indicated at two levels. On the first level, Paper V 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 presented in Paper V, which provides evidence of the proposed indications. At the second level, Paper VI and Paper VII complement the OC impact by examining the relationships between OC elements and sub-elements of the X-Model on BITA criteria and attributes of the SAM model. Since the X-Model is the most comprehensive model for OC, this contribution is seen as being valuable in covering the maximum level of indications for OC's theoretical impact on BITA.

Practical contribution:

- 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). The new way is demonstrated by finding the high-level barriers in organisations' processes related to organisational, organisational culture or hybrid aspects that cause misalignment between business and IT domains. The results in the 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, the process clearly provides a more accurate assessment of BITA maturity by helping decision-makers gain a clear picture of their organisation.

- The result of restructuring BITA components has made an invaluable contribution to 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. In the proposed extended SAM, it becomes easier for decision-makers and professionals to focus on one aspect of each BITA attribute, taking into consideration its category (organisationally related or organisational culture related) when assessing the situation.

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

Research Objective 4: To analyse the influence of business-IT alignment on organisational culture.

The result of this research contribution shows a clear interrelation in the theories of both BITA and organisational culture, and clear indications of BITA impact on organisational culture and its change. The findings may help both practitioners and researchers to understand the insights into the relationships between BITA and organisational culture components and provide a roadmap for improvements or desired changes in organisational culture within highlighted target business areas. The knowledge contributions to the achievement of the research objective are both theoretical and practical.

Theoretical contributions:

- The research investigated and found links between the theories of BITA and organisational culture. The research into organisational culture and its change is an ongoing process. Different factors that have a clear impact on it have not been well studied and examined yet. Business-IT alignment is proven to be one of the factors that are playing an important role in organisational culture. The study is argued to be the first to examine the influence of BITA on OC.

Practical contributions:

- The study provides indications of the influence of BITA on OC profiles. The contributions of this research may be argued to be a roadmap for managers and leaders to reach desired changes in organisational culture in regard of support from alignment criteria in BITA as checkpoints. It can also be argued that the development of a framework for prioritisation of business and IT areas in which improvements should be made or to find a balance among all BITA criteria.

Research Objective 5: To analyse the mutual relationships between business-IT alignment components and organisational culture profiles and to develop an integrated view.

The purpose of this research objective was to develop and validate a set of relationships between the components of BITA and OC towards the development of a BITA-OC integrated view. The aim with this integrated view is to help business and IT managers in organisations to better understand the relationships between BITA and OC, and to provide a roadmap for improvements or desired changes in OC with highlighted target business areas. The knowledge contribution of this study is both theoretical and empirical.

Theoretical contributions:

- The research contributes to theories in both the BITA and OC domains, and to resolving a great part of the complexity that is attached to defining and understanding OC changes. By identifying the relationships between elements of OC and BITA components it would be easier for researchers in both domains of practice to find dependencies between related components from one side, and to understand the influences from the other side.
- The study contributes to widening the research on BITA as well as OC by analysing their mutual influence. In addition to that, as the study was conducted in a real-life setting (i.e. case studies and survey). It contributes to shedding light on the causal effects and applications of the results in practice by assessing actual behaviour instead of results merely based on theoretical indications.

Practical contributions:

- The research represents a set of validated indications by analysing the relationships between BITA and OC. The contributions of this research may be argued to be a roadmap for business and IT managers to reach desired changes in OC in relation to support from BITA criteria as checkpoints.
- The proposed BITA-OC integrated view introduces a new way for business and IT managers, consultants and decision-makers to assess BITA and OC and focus on different specific areas of misalignment between business and IT as well as how to prioritise actions. The statistical validation is argued to contribute to answering interesting empirical questions such as: ‘What types of organisational culture exist with

higher maturity of alignment?', 'If an organisation wants to improve or to have high BITA maturity, what changes should they expect to have or target in their OC profiles?' and 'If an organisation has a certain type of BITA maturity, what OC profile should they have in different situations?'

- By answering these questions, it can be argued that the proposed BITA-organisational culture integrated view, unlike the original SAM and OCAI, has succeeded in focusing on the '*how things are done*' question in analysing the reasons behind all the BITA criteria and attributes. Therefore, it can be used not only for supporting the assessment of BITA maturity level in an organisation, but also for highlighting the business areas in which organisational culture impacts on the level of BITA maturity.

5.2 Limitations

The research presented in this thesis sets out to fill in the research gap on practices of business-IT alignment based on: i) studying the barriers to achieving BITA from an empirical perspective of organisations' practitioners, ii) supporting business/IT practitioners and decision-makers in organisations in selecting BITA models that support their needs and desired development, and iii) the relationships between BITA and organisational culture (OC). Although the thesis has successfully achieved its research objectives, undeniable limitations exist that should be highlighted in this section but also should be considered for future research:

Limitation regarding objective 1:

- Although the research for achieving objective 1 provides a comprehensive list of barriers from practitioners' perspective, the usability of the list has not been tested in terms of how it can be applied in practice, and how organisations can benefit from it.

Limitation regarding objective 2:

- The evaluation framework that resulted from the research for achieving objective 2 is argued to provide a complete set of criteria with a sufficient level of coherence, but its usability and efficiency are assessed differently by researchers and practitioners. This may be because it has not yet been practiced in real-life settings.

Limitation regarding objective 3:

- The research on research objective 3 resulted in an extended-BITA model from an organisational culture perspective. It should be made clear that the research is not aimed at developing a new model for BITA or a unified BITA model. There are, however, a large number of BITA models. The goal was 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. Although the model was tested on real-life settings and used for assessing BITA in organisations, it should be noted that feedback and reflections from

its applications were not incorporated for further development of the model. In addition to that, different weights of the attributes have been remarked by practitioners, which may be of interest to consider in developing the model.

Limitation regarding objective 5:

- The usability of the proposed BITA-OC integrated view has not been empirically tested. This is mainly because of the limited time frame for the PhD process.
- The correlations between BITA and OC components are based on literature and the focus was only on positive relationships. In the statistical analyses, different negative correlations were also reported with high significance. However, to keep the same level of the internal as well as the external validity of the proposed BITA-organisational culture integrated view, it was decided to only focus on the positive correlations between BITA and OC components as they are of higher value to managers for tracing desired changes. For the future, more attention could be given to negative correlation as well.

5.3 Suggestions for Future Research

Taking into consideration the research done in the thesis, the following possibilities for further future research are identified:

- The list of barriers identified as a result of achieving research objective 1 can be enhanced by quantitative analyses through introducing importance/weights for each barrier. In addition to that, applications of this list to organisations can also contribute to enhancing how the barriers can be considered in relation to improving BITA achievement. Moreover, comparative analyses between the practitioners' view of barriers and the list of barriers from literature can be further studied.
- The proposed framework, as a result of achieving objective 2, could be further developed by providing guidelines that provide greater support for decision-makers in selecting an appropriate BITA model according to their requirements. For example, if an organisation experiences a certain type of alignment problem (i.e. related to how it is defined, practically achieved, assessed or maintained) or in certain alignment components (i.e. alignment criteria or attributes), the focus can be on a certain group of criteria in the framework. Future research might also include extending the framework evaluation by gathering reflections concerning the framework adaptability in organisations from different groups of practitioners (e.g. different industries, experience backgrounds, project types, etc.). In addition to that, the framework can be evaluated in terms of its high potential for collaborative learning principles between business and IT domains for the diversity of knowledge and experience that positively impacts on learning outcomes regarding alignment and its achievement.
- The findings on OC impact on BITA (research objective 3) were based on studying the X-Model (Smit et al, 2008). The study can therefore be seen as being comprehensive from the OC point of view, 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 the ones to that should be applied by various practitioners or researchers. Therefore, the impact of OC can be studied by using other comprehensive models of BITA, such as Maes et al (2000) or Hu and Huang (2006).

- Future research on the proposed BITA-OC integrated view, i.e. research objective 5, may include:
 - Empirical validation of the use of the proposed BITA-OC integrated view, including a detailed level of correlating the attributes of BITA for each criterion with specific details on culture profiles.
 - Development of empirical guidelines to apply and use the integrated view. This should be expected to have a great value for practitioners.
 - Development of a meta-model consolidating the relationships between BITA and OC. This can be seen as a natural extension of the overall research in the PhD thesis. This type of model can provide a supportive tool for practitioners as well as researchers to assess BITA and OC in organisations and provide a roadmap for reaching desired changes in BITA and OC in relation to each other.
 - Lastly, the negative correlations of the relationships between BITA and OC can also be further developed and studied empirically in future research. Negative correlations might also provide useful indications for decision-makers in organisations of different undesired implications between BITA and OC components.

REFERENCES

- Ailon, G. (2008). Mirror, mirror on the wall: Culture's Consequences in a value test of its own design. *The Academy of Management*, 33(4), pp. 885-904.
- Arab Sorkhi, A., Zare Mirakabad, A. & Samkhani, S. (2010). Developing a Conceptual Model for Assessing the Readiness of Organization for Strategic Alignment of Information Technology and Business (Case of Iran Telecommunications Research Center). *International Bulletin of Business Administration*. EuroJournals, 8, pp. 18-34.
- Arogyaswamy, B. & Byles, C.C.M. (1987). Organisational Culture: Internal and External Fits. *Journal of Management*, 13(4), pp. 647-659.
- Aversano, L., Grasso, C. & Tortorella, M. (2012). A Literature Review of Business/IT Alignment Strategies. *Procedia Technology*, 5, pp. 462-474.
- Avison, D., Baskerville, R. & Myers, M. (2001). Controlling Action Research Projects. *Information Technology and People*, 14(1), pp. 28-45.
- Avison, D., Jones, J., Powell, P. & Wilson D. (2004). Using and Validating the Strategic Alignment Model. *Journal of Strategic Information Systems*, 13(3), pp. 223-246.
- Baets, W.R.J. & Galliers, R.D. (1998). *Information Technology and Organizational Transformation*. New York: John Wiley and Sons.
- Baskerville, R., Pries-Heje, J. & Venable, J. (2009). Soft Design Science Methodology. In: *Proceedings of Design Science Research in Information Systems and Technology (DESRIST)*. Malvern, PA, pp. 9-20.
- Benbya, H. & McKelvey, B. (2006). Using Coevolutionary and Complexity Theories to Improve IS Alignment: A multi-level approach. *Journal of Information Technology*, 21(4), pp. 284-298.
- Bergeron, F., Raymond, L. & Rivard, S. (2004). Ideal patterns of strategic alignment and business performance. *Information and Management*, 41(8), pp. 1003-1020.
- Biehl, M. (2007). Implementing global information systems: Success factors and failure points. *Journal of the Association for Computing Machinery (ACM)*, 50(1), pp. 52-58.
- Brown, A. (1995). *Organisational Culture*. 2nd ed. Pitman Publishing.
- Brown, I. & Motjoloane, I. (2005). Strategic business-IT alignment, and factors of influence: a case study in a public tertiary education institution. In: *Proceedings of The South African Institute of Computer Scientists and Information Technologists (SAICSIT)*. pp. 147-156.
- Bryman, A. (2012). *Social Research Methods*. 4th ed. Oxford: Oxford University Press.
- Cameron, K. S. & Quinn, R. E. (1999). *Diagnosing and Changing Organisational Culture: Based on the Competing Values Framework*. Addison-Wesley, Reading, Massachusetts (1999).
- Cameron, K. S., & Quinn, R. E. (2006). *Diagnosing and Changing Organisational Culture: Based on the Competing Values Framework*. (Rev. ed.). San Francisco: Jossey-Bass
- Cameron, K. S., & Quinn, R. E. (2011). *Diagnosing and Changing Organisational Culture: Based on the Competing Values Framework*. 3rd ed. San Francisco, CA: Jossey-Bass.
- Campbell, B., Kay, K. & Avison, D. (2005). Strategic alignment: A practitioner's perspective. *Journal of Enterprise Information Management*, 18(6), pp. 653-664.
- Cecez-Kecmanovic, D. (2001). Doing Critical IS Research: the Question of Methodology. In: E. Trauth, ed., *Qualitative Research in IS: Issues and Trends*, Idea Group Publishing, Hershey.

- Chan, Y. E. & Reich, B. H. (2007). IT alignment: what have we learned? *Journal of Information Technology*, 22(4), pp. 297-315.
- Chan, Y. E., Huff, S. L. & Copeland, D. G. (1998). Assessing Realized Information Systems Strategy. *Strategic Information Systems*, 6(4), pp. 273-298.
- Chan, Y.E. (1992). *Business Strategy, Information Systems Strategy, and Strategic Fit: Measurement and Performance Impacts*. Unpublished Doctor of Philosophy Thesis, University of Western Ontario.
- Chan, Y.E. (2001). Information Systems Strategy, Structure and Alignment. In: R. Papp, ed., *Strategic Information Technology: Opportunities for Competitive Advantage*, 1st ed., Hershey, PA: Idea Group Publishing, pp. 56-81.
- Chan, Y.E. (2002). Why haven't we mastered alignment? The importance of the informal organization structure, *MIS Quarterly Executive*, 1(2), pp. 97-112.
- Chan, Y.E., Huff, S.L., Barclay, D.W. & Copeland, D.G. (1997). Business Strategic Orientation, Information Systems Strategic Orientation, and Strategic Alignment. *Information Systems Research*, 8(2), pp.125-150.
- Chan, Y.E., Sabherwal, R. & Thatcher, J.B. (2006). Antecedents and Outcomes of Strategic IS Alignment: An Empirical Investigation. *IEEE Transactions on Engineering Management*, 51(3), pp. 27-47.
- Charles, S. T., Reynolds, C., & Gatz, M. (2001). Age-related differences and change in positive and negative affect over 23 years. *Journal of Personality and Social Psychology*, 80, 136-151.
- Checkland, P. & Holwell, S. (1998). *Information, Systems and Information Systems: Making Sense of the Field*. Wiley, Chichester, U.K.
- Checkland, P. (2000). Soft Systems Methodology: A Thirty Year Retrospective, *Systems Research and Behavioral Science*. 17(S1), S11-S58.
- Chen, W. & Hirschheim, R. (2004). A paradigmatic and methodological examination of information systems research from 1991 to 2001. *Information Systems Journal*, 14(3), pp. 197-235, Blackwell Publishing Ltd.
- Choudrie, J., & Dwivedi, Y. K. (2005). Investigating the research approaches for examining technology adoption issues. *Journal of Research Practice*, 1(1), Article D1. Available at: <http://jrp.icaap.org/index.php/jrp/article/view/4/8> [Accessed 26 Apr 2016].
- Ciborra, C. U. (1997). De Profundis? Deconstructing the concept of strategic alignment. *Scandinavian Journal of Information Systems*, 9(1), pp. 67-82.
- Coltman, T., Tallon, P., Sharma, R. & Queiroz, M. (2015). Strategic IT alignment: twenty-five years on *Journal of Information Technology*, 30(2), pp. 91-100.
- Cragg, P., King, M. & Hassin, H. (2002). IT alignment and firm performance in small manufacturing firms. *Strategic Information Systems*, 11(2), pp. 109-132.
- Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches*. 2nd ed. Thousand Oaks, CA: Sage.
- Darke, P., Shanks, G. & Broadbent, M. (1998). Successfully Completing Case Study Research: combining rigour, relevance and pragmatism. *Information Systems Journal*, 8(4), pp. 273-289, Blackwell Science.
- Davidson, W. (1996). Managing the Business Transformation Process. In: J. N. Luftman, ed., *Competing in the Information Age*, New York: Oxford University Press.
- De Haes, S. Van Grembergen, W., Gemke, D. & Thorp, J. (2012). Inter-Organizational Governance of Information Technology: Learning from a Global Multi-Business-Unit Environment. *International Journal of IT/Business Alignment and Governance (IJITBAG)*, 3(1), pp 27-46.
- Deal, T. E. and Kennedy, A. A. (1982). *Corporate Cultures: The Rites and Rituals of Corporate Life*. Harmondsworth: Penguin Books.

- DeLone, W.H. & McLean, E.R. (1992). Information systems success: The quest for the dependent variable. *Information Systems Research*, 3(1), pp. 60-95.
- DeLone, W.H. & McLean, E.R. (2003). The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. *Journal of Management Information Systems*, 19(4), Spring, pp 9-30.
- Demir, N. (2015). On the Importance of Strategic Alignment in Organisational Culture. *American Journal of Business, Economics and Management*, 3(3), pp. 126-131.
- Denison, D. R. (2000). Organizational Culture: Can it be a Key Lever for Driving Organizational Change. In: S. Cartwright & C. Cooper, eds., *The Handbook of Organizational Culture*, London: John Wiley and Sons.
- Denning, P. J. (1997) A new social contract for research. *Communications of the ACM*, 40(2), pp. 132-134.
- Deresky, H. (2011). *International Management: Managing Across Borders and Cultures*, 7th ed. New Jersey, Prentice Hall.
- Dobson, P. (2001). The Philosophy of Critical Realism-An Opportunity for Information Systems Research. *Information Systems Frontiers*, 3(2), 199-210, Kluwer Academic Publishers.
- Doherty, D. (1992). Interpretive barriers to successful product innovation in large firms. *Organization Science*, 3(2), pp. 179-202.
- Earl, M.J. (1996). Integrating IS and the organisation: A framework of organisational fit. In: M. J. Earl, ed., *Information Management: the Organisational Dimension*, Oxford University Press, Oxford.
- El-Mekawy, M. & Rusu, L. (2011). Impact of Organisational Culture on Business-IT Alignment: A Case Study of a Multinational Organisation. In: *Proceedings of the 44th Hawaii International Conference on System Sciences (HICSS-44)*. IEEE Computer Society, Hawaii, USA.
- El-Mekawy, M., Kaboudvand, E. & Rusu, L. (2012a). An Organisational Culture Perspective on Business-IT Alignment. *International Journal of IT/Business Alignment and Governance (IJITBAG)*, 3(1), pp. 1-26.
- El-Mekawy, M., Kaboudvand, E. & Rusu, L. (2012b). Extending the BITA Maturity Model from an Organisational Culture Perspective. In: *Proceedings of the 45th Hawaii International Conference on System Sciences (HICSS-45)*. IEEE Computer Society, Hawaii, USA.
- El-Mekawy, M., Rusu, L. & Perjons, E. (2014). The Impact of Business-IT Alignment on Organisational Culture. In: *Proceedings of the 18th Pacific Asia Conference on Information Systems*. Association for Information Systems, Chengdu, China.
- Feeny, D.F., Edwards, B.R. & Simpson, K.M. (1992). Understanding the CEO/CIO Relationship. *MIS Quarterly*, 16(4), pp. 435-448.
- Freestone, R. & Wood, D. (2006). Exploring Strategies for Linking Research and Teaching. *Journal for Education in the Built Environment*, 1(1), pp. 94-111.
- Galliers, R. (1992). *Information Systems Research: Issues, Methods and Practical Guidelines*. Blackwell, Oxford, U.K.
- Galliers, R. D. (2004). Reflections on information systems strategizing. In: C. Avgerou, C. Ciborra, & F. Land, eds., *The Social Study of Information and Communication Technology*, 1st ed. London: Oxford University Press, pp. 231-262.
- Galliers, R. D. & Land, F. F. (1987). Choosing an Appropriate Information Systems Research Methodology. *Communications of the ACM*, 30(11), pp. 900-902.
- Galliers, R. & Newell, S. (2003). Back to the future: from knowledge management to data management. *Information Systems and e-Business Management*, 1(1), pp. 5-14.
- George, M. H. (2012). *How To Write a Paper*. 5th ed., BMJ Books.

- Glass, R., Ramesh, V. & Vessey, I. (2004). An Analysis of Research in Computing disciplines. *Communications of the ACM*, 47(6), pp. 89-94.
- Goedvolk, H., van Schijndel, A., van Swede, V. & Tolido, R. (1997). Architecture. In: D.B.B. Rijsenbrij, ed., *The Design, Development and Deployment of ICT Systems in the 21st Century: Integrated architecture framework (IAF)*, Cap Gemini Ernst and Young (2000).
- Goles, T. & Hirschheim, R. (2000). The paradigm is dead, the paradigm is dead . . . long live the paradigm: The legacy of Burrell and Morgan. *Omega*, 28(3), pp. 249-268.
- Gonzalez, R. & Dahanayake, A. (2007). A Concept Map of Information Systems Research Approaches. In: *Proceedings of the Information Resources Management Association International Conference*, Vancouver, BC, Canada: IGI Publishing, pp. 845-848.
- Goodwin, C. J. (2005). *Research in Psychology: Methods and Design*. USA: John Wiley & Sons, Inc.
- Gregor, S. (2006). The Nature of Theory in Information Systems. *MIS Quarterly*, 30(3), pp. 611-642.
- Griswold, Ch. L. (2001). *Platonic Writings/Platonic Readings*. Penn State Press, London.
- Gutierrez, A. & Lycett M. (2011). IS Alignment factors: Dynamic relationships at Strategic, Tactical and Operational level. In: *Proceedings of UK Academy for Information Systems (UKAIS) Conference*. Oxford, UK 12-13 April 2011.
- Gutierrez, A., Orozco, J. & Serrano, A. (2009). Factors affecting IT and business alignment: A comparative study in SMEs and large organizations. *Journal of Enterprise Information Management*, 22(1/2). Emerald Group Publishing Limited.
- Gutierrez, A., Orozco, J., Papazafeiropoulou, A & Serrano, A. (2008). Developing a Taxonomy for the Understanding of Business and IT Alignment Paradigms and Tools. In: *Proceedings of the 16th European Conference on Information Systems (ECIS 2008)*. Galway, Ireland.
- Henderson, J. C., & Sifonis, J. (1988). The Value of Strategic IS Planning; Understanding Consistency, Validity and IS Markets, *MIS Quarterly*, 12(2), pp. 187-200.
- Henderson, J. & Venkatraman, N. (1993). Strategic alignment: leveraging information technology for transforming organizations. *IBM Systems Journal*, 32(1), pp. 472-484.
- Hevner, A. & March, S. (2003). The Information Systems Research Cycle. *IT Systems Perspective*, 36(11), pp. 111-113.
- Hevner, A. R., March, S. T., Park, J. & Ram, S. (2004). Design science in information systems research. *MIS Quarterly*, 28(1), pp. 75-105.
- Higgins. J.M. & Allater. C.M. (2004). If You Want to Strategic Chance, Don't Forget to Chance, Your Cultural Artifacts. *Journal of Change Management*, 4(1), pp. 63-73.
- Hirschheim, R. (1992). Information Systems Epistemology: an historical perspective. In: R. Galliers, ed., *Information Systems Research: issues, methods and practical guidelines*, Alfred Waller Ltd., Henley-on-Thames.
- Hirschheim, R. & Lyytinen, K. (1996). Exploring the intellectual foundations of information systems. *Accounting, Management and Information Technology*, 2(1/2), pp. 1-64.
- Hirschheim, R. & Sabherwal, R. (2001). Detours on the path towards strategic IS alignment. *California Management Review*, 44(1), pp. 1-12.
- Hofstede, G. (1980). *Culture's Consequences: International Differences in Work Related Values*. Beverly Hills, Sage Publications, California.
- Hofstede, G. (1991). *Culture and organisations: Software of the mind*. London, UK: McGraw Hill.

- Hofstede, G. (2000). The information age across cultures. In: *Proceedings of 5th AIM conference, Information Systems and Organisational Change*. CD-Rom, Article 10.
- Hofstede, G. & Bond, M.H. (1984). Hofstede's Culture Dimensions: An Independent Validation Using Rokeach's Value Survey. *Journal of Cross-Cultural Psychology*, 15(4), pp. 417-433.
- Hofstede, G., Neuijen, B., Ohayv, D., & Sanders, G. (1990). Measuring organizational cultures: A qualitative and Quantitative study across twenty cases. *Administrative Science Quarterly*, 35(2), pp. 286–316.
- House, R. J., Hanges, P. J., Javidan, M., Dorfman, P. W., and Gupta, V. (2004). *GLOBE Associates, Culture, Leadership and Organizations: The GLOBE Study of 62 Societies*. Thousand Oaks, CA: Sage.
- House, R., Javidan, M., & Dorfman, P. (2001). Project GLOBE: An introduction. *Applied Psychology: An International Review*, 50(4), pp. 489-505.
- Hu, Q. & Huang, C. D. (2006). Using the Balanced Scorecard to Achieve Sustained IT-Business Alignment: A Case Study. *Communications of the Association for Information Systems*, 17, Article 8, pp. 181-204.
- Irani, Z. (2002). Information Systems Evaluation: Navigating Through the Problem Domain. *Information Management*, 40(1), pp. 11-24.
- Jarvenpaa, S. L., & Ives, B. (1994). The global network organization of the future: Information management opportunities and challenges. *Journal of Management Information Systems*, 10(4), pp. 25-57.
- Jentsch, Ch. & Beimborn, D. (2014). Shared Understanding among Business and IT – A Literature Review and Research Agenda. In: *Proceedings of the 22nd European Conference on Information Systems (ECIS 2014)*. Tel Aviv, Israel.
- Johannesson, P. & Perjons, E. (2012). *A Design Science Primer*. 1st ed., CreateSpace Independent Publishing Platform.
- Kappelman, L., McLean, E., Johnson, V. & Torres, R. (2016). The 2015 SIM IT Key Issues and Trends Study. *MISQ Executive*, 15(1). pp. A1-A10.
- Karpovsky, A. & Galliers, R. D. (2015). Aligning in Practice: From current cases to a new agenda. *Journal of Information Technology*, 30(2), pp.136-160.
- Kimberly, J.R. & Quinn, R.E. (1984). *Managing Organisational Transitions*. McGraw-Hill, Irwin.
- Klein, H. & Myers, M. (1999). A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems. *MIS Quarterly*, 23(1), pp. 67-96.
- Labovitz, G., & Rosanky, V. (1997). *The power of alignment: How great companies centered and accomplished extraordinary things*. New York, NY: John Wiley and Sons.
- Laudon, K. & Laudon, J. (2006). *Management information systems: Managing the digital firm*. 9th Ed. Prentice Hall.
- Lee, Y., Lee, Z., & Gosain, S. (2004). The Evolving Diversity of the IS Discipline: Evidence from referent theoretical frameworks, *Communications of the AIS*, (13), Article 33, pp. 546-579.
- Leonard, J. & Seddon, P. (2012). A Meta-model of Alignment. *Communications of the Association for Information Systems*, 31(1), pp. 230-259.
- Livonen, M., Sonnenwald, D. H., Parma, M. & Poole-Kober, E. (1998). Analyzing and understanding cultural differences: Experiences from education in library and information studies. In: *Proceedings of the 64th IFLA General Conference*. Amsterdam, Netherlands.
- Luftman, J. (1996). *Competing in the Information Age: Practical Applications of the Strategic Alignment Model*. New York: Oxford University Press.
- Luftman, J. (2000). Assessing Business-IT Alignment Maturity. *Communications of the AIS*, 4(14), pp. 1-51.
- Luftman, JN. (2004). *Managing IT Resources*. Prentice Hall. Upper Saddle River, pp. 33-44. NJ, USA.

- Luftman, J., Ben-Zvi, T. Dwivedi, R. & Rigoni, E.H. (2010). IT Governance: An Alignment Maturity Perspective. *International Journal of IT/Business Alignment and Governance (IJITBAG)*, 1(2), pp. 13-25.
- Luftman, J., Brown, C. & Balaji, S. (2011). Customer-provider strategic alignment: a maturity model. In: H. Dermikan et al, eds., *Service Systems Implementation*, pp. 145-163. Springer.
- Luftman, J., Papp, R., & Brier, T. (1999). Enablers and Inhibitors of business-IT alignment. *Communications of the Association for Information Systems*, 1, Article 11.
- Luftman, J., Zadeh, H.S., Derksen, B., Santana, M. & Rigoni, E.H. (2013). Key Information Technology and Management Issues 2012–2013: An international study. *Journal of Information Technology*, 28(4), pp. 354-366.
- Maes, R. (1999). A Generic Framework for Information Management, *Prime vera Working Paper, Unpublished manuscript*.
- Maes, R., Truijens, O., Rijsenbrij, D. & Goedvolk, H. (2000). Redefining business-IT alignment through a unified framework. In: *Proceedings of the Universiteit Van Amsterdam/Cap-Gemini White Paper*. pp. 1-25.
- Marakas, G.M. & Elam, J.J. (1998). Semantic structuring in analyst acquisition and representation of facts in requirements analysis. *Information Systems Research*, 9(1), pp. 37-63.
- March, S. & Smith, G. (1995). Design and natural science research on information technology. *Decision Support Systems*, 15(4), pp. 251-266.
- McGrath, K. (2005). Doing critical research in information systems: a case of theory and practice not informing each other. *Information Systems Journal*, 15(2), pp. 85-101, Blackwell Publishing.
- McKay, J. & Marshall, P. (1999). A framework for rigour in action research. In: *Proceedings of the Americas Conference on Information Systems (AMCIS)*, Milwaukee, WI, August
- McKeen, J.D. & Smith, H. (2003). *Making IT Happen: Critical issues in IT management*. Chichester, Hoboken, NJ: Wiley.
- McLaren, T.S., Head, M.M., Yuan, Y. & Chan, Y.E. (2011). A Multilevel Model for Measuring Fit Between a Firm's Competitive Strategies and Information Systems Capabilities. *MIS Quarterly Executive*, 35(4), pp. 909-929.
- Miles, R.E. & Snow, C. C. (1978). *Organisational strategy, structure and process*. New York, McGraw-Hill.
- Mingers, J. (2001). Combining IS Research Methods: Towards a Pluralist Methodology. *Information Systems Research*, 12(3), pp. 240-259.
- Mitchell, R. K., Morse, E. A. & Sharma, P. (2003). The transacting cognitions of nonfamily employees in the family businesses setting. *Journal of Business Venturing*, 18(4), pp. 533-551.
- Mitev, N. (2000). Toward Social Constructivist Understanding of IS Success and Failure: introducing a new computerized reservation system. In: *Proceedings of the 21st international conference on information systems (ICIS)*. December, Brisbane, Queensland, Australia, pp. 84-93.
- Mobley, W. H., Wang, L. & Fang, K. (2005). Organisational culture: Measuring and developing it in your organisation. *Harvard Business Review China*, pp. 128-139.
- Myers, M.D. (2009). *Qualitative Research in Business & Management*. Sage Publications, London, UK.
- Nandhakumar, J. & Jones, M. (1997). Too close for comfort? Distance and engagement in interpretive information systems research. *Information Systems Journal*, 7(2), pp - 109-131.
- Nelson, K. M., & Coopridge, J. G. (1996). The contribution of shared knowledge to IT Group performance. *MIS Quarterly*, 20(4), pp. 409-432.

- Neuman, W. L. (2000). *Social research methods: Qualitative and quantitative approaches*. Boston: Allyn & Bacon.
- Ngwenyama, O. & Nielsen, P. (2003). Competing values in software process improvement: An assumption analysis of CMM from an organisational culture perspective. *IEEE Transactions on Engineering Management*, 50(1), pp. 100-112.
- Orlikowski, W.J. & Baroudi, J.J. (1991). Studying Information Technology in Organizations: Research Approaches and Assumptions. *Information Systems Research*, 2(1), pp. 1-8.
- Panagiotidis, P. and Edwards, J. (2001). Developing Intrinsically Motivated Information systems – a critical systems approach. *Information Systems Frontiers*, 3(2), pp. 211- 226.
- Papp, R. (1999). Business–IT Alignment: Productivity paradox payoff? *Industrial Management & Data Systems*, 99(8), pp. 367-373.
- Papp, R., Luftman, J. & Brier, T. (1996). Business and IT in Harmony: Enablers and Inhibitors to Alignment. In: *Proceedings of the Americas Conference on Information Systems (AMCIS)*, Phoenix, Arizona, USA.
- Peffer, K., Tuunanen, T., Rothenberger, M. & Chatterjee, S. (2007). A Design Science Research Methodology for Information Systems Research. *Journal of Management Information Systems*, 24(3), pp. 45-77.
- Piplani, R. & Fu, Y. (2005). A coordination framework for supply chain inventory alignment. *Journal of Manufacturing Technology Management*, 16(6), pp. 598-614.
- Pongtichat, P. & Johnston, R. (2008). Exploring strategy-misaligned performance measurement. *International Journal of Productivity and Performance Management*, 57(3), pp. 207-222.
- Porter, M. E. (1996). What is strategy? *Harvard Business Review*, Nov-Dec, 61-78.
- Preston, R. (2014). CIO worries: Security, talent and (sadly) ‘alignment’, InformationWeek. Available at: [http://www.informationweek.com/strategic-cio/digital-business/cio-worries-security-talent-and-\(sadly\)-alignment/a/d-id/1315575](http://www.informationweek.com/strategic-cio/digital-business/cio-worries-security-talent-and-(sadly)-alignment/a/d-id/1315575) [Accessed 26 Apr 2016].
- Purao, S. (2002). Design Research in the Technology of Information Systems: Truth or Dare. *GSU Department of CIS Working Paper*. Atlanta.
- Quinn, R.E. & Rohrbaugh, J. (1983). A spatial model of effectiveness criteria: Towards a competing values approach to organisational analysis. *Management Science*, 29(3), pp. 363-377.
- Reich, B.H. (1993). Investigating the Linkage between Business and Information Technology Objectives: A multiple case study in the insurance industry. *Unpublished Doctor of Philosophy Thesis, University of British Columbia*.
- Reich, B.H. & Benbasat, I. (1996). Measuring the Linkage between Business and Information Technology Objectives. *MIS Quarterly*, 20(1), pp. 55-81.
- Reich, B.H. & Benbasat, I. (2000). Factors That Influence The Social Dimension of Alignment Between Business And Information Technology Objectives. *MIS Quarterly*, 24(1), pp. 81-113.
- Reich, B. H. & Kaarst-Brown, M.L. (2003). Creating social and intellectual capital through IT career transitions. *Journal of Strategic Information Systems*, 12(2), pp. 91-109.
- Rowlands, B., Haes, S., & Grembergen, W. V. (2014). Exploring and Developing an IT Governance Culture Framework. In: *Proceedings of the 35th International Conference on Information Systems (ICIS)*. Auckland, New Zealand.
- Sabherwal, R. & Chan, Y.E. (2001). Alignment Between Business and IS Strategies: A Study of Prospectors, Analyzers, and Defenders. *Information Systems Research*, 12(1), pp.11-33.

- Salim, J. & Abu Seman, E.A. (2013). Antecedents factors affecting alignment and its impact to organizational performance in universities. In: *Proceedings of the 15th International Conference on Business Administration*. Marketing and Economics.
- Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. Basic Books, New York, USA.
- Schwartz, H. & Davis, S.M. (1981). Matching Corporate Culture and Business Strategy. *Organisational Dynamics*, 10(1), pp. 30-48.
- Schwarz, A., Kalika, M., Kefi, H. & Schwarz, C. (2010). A Dynamic Capabilities Approach to Understanding the Impact of IT-Enabled Business Processes and IT-Business Alignment on the Strategic and Operational Performance of the Firm. *Communications of the Association for Information Systems*, 26(4), pp. 57-84.
- Seddon, P. B. (1997). A respecification and extension of the DeLone and McLean Model of IS success. *Information Systems Research*, 8(3), pp. 240-253.
- Silvius A.J.G. (2008). The impact of national cultures on Business & IT Alignment. *Communications of the IIMA*, 8(2), Article 2.
- Silvius, A.J.G., De Haes S. & Grembergen W.V. (2009). Exploration of Cultural Influences on Business and IT Alignment. In: *Proceedings of the 42th Hawaii International Conference on System Sciences (HICSS-42)*. IEEE Computer Society, Hawaii, USA.
- Silvius, A.J.G., Smit, J. & Driessen, H. (2010). The Relationship between Organisational Culture and the Alignment of Business and IT. In: *Proceedings of the Americas Conference on Information Systems (AMCIS)*, Lima, Peru.
- Simon, H. A. (1996). *The sciences of the artificial*. (3rd ed.), MIT Press, Cambridge MA, USA.
- Sinha, A. P. & Vessey, I. (1999). An empirical investigation of entity-based and object-oriented data modelling: A development life cycle approach. In: *Proceedings of the 20th International Conference on Information Systems (ICIS)*. Charlotte, North Carolina, USA, pp. 229-244.
- Sledgianowski, D., Luftman, J. & Reilly, R. R. (2006). Development and Validation of an Instrument to Measure Maturity of IT Business Strategic Alignment Mechanisms. *Information Resources Management Journal*, 19(3), pp. 18-33.
- Smaczny, T. (2001). Is an alignment between business and IT the appropriate paradigm to manage IT in today's organisation? *Management Decision*, 39(10), pp. 797-802.
- Smit, J., Ludik, J. & Forster, S. (2008). Organisational Culture in the South African Context: The X Model. *The International Journal of Knowledge, Culture and Change Management*, 7(10), pp. 73-86.
- Sollaci, LB., Pereira, MG. (2004). The introduction, methods, results, and discussion (IMRAD) structure: a fifty-year survey. *Journal of the Medical Library Association*, 92(3), pp. 364-367.
- Subramani, M.R., Henderson, J.C. & Coopriider, J. (1999). Linking IS-user partnerships to IS performance: a socio-cognitive perspective. *MISRC Working Paper WP99-01*, University of Minnesota.
- Suddaby, R. (2006). From the Editors: What Grounded Theory is Not? *Academy of Management Journal* 46(4), pp. 633-642.
- Takeda, H., Veerkamp, P. & Yoshikawa, H. (1990). Modelling Design Process. *AI Magazine*, 11(4), pp. 37-48.
- Tallon, P. P., Kraemer, K. L., & Gurbaxani, V. (2000). Executives' Perceptions of the Business Value of Information Technology: A process-Oriented Approach. *Journal of Management Information Systems*, 16(4), pp. 145-173.

- Tallon, P.P. & Pinsonneault, A. (2011). Competing Perspectives on the Link Between Strategic Information Technology Alignment and Organisational Agility: Insights from a Mediation Model. *MIS Quarterly*, 35(2), pp. 463-486.
- Tan, F. B. & Gallupe, B. (2006). Aligning business and information systems thinking: A cognitive approach, *Engineering Management. IEEE Transactions*, 53(2), pp. 223-237.
- Teo, T.S.H. & Ang, J.S.K. (1999). Critical Success Factors in the Alignment of IS Plans with Business Plans. *International Journal of Information Management*, 19(1), pp. 173-185.
- Tsichritzis, D. (1998). The dynamics of innovation, In: P. J. Denning & R. M. Metcalfe, eds., *Beyond Calculation: The Next Fifty Years of Computing*, Copernicus Books, New York, USA, pp. 259-265.
- Vaishnavi, V. K. & Kuechler, W. (2007). *Design Science Research Methods and Patterns: Improving and Innovating Information & Communication Technology*. 2nd ed., Auerbach Publications, USA.
- Van Der Zee, J.T.M. & De Jong, B. (1999). Alignment is Not Enough: Integrating business and information technology management with the balanced business scoreboard. *Journal of Management Information Systems*, 16 (2), pp. 137-156.
- Van Grembergen, W. & De Haes, S. (2010). A Research Journey into Enterprise Governance of IT, Business/IT Alignment and Value Creation. *International Journal of IT/Business Alignment and Governance (IJITBAG)*, 1(1), pp 1-13.
- Venkatraman, N. (2000). Five steps to a dot-com strategy: How to find your footing on the web. *Sloan Management Review*, 41(3), pp. 15-28.
- Vestal, K.W.; Fralicx, R.D. & Spreier, S.W. (1997). Organisational Culture: The Critical Link Between Strategy and Results. *Hospital & Health Services Administration*, 42 (3), pp. 339-365.
- Wallace, J., Hunt, J. & Richards, C. (1999). The relationship between organizational culture, organizational climate and managerial values. *International Journal of Public Sector Management*, 12(7), pp. 548-564.
- Walsham, G. (1995). The Emergence of Interpretivism in IS Research. *Information Systems Research*, 6(4), pp. 376-394.
- Walsham, G. (2005). Learning about being critical. *Information Systems Journal*, 15(2), pp. 111-117.
- Weber, R. (2003). Editor's comments: Still desperately seeking the IT artefact. *MIS Quarterly*, 27(2), pp. iii-xi.
- Weill, P. & Broadbent, M. (1998). *Leveraging the New Infrastructure: How Market Leaders Capitalize on Information Technology*. Boston, Mass, Harvard Business School Press.
- Wilson, A. M. 2001. Understanding organisational culture and the implications for corporate marketing. *European Journal of Marketing*, 35(3/4), pp. 353-367.
- Wynekoop, J. & Russo, N. (1997). Studying Systems Development Methodologies: an examination of research methods. *Information Systems Journal*, 7(1), pp. 47-65, Blackwell Science Ltd.
- Wynn, E. (2001). Möbius Transitions in the Dilemma of Legitimacy. In: E. Trauth, ed., *Qualitative Research in IS: issues and trends*, Idea Group Publishing, Hershey.
- Yin, R.K. (2009). *Case Study Research: Design and Methods*. 4th ed., Sage Publications, Thousand Oaks, CA, USA.
- Zviran, M. (1990). Relationship between organizational and information systems objectives: some empirical evidence. *Journal of Management Information Systems*, 7(1), pp. 65-84.