ALIGNMENT OF INFORMATION TECHNOLOGY STRATEGIZING PRACTICES AND ORGANISATIONAL GOALS

by

SUDESH NAIDU

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ABSTRACT

As the information age progresses, people and businesses alike have become accustomed to the convenience that technology brings into our lives. However, in the business world, high failure rates of projects to produce such technological systems have led to depleted profits and are an embarrassment to managers. These pressures have created a cultural gap between business and IT managers. It would benefit both business and IT managers to align the outputs of the IT function with the goals of the organisation and reduce this gap. However, the literature shows that, in the three to four decades that IT has been used in business, managers have been having difficulty in implementing the alignment of business and IT in practice. Therefore, the study began with the general purpose of determining why implementation of alignment is so difficult, and to develop a framework to guide practitioners towards successful implementation of alignment within their organisations. A review of the field of business and IT alignment was done which revealed a rich theory base and that the solution must lie in applying theory to the firm. The review also revealed a very well-established model in business-IT alignment theory; the Strategic Alignment Model (SAM). These findings shifted the main purpose of the study to focus the quest for a business and IT alignment solution to the *context of the organisation*. In particular, to determine the organisational attributes that could be used to provide a guiding framework for business and IT managers that could lead them to one of the four perspectives of the SAM most suited to their specific organisation. The academic importance of this study is the introduction of the three antecedents of alignment, namely, the *role of the IT function*, the *mode of operation of the IT function* and the *sourcing option of the IT function*. The methodology entails a web-based survey of a case organisation to establish the preconditions or antecedents of alignment. The study further shows how to extract viable focus areas to determine the goals of alignment and how to establish matters of timing between business and the IT function. It is hoped the framework developed, based on contextual information of the organisation, may fill the gap of applying alignment theory to practice.

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NOTICE

This thesis is presented in the format known as “Publication Based Thesis” (PBT) also known as “PhD by publication”.

The reader can expect some overlap between the different papers for the design elements. Each paper was submitted to a different journal (ISI or IBSS) and is at some stage of the review process – thus no reviewer feedback has been included in the thesis that is presented for examination.

CHAPTER 1: INTRODUCTION

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1.1. BACKGROUND

The role of the IT function within the business organisation has evolved from the traditional back-office support function of keeping track of financial transactions to a more strategic and central role within organisations (Venkatraman, Henderson & Oldach, 1993:139). IT is transforming the nature of products, processes, and competition and is having far-reaching strategic impact on organizations and industries (Premkumar & King, 1992:100). Whereas formerly the IT function simply facilitated business, now it changes the way business is done. In the banking industry, for example, clients used to have to physically go to a bank to perform transactions; now many use the internet. Cellphone banking services, like e-Wallet, that allow people to transfer money to others who do not even have a bank account, have completely altered the strategic landscape of the banking industry. Therefore we, as a society, have let technology become an inextricable part our lives (Evans & Hoole, 2005:310).

Shocking IT project failure statistics and the need for alignment between business and IT

Just as we have become addicted to the allures of technology, businesses are finding that it comes at a significant cost. The literature shows shocking statistics of IT projects that fail to meet the expectations of business. D'Amico (2005:251) reports that 40% of IT projects fail to meet project objectives such as time, budget and quality. The failure rate is found to worsen to 80% in software development projects. Kruger (2012:2) mentions the Standish Chaos Report that revealed a 68% failure rate. Kilov and Sack (2009:98) cite a 1999 *Computer World* report that “85% of IT departments in the US fail to meet their organisations’ business objectives”; six years later a very similar percentage of 84% was reported. Mpazanje, Sewchurran, and Brown (2013:1) point out that reports *persistently* indicate that over 50% of IS projects fail to deliver on the project success triad of quality, schedule, and budget. These authors attribute the problems with design and development, and the associated losses of finance and customer trust, to the proverbial “communication gap” between business and IT experts.

Evans and Hoole (2005:310) refer to it as the “expectation gap” that exists between business and IT and also see it as the main reason for the poor perception of IT. They conclude that organisations are also lacking an integrated approach to organisational and technical change, and often do not successfully attend to the human and organisational aspects of changing technology. Kunda (2001) in Evans (2004:304) mentions that the major cause of software failures is people, rather than the technology. Evans (2004:304) also aptly points out that the poor performance of the IT function and the gap between business and the IT staff are related to each other in a “chicken-and-egg” manner. The IT function performs poorly because of the communication gap between business and IT staff, while at the same time the gap between business and IT increases because of the poor performance of the IT function. The situation is self-sustaining and often leads to a completely dysfunctional relationship between business and the IT function. Kruger (2012:1) attributes the misalignment between business and IT to this gap, and sees it as the most significant factor

of IT project failure. It stands to reason that those in charge of managing business and IT, and who are cognisant of this gap between business and IT, would be strongly motivated to reduce it. It is due to this motivation that the endeavour to *align* business and IT was born.

Duration of the alignment problem

The alignment of business and IT is, however, a long-standing problem that has been a key concern for practitioners and academics for many years (Kruger, 2012:2; Brown & Motjolopane, 2005:20; Brown, 2007:1157; Norton, 2002:13; Smaczny, 2001:797; Valorinta, 2011:46). One of the earliest reports of the desire to align business and IT dates back to almost four and a half decades ago (Valorinta, 2011:55). Smaczny (2001:797) and Norton (2002:13) estimate the origin of the problem to be about three decades ago, while Brown (2007:1157) estimates about two decades ago. Although the literature shows little consensus on the duration of the alignment problem between business and IT, it is reasonable to conclude that it has been around for at least two decades.

Other characteristics of the alignment problem

Besides the persistence of the business-IT alignment problem, four other characteristics of the problem can be observed. The first is that it is a *top priority* for CIOs and IT managers (Chen, 2010:9; Jorfi, Nor & Najjar, 2011a:76; Singh & Woo, 2009:177); the second is that it *consistently* shows up high on priority lists (Mpazanje, 2013:1; Brown, 2007:1157; Tallon, 2007:227); the third is that it is believed that an organisation *cannot be competitive* without alignment (Jorfi et al., 2011:76; Avison et al., 2004:233); and finally, alignment between business and IT is a state that is *difficult to attain* (Karpovsky & Galliers:2015:1; Ullah & Lai, 2011:21; Tallon, 2007:227).

Benefits of business and IT alignment

Therefore, the question that naturally arises is that if alignment between business and IT is so difficult to attain, why are practitioners and academics so persistently pursuing it? The literature shows that the answer to this question could possibly lie in the *benefits* of alignment of business and IT. Perhaps the most desired benefit associated with business and IT alignment is *improved firm performance* (Brown & Motjolopane, 2005:20; Cohen & Toleman, 2006:457; Croteau & Raymond, 2004:178; Dong et al., 2008:348; Garg & Pellissier, 2005:33; Kearns & Lederer, 2003:1; Lee, Kim, Paulson, & Park, 2008:1167; Raymond & Bergeron, 2008:577; Sanders, 2005:4; Singh & Woo, 2009:177; Tarafdar & Qrunfleh, 2010:107; Teo & King, 1996:309; Wakabayashi, 2008:663). The above studies suggest a positive relationship between *business-IT alignment* and *firm performance,* where firm performance is defined as either financial performance or competitive advantage. Another significant benefit associated with business-IT alignment is *improved IT credibility* (Chen, 2010:9; Lee et al., 2008:1167; Tarafdar & Qrunfleh, 2010:107). Other benefits include *improved firm growth* (Raymond & Bergeron, 2008:577; Wakabayashi, 2008:663), *improved information system (IS) planning* (Chen, 2010:9; Teo & King, 1996:309), *better strategy*

execution (Tarafdar & Qrunfleh, 2010:107) and *improved productivity* (Raymond & Bergeron, 2008:577). The literature therefore explains, at least on a theoretical level, the incentive for the pursuance of business and IT alignment.

Categorisation of approaches used to align business and IT

Arguably the broadest classification of business and IT alignment approaches in the literature is based on alignment *dimension* (Lee et al., 2008:1167; Martin et al., 2005:28; Reich & Benbasat, 2000:82). Alignment approaches can be classified as belonging either to the *intellectual* dimension or the *social* dimension. Although more precise definitions are provided in the literature, a simple understanding of these categories is provided by Lee et al. (2008:1169). They explain that the "intellectual dimension of alignment emphasizes the content of plans and planning methodologies" and the "social dimension of alignment concentrates on the people in the organization". The review (in chapter 3) of the field of business and IT alignment, classify studies found in the literature into intellectual alignment approaches, social alignment approaches and a combination of intellectual and social approaches. They further show that within the studies that fall under the category of *intellectual* alignment approaches, several sub-categories emerge. These sub-categories include studies that focus on (1) aligning business and IT *strategies*, (2) business and IT *planning*, (3) aligning IT with *business processes*, (4) implementing business and IT *governance*, (5) focusing on *enterprise architecture*, (6) implementing alignment through *project management* processes, and finally, (7) implementing *engineering approaches*. Among the studies that fall under the *social* dimension no particular sub-categories emerged. The literature therefore shows a wide variety of alignment approaches, enough to create a taxonomy of approaches.

Dominant models in the literature

Also presented in the review of the field of business and IT alignment is an analysis of theoretical models found in the literature. They categorise these models in three categories, namely, (1) models based on the Strategic Alignment Model (SAM), (2) models with performance as the dependent variable, and (3) factor models that investigate different factors that lead to alignment. It is pointed out here that the Strategic Alignment Model (SAM) of Henderson and Venkatraman (1989:14) is arguably one of the most widely used and cited models in business-IT alignment. The SAM, presented in Chapter 3 of this study, essentially attempts to integrate the *internal* and *external* environments of an organisation while simultaneously integrating *IT* and *business* functions within the organisation. Venkatraman et al. (1993:143) further detail *four perspectives* of interpreting and using the model.

A change in the problem description

Therefore, the literature shows that over the last three decades a vast body of knowledge has been amassed on the subject of business and IT alignment. The body of knowledge is

mature in the sense that, over this period of time, researchers have explored a wide variety of approaches to addressing the business and IT alignment problem. It does appear that the persistence of the business and alignment problem is *not because of a lack of knowledge* on the subject but perhaps that there may be *difficulty in applying* the vast amount of knowledge to the immediate practical situation. Karpovsky and Galliers (2015:1) argue that alignment research should go beyond abstract macro analysis of alignment processes to that which considers the actual micro practices of aligning. In particular, they suggest that researchers should focus on what organisational actors actually do daily, to align business and IT.

A focus on context

The change in the problem description above is quite significant because it changes the focus from searching for a solution for alignment of business and IT to determining how to apply existing solutions found in the literature to the particular situation that the IT manager finds himself in. Chapter 4 shows that the basics of problem-solving theory can help the researcher of business and IT alignment in this new quest of determining how to apply alignment theory. Augier et al. (2001:125), for instance, have been researching how organisations solve complex and unstructured problems and observe that context and contextualisation are central elements in problem solving. Kokinov and Yoveva (1996:1) point out that it often assumed that one starts off with a clear problem description, and therefore the background of the problem is usually ignored. They further explain that causal entities may exist in this background that may influence the solution. Jonassen (2000:68) also mentions that problem-solving skills are domain-and firm-specific and that the role of context is specifically vital in defining ill-structured problems. Therefore, in applying basic problem-solving theory to the problem of determining how to apply business and IT alignment to a particular organisation, it stands to reason that focusing on the firm-specific variables, or the preconditions or antecedents of alignment, would provide a good starting point.

A focus on context implies a focus on antecedents

Therefore, to implement the alignment of business and IT within an organisation using the Strategic Alignment Model (SAM) of Henderson and Venkatraman (1989:14), for example, would first require looking at the firm-specific variables within the organisation that define the problem in the problem-space before looking for a solution in the solution-space. Since these variables are not part of the SAM itself, they can be seen as *antecedent variables* to the model. Once defined and evaluated, they have the potential to influence how the solution will be implemented. Chapter 4 defines the *role of the IT function* as one of the antecedent variables most fundamental to the problem of business and IT alignment. Within this study the *role of the IT function* is defined as “the mandate that the organisation in which the IT function operates imposes on it”. The variable is described as having values that exist on a continuum that ranges from a *utility service provider,* at one end of the continuum, to a *strategic business partner,* at the other end. Two other antecedent variables are introduced in Chapter 5, namely, the *mode of operation of the IT function* and the *sourcing options of the IT function*. The *mode of operation of the IT function* is defined in this study as the

degree of responsiveness with which the IT function executes its functions. It may vary on a continuum between two extremes; on the one end completely *reactive,* and on the other end completely *proactive*. The *sourcing option of IT* refers to the location of IT skills relative to the host organisation. That is, should core IT skills, in particular with respect to infrastructure, software development and desktop support, be housed *within* the organisation or *outside* it?

1.2. PROBLEM STATEMENT

The practice of management of IT shows symptoms of shocking project failure rates and a general deterioration in the relationship between business and IT management. The literature shows that the natural response of practitioners and researchers in the field is to *align* the efforts of business and IT, so that IT delivers exactly what business expects, and to cultivate a culture of working together towards the same goal (Kilov & Sack, 2009:98). The problem is that the alignment of business and IT has proved difficult to attain in practice, despite a three-decade theory base (Karpovsky & Galliers, 2015:1). This study argues that the persistence of the alignment problem between business and IT is not so much due to a lack of solutions, but rather due to a lack of ability to *select* an appropriate solution for the particular context. Therefore, the problem is reduced from determining how to develop a generic solution to business and IT alignment, to *how to apply what we know about the context of the organisation to improve the probability of arriving at a specific alignment solution for the organisation.*

1.3. PURPOSE STATEMENT

The purpose of this study is to shift the focus of the quest for business and IT alignment to the *context of the organisation*. In particular, to determine the organisational attributes that could be used to provide a guiding framework for business and IT managers that could lead them, to one of the four perspectives of the Strategic Alignment Model (SAM) most suited to their specific organisation.

1.4. RESEARCH OBJECTIVES

The primary objective of this study is to develop a framework that would assist a case organisation in selecting an appropriate SAM perspective.

In support of this primary objective the following secondary objectives arise:

- To introduce to the body of knowledge the *role of the IT function* as an antecedent variable to business and IT alignment
- To determine the *role of the IT function* for the case organisation

- To introduce to the body of knowledge the *mode of operation of the IT function* as an antecedent variable to business and IT alignment
- To determine the *mode of operation of the IT function* for the case organisation
- To introduce to the body of knowledge the *sourcing option of the IT function* as an antecedent variable to business and IT alignment
- To determine the *sourcing option of the IT function* for the case organisation
- To determine the appropriate *strategic focus areas* within the case organisation
- To determine whether business or IT should take the lead with respect to planning, communication, and aligning visions within the case organisation
- To show how the antecedents of alignment, together with the strategic focus areas, can lead to the appropriate SAM perspective and the basis of an alignment strategy for business and IT

1.5. THESIS STATEMENT (HYPOTHETICAL PROPOSITION)

The context of business and IT alignment is defined by fundamental boundary conditions within the organisational context such as the *role of the IT function*, *mode of operation of the IT function* and the *sourcing option of the IT function*. These boundary conditions need to be evaluated first, and together with organisational strategy information, such as *strategic focus areas* and dynamics about *who should lead strategic alignment*, provide the starting point for developing a business-IT alignment strategy. It is the stance of this study that the lack of cognisance of these fundamental variables has led to practitioners of business and IT alignment having difficulty in developing sustainable firm-specific alignment strategies.

1.6. DELINEATIONS AND LIMITATIONS

Figure 1.1 delineates the scope of this study and its positioning relative to the rest of the field of business-IT alignment.

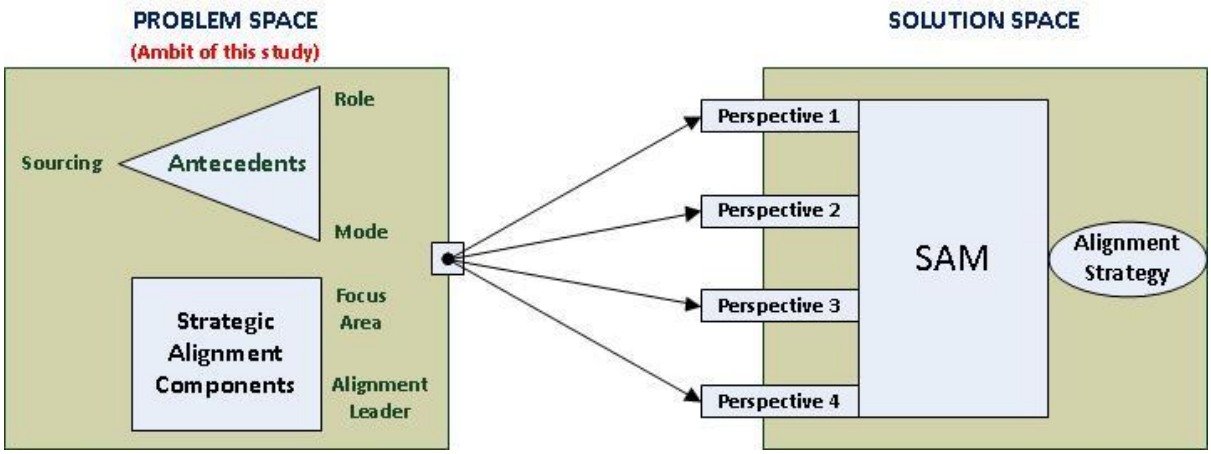

Figure 1.1 Positioning of this study relative to the field of business-IT alignment

While most studies in business-IT alignment operate in the solution space, this study suggests taking a step back and focusing on the problem space. That is, spending more time in understanding and analysing the problem in the context of the organisation. The proposition made is that the reason for business-IT alignment being difficult to implement in practice, is that there is no generic solution that fits all situations. The methodology of this study is to inductively gather certain alignment characteristics of the organisation that would lead the alignment practitioner to a firm-specific alignment strategy.

Due to the fact that this study is introducing the antecedent variables that define the context of alignment, the scope of the study is set to a particular organisation. No attempt has been made to determine how these variables change over time or across different types of organisations, as the focus is on obtaining a first understanding of these variables and how they relate to alignment of business and IT. Although the limiting of the scope of this study to a singular organisation allows a deeper understanding of the dynamics of these variables, it should be understood that not all the results can be directly generalised to other organisations. Therefore the empiric part of this study entails a method to inductively gather the particular alignment characteristics for the organisation undergoing alignment. It would therefore not be expected that these alignment characteristics would be the same for every organisation. For instance, if the *role of the IT function* is measured as a *utility service provider* in this case organisation, this does not necessarily mean that it will measure as utility in another organisation of the same size or industry. However, the general direction of the relationships between the antecedent variables, and the principles of how to use them in defining the boundary conditions for an alignment strategy, should be generalisable.

1.7. DEFINITION OF TERMS

Alignment

In general, alignment refers to act of bringing in line. Specifically, in the literature of business and IT alignment, the word “alignment” is refers to the alignment of business and IT strategies (Venkatraman et al*.,* 1993:143), plans (Kearns & Lederer, (2003:1), processes (Tallon, 2007:227), models (Grant, 2003:159) and domains (Valorinta, 2011:46). In the context of this study, alignment refers to bringing the efforts of the IT function in line with the business of the organisation and vice versa.

Alignment strategy

In the context of business and IT alignment, alignment strategy refers to plans that result from the process of evaluating and aligning business strategy, IT strategy, the business organisation and IT infrastructure and processes (Baets, 1996:156). Alignment strategy, within the context of this study, refers to the plans made to keep the efforts of the IT function supportive of the goals of the organisation within which it operates.

Role of the IT function

The *role of the IT function* is a new variable, introduced in this study, to the field of business and IT alignment. It is defined as the mandate that the organisation in which the IT function operates, imposes on it. There are two extreme roles, namely, a *utility service provider* or a *strategic business partner*. The role of most IT functions involves some combination of these two extremes.

Mode of operation of the IT function

The *mode of operation of the IT function,* also introduced in this study, is defined as the degree of responsiveness with which the IT function executes its functions. There are two extreme modes, namely, *reactive* or *proactive*.

Core IT skills

Although the IT skills required within the IT function of an organisation may vary significantly, and include skills such as administration and management, for the purposes of this study, the core IT skills refer to infrastructure support, software development and desktop support.

Sourcing option of IT

In the field of IT, outsourcing is a more well-known term. Specifically, Valorinta (2011:48) defines IT outsourcing as a decision by an organisation to hand over some of its IT services, assets, or even the entire IT function, to an external organisation for monetary returns over a contractual period. The alternative to outsourcing is to keep IT skills “in-house” meaning within the organisation. In the context of this study, the sourcing option of IT refers to the location of core IT skills relative to the host organisation. The core IT skills maybe kept *in-house* or *outsourced*.

Strategic focus area

In the context of this study, the strategic focus areas are defined as those areas in the organisation from which IT could derive the goals with which it should align itself. Options for strategic focus areas stem from studies in the literature and include: analysing *top-level mission statements* (Reich & Benbasat, 2000:81), analysing *division-level mission statements* (Gyampoh-Vidogah, Moreton & Proverbs, 2003:157), analysing *business processes* (Tallon, 2007:227), monitoring *new and innovative technologies* (Aerts *et al.* 2004:781).

Alignment dimension

This is the broadest classification of alignment approaches found in the literature of business and IT alignment. Alignment approaches are broadly classified into two categories; namely, the *intellectual* dimension and the *social* dimension (Lee et al., 2008:1167; Martin et al., 2005:28; Reich & Benbasat, 2000:82).

Intellectual dimension of alignment

The intellectual dimension of alignment emphasises the content of plans and planning methodologies, such as, inter-related IT and business plans, corporate governance arrangements, internal and external reporting, audit and managerial review, and the use of tools such as the balanced scorecard and enterprise architectural models (Reich & Benbasat, 2000:82).

Social dimension of alignment

The social dimension of alignment concentrates on the people in the organisation: in particular, whether business and IT executives within an organisational unit understand and are committed to the business and IT mission, objectives, and plans and that there exists overt management support for IS, the processes used in business planning for IS, and the communication of plans (Reich & Benbasat, 2000:82).

1.8. ASSUMPTIONS

- When measuring perceptions of the IT function, it was assumed that the exposure of the respondents to the IT function was the same across the organisation. Thus, although the finance function might be more intensive users of technology than HR, no attempt was made to weight the responses according to usage of technology,

- It was assumed that responses about the perception of the IT function were not based on particular successful or failed projects of the past that might have influenced the perceptions of particular segments of the organisation.

1.9. SIGNIFICANCE OF THE STUDY

It is said in problem solving that one should spend more time in the problem-space before moving to the solution-space. This study has attempted to apply this philosophy in addressing the very persistent business-IT alignment problem. The idea is to develop a structured framework that will force the practitioner to thoroughly understand the problem in

the context in which it exists, before attempting to find a solution to it. This is the primary contribution of this study.

In trying to achieve this primary goal, this study introduced to the body of knowledge the *role of the IT function*, the *mode of operation of the IT function* and the *sourcing options of the IT function* as antecedent variables to the alignment of business and IT within the organisation. Within this study, these antecedents are defined and measured in a case organisation. It is suggested that the evaluation of these variables should set the boundary conditions for the business-IT alignment problem.

This study has also introduced the determination of the *strategic focus areas,* or sources within the organisation that provide the goals to which to align, as an important factor to be considered in the alignment process.

Yet another factor that is particular to the culture of the organisation within which the IT function exists is to determine the rules about who should initiate alignment-related actions such as planning, communication and sharing of visions.

Finally, the study shows how all this preliminary information can be used to select an alignment strategy based on the Strategic Alignment Model (SAM).

1.10. BRIEF CHAPTER OVERVIEWS

Chapter 2 describes the overall research design and methodology followed in the four papers.

Chapter 3 presents the first paper. The paper reviews the literature on the field of business and IT alignment. It starts by showing the symptoms that lead to the quest for alignment and that alignment of business and IT is actually a long-standing issue that is consistently a top priority for IT managers. The field is then reviewed with the purpose of determining whether it is mature enough to provide the theoretical basis for practitioners to implement alignment. The paper examines five aspects of the field, namely, benefits of alignment, categorisation of alignment approaches, factors that promote alignment, models of alignment, and finally, time trends of alignment.

Chapter 4 presents the second paper. Having concluded in the review paper, Chapter 3, that the theory base on business and IT alignment is substantive enough to support

implementation of alignment, it is hypothesised that perhaps the elusiveness of a sustainable solution to the alignment problem is due to difficulties in *applying* the theory to the context of the organisation. The paper then uses the basis of problem-solving theory to show the importance of context in problem-solving. This leads to the introduction of the *role of the IT function* as one of the most fundamental firm-specific variables and an antecedent to alignment. The paper then goes on to define, describe and measure the *role of the IT function* within a case organisation.

Chapter 5 presents the third paper. Based on the recommendations of a previous review of the field of business and IT alignment, this paper continues to identify the antecedents of alignment and explore the relationships between them. It introduces two new antecedents, namely, the *mode of operation of the function* and the *sourcing option of the IT function*. The paper shows how they are related to the *role of the IT function* discussed in the previous paper. The paper also demonstrates that combinations of these antecedents can be used to create points of stability that facilitate alignment. These antecedents can therefore be said to set the boundary conditions for business and IT alignment. Finally, the three antecedents are measured for a case organisation and the points of stability recommended for that organisation.

Chapter 6 presents the fourth paper. This paper introduces the determination of *strategic focus areas* within the organisation as key to deriving the goals with which the IT function must align. It further introduces the aspect of *timing,* by determining whether business or IT should initiate certain components of the alignment strategy construct (planning, communication and congruence of visions). These considerations, together with the antecedents of alignment, are finally put together into a framework that could assist an organisation to select a particular Strategic Alignment Model (SAM) perspective. This perspective would set the organisation on its path to developing a firm-specific business-IT alignment strategy.

Chapter 7 is the conclusion of the study; it includes the summary of findings, discussion of conclusions, implications for existing theory and suggestions for future research.

CHAPTER 2: METHOD

Contents:

2.1 Introduction

2.2 Research Design

2.3 Methodology

2.4 Limitations

2.5 Ethical Considerations

2.6 Conclusion

2.1. INTRODUCTION

The main purpose of this study was to shift the focus of the business and IT alignment problem to the *context* of the firm by determining the antecedents of alignment and providing a *guiding framework* for managers to select an appropriate alignment strategy. In order to gather such firm-specific information, it followed naturally that scope of the study should be set to a particular case organisation.

However, the research design had to serve a dual purpose. Firstly, it had to be capable of gathering firm-specific information, and secondly, it had to serve as a simple methodology that could be included in a framework that practitioners could apply easily in practice. Although a *case study* research design would have provided a richer array of corroborating evidence, such as interviews and analyses of organisational documents, the decision to use an *electronic survey* was due to the inclusion of the second criteria. That is, the research design had to also serve as a tested methodology that could easily performed by managers, possibly on a regular basis. Also, the methodology had to be as broadly applicable as possible to be useful as a practical framework. That is, for instance, if no organisational strategy documents were available, or in situations where interviews were impractical.

For the particular case organisation, antecedents such as the *role of the IT function*, the *mode of operation of the IT function* and the appropriate *sourcing option of the IT function* were determined. Other fundamentally important pieces of information for development of an alignment strategy were to determine the areas within the organisation that the IT function could focus on to derive the goals with which to align (*Strategic Focus Areas*). Finally, information was needed about whether business or IT should lead with respect to *strategic planning*, *communication* and *congruence of visions*.

The rest of the chapter describes the research design, methodology, limitations of the method and finally the ethical considerations.

2.2. RESEARCH DESIGN

2.2.1. DESCRIPTION OF OVERALL APPROACH

The overall approach used in this research could most accurately be described as *web-based survey*. One way of describing the research design is through Mouton's (2001:146) classification framework of design types. This framework classifies research design types according to four dimensions. The first dimension ranges from *empirical* to *non-empirical*.

The second dimension classifies the data source as *primary* (new data) or *secondary* (existing data). The third dimension classifies the type of data, ranging from *numeric* to *textual*. The fourth dimension classifies the *degree of control* in design from *low control* to *high control*.

Neuman (1997:7) defines *empirical* evidence as observations that people experience through their senses. Since the *web-based survey* in this study captured the *perceptions* of employees of a case organisation with respect to various characteristics about their IT function, this web-based survey can be classified as *empirical*. Since *new data* was captured and analysed, rather than existing data, the data source for this design is classified as *primary* data. All the questions in the instrument, besides the demographic questions, used a Likert-type scale to measure responses of the respondents. Bertram (2007:1) defines a *Likert scale* as a psychometric response scale aiming to obtain a participant's degree of agreement with a statement by way of an *ordinal scale*. As such, the *type of data* in this study is classified as *numeric*. Finally, the *degree of control* for a web-based survey is regarded as being not as high as an experiment and not as low as ethnographic studies (participatory) research. Mouton (2001:145) therefore describes the degree of control in surveys as a *medium* level of control.

Therefore, according to Mouton's design classification, the survey design is classified as being *empirical*, using *primary*, *numeric* data and of *medium* design control (Mouton, 2001:152).

2.2.2. STRENGTHS AND WEAKNESSES OF THE DESIGN

Mouton (2001:153) mentions that one of the strengths of the survey design method is the potential to generalise to a large population if the appropriate sampling design has been implemented. In this particular study, one of the important aims was to measure the "group think" of the organisation with respect to alignment variables, such as the *role of the IT function*, *mode of operation of the IT function* and the preferred *sourcing option of the IT function,* for the business that the organisation was involved in. Furthermore, it was important to determine whether certain cultural dynamics were at play within sub-groups within the population. For example, did IT staff members have different perspectives of these variables from those of their client colleagues? These generalised opinions of groups and sub-groups supported the use of the survey design over other methods such as interviews with particular members of the organisation or sub-group.

The other strengths of the survey design, mentioned by Mouton (2001:153), are high measurement *reliability* and *validity*. Neuman (1997:138) defines the reliability of an instrument as its dependability in giving the same result each time the same thing is measured. A structured interview method could also provide reliability close to that of a

survey, provided the interviewer kept strictly to the set of questions. However, interviews place a considerable amount of reliance on the discipline of the interviewer to avoid leading the respondent to the desired response. This characteristic of interviews is even more difficult to control if several interviewers are used to cover a large sample size. This aspect of the web-based survey was a significant factor in its selection.

Neuman (1997:141) defines measurement validity as the degree of fit between a construct and indicators of it. He further mentions that an indicator is valid for a particular purpose and definition. Although it is not possible to be absolutely certain that an instrument is measuring exactly what it is intended to measure, two factors in support of the validity of this study are that the instrument was custom-designed for the particular purpose of the study and that it was informed by the literature in its development.

Mouton (2001:153) also mentions two limitations often associated with survey designs. The first is that it is often said to lack depth, in the sense that it does not allow the investigator to probe further if the opportunity presents itself. Since this introductory study on the antecedents of alignment was more concerned with exploring, describing and measuring new antecedent variables for alignment, rather than determining causation, deeper probing was not required. The other limitation that Mouton (2001:153) mentions is that survey data is sometimes sample- and context-specific. However, the whole purpose of this study was to shift the focus of business and IT alignment to the firm. Thus, *rather than finding a generalised solution for business and IT alignment, the idea was to craft an instrument that could be used to extract specific information about the organisation dynamics that could be used as the boundary conditions to develop a firm-specific alignment strategy*.

2.2.3. ALTERNATIVE METHODS CONSIDERED

One of the alternative methods considered that could have provided the information required for this study was a *structured interview*. However, one of the objectives of this study was to get an idea of the “group-think” of the organisation towards various characteristics of its IT function. Therefore, for the perceptions to be representative of the organisation, the minimum sample size of interviewees was computed to be 312 for the population of employees within the organisation. The time required to personally interview 312 employees made this method impractical. Furthermore, the type of information required was a classification of perceptions rather than deep probing.

To meet the above conditions the survey had to be self-administered. Besides overcoming the time constraint, the self-administered survey had the benefit of anonymity. Someone who had a negative opinion about the IT function would generally be more comfortable expressing it anonymously than face to face with an interviewer from the IT function.

The simplest alternative of self-administered surveys, from a technical perspective, would have been a paper-based survey. However, with this method there would have been no way to validate the questionnaire while the respondent was filling in the form. For instance, if the respondent did not answer some questions in the survey, there would be no way to prompt him to do so. Furthermore, this method would require the paper-based responses to be manually captured into electronic format to be analysed. Therefore there would be potential sources of error in incorrect capturing of the data and incompleteness of the data.

This led to the decision to use the web-based self-administered survey, because validation could be administered in real time while the respondent was answering the survey, and the data could be captured directly into electronic format. This method reduced the time of capturing and improved the completeness and quality of the data captured.

2.3. METHODOLOGY

2.3.1. RESEARCH INSTRUMENT

The instrument employed to capture the data is given in Annexure A.

Purpose of the instrument

The idea was to design an instrument that was not only usable for the study of the case organisation, but could also be included as part of the framework to be used by an alignment practitioner within an organisation. In particular, the instrument needed to rapidly identify the boundary conditions of alignment present within the organisation, determine the most effective approach to identifying the business goals with which the IT function should align itself, and finally, to determine norms within the organisation about which function should lead (business or IT) with respect to the different aspects of alignment. Furthermore, the process of gathering and analysing the data had to be efficient enough to extract just the required information from the organisation without being too burdensome to be implemented by practitioners in the field.

Design of the instrument

The instrument is divided into five sections, namely:

- Business demographics

- Role of IT
- Mode of operation of IT
- Resources of IT
- Alignment strategy

The *business demographics* section (section A) attempts to divide the respondents into two main demographics, *position and division*. These demographics would enable the alignment practitioner to determine whether certain cultural dynamics that are typically associated with technical management are at play within the organisation. For example, the *position* demographic could be used to determine whether the typical power play between managerial and technical personnel, identified by Creighton (1990:63), exists within the organisation. The *division* demographic could be used to determine whether there are differences in responses due to division affiliation. For simplicity, this demographic is defined as having just two states; the respondent is classified as being either within the IT function or outside the IT function (client function).

The *Role of IT* section (section B) tries to ascertain the *role of the IT function* within the organisation. However, one could not directly ask the average employee whether he or she felt that the *role of the IT function* should be that of a *utility service provider* or a *business partner,* since his or her response could be influenced by various personal factors, such as, exposure to IT jargon and previous experiences with IT. The *role of the IT function* therefore had to be inferred through a measure that all employees had in common and that was indicative of the role of the IT function within the organisation. The relative preference of employees with respect to the various services provided by IT was the most direct choice of indicator. Of the five services provided, the first three, *network infrastructure, desktop support and procurement of off-the-shelf systems*, are regarded as *utility-type* services, in that they do not create any business differentiation for the host organisation compared with its competitors. For example, if the only technological difference between two organisations was that their IT was running on two different network systems, the way they performed their business would not be affected by technology, since the differences in the two systems would not be perceivable by the employees. The last two of the five services, *creating* and *maintaining custom-suited systems*, on the other hand, do have the potential of creating business differentiation for the organisation. Custom-suited systems that are unique to the organisation can give one organisation a competitive edge over another. The requirement for the *creation and maintenance of custom-suited* systems is therefore an indication of the need for more of a *business partner* relationship between the IT function and the host organisation.

Anticipating that there could be a vast difference between the *current role of the IT function* and the *ideal role of IT function*, each question asked for two Likert-type responses; one for the *current* perception and one for the *ideal* perception. The distinction was required

because the *current* role of the IT function is limited by current environmental factors such as resources. In order to determine the *role of the IT function* that would ideally suit the business, it was important to determine the *ideal* role of the IT function, free from constraints that might have developed over time.

The *Mode of Operation* section (section C) of the instrument measured the required reactivity or proactivity of the IT function within the business setting of the organisation. As with the *role of the IT function*, this question could not be asked directly, since most respondents would reply that the IT function should always act proactively. However, there exists a well-known business philosophy that suggests that support functions such as IT should only *react* to a clear business demand. However, technological innovations occur sporadically and are usually only harnessed timeously, for business purposes, if the organisation is *proactively* looking for them via research and development. These two strong and opposing arguments make the question of *mode of operation* much more complex when applied to the IT support function. Therefore to disguise the intention of the question, while at the same time making the context recognisable to the respondent, two scenarios were presented. Scenario A described a practical situation in which IT was clearly required to behave *reactively*, while scenario B described a *proactive* situation. Both these scenarios were placed on either side of a Likert scale that measured the tendency of the respondent towards a particular scenario. As with the *role of the IT function*, the *mode of operation* questions were also split into a *current* mode of operation and an *ideal* mode of operation.

The *Resources of IT* section (section D) first determines which of the core IT staff the organisation believes should be kept in-house and which should be outsourced in order to keep the business running efficiently. It then reaffirms the required focus of the IT function: administrative or technical. Finally, it attempts to measure the benefits the respondents believe will result from keeping the various IT services *in-house* or *outsourcing* them.

The *Alignment Strategy* section (section E) starts by determining which *approach* the organisation believes to be most effective in order to *derive the goals of alignment*. Options range from traditional approaches, like examining mission statements of the organisation, to self-discovering goals by analysing business processes and looking at the technology horizon. Finally, as a control, not strategising at all was presented as an option. The rest of the instrument attempts to measure whether there is confusion in the organisation about whether business or IT should lead with respect to *strategic planning*, *strategic communication* and *congruence of visions*.

Reliability and validity of the instrument

As mentioned above, Mouton (2001:153) indicates that the reliability of web-based surveys is generally better than other research designs, such as interviews, in that it has the ability of

presenting questions to respondents in a very consistent manner. With regard to the reliability of this particular instrument, Cronbach alpha values were computed in certain scenarios where it was relevant. Tavakol and Dennick (2011:53) explain that the Cronbach Alpha is a measure of the internal consistency of a test or scale. For instance, when analysing the indicators of IT as utility and indicators of IT as a business partner, Cronbach alpha values of 0.78 and 0.84, respectively, were measured. These values are comfortably above the 0.7 limit for good internal consistency.

With regard to the validity of the instrument, there is no conclusive way to be absolutely certain that an instrument measures what it is intended to measure (Neuman, 1997:141). However, the pretesting method that was used for this instrument provided some degree of feedback about its validity. The instrument was exposed to three respondents that were interviewed as they completed the questionnaire. These respondents were questioned about their understanding of each of the questions. The ease and speed with which they the questionnaire was completed also observed. Neuman (1997:141) also points out that at its core, measurement validity refers to how well the conceptual and operational definitions mesh with each other. This pretesting method did provide some confidence that the conceptual and operational definitions were in agreement.

2.3.2. DATA

Population

Schonlau, Fricker and Elliott (2002:37) define a closed population as a population within an organisation that maintains some sort of list of their membership, for example, a list of company employees. The target population in this study consists of all the employees of the case organisation and can therefore be classified as a closed population. At the time of the study, the staff compliment of the case organisation was 1659. A sample frame of the population was provided by a company database administrator who ran a query of all the active employees of the organisation at the time.

Sample

Samples can be broadly classified as *probability* samples or *non-probability* samples. Probability samples are based on principles of randomness from probability theory while non-probability samples are not (Neuman, 1997:204). Schonlau et al. (2002:37) classify samples derived from closed populations as probability samples, as they have well-defined sampling frames that fully represent the target population. Since the invitation email was sent to every employee of the organisation, every employee had an equal opportunity of

responding. The sample used for this study can therefore be considered to be a probability sample.

For a population of 1659 employees, with a confidence level of 95% and a confidence interval of 5%, the minimum sample size was calculated to be 312 responses. The final sample included 324 responses representing a response rate of 20%. Since the web-based survey application included strict validation, all 324 responses were complete, and therefore useable for analysis.

2.3.3. ANALYSIS

The instrument used for this study consisted of several Likert scale questions on a web-based survey. Bertram (2007:1) defines a Likert scale as a psychometric scale that is mainly used to determine the degree of agreement with a statement by way of an *ordinal* scale. It normally presents the respondent with a five-point scale ranging from “strongly disagree” to “strongly agree” with a middle option of “neither agree or disagree”. Although the ranks of the scales have order, the intervals between the scales may not be equal (Sheldon, Fillyaw & Thompson, 1996:222). For instance, “strongly agree” shows more agreement than just “agree” but the interval between “agree” and “strongly agree” may vary from respondent-to-respondent. For ordinal-type data, non-parametric tests, which are based on ranks, are usually used for testing hypotheses and relationships between variables. However, in practice, it is not uncommon to make the assumption of equal intervals between Likert-scale data and perform parametric tests on it.

Friedman Test

Sheldon et al. (1996:221) show that the Friedman test is normally used for analysis of ordinal-scale data. The application of the Friedman test in this particular study involved each respondent being asked his preference of several aspects of a variable with the intention of determining the most dominant aspect. For instance, for the *role of the IT function* variable, respondents were asked for their preferences towards the different services of IT. Each service produced a set of data similar to the different treatments. Using the Friedman test, the relative preferences for the different IT services could be determined. In this scenario the intention was to determine whether the *utility* services were preferred over *custom* services thereby determining the *role of the IT function*. In many cases further differentiation was required between the *current* (as-is) and *ideal* (to-be) opinion of the respondent towards a particular question. Friedman analysis was also used in these situations.

Analysis of Variance (influence of demographic splits)

The Friedman test is usually used to determine statistical differences of measures on more than two groups on *single-factor* designs. Little, Henry and Ammerman (1998:1216) show how two sets of measurements on the same sample can be analysed. In particular, they analyse various statistical methods used to analyse designs with multiple measurements. Littel et al. (1998:1216) conclude by asserting that within the Statistical Analysis System (SAS), mixed linear models can be implemented with the General Linear Model (GLM) procedure of SAS. Therefore, within this study, whenever the effect of the two demographic factors (position and division) was required, the "GLM procedure, Analysis of Variance, Univariate Tests of Hypotheses for Within Subject Effects" was used within the SAS system.

2.3.4. CASE ORGANISATION INFORMATION RELEVANT TO THE ANALYSIS

Although the case organisation requested to be anonymous, there are some firm-specific pieces of information that are necessary for the reader to make sense of the analysis. The organisational information that follows should not infringe on the anonymity requirement because it could apply to any organisation.

The case organisation operates in the financial sector in a role that requires constant research, evaluation and monitoring of the financial institutions operating around it. It is, therefore, very dependent on sophisticated IT systems to provide reliable and timely information. The role of the organisation also does not require it to be competitive. The IT function, within the case organisation, only needs to provide a support function to facilitate its research, evaluation and monitoring functions, and not to provide competitive advantage. The case organisation is also very hierarchical with many levels of management.

One of the impetuses of this study stemmed from a cultural analysis, done within the case organisation, that revealed, amongst other findings, that there was significant discontent within the IT function, and amongst the client-functions of the IT function. Senior IT management wants to make a concerted effort to improve this attitude towards the IT function and desires to become a strategic business partner to executive management.

Some of the management trends within the IT function include, increased outsourcing of IT projects, the desire to improve relations with client functions, to be agile, responsive and cost-driven.

2.4. LIMITATIONS

Mouton (2001:153) mentions two main limitations of surveys are that they are often criticized for lacking depth and that they are usually very sample and firm-specific. It would have been more re-assuring if both a survey and structured interviews were carried out. However, besides drastically increasing the time line of the study, including structured interviews as an instrument would also make the procedure too cumbersome to be part of a framework that could easily be performed by the practitioner of alignment on a regular basis.

With regard to the second limitation of being firm-specific, the ideal design would include many organisations in different strata of business strategy; some organisations in highly competitive environments, some in slightly competitive environments and some in non-competitive environments. However, extending the scope of the study to this extent would be very time and resource extensive. Furthermore, the objective of this study was to point out the importance of *context* in the alignment of business and IT and to introduce the fundamental variables associated with the process. It would therefore be premature to carry out a large scale study before introducing these variables and defining a process of how they could be used in aligning business and IT. However, expanding the scope in this manner would make a viable next-step for future research.

2.5. ETHICAL CONSIDERATIONS

Using the University of Pretoria ethical clearance form as a guideline of ethical considerations, the main ethical considerations were around the *methodology* and the impact on *human respondents*.

2.5.1. METHODOLOGY

The first consideration with regard to the methodology was to do with how the *instrument* was disseminated. The method used in this study was a web-based survey. A database administrator ran a query on the company database to generate a list of all active employees. This list was programmatically read by the survey program that emailed each employee within the organisation an introductory letter with a hyperlink to the web-based survey. Therefore there was little to no room for unethical practices with regard to dissemination of the instrument.

The second consideration with regard to methodology was dissemination of *results*. A selection of dissemination to “academia” was made in the ethical clearance document as the case organisation elected to be anonymous. For this reason no mention of the case organisation has been made in the publishable articles.

2.5.2. HUMAN RESPONDENTS

Ethical considerations with regard to human respondents in the university ethical clearance document referred to the following:

- Informed consent
- Anonymity
- Risks and disadvantages to the respondents
- Consequences to the respondent with regard to participation/non-participation
- Minor subjects
- Personal records

Annexure A shows the email that was sent to the respondents prior to completing the web-based survey. The email informs the respondent about the study, mentions that participation is completely voluntary and mentions that there would be no repercussions to the respondent with regard to participation. Anonymity was implemented through the very nature with which the web-based survey application works. As soon as the respondent completed the questionnaire an entry was made to a database table for the responses without the name of the respondent. The consideration with regard to minors was not applicable because all employees of the case organisation were above 18 years of age. The consideration with regard to personal records was also not applicable because questions in the instrument were not of a personal nature. All questions were about opinions about how the organisation should operate.

2.6. CONCLUSION

Since this is a four-paper dissertation, the method is split according to the objectives of the four papers. The first paper was a review paper and is qualitative in nature. It therefore does not include the quantitative method described above. The method explained in this chapter therefore pertains to the remaining three papers (chapters 4 to 6). Each paper includes data from different parts of the instrument. Paper 2 pertains to data from section B of the instrument (role of the IT function), Paper 3 pertains to data from sections C and D (mode of operation and resources of the IT function, respectively) and Paper 4 pertains to data from section E (Alignment strategy).

CHAPTER 3: PAPER 1 - ALIGNMENT OF BUSINESS AND INFORMATION TECHNOLOGY (IT): A REVIEW OF THE FIELD WITH A FOCUS ON ITS ABILITY TO SUSTAIN IMPLEMENTATION OF ALIGNMENT

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3.9 Discussion

3.1. ABSTRACT

The literature shows that the issue of aligning business and IT is a long-standing issue that is consistently considered a top priority for enabling organisational competitiveness, even though it has proved difficult to obtain. The purpose of this article is therefore to determine whether the field of business and IT alignment is mature enough to provide practitioners with the theoretical basis to implement such an alignment.

In particular it examines whether there is completeness and consensus in the field of business and IT alignment regarding five aspects: the benefits of alignment, categorisation of approaches, factors of alignment, models of alignment and trends of alignment. The approach followed in the study was a review of the literature, which involved summarising and synthesising the literature with respect to the five aspects mentioned above.

The findings on the benefits of alignment show consensus that improved business performance is the most common benefit. Other identified benefits included improved IT effectiveness, improved IT credibility, firm growth, improved IT planning, better strategy execution and improved productivity. There was consensus on the broad classification of approaches into intellectual and social dimensions. Seven sub-classifications of intellectual approaches were identified. Completeness was found in the full spectrum of methods used to identify the factors of alignment. Communication was identified as the most important factor and there appears to be more consensus on social factors than intellectual factors. Three classes of models were identified and three dominant trends over time.

While the articles reviewed in this study range from 1989 to the present, the study does not claim to be exhaustive to the point that every article on the subject of business and IT alignment in that period was found. The articles reviewed should be seen as a sample of the complete set.

3.2. INTRODUCTION

Being well immersed in the information era, most of us have by now become accustomed to the use of information technology (IT) in our personal lives, and can appreciate the value that IT has to offer at first hand. It is therefore no surprise that new information technologies are an integral part of the business world as well (Evans & Hoole, 2005:310). Yet, at the same time, prevalent in the literature are shocking statistics of IT projects that fail to meet the expectations of business. D'Amico (2005:251) reports that 40% of IT projects fail to meet project objectives such as time, budget and quality. The failure rate is reported to go up to 80% for application development projects. Kilov and Sack (2009:98) cite *Computer World* (1999), reporting that "85 percent of IT departments in the US fail to meet their organisations' business objectives", and six years later a very similar percentage was reported (84%). These authors attribute the problems with design and development and the associated losses of finance and customer trust to the proverbial "communication gap" between business and IT experts. Kruger (2012:1) attributes the misalignment between business and IT to this gap, and sees it as the most significant factor of IT project failure.

The literature therefore exhibits symptoms of a significant problem with IT performance, which is largely attributed to a "gap" or a divide between business and IT functions. It follows logically, then, that many in the field of IT management would want to reduce this gap. It is from this perspective that the endeavour to align business and IT was born.

The alignment of business and IT is a long-standing issue (Kruger, 2012:2; Alter, 2008:40; Brown, 2007:1157; Tallon, 2007:227; Valorinta, 2011:46). The earliest mention of the need to align business and IT was over four and a half decades ago in the 1960s (Valorinta, 2011:46). Norton (2002:12) mentions that the "problem of alignment has not been solved for over two decades", which places it at around the early 1980s. Tallon (2007:227) and Brown and Motjolopane (2005:20) mention "over a decade" at the time of their writing, which makes it the early 1990s. It therefore appears that although there is little consensus in the literature about the exact duration of the alignment problem, the problem could conservatively be said to have existed for at least two decades.

Besides the persistence of the business and IT alignment issue, the literature reveals four predominant characteristics. The first characteristic is that alignment of business and IT is seen by many practitioners and researchers as a *top priority* (Alter, 2008:40; Brown & Motjolopane, 2005:20; Brown, 2007:1157; Chen, 2010:9; Jorfi, Nor & Najjar, 2011a:76; Silvius, 2008:11; Singh & Woo, 2009:177). The second characteristic of the alignment issue is *consistency*. Many make mention of the alignment issue as consistently being a priority on the list of Chief Information Officers (CIOs) and other IT managers (Brown, 2007:1157; Reich & Benbasat, 2000:81; Tallon, 2007:227). The third characteristic of the alignment problem is that many believe that alignment of business and IT is *difficult to attain* (Avison, Jones, Powell & Wilson, 2004:223; Grant, 2003:159; Silvius, 2008:11; Tallon, 2007:227; Ullah & Lai, 2011:21). The final characteristic of business and IT alignment is that it is

believed that the organisation *cannot be competitive* without it (Avison et al., 2004:223; Jorfi et al., 2011:76). Therefore the literature shows that the issue of aligning business and IT is a *long-standing issue* that is *consistently* considered a *top priority* for enabling organisational *competitiveness* even though it has proved to be *difficult to obtain*.

The battle to achieve alignment between business and IT has been going on for so long that researchers have almost created a sub-field within the field of IT management. There are even signs of fatigue in the field, as demonstrated by Parkinson (2002:98), who recommends that we should rather direct our efforts at problems that are easier to solve. It appears that many attempts have been made to address the alignment problem over a relatively long time, yet the problem still exists. The situation therefore raises the questions: Have researchers in the field been working cohesively together? Is there consensus on theories and are they clear enough for practitioners to use? This review therefore sets out to determine whether the field is mature enough for practitioners to implement the alignment of business and IT.

3.3. RESEARCH METHOD

In order to meet this objective, the following method was followed. Academic articles were sourced from the following academic platforms and databases: EBSCOhost (Business Source Premier and Academic Search Premier), Emerald, Infotrac, Proquest (American Business Index and Accounting and Tax), Science Direct, SpringerLink, Wiley Science and SABINET ePublications. The key words searched for included: “Business Alignment”, “Information Technology Alignment” and “Alignment of Information Technology and Business”. Over 100 papers were studied and the themes were grouped together in a mind map. The themes that emerged from this process are presented in this paper.

3.4. THE BENEFITS OF BUSINESS AND IT ALIGNMENT

After at least two decades of battling with the problem of alignment, why are researches and practitioners still dedicated to the cause of aligning business and IT? More specifically, what are the alluring benefits that alignment offers?

The literature suggests that by far the most alluring benefit of business-IT alignment is *improved firm performance* (Brown & Motjolopane, 2005:20; Cohen & Toleman, 2006:457; Croteau & Raymond, 2004:178; Dong *et al.*, 2008:348; Garg & Pellissier, 2005:33; Kearns & Lederer, 2003:1; Lee *et al.*, 2008:1167; Raymond & Bergeron, 2008:577; Sanders, 2005:4; Singh & Woo, 2009:177; Tarafdar & Qrunfleh, 2010:107; Wakabayashi, 2008:663). The above studies all claim to empirically establish a positive relationship between alignment and firm performance and define firm performance either as improved financial performance or

increased competitive advantage. Other benefits of alignment include *increased IT effectiveness* or *improved IT credibility* within the organisation (Chen, 2010:9; Lee *et al.*, 2008:1167; Tarafdar & Qrunfleh, 2010:107). Furthermore, Wakabayashi (2008:663) and Raymond and Bergeron (2008:577) report *increased firm growth* as a result of alignment. Chen (2010:9) and Teo and King (1996:309) also report *improved IS planning* as a benefit. Other singular benefits that result from business-IT alignment include *better strategy execution* (Tarafdar & Qrunfleh, 2010:107) and *improved productivity* (Raymond & Bergeron, 2008:577).

The literature also did reveal a few critics of business-IT alignment. Powell (1993:320) argues that business-IT alignment is often used as a mechanism for IT to acquire resources from the organisation. He elaborates that many IT projects are deemed to have strategic importance when they are in fact just operational. Also found in the literature is a small following that are not totally against the principle of business-IT alignment but believe that it is too difficult to achieve and, therefore, a waste of effort. Parkinson (2002:98) points out that the difficulty of getting all parties within the organisation to agree on what is needed to achieve alignment is an obstacle that will always hinder the process. He also argues that the rapid change of IT further opposes any effort made towards alignment and that organisations should rather focus on problems that could be solved. Norton (2002:12) is another author who believes that alignment is too difficult to achieve. He argues that organisations seldom have a clearly defined business strategy and therefore trying to align to it is a pointless exercise. He points out that even when organisations do have a clear strategy defined, it is seldom adequately disseminated throughout the organisation making alignment difficult. The final point that he makes is that the problem of alignment is bigger than the IT function and that it must be addressed from the “enterprise in” rather than “IT out”. That is, alignment should not just be an effort of the IT function because, without support or total dedication from top-level executives, no effort will be made to clarify business strategy or effectively promote it throughout the organisation.

In general, the literature shows that the number of researchers that are for alignment appear to out-number those that are against it. Furthermore the few arguments made against business-IT alignment could be refuted in other ways. For example, most of the arguments against alignment seem to be about the difficulty of achieving alignment. It could therefore be counter-argued that it is all the more reason for researchers to be putting more effort into it rather than abandoning the process.

3.5. CLASSIFICATION OF APPROACHES TO ALIGNMENT

The degree of agreement and completeness of classification within a field can also be seen as indications of the maturity of the field.

3.5.1. INTELLECTUAL VERSUS SOCIAL ALIGNMENT

The literature reveals that perhaps the broadest classification of alignment approaches would be the division into two *dimensions*, namely, the *intellectual dimension* or *social dimension* of alignment. Reich and Benbasat (2000:82) define *the intellectual dimension* of alignment as "the state in which a high-quality set of interrelated IT and business plans exist." Their definition of the *social dimension* is "the state in which business and IT executives within an organizational unit understand and are committed to the business and IT mission, objectives, and plans." Martin *et al.* (2005:28) elaborate on the elements that makeup intellectual and social alignment. They find *intellectual* alignment to "include corporate governance arrangements, strategic plans, internal and external reporting, audit and managerial review, and the use of tools such as the balanced scorecard and enterprise architectural models" and *social* alignment to "include overt management support for IS, the processes used in business planning for IS, and the communication of plans." Lee *et al.* (2008:1169) aptly provide a simple working definition of these concepts in stating that "the intellectual dimension of alignment emphasizes the content of plans and planning methodologies" and "social dimension of alignment concentrates on the people in the organization."

Using these working definitions of alignment approaches, Table 3.1 was created to broadly classify the literature into *intellectual* alignment, *social* alignment and those works that included a *combination* of the two approaches. Also shown in Table 3.1 are sub-categories that emerged within the category of *intellectual* alignment. For instance, a large portion of alignment studies focussed on aligning the *strategy* of the IT function with the *strategy* of the organisation. Similarly, other sub-categories emerged through a focus on planning, business process, governance, enterprise architecture, engineering and project management.

Table 3.1: Classification of alignment approaches

Intellectual Alignment
<u>Strategy:</u> Cragg *et al.* (2002), Phillips & Sherwin (2003), Venkatraman *et al.* (1993), Croteau & Raymond (2004), Avison *et al.* (2004), Aerts *et al.* (2004), Garg & Pellissier (2005), Luftman *et al.* (2006), Byrd *et al.* (2006), Jaffar *et al.* (2007), Brown (2007), Raymond & Bergeron (2008), Dong *et al.* (2008), Tarafdar & Qrunfleh (2010), Weiss & Thorogood (2011), Levy *et al*, (2011), Jorfi *et al.* (2011), Zarrabi & Vahedi (2012), Suh *et al.* (2013) <u>Planning:</u> Newkirk *et al.* (2008), Peak *et al.* (2005), Peak *et al.* (2011), Teo & King (1996), Baets (1996), Kearns & Lederer (2000), Croteau & Bergeron (2001), Kearns & Lederer (2003), Grant (2003), Brown & Motjolopane (2005), Kearns & Sabherwal (2006), Chen *et al.* (2008), Gutierrez *et al.* (2009) <u>Business Process:</u>

Baets (1992), Norton (2002), Cassese (2006), Tallon (2007), Holland & Skarke (2008), de Vries & van Rensburg (2008), Bush *et al.* (2009), Tallon (2011), Lepmets *et al.* (2012), Sanders (2005), Wakabayashi (2008), Alter (2008), Singh & Woo (2009), Cumps *et al.* (2009), Brodbeck *et al.* (2009), Mocnik (2010), Richardson & Mahfouz (2011), Versendaal *et al.* (2013) Governance (IT and business): King (2006), Kashanchi & Toland (2006), Hu & Huang (2005), Huang & Hu (2007), De Haes & Van Grembergen (2009), Chen (2009), Niebecker *et al.* (2010), Abu-Musa (2010), Gordon (2013) Enterprise Architecture: de Vries & van Rensburg (2008), de Vries (2010), Castellanos & Correal (2013) Engineering Approach: Chen *et al.* (2005), Ullah & Lai (2011) Project Management: D'Amico (2005), Chiang & Nunez (2013)
Social Alignment
Reich & Benbasat (2000), Evans (2004), Baker (2004), Taxen (2005), Martin *et al.* (2005), Evans & Hoole (2005), Lee *et al.* (2008), Hartung *et al.* (2000), Wong *et al.* (2012), Reich & Benbasat (2000), Shao *et al.* (2012), Broadbent *et al.* (1994), Baker (2004), Cohen & Toleman (2006), Silvius (2008), Kilov & Sack (2009), Chao & Chandra (2012)
Combination of Intellectual and Social Alignment
Nath (1989), Burn & Szeto (2000), Cassese (2006), Tafti *et al.* (2007), Chen (2010), Valorinta (2011), Cao & Hoffman (2011)

Table 3.1 clearly shows that in the literature more focus has been given to the *intellectual* dimension than the *social* dimension and that even fewer studies considered a combination of the two. It must be pointed out though that a significant number of works focussed on building theory rather than being a holistic practical guide. That is, the goal was often not holist completeness but rather focussing in on some of the deeper dynamics between variables of alignment and, hence, the scatter of approaches.

3.5.2. SUB-CATEGORIES OF INTELLECTUAL ALIGNMENT

Also, observed in the literature was that within the broad category of intellectual alignment several clusters of themes emerged. These themes can be considered as sub-categorisations within the *intellectual* dimension of alignment and are shown in Table 3.1 as

the subheadings of (1) strategy, (2) planning, (3) business process, (4) governance, (5) enterprise architecture, (6) engineering approach and (7) project management approach.

Studies sub-categorised as *strategy* include those studies where the main focus of alignment was on analysing the strategy of the business and developing IT strategies to support them. The process involves mainly breaking down vision and mission statements of business and interpreting them. Cragg *et al.* (2002) for example, used *matching* and *moderation* processes to compare items of business strategy and IT strategy. *Matching* involved the differences between two pairs of related items of business and IT strategies, and *moderation* involves the interaction between each item of business strategy with the corresponding item in IT strategy. The common thread in this sub-category is that alignment is seen to take place at a strategic objective level. It is perhaps the most obvious approach to alignment but it is also the most criticised. The main reason cited being that business does not always have a clearly defined set of strategic objectives for IT to follow and, when they do, they are seldom adequately communicated (Norton, 2002:12).

The *planning* sub-category involved mainly focussing on attempting to understand how planning occurs within the organisation with the intent of aligning the *plans* of IT and business. Peak *et al.* (2011), for example, examine the process of planning within a company using action research and Newkirk *et al.* (2008) looked at the relationship of variables in the planning process.

The *business process* sub-category refers a growing following that believe that IT maps more directly to business processes than to the relatively more general statements in visions and missions. Tallon (2007:227) further suggests that alignment should be tightest around processes that are considered strategically critical to the business. The main thrust of Tallon's argument is that when aligning business and IT, the "type of fit" is more important than the "extent of fit" and that by aligning at a process level more focus is given to the "type of fit".

The *governance* sub-category includes business and IT governance and its implementation through tools such as the Balanced Scorecard used by Hu and Huang (2005; 2007) and the Information Technology Infrastructure Library (ITIL) used by Kashanchi and Toland (2006). The main focus in this group of studies was on controlling the implementation of strategy.

Enterprise architecture approaches are mainly concerned about centralizing IT strategy and control over execution of the IT function within the organisation. Although a significant part of enterprise architecture has to do with governance as shown by de Vries and van Rensburg (2008), and could possibly be merged with that sub-category, the field enterprise architecture is much broader than just governance and has therefore been kept as a separate sub-category.

The *engineering* approaches are very task-oriented approaches that are relatively more prescriptive in how business and IT should be aligned. Approaches such as Chen *et al.* (2005) BITAM (Business IT Alignment Method) is a 12-step method on how to detect and correct misalignment. The focus in these approaches is to provide guidance to practitioners.

The *project management* approach attempts to use the discipline of project management to implement alignment between business and IT. The reasoning being that, since many IT endeavours are managed as projects within organisation, the project management discipline could also be used to implement alignment, especially in the way of project prioritisation that could be aligned to strategic initiatives (Chiang & Nunez, 2013; D'Amico, 2005).

From the sample of studies reviewed in this article, there does appear to be an imbalance of the number of studies that exhibit the intellectual dimension compared with those that exhibit the social dimension. It could be argued that intellectual approaches are more popular because plans and methodologies are perhaps easier to create and change than the perceptions and attitudes of people, which is the focus of the social approaches. It could also be argued that to implement any plan, people are required, which would make social approaches the more effective approach. Therefore, with regard to consensus between the two domains, there are few that would disagree that both intellectual and social dimensions are required for the development and implementation of alignment strategies. From the perspective of completeness, however, there does seem to be room for increasing the number of studies that focus on the social dimension.

3.6. MAIN FACTORS OF ALIGNMENT

One perspective of looking at the role of the factors of alignment is to view alignment as a *process* as in Figure 3.1, with inputs and outputs. From this perspective the *inputs* could be seen as the *factors* that influence the alignment process and the *outputs* would be the *benefits* of alignment such as improved firm performance, increased firm growth and improved IT effectiveness (as mentioned above).

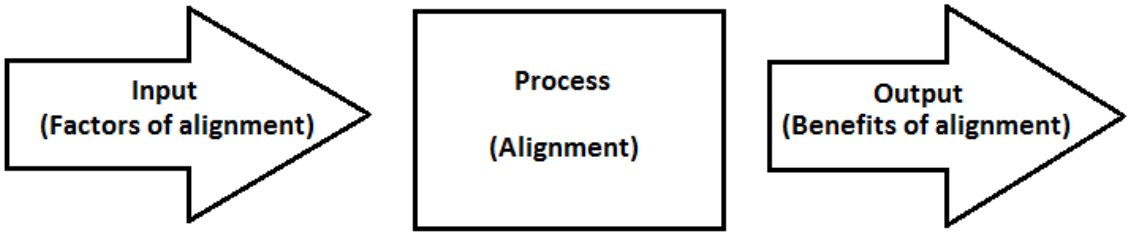

Figure 3.1: Alignment as a process [own compilation]

The literature shows several studies in which researchers attempt to determine various factors that could influence business-IT alignment (Brodbeck *et al.*, 2009; Brown & Motjolopane, 2005; Brown, 2007; Chen, 2010; Gutierrez *et al.*, 2009; Hartung *et al.*, 2000; Jorfi & Jorfi, 2011; Jorfi *et al.*, 2011; Kilov & Sack, 2009; Nath, 1989; Reich & Benbasat, 2000; Tarafdar & Qrunfleh, 2010; Wong *et al.*, 2012). In analysing the approaches that

researchers have used in determining the factors of alignment three approaches emerge as dominant. The first approach that was observed could be termed the "First Principles Approach" where the researcher starts from scratch. A good example of this category is Evans and Hoole (2005) where a literature study, survey and interview were done in order to explore the dominant factors of alignment. The survey, in particular, required the respondents to identify 25 factors and then rank the top ten. That is, starting from scratch in the sense that they allow the respondents to broadly brainstorm factors and then filter down to the most dominant ones. The second approach observed could be termed "Practice-to-Confirmation" where the researcher starts with factors that are observed in practice and then attempts to empirically test whether they influence alignment. Reich and Benbasat (2000) for example start with four factors of alignment, namely, (1) shared domain knowledge between business and IT executives, (2) IT implementation success, (3) communication between business and IT executives, and (4) connections between business and IT planning processes. They then operationalize alignment as a dependent variable and show empirically that the factors have a positive influence on alignment. These two types often become the seminal studies for the third approach which could be termed the "Build-on-Literature". In this approach the researcher starts with factors identified in a seminal study and "build-on" that literature by either confirming it empirically or using it to further some other objective. Brown and Motjolopane (2005) and Brown (2007) use ideas spawned by Reich and Benbasat (2000) in their case studies to confirm factors like (1) integration of business and IT planning, (2) rational adaptation of planning, (3) IT implementation success and (4) IT managerial resources. Therefore, the literature shows that with regard to the approaches used in determination of factors of alignment, the field exhibits a significant degree of completeness.

With regard to consensus of the factors of alignment, Table 3.2 may give some indication. The table was created by taking a simple count of factors identified in the various studies in this review. The names of the factors in the studies were sometimes changed to more commonly used names in the literature when it was found that the gist of a factor matched another.

Table 3.2: Occurrences of alignment factors observed in this review

Alignment Factor	Count	Dimension
Communication	12	Social
IT staff skills and attitude	9	Social
Partnering relationships between IT and business	6	Social
Governance	5	Intellectual
Shared domain knowledge between IT and business	4	Social
Integration of business and IT planning	3	Intellectual
Educating upper management about IT	3	Social
Upper management commitment to IT	2	Social
Improving IT infrastructure	2	Intellectual
IT architecture	2	Intellectual
IT implementation success	1	Intellectual
Strong set of organisational goals concerning IT	1	Intellectual

Behavioural and cultural issues	1	Social
Involvement of IT manager in strategy	1	Social
Negative attitude towards IT function	1	Social
Rational adaptation of IT Planning	1	Intellectual
IT managerial resources	1	Intellectual
Creating and improving strategic applications	1	Intellectual
Sourcing	1	Intellectual
IT flexibility	1	Intellectual
Employee trust	1	Social
Total	59	

From Table 3.2 it can be seen that *communication* is the most commonly considered factor. In most studies communication is referred to as communication between IT and business executives and in others the reference is between the IT and business functions. The finding emphasizes that, although communication is often considered common sense, the power of its influence should not be underestimated. Kilov and Sack (2009:98) and others make reference of “the proverbial communication gap between business and IT experts”. In particular, they point out that in order to communicate effectively people should use the same *terms* and the same system of *concepts*. A significant reason for the communication gap is because the terms and concepts in the field of IT are not generally used and understood by business staff. This lack of usage of the same terms and concepts stems from absence of the “shared domain knowledge” referred to by (Reich & Benbasat, 2000:84). This is consistent with their correlation of low levels of shared domain knowledge and poor communication. That is, the less knowledge you have in common, the less likely you are to communicate.

The second most common factor identified was IT staff skills and attitude. Although, IT *skills* fall under the *intellectual* dimension of alignment, *attitude* falls under the *social* dimension. *Partnering relationships* between business and IT leaders is also a social factor. It is interesting to note that the top three factors of alignment in Table 3.2 are related to the *social* dimension while Table 3.1 shows a distinctly greater number of studies that are explicitly directed to the *intellectual* dimension of alignment. One could infer from this that although the social dimension studies are fewer in number there is greater consensus on the factors that lead to alignment. With the intellectual dimension, on the other hand, the literature shows a much wider spread of factors. Practitioners may therefore experience more difficulty deciding which ones to focus on in a particular firm context.

Therefore in analysing the approaches used in determining the main factors of alignment, the literature shows that the full gambit of approaches has been used; first principles, practice-to-confirmation and build-on-literature. From the perspective of approaches used, the field could be said to demonstrate completeness. With regard to consensus, there is relatively high consensus that *communication* is a very influential factor in business and IT alignment and that the social factors are generally highly regarded as influential factors.

3.7. ANALYSIS OF BUSINESS-IT ALIGNMENT MODELS

Of the 93 business-IT alignment studies reviewed, 21 were found where the authors expressed their findings graphically in terms of a model. On examination of these models it was found that they were mainly of three categories, namely, (1) models based on the Strategic Alignment Model (SAM), (2) models with Performance as the dependent variable, and (3) Factor models that investigate different factors that lead to alignment.

3.7.1. MODELS BASED ON SAM

The literature shows that the Strategic Alignment Model (SAM) of (Henderson & Venkatraman, 1989:14) is arguably one of the most widely used and cited models in business-IT alignment. Of the 21 models examined in this study, 5 were based on SAM and at least 15 cited the model.

In order to analyse and synthesise how other researchers have used SAM, it is necessary to briefly describe the model. The SAM, shown in Figure 3.2 below, is a conceptual model developed when researchers in the field realised the potential of IT of being more than just a support function but rather a mechanism of creating strategic advantage (Luftman & Brier, 1999:110; Venkatraman *et al.*, 1993:139). The model was therefore designed to integrate the internal and external environments while simultaneously integrating IT and business functions. It therefore conceptually divides the organisation into four domains that need to be aligned to each other. These are (1) *business strategy*, (2) *organizational infrastructure and processes*, (3) *I/T strategy* and (4) *I/S architectures and processes*. Each domain is further made of three components as indicated in Figure 3.2.

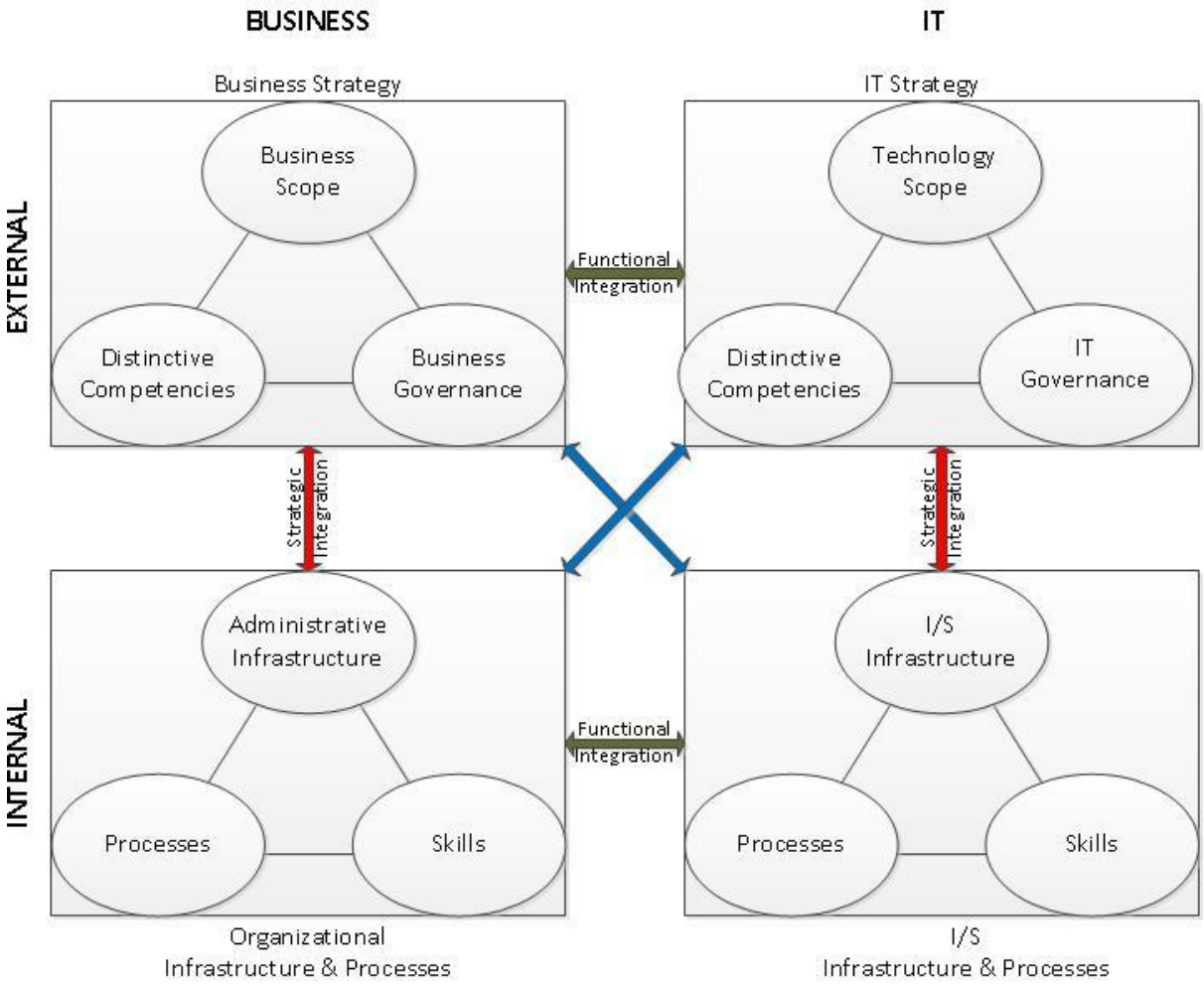

Figure 3.2: The Strategic Alignment Model (SAM) **(Henderson & Venkatraman, 1989:14)**

The literature also reveals that those researchers that have based their models on SAM have done so in one of two ways. They have either tried to transform the conceptual value of SAM into practical value or they have extended the SAM conceptually by revealing more micro-level dynamics.

The work by Avison *et al.* (2004) falls into the first category in that they attempt to harness the conceptual value of the SAM by creating a practical framework that would enable technology managers to determine current levels of alignment and also monitor and change alignment methods. They used data from completed projects in the financial services context and applied it to the SAM. Their conclusion was that the SAM has both conceptual and practical value through the use of their framework. Croteau and Raymond (2004) also fall into this category; however, they focus on the top two quadrants in Figure 3.2, namely, *Business Strategy* and *IT Strategy*. In particular, they focus on the components of *Distinctive Competencies* in these domains renaming them to *Strategic Competencies* and *IT Competencies*. They then empirically establish a positive relationship between *Strategic Competencies* and *IT Competencies* and firm *Performance*, thereby showing the practical value of the SAM in improving firm performance.

In contrast to the above two models the work by Aerts *et al.* (2004) extends the main domains of the SAM, conceptually. As shown in Figure 3.2, the SAM has two distinct domains that are shown column-wise. These are the *business domain* and the *IT domain*. Aerts *et al.* (2004:785) expands this to three domains by splitting up the *IT domain* into the A*pplication Software domain* and *ICT Platform domain*. They refer to the A*pplication Software domain* as the development of software components and their interactions which is confined to the discipline of computer science. The *ICT Platform domain* refers to computers, networks, peripherals, operating systems and database administration systems and falls into the discipline of computer systems engineering. This distinction of the two domains has evolved over the time from which SAM was developed, in that, IT systems have become more distributed over networks within the organisation and across the world (via the internet). However, the principle established in SAM of keeping all domains simultaneously aligned, still applies. Also in this second category of extending the conceptual value of SAM, is the model of Kashanchi and Toland (2006:343) which extends the lower right quadrant of the SAM in Figure 3.2 to reveal more micro-level detail. They make the connection that the relatively new disciplines embodied in the Information Technology Infrastructure Library (ITIL) have the potential to detail the *IT Infrastructure and Processes* quadrant of SAM. Tallon (2007:227), on the other hand, shifts the alignment focus from a *firm level* to a *process level* arguing that IT could add more value to the goals of the organisation by aligning to the processes within the organisation rather than the strategy of the firm as a whole.

This review shows that the SAM is often used as a starting point of many researchers' studies that are focused on improving business and IT alignment. The above studies also show that the SAM appears relatively durable over the last three decades in that although the technology has changed significantly during this period the conceptual principles in the model are still generic enough to be applicable.

3.7.2. MODELS WITH PERFORMANCE AS A DEPENDENT VARIABLE

Of the 21 models analysed in this study, 9 were found with *business performance* as a *dependent* variable. All nine models were based on empirical studies that attempted to establish whether alignment of *business* and *IT* resulted in increased business performance. Amongst these models a common thread was that the *independent* variables included some *aspect of business* being aligned with some *aspect of IT*.

Of these 9 models, 3 involved *business strategy* being aligned with *IT strategy* as a common thread. Byrd *et al.* (2006) explored the relationship between *IT investment* as an independent variable and *business performance* as a dependent variable. In this model the *alignment* of business strategy and IT strategy was used as a moderator variable of this relationship. Cao and Hoffman (2011) used *alignment* of business strategy and IT strategy as independent variable with *business performance* as the dependent variable. They moderate the relationship with the *years of association* between the general manager and operational manager. Dong *et al.* (2008) look at *alignment* of business strategy and IT strategy as independent variable with *business performance* and *IT performance* as separate dependent variables. All three studies showed *alignment* of business and IT

strategies resulted in increased *business performance*. Other interesting findings in this set of studies were that *alignment* of business strategy and IT strategy was a better predictor of *business performance* than *business strategy* alone. Also, *investment in IT* was no guarantee of superior *business performance*, however, *alignment* of business and IT strategies did improve business performance.

Of the remaining six models, five aligned various other aspects of business and IT as independent variables to create improved business performance (shown in Table 3.3).

Table 3.3: The various aspects of IT and business that were aligned per model

Author (s)	IT aspect	Business aspect
Kearns & Lederer (2003)	CIO participation in business plan	CEO participation in IT plan
Croteau & Raymond (2004)	IT competencies	Strategic competencies
Garg & Pellissier (2005)	Use of IT for assessment of business uncertainty	Environmental uncertainty
Cohen & Toleman (2006)	IT understanding of business, IT Vision, Commitment	Business understanding IT, Business Vision, Commitment
Raymond & Bergeron (2008)	e-Business Capabilities (e-Commerce,e-Communication,e-Intelligence,e-Collaboration)	Strategic Orientation (defender, analyser, prospector)

In all of the models included in Table 3.3, alignment of the various aspects of IT and business empirically showed improved business performance.

The last of the nine models in this category of models with performance as a dependent variable was that of Lee *et al.* (2008:1172). This model was unique in that it was the only model that empirically considered *social alignment* together with *technical alignment* as independent variables. They also were able to empirically show that social and technical alignment was associated with improved business performance.

Therefore the literature shows that alignment of business and IT has been associated with improved business performance in a significant number of studies.

3.7.3. FACTOR MODELS

The last category of business-IT alignment models observed in the literature is a category that can be termed “Factor Models”. These are models where the *dependent* variable is *business-IT alignment* and the objective is to determine which *factors* (independent variables) would lead to successful business-IT alignment. Of the 21 models in this study, six

were classified as factor models. The factors they considered were evenly split between social and intellectual factors.

Among the factor models that addressed the *social* aspect of alignment is that of Martin *et al.* (2005:30) who focussed on factors such as management support, business planning style and business planning communication by qualitatively examining the cases of six government agencies. Wong *et al.* (2012) also looked at the social aspect of alignment but focussed on factors such as employee trust, employee knowledge and employee communication using quantitative methods. They showed that the employee trust and knowledge was associated with the alignment dependent variable but only through the employee communication variable. Holland and Skarke (2008) looked at a combination of *social factors* such as cooperation of C-level executives, and *intellectual factors* such as matching business processes to IT applications and IT processes to supporting architecture.

Addressing the *intellectual* aspect were factor models, such as that of Peak *et al.* (2005:638), that looked particularly at creating a framework for integrating *IT Planning* and *Corporate Planning*. Jorfi *et al.* (2011b) considered *IT Flexibility* and *IT Capability* as factors of alignment. Jorfi and Jorfi (2011:1612) followed this shortly afterwards with another model with *IT Flexibility*, *IT Capability* and *Communications Effectiveness* as separate independent variables but with *Strategic IS Planning* as a moderator variable.

The literature therefore shows that there are a considerable number of factor models and that there is also considerable variation in the factors used to create business-IT alignment. Also the appearance of an increasing number this type of model (with alignment as the dependent variable rather than performance) could mean that researchers are becoming less concerned about whether alignment of business and IT would lead to improved firm performance. In other words, improved firm performance is gradually being associated with alignment. Therefore, rather than re-affirming performance benefit, the focus is turning to what needs to be done to create business-IT alignment.

3.8. TIME TREND OF ALIGNMENT

As mentioned, the endeavour to align business and IT has been going on for at least two decades and, in that time, the literature reveals that a few trends have emerged. At least three dominant trends can be identified in the literature. These trends have to do with changes to the *goal of the alignment process,* changes to the *role of IT* within the organisation, and the move to *fusion*.

3.8.1. CHANGES TO THE GOAL OF THE ALIGNMENT PROCESS

In the early stages of aligning business and IT the idea was to get business and IT to work together to support a common strategy. The goal was to reach an *aligned state* so that productivity and firm performance would improve. However, the endurance of the alignment problem indicates that the situation is more complex than was originally thought. Brown

(2007:1167) observes that misalignment can occur from multiple sources that continuously vary depending on the various strategic decisions made. She therefore aptly summarises the situation as a movement away from the goal of an *aligned state* to a *continuous striving for alignment*. Venkatraman *et al.* (1993:139) in their explanation of the Strategic Alignment Model (SAM) indicate that the organisation's ability to leverage IT functionality requires a dynamic administrative process that continuously aligns the business and IT domains. This sentiment is re-iterated by (Wakabayashi, 2008:663-679) who mentions that strategic alignment occurs through continuous adaptation and organisational change. This dynamic nature of the alignment problem could possibly explain the endurance of the problem and why practitioners have been having difficultly implementing alignment. That is, maybe the reason for the endurance of the alignment problem is not because the body of knowledge on business-IT alignment is not complete enough, but rather that the details of the alignment problem keep changing.

3.8.2. CHANGES IN THE ROLE OF IT

In most companies, except those whose core business output is technology itself, the role of IT is often seen as a *support function* to the core business. Venkatraman *et al.* (1993:139) observe that IT has evolved from a traditional back-office support function to a more strategic central role within the organisation. Especially since the ushering in of the technology era, technology has often been seen as the *driver* of business strategy. Phillips and Sherwin (2003:66) observe in their study that, in the financial sector, technology is the *key driver* in enabling financial institutions to reach their potential. Holland and Skarke (2008:48) go as far as saying that IT must lead – not just follow – business innovation initiatives. Therefore the second trend found has been a move to upgrade the role played by IT from a *support function* to a *strategic partner*.

3.8.3. ALIGNMENT TO FUSION

The third trend that has been propagated is the notion of *fusion*. The main argument is that the alignment process is often a "sequential development of strategies and a sequential operationalization" that has become too slow in the modern business environment (Smaczny, 2001:797). He explains that any previous alignment successes, such as the Strategic Alignment Model (SAM), were possible because the business environments were more stable at the time. He therefore suggests that business and IT strategies are developed and implemented simultaneously. Hence the coining of the term "fusion" where business and IT strategies are integrated to such an extent that there is no distinction between the two and they appear to be inextricably *fused*. Since then the term has been used in the literature whenever researchers needed to emphasise the "coming together" of business and IT or to refer to the simultaneous nature of processes. For example, Evans (2004:303) define fusion as the "process by which the elements of the IT function and the rest of the business work together to achieve a common goal". Others like Gutierrez *et al.* (2009:197) and Brown (2007:1158) focus on the simultaneous aspect concluding that a

simultaneous strategy will lead to more effective use of IT and therefore better levels of alignment. Evans and Hoole (2005) take the concept further by looking at how organisational development can contribute towards fusion.

It should, however, be pointed out that the Smaczny (2001:797) article may appear to challenge the concept of alignment with a title of “Is alignment between business and information technology the appropriate paradigm to manage IT in today’s organisations?” In particular it questions the validity of the Strategic Alignment Model (SAM) citing mainly that SAM is sequential in nature. However, it could be argued that SAM is a conceptual model making no prescription on the sequence of events. A significant part of SAM is to bring together the business and IT domains which perfectly supports the “coming together” aspect of the term fusion. As for the “simultaneous” aspect, it should be possible to implement SAM in such a way that business and IT strategies can be developed and implemented simultaneously. To summarise, although the tone of the Smaczny (2001) article, and perhaps the intention as well, places *fusion* and *alignment* as diametrically opposed concepts, there seems to be no reason why they should be.

Therefore, amongst the time trends of the business and IT alignment, it seems that researchers are in general consensus of the adjustments that have had to be made over time.

3.9. DISCUSSION

The poor performance of IT in meeting the expectation of business is largely attributed to IT not being aligned to the needs of business. Researchers and practitioners of business management have understandably made alignment of business and IT a top priority, yet in practice, the problem of aligning business and IT seems to be surprisingly enduring. This review therefore set out to determine the maturity of the field of business and IT alignment. In doing so various aspects of the field were reviewed, namely, the benefits of alignment, the approaches used, the factors of alignment, the models developed and the trends that have emerged over time.

The findings with regard to the *benefits of alignment* show definite consensus on the benefit of firm performance as a result of alignment. Other benefits included improved IT effectiveness, improved IT credibility, firm growth, improved IT planning, better strategy execution and improved productivity. Generally there appears to be consensus that the benefits of business IT alignment outweigh the difficulties in achieving it. The findings with regard to the *classification of approaches* show significant consensus on the broad classifications of intellectual and social alignment. In the process Table 3.1 was synthesised showing a disproportionate favour towards intellectual approaches. Also, within the intellectual category seven sub-categories of approaches emerged. These were approaches to do with strategy, planning, business process, governance, enterprise architecture, engineering and project management. The social approaches reported were too few in

number to generalize into sub-categories. Findings of the determination of the *main factors of alignment* showed completeness in a full spectrum of methods used that include “first-principles” methods, “practice-to-confirmation” methods, and “build-on-literature” methods. There is significant consensus on the communication between business and IT being the most important factor of alignment. Table 3.2 was also synthesised from the literature and could be indicative of the relative importance of the factors of alignment. Table 3.2 also alludes to the finding that social factors appear more dominant than intellectual factors, despite the greater number of intellectual studies in this sample. This may indicate a greater consensus in the social dimension of alignment. Findings on the *analysis of models* showed the emergence of three types of models, namely models based on SAM, models with performance as a dependent variable, and factor models. It was found that after three decades SAM is a surprisingly durable model and is often used as a starting point for researchers to build on. Part of its durability is attributed to the fact that it is conceptual and not significantly affected by the changes in technology. The models with performance as a dependent variable show that organisational performance is an established benefit of alignment within the field. The growing number of factor models shows a movement away from the re-affirmation of performance as a benefit of alignment, to a focus on how to create alignment. Finally, the findings with regard to the *trends of business-IT alignment* show that there appears to be three dominant trends. The first trend is a shift in the goal of alignment from a *state* to a *continuous process*. The second is a change in the role of IT from a *support function* to *strategic partner*. The third trend is a movement from *separate* strategizing and planning to *fusion*.

The findings observed, above, expose several avenues for further research. Firstly, correction of the disproportionate distribution of intellectual and social studies by increasing the number of alignment studies in the social dimension. Secondly, further investigation is required on whether there is greater consensus in the social domain and why this is so. Third, continue with studies on how to create alignment rather than re-affirm the benefits of alignment. Fourth, determine ways on how to promote IT from a support function to a business partner, and finally, determine how to make the fusion of business and IT strategizing practical.

This article contributes to the body of knowledge on business and IT alignment by summarising and synthesising different aspects of the field with the intent of determining whether the field is mature enough for practitioners implement alignment. In particular, whether there is completeness and consensus in the different aspects of the field. The results have shown that there is a relatively high degree of completeness in the different aspects of the field except possibly for the disproportionate distribution of intellectual and social approaches. There is also general consensus amongst researchers on the different aspects of the field. This can be seen in endurance of seminal models such as SAM and agreement on broad categorisations and factors of alignment. The field can generally be said to be relatively mature and capable of supporting implementation of alignment. Therefore, the high failure rate of IT projects in practice is possibly attributed to the differences in the context of the firms and difficulties in applying the body of knowledge.

CHAPTER 4: PAPER 2 - INVESTIGATING THE ROLE OF THE INFORMATION TECHNOLOGY (IT) AS AN ANTECEDENT TO BUSINESS AND IT ALIGNMENT

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4.1. ABSTRACT

The literature shows that despite an extensive theory base, the alignment of business and IT remains an elusive goal. Theory on problem solving alludes to the solution being in the context of problem. Since the role of the IT function is one of the most fundamental firm-specific variables, the purpose of this study is therefore to establish the *role of the IT function* within the organisation (utility service vs business partner) as an antecedent to the problem of aligning business and IT by demonstrating how it can be measured and interpreted as the pre-conditions to alignment. This paper further demonstrates how it can be measured and interpreted to make fundamental decisions about alignment in the context of the firm. The research started with a review of the literature to investigate the reason for the poor implementation of business and IT alignment. This was followed with a survey deployed within a case organisation to measure the role of the IT function and make alignment decisions based on the measurement. The findings show that, within the organisation observed, the role of the IT function was measured to be that of a utility service provider. Interestingly, the ideal role of the IT function was also measured as utility. This measurement was consistent across the demographics of position and division within the case organisation. The finding was contradictory to what one would expect for an organisation that is heavily dependent on IT. It is also contradictory to the general strategy of the IT function, within the case organisation, to become a strategic partner. Theory-wise the findings show that it is very plausible that an organisation could have many personnel, within its ranks, that have an unclear, and even opposing, perception of the role of the IT function within the organisation. One of the limitations of this type of study is that, because it is tightly related to the firm, not all the results can be directly generalised. What can be generalised, however, is the identification of the role of the IT function as an antecedent variable to alignment, the methodology of measurement and analysis, and the interpretation of the results for improving alignment.

4.2. INTRODUCTION

The solution to the problem of aligning business and IT has been an elusive goal for many IT practitioners (Chen, 2010:9; Jorfi *et al.*, 2011:76; Tallon, 2007:227; Tallon, 2011:9). The problem persists despite there being an extensive theory base for practitioners to draw from (Chapter 3). The literature shows that most research on business and IT alignment approaches the issue directly. Approaches such as aligning the *strategies* of business and IT (Luftman *et al.*, 2006; Suh *et al.*, 2013; Tarafdar & Qrunfleh, 2010; Weiss & Thorogood, 2011), aligning *planning* of business and IT (Gutierrez *et al.*, 2009; Newkirk *et al.*, 2008; Peak *et al.*, 2011), examining *business processes* as sources of alignment (Holland & Skarke, 2008; Tallon, 2007; Wakabayashi, 2008), formalising *governance* (Chen, 2009; Gordon, 2013; Kashanchi & Toland, 2006; Niebecker *et al.*, 2010), implementing alignment through *enterprise architecture* (Castellanos & Correal, 2013; de Vries & van Rensburg, 2008; de Vries, 2010), using *engineering* methods (Chen *et al.*, 2005; Chiang & Nunez, 2013; D'Amico, 2005; Ullah & Lai, 2011), and *project management* approaches (Chiang & Nunez, 2013; D'Amico, 2005). The approach of this study is to take a step back and start to look at the problem of why alignment of business and IT is still elusive in practice despite extensive research.

Problem-solving theory suggests that considering the *context* of a problem can be helpful in determining the solution (Augier *et al.*, 2001:125; Jonassen, 2000:68; Kokinov & Yoveva, 1996:1). It follows naturally, then, that with regard to the problem of aligning business and IT, others would see the connection to context as a viable solution. Karpovsky and Galliers (2015:1) suggest that we “go beyond abstract macro analysis of alignment processes and consider more micro practices of alignment”. They mention that there is limited knowledge of what “organisational actors actually do” on a daily basis with regard to alignment. Mpazanje et al. (2013:1) also suggest that we deepen our understanding of IS management by exploring and describing “as-lived” experiences of stakeholders of IS projects. In the vein of contextualizing the problem of business and IT alignment, and as a start to this new approach, this study attempts to answer a fundamental question that should precede any attempt to align business and IT. That is, what is the mandate or role that the organisation has given to the IT function?

Premkumar and King (1992:99) recognised that the role of IT varies from one organisation to another and that IT managers would have to accommodate for differences with regard to IS planning and organisational support. This article aims to re-ignite the value of the role of IT variable and to associate it with alignment. Furthermore, an attempt is made to modify the way that the variable is operationalized.

The practical result of an IT function not clearly understanding its role within the organisation, or if the role is not clearly seen by its client functions, can leave the IT function in a very confused state. The problem is subtle and elusive in that the IT function can exist in this confused state without it knowing that it is confused. The repercussions of an IT function

not having a clear understanding of its role may have a significant influence on its strategies, on its human resource composition and on its mode of operation. The academic importance of this study is that it introduces the *role of the IT function* as an antecedent variable to existing models of business and IT alignment and leads to the understanding of the deeper dynamics involved in the situation.

The literature with respect to the role of the IT function within the organisation shows two extreme views, namely, IT as a *utility service provider* and IT as a *strategic business partner*. The *utility view* basically portrays the IT function as a provider of utility services similar to water, electricity or natural gas (Bartholomew, 2005:64; Bhandari, 2005:1). That is, IT services are provided on demand, when and where it is needed and payment is based on what is used. In practice, these utility services would entail IT carrying out the basic functions such as establishing a network infrastructure within the organisation, setting up an email system and installing software products purchased off-the-shelf. The *strategic-business-partner-view*, on the other extreme, is one that recognises that technological innovation cannot be turned on and off like a tap; it emerges as technologists are in close interaction with business strategists and operational personnel (Venkatraman *et al.*, 1993:139). In practice this would mean an IT function that is innovatively focussed, that is involved early in corporate strategy, that has the skillset to create custom-suited solutions, and that can bring the strategies and solutions together. However, it is quite reasonable to theorise that the role of the IT function within the organisation may not be at either of the extremes but could exist on a continuum anywhere between these two extreme views.

The main purpose of this article is therefore to acquire a deeper understanding of the *role of the IT function* within the organisation as an antecedent to the problem of aligning business and IT. In particular, this study suggests how the *role of the IT function* could be measured within a case organisation and explores some of the deeper dynamics that are at play. Finally, it shows how information about the role of the IT function can be used as pre-conditions for a business and IT alignment strategy.

The research questions used in the measurement of the *role of the IT function* within the case organisation were as follows:

- Currently, what is the predominant *role of the IT function* (utility service provider or business partner)?
- Is there a difference between the current and ideal perceptions of the *role of the IT function*?
- Does the perception of the *role of the IT function* vary across the positions of the employees?
- Does the perception of the *role of the IT function* vary whether an employee is part of the IT function or part of a client function?

The rest of the article is structured into four main sections. First, a review is done that includes an overview of business and IT alignment, the use of context in problem solving and the *role of the IT function* as firm-specific variable. This is followed by a description of the research design, a report of the findings and, finally, a discussion of the findings.

4.3. AN OVERVIEW OF BUSINESS AND IT ALIGNMENT THEORY

4.3.1. THE NEED FOR BUSINESS AND IT ALIGNMENT

The literature shows that the need for business and IT alignment appears to be sustained by *push* and *pull* forces at the same time. It is *pushed* by drivers that, if not adhered to, detract from the profitability of business, and *pulled* by alluring benefits that promise improved business performance.

Negative impact on profitability

One of the main drivers of business and IT alignment stems from the disturbing statistics of high failure rates of IT projects while, at the same time, businesses are becoming increasingly dependent on IT (Evans & Hoole, 2005:310). D'Amico (2005:251) mentions IT project failure rates of 40%, going up to 80% in the case of application development projects. Kilov and Sack (2009:98) provide validation for these high failure estimates by referring to issues of *Computer World* that reported failures at 85% in 1999 and 84% in 2005. They further ascribe the problems in the application development process to a 'communication gap' that exists between business and IT experts. Evans and Hoole (2005:310) refer to it as an 'expectation gap' and claim that this gap is the main reason for the poor reputation of IT. Kearns and Lederer (2000:265) allude to a 'lack of shared understanding' between business and IT professionals when it comes to organisational planning. Evans (2004:303) also highlights the fact that the situation leads to a downward spiral for IT. The relationship between business and IT deteriorates because IT fails to meet the expectations of business and, conversely, many projects result in failure because of poor relationships between business and IT personnel. Kruger (2012:1) attributes the misalignment between business and IT to this gap, and sees it as the most significant factor of IT project failure. It therefore stands to reason that managers would want to reduce this 'gap'. The reduction of this gap has become the main driver for the need for business and IT alignment.

Alluring benefits of alignment:

The other reason that business and IT alignment has become such a sought after state to achieve is that it is *pulled* by alluring benefits (Kruger, 2012:2). Chapter 3 shows that the most alluring benefit for practitioners is improved firm performance. This is followed by

improved IT effectiveness and credibility, increased firm growth, improved IS planning, strategy execution, and productivity.

Therefore, the endeavour to overcome the above-mentioned high project failure rates, while at the same time, being attracted by benefits such as improved firm performance, have kept managers dedicated to the goal of achieving alignment between business and IT.

4.3.2. MUCH RESEARCH HAS BEEN DONE BUT THE PROBLEM PERSISTS

Chapter 3 also shows that the alignment of business and IT is a long-standing issue that has a longevity ranging from two to four decades. Considering that the use of desktop computers in business only started in the eighties, it means that the problem of aligning of business and IT has existed for almost the entire lifetime of the IT function. The literature shows that business and IT alignment has also *consistently* been listed as a top priority amongst IT practitioners such as Chief Information Officers (CIOs) and IT managers (Brown, 2007:1157; Chen, 2010:9; Jorfi *et al.*, 2011:76; Tallon, 2007:228). Practitioners also believe that alignment is difficult to attain (Silvius, 2008:11; Tallon, 2007:230; Ullah & Lai, 2011:21). Many now believe that alignment is not a *state* that one can attain but rather a continuous *process* (Brown, 2007:1168). There are even a few that believe that alignment of business and IT is unattainable and that practitioners should rather place their efforts on problems that can be solved (Parkinson, 2002:98).

Therefore, literature shows that there seems to be a discontinuity between theory and practice. On the one hand we have research, which is relatively vast, and that empirically shows that business and IT alignment leads to improved firm performance, and on the other hand, we have practitioners that are battling to align business and IT.

4.3.3. THE MATURITY OF THE FIELD OF BUSINESS AND IT ALIGNMENT

Chapter 3 reviewed the field of business and IT alignment with the intent of determining whether the field was mature enough for practitioners to implement alignment. Various aspects of the field were reviewed, such as, the approaches used, the factors of alignment discovered, the models developed and the trends over time. The results show that there exists a relatively high degree of completeness and consensus amongst the different aspects of the field. The conclusion was that the high failure rate of IT projects in practice is possibly attributed to differences in the *context of the organisation*s and difficulties in applying the body of knowledge.

4.4. CONTEXTUALIZING OF A PROBLEM DURING PROBLEM SOLVING

4.4.1. PROBLEM SOLVING THEORY AND THE ROLE OF CONTEXT IN THE PROBLEM SOLVING PROCESS

In typical problem solving, it is taken for granted that one usually starts with a clear problem description, and that often the *background* of the problem is ignored in the problem solving process (Kokinov and Yoveva, 1996:1). They further explain that little attention is paid to causal entities that may exist in the environment, that are not part of the problem description, but might influence the problem solving process. Jonassen (2000:68) provides support to this viewpoint by claiming that in contemporary problem solving theory, problem-solving skills are *domain*-and-*context-specific*. He further elaborates that the role of context becomes vitally important in defining ill-structured problems. Augier *et al.* (2001:125) have also been following theories that view the firm as a knowledge-creating entity and that have focussed on how organisations solve complex and unstructured problems. They observe that these theories suggest that *context* and *contextualization* are central elements in problem solving.

In particular, Jonassen (2000:68) points out that complex problems are usually dynamic, in the sense that the environment and its factors change over time. He further elaborates that problems in everyday professional situations are embedded in those contexts. Specifically, these situations require the problem solver to separate important information from the irrelevant and to construct a problem space that includes relevant information from the context. Augier *et al.* (2001:127) focus further into role of context in problem solving in the firm situation. In particular, they suggest the theory that complex problems are created, shaped and solved in the process of choosing and that, in this process, context emerges and transforms.

The final point to draw from the theory of problem-solving is on the people involved in the problem solving process. Both Jonassen (2000:72) and Augier *et al.* (2001:127) mention that besides the context, problem-solving also depends on the problem-solver. In particular, solving the problem depends on the problem-solvers' skill and the situation in which they exist.

The literature on the role of context in problem-solving theory therefore may suggest an explanation for why the alignment of business and IT has been so difficult to attain practically, despite an extensive theory base. This theory suggests that perhaps the business and IT alignment problem should be treated from the specific *context* of the firm in which the problem exists. Mpazanje et al. (2013:1) exemplify this point-of-view by suggesting a deeper understanding of IS project management practice that explores and describes the as-lived experiences of stakeholders in IS projects.

4.5. THE ROLE OF THE IT FUNCTIONS IN ORGANISATIONS

4.5.1. THE ROLE OF THE IT FUNCTION AS AN ANTECEDENT

As a precursor to the problem of aligning business and IT, and from the view of focusing on context, one would first want to know about the relationship between the IT function and organisation within which it operates. The IT function could be seen as an *organ* and the *organisation,* in which it operates, as the *host* body. The IT function has to operate cohesively within the boundaries that the host organisation imposes, or face “rejection”. Since IT functions within organisations may differ vastly from one-man desktop support to sophisticated IT functions with the capability of developing custom-suited systems that differentiate the organisation from its competitors, it is important to establish the *role of the IT function* as an *antecedent* to the aligning of the IT function to the organisation.

Premkumar and King (1992:99) also recognised the importance of the role of IT in business-IT alignment. They argued that organisations may have different roles for IT in their operations, and that strategic IT planning and organisational support will vary depending on the role of IT. They base their definition of the role of IT on the mission of the IT function within the organisation and its impact on business operations.

Within this study, the *role of the IT function* is defined as the mandate that the organisation in which it operates imposes on it. In most organisations this mandate may not be formal, and even if it is, it is usually not clearly understood and agreed upon by both business and IT managers. Since the *role of the IT function* affects its scope of work, its operation and the resources it requires, it is critical that this variable be established early on if alignment between business and IT has any chance of being successful.

4.5.2. IT AS A UTILITY SERVICE PROVIDER

There exists a view of IT that has been emerging recently, of seeing the IT function as a utility service provider. The idea is similar to the way one obtains water, electricity and natural gas, one could have computing power and software on tap, and pay only for what one uses (Bartholomew, 2005:64; Bhandari, 2005:1). Lindquist (2004:1) elaborates that utility computing is about providing flexible computing resources when and where they are needed. Hirschheim, Schwarz and Todd (2006:181) provide one explanation for how the phenomenon has come about. They believe that dramatic cycles of restructuring, re-engineering, downsizing, outsourcing and now off-shoring of the IT function have led to the view of the IT function as a commodity.

Bhandari (2005:1) points out that certain IT services can be treated as utility services. He mentions e-mail, the Internet, word processing and spread sheets, basic transaction processing, and the entire infrastructure that supports these applications. However, there is not much consensus on what exactly constitutes an IT utility service. Bartholomew (2005:64) mentions computers, network connections and services. Others view it to also include cloud storage and, more recently, cloud applications.

The main driver for the utility view seems to be cost. Utility computing promises lower licensing costs by consolidating multiple instances of applications into fewer licenses and allowing companies to pay only for what they use (Lindquist, 2004:4). He further explains that one could provision less and still have a safety margin to handle unexpected spikes in demand. On the other hand there also exists some reluctance to accept the utility concept. Bartholomew (2005:64) cite one reason being that many have already invested large sums of money and staff time on existing systems, resource planning and customer relationships. Another reason mentioned is that IT functions are reluctant to outsource applications to shared servers due to their concern over security (Business/Technology Editors, 2001:1).

It seems that the utility view is not unanimously supported and that not everything in IT can be treated as a utility. Bhandari (2005:1) aptly points out the need to segregate IT *utility* services from *strategic* IT services.

4.5.3. IT AS A STRATEGIC BUSINESS PARTNER

The *strategic* use of IT leads to another view of the role of the IT function within the organisation. Venkatraman *et al.*, (1993:139) postulate that IT has evolved from a traditional administrative, back-office support role towards a more strategic and central role within organizations. They further assert that an organisation can strategically differentiate itself from its competitors, through IT, provided that there is a dynamic process in place that continuously aligns the business and IT domains. Phillips and Sherwin (2003:66) found that in financial institutions, in particular, technology is the *key* driver that enables organisations to reach their full potential. Holland and Skarke (2008:48) are of the opinion that IT should even *lead* business innovation initiatives.

Based on the summarised literature, this study therefore accepts that the role of the IT function within the organisation can be viewed on a continuum that ranges from a *utility service provider* on one extreme to a *strategic business partner* as the other extreme. In practice, it quite likely that an organisation may have some combination utility and strategic components.

4.5.4. OPERATIONALIZING THE ROLE OF THE IT FUNCTION

Premkumar and King (1992:102) base their operationalization on a strategic grid that measured the role of IT in two dimensions, viz., the strategic impact of the *future* application development portfolio and the strategic impact of *existing* systems. That is, they viewed the role of IT as strategic or internal (strategic dimension) and existing or future (time dimension). This article views the role of IT as simply belonging along the strategic dimension. That is, does the IT function have a strategic influence (strategic business partner) or an internal influence (utility service provider). However, there is no reason why the role of IT variable cannot be measured for two time intervals, as is done in this article; once to measure the *current* role of IT and once to measure the *future* (or ideal) role of IT.

By basing the definition of the role of the IT function, and the strategic influence that it should have within the organisation, the process of operationalization led naturally to measuring the type of IT services that organisation required to carry out its business operations. The need for services that created strategic differentiation for the organisation would imply a *strategic* role for IT, and the need for only supportive services would imply a *utility* role for IT.

4.5.5. DEMOGRAPHIC VARIABLES INFLUENCING PERSPECTIVES OF ALIGNMENT

Within the deeper dynamics of the role of the IT function, the literature also shows evidence of certain perspectives amongst the role players that could be seen as demographic splits (Creighton, 1990:63; Cordero *et al.*, 2004:19; Burn & Szeto, 2000:197; Baker, 2004:22; Evans, 2004:303). In the search to better understand the deeper dynamics of the *role of the IT function* variable, it is important that these dynamics are considered in any alignment effort.

Creighton (1990:63) observed that managing technical staff is particularly difficult. The main reason he cites is that technical people usually work in a self-directed manner and often see attempts to provide direction as interference. He further points out that the manager who takes a superior attitude may find a general lack of cooperation from technical staff. Cordero *et al.* (2004:19) highlight another interesting dynamic in their study of technical management. They found that the more supervisors possess technical, but also, people and administrative skills, the more technical staff found their work environment stimulating. Therefore there is also some evidence in the literature that managers and technical personnel may also have different perspectives and that this dichotomy should also be considered as a demographic.

A similar dichotomy exists between business and IT staff. Burn and Szeto (2000:197) carried out a study to determine whether there were differences in perspectives of business and IT managers with respect to alignment. The results of their study indicated that the two perspectives were largely equivalent, except for their overall perception of the factors that

were necessary for creating alignment. Also, in organisations that were highly IT-dependent, business and IT managers had significantly different perspectives. Baker (2004:22) observed that the gap between the views of IT executives and their business colleagues was wide, most notably with regard to issues such as clarity of business strategy and mutual cooperation. Evans (2004:303) also reports of business experts having a negative perception of people working in IT. Therefore, some evidence does exist in the literature that there may be a difference in perspectives between business and IT managers and that it would be prudent of researchers to include it as a demographic in the context of their studies on alignment.

4.6. RESEARCH AND DESIGN METHODOLOGY

Table 4.1 describes the research design of the section of this study that pertains to this article.

Table 4.1: Research design for investigating business and IT alignment

Component	Description
Problem	Despite an extensive theory base in the field of business and IT alignment, alignment in practice remains an elusive goal. Problem-solving theory suggests that the solution may lie in the antecedents of alignment. The role of the IT function within the organization is one of the most fundamental antecedents to business-IT alignment problem but it has not been defined nor measured.
Research question	How can the *role of the IT function* be defined and measured to describe the pre-conditions for an alignment strategy between business and IT?
Context	Business organisations that use IT
Hypotheses	H_{1o}: The current role of the IT function is predominantly utility. H_{1a}: The current role of the IT function is predominantly business partner. H_{2o}: There is no difference between the current and ideal roles of the IT function. H_{2a}: There is a difference in the current and ideal roles of the IT function.

Component	Description
	H_{3o}: The current role of the IT function does not vary across positions of employees. H_{3a}: The current role of the IT function varies across positions of the employees. H_{4o}: The current role of the IT function does not vary across divisions of the organisation. H_{4a}: The current role of the IT function varies across divisions of the organisation. H_{5o}: The ideal role of the IT function does not vary across positions of employees. H_{5a}: The ideal role of the IT function varies across positions of the employees. H_{6o}: The ideal role of the IT function does not vary across divisions of the organisation. H_{6a}: The ideal role of the IT function varies across divisions of the organisation.
Phenomenon Investigated/ Unit of analysis	Perception of the role of the IT function
Unit of observation	Employees of a large financial institution
Method	Electronic survey measuring aspects associated with the role of an IT function within a case company.
Logic linking the data to the propositions	Business and IT managers within the organization differ in perception about the role of the IT function within the organization. Therefore asking the employees (the users of IT systems) from all levels and functions of the organization certain inference-type questions can provide an objective

Component	Description
	measurement of what the role of the IT function is within the organization.
Criteria for interpreting the findings	Measurements of elements associated with alignment

4.6.1. SAMPLING

The purposive population for this study was the employees of a large organisation in the financial sector in South Africa that has elected to remain anonymous. The unit of observation was the individual employee. This organisation was particularly appropriate because of its many hierarchical levels of management and its high dependence on technology, as well as the existence of an IT function within the organisation.

A list of all the employees of the organisation with their email addresses was generated from the company's human resource database by a database administrator. This list served as the sampling frame. After permission of senior management had been obtained, an email with a link to a web-based survey application was sent to all employees of the organisation. For a population of 1 659 employees, with a confidence level of 95% and a confidence interval of 5%, the targeted sample size was calculated to be 312 responses. The final sample included 324 responses, representing a response rate of 20%. Due to the validation requisite on the survey application, all 324 responses were complete and therefore useable for analysis.

4.6.2. DATA COLLECTION

The survey questionnaire was pretested to determine whether the questions were reasonably understandable and whether they would be interpreted correctly. Three employees were asked to complete the questionnaire while the researcher was present and observing their understanding of the questions. Each respondent was asked to specifically point out to the researcher anything that was unclear. Adjustments were made and the survey was sent out to all the employees of the organisation.

4.6.3. MEASURES

Role of the IT function

The *role of the IT function* within the organisation measured the internal mandate that the IT function is given by the organisation. The construct could vary on a continuum with extremes that ranged from *utility* to *business partner*. To determine whether the respondent perceived the *role of the IT function* as a *utility* service provider or a *business partner*, five IT service elements were presented as key services of IT ranging from *utility* services to *partner* services. The measure included 10 Likert scale statements of which the scale points were labelled as follows: 1 = Strongly Disagree, 2 = Partially Disagree, 3 = Neutral, 4 = Partially Agree and 5 = Strongly Agree. Two statements for each of the five services were presented. One statement for each service required the respondents' *current* view towards the importance of the service and the other required their *ideal* view. During pretesting it was observed that the respondent could quite easily select Strongly Agree (option 5) for all five services. Anticipating that a range of two scale points (4 and 5) would make it difficult to determine the order of preference of five services, a ranking question was added to distinguish the order of preference of the services in cases where the scale points were too close.

The five IT services presented in the *role of the IT function* construct were (1) network infrastructure, (2) desktop support, (3) software procurement, (4) development of custom-made systems and (5) maintenance of custom-made systems. The first two services, network infrastructure and desktop support, are regarded as typical *utility services* since they are more administrative in nature (labelled as the group US in the findings). Development and maintenance of custom-made systems are regarded as more business partner type services since they require input from business and have the potential of creating strategic differentiation (labelled as PS). Software procurement is seen as mix of utility and partner services since although it is administrative in nature it is possible to procure a piece of software that competitors have not discovered and thereby create strategic differentiation (labelled MS). The Cronbach alphas were originally calculated grouping US and MS as utility service questions and PS as the business partner questions. However, it was found that the Cronbach alpha value improved by removing software procurement (MS) from the utility service group. The final Cronbach alpha coefficients of internal consistency was 0.79 for utility service questions (including network support and desktop support) and 0.85 for business partner service questions (including development and maintenance of custom-made systems). Both values are above 0.7 indicating acceptable levels of internal consistency.

Demographic variables

The demographic variables that were measured were *position and division*. *Division* broadly classified whether the respondent was IT staff or a client of IT. The *function* demographic classified respondents into managers, technical staff, administrators or combinations thereof.

4.7. FINDINGS

Table 4.2, provides data that attempts to answer the first research question, that is, "Currently, what is the predominant role of the IT function (utility service provider or business partner)?"

Table 4.2: Current perception of the role of the IT function

IT Service	Mean	Standard Deviation	Median
Network infrastructure + desktop support (US)	4.15[a]	0.95	4.5
Creation + maintenance of custom software (PS)	3.77[b]	1.02	4.0
Procurement of software (MS)	3.51[c]	0.99	4.0

Note:
Friedman p-value < 0.0001 indicating some means differ significantly.
Those means that differ significantly are represented by different superscripts.

The p-value of the Friedman analysis, of less than 0.0001, shows that there are statistically significant perceptual differences for the different service elements of IT. The utility group of services, Network Infrastructure and Desktop Support (US), was statistically different from the partner service grouping of Creation and Maintenance of Software (PS), which is statistically different from the mixed service of Procurement of Software (MS). The magnitude of the means indicate the relative importance of the services within this organisation. The utility group of services (US) is most favoured, followed by the partner group of services (PS), followed by the mixed service of procurement of software (MS). Therefore the null hypothesis H_{1o} cannot be rejected. That is, the current role of the IT function is predominantly utility.

Table 4.3, provides data that attempts to answer the second research question, that is, "Is there a difference between the *current* and *ideal* perceptions of the *role of the IT function*?"

Table 4.3: Ideal perception of the role of the IT function

IT Service	Mean	Standard Deviation	Median
Network infrastructure + desktop support (US)	4.56[a]	0.97	5.0
Creation + maintenance of custom software (PS)	4.35[b]	1.00	5.0
Procurement of software (MS)	3.64[c]	1.18	4.0

Note:
Friedman p-value < 0.0001 indicating some means differ significantly.
Those means that differ significantly are represented by different superscripts.

The p-value of the Friedman analysis of less than 0.0001 also confirms statistically significant differences amongst the different services of IT. The same pattern was observed for the *ideal* perception as was seen for the *current* perception, however, the mean values are generally higher for the *ideal* perception. Comparing the current and ideal perceptions for the *role of the IT function* it is found that, in both cases, the *utility* services of the IT function are favoured indicating a *utility service role* for the IT function of the case organisation. Therefore the null hypothesis H_{2o} cannot be rejected. That is, there is no difference between the current and ideal roles of the IT function.

Table 4.4 shows the results of the ANOVA where the dependent variable is the *current role of IT* and the demographic factors are *position and division*. These results provide the answer to the third and fourth research questions for the *current* situation. That is, "Does the perception of the role of the IT function vary across the positions of the employees?" and "Does the perception of the role of the IT function vary across divisions?"

Table 4.4: Analysis of variance for the current role of the IT function (DV) - position and division (Factors)

Source of variation	DF	F Value	Pr > F
Current Role of the IT function	4	16.84	<.0001
Current Role of the IT function * position	20	1.21	0.2335
Current Role of the IT function * division	4	1.88	0.1121

While there were differences observed between respondents for the elements of c*urrent* role of the IT function (row 1), the *position and division* demographics did not contribute significantly to the variation. Therefore, the null hypotheses H_{3o} and H_{4o} cannot be rejected. That is, the current role of the IT function does not vary across position or division.

Table 4.5 shows again the same pattern of results of the ANOVA where the dependent variable is the *ideal role of the IT function* and the demographic factors are *position and division*. The same pattern was visible in table 4.5 as was found in table 4.4 and answers the third and fourth research questions for the *ideal* situation. That is, "Does the perception of the role of the IT function vary across the positions of the employees?" and "Does the perception of the role of the IT function vary across divisions?"

Table 4.5: Analysis of variance for the ideal role of the IT function (DV) - position and division (factors)

Source of variation	DF	F Value	Pr > F
Ideal Role of the IT function	4	30.12	<.0001
Ideal Role of the IT function * Position	20	0.59	0.9241
Ideal Role of the IT function * Division	4	2.21	0.0663

The p-value of less than 0.0001 for the *Ideal Role of the IT function* (row 1) shows that, in the sample as a whole, significant differences exist between the different roles of the IT function. However, the p-values in rows 2 and 3 indicate that these differences were not as a result of *position and division*. Therefore, the null hypotheses H_{5o} and H_{6o} cannot be rejected. That is, the ideal role of the IT function does not vary across position or division.

4.8. DISCUSSION

The goal of aligning business and IT has been shown to be very elusive in practice. Literature on problem-solving theory proposes the possibility that solution may exist in the context. In the field of business and IT alignment the most fundamental firm-specific variable is the perceived role of the IT function within the organisation. This article therefore started out with the purpose of acquiring an understanding of the *role of the IT function* within the organisation by exploring some of the deeper dynamics within a case organisation. The intention was to show how the perception about the role of the IT function can be used to understand the pre-conditions for a business and IT alignment strategy.

4.8.1. SUMMARY OF FINDINGS

The findings section was divided into four sections based of four research questions. The first research question set out to ascertain the overall perception of the role of the IT function within the organisation. The results showed that currently the *overall* perception of the *role of the IT function* within the organisation being observed is that of a *utility* service provider.

To determine whether this perception of the role of the IT function is not just due to poor performance of the IT function or some other external factor(s) the research looked at the *ideal* role of the IT function. This is the perception of the role of the IT function under perfect circumstances. This measure could also be indicative of the role of the IT function that is appropriate for the particular business in which the organisation operates. Therefore, the second research question measured the *ideal* perception of the role of the IT function and to compare it to the *current* perception. The results in Tables 4.2 and 4.3 show that the relative importance of the roles of the IT function is maintained in the current and ideal perceptions. This indicates that overall perception of the role of the IT function is that of a *utility* service provider both currently and ideally. This may indicate that the business environment in which the organisation operates prioritises a stable and consistent IT infrastructure and support over innovative technology. This is consistent with Tan's (1995:171) study that found that companies with an aggressively competitive strategy were more likely to consider IT as a strategic business partner. The case organisation is not a profit driven organisation nor does it operate in a competitive environment, being the only one of its kind in the country. The utility view of the IT function is therefore understandable from this perspective.

The third and fourth research questions had to do with understanding the role of the IT function across the demographics of *position and division*. The results show that these demographics did not have an influence on the perception of the role of the IT function within the organisation being observed. That is, neither the dynamic of *managerial* versus *technical* versus *administrative* staff nor *business* versus *IT* staff had any influence on the role of the IT function for this organisation. One could therefore infer from this that there are no organisational culture issues at play within the case organisation based on divisional affiliation. If any of these dynamics existed within the organisation they would have to be addressed before embarking on the alignment process.

4.8.2. MANAGERIAL IMPLICATIONS

The implication for management can be given in two parts; implications with regard to general theory and implications for the organisation under investigation.

Premkumar and King (1992:101), who first recognised the role of IT as a variable, emphasised the contingent nature of IS planning based on this role. With regard to general theory, therefore, this article proposes we examine the managerial implications of *role of the IT function* being at the two extreme ends of the continuum, namely, *pure utility* or *pure business partner*. For each extreme we could describe how each state affects IS planning with respect to three aspects of the IT function that are affected, namely, *strategy*, *resources* and *mode of operation* as shown in the descriptions of each that follow.

If an IT function‘s role was *pure utility* its *strategic focus* would be mainly on cost and efficiency. Human *resource-wise* it would therefore rather outsource new development than keep expensive highly skilled software developers in-house. Staffing would include more administratively-inclined personnel to set up efficient call centres to route problems to technical vendors outside the organisation. Administrators with strong service-level agreement (SLA) skills would be required to setup and enforce agreements with outside technical vendors to respond to operational problems within a time period that was acceptable to business. The *mode of operation* of the pure utility would therefore be mainly reactive in the sense that new technology will only be invested in if there is a strong and consistent business demand. The idea would be to get the maximum lifespan out of existing technology. If new technology was required, a request for proposal (RFP) would be sent out to technical vendor companies to propose a solution to the business demand. No research and development (R & D) into innovative technologies will be necessary.

At the other extreme, if the IT function’s role was *pure business partner*, its *strategic focus* would be on using technology to improve competitive performance of the organisation. Its human resources would include a skilled set of software developers, testers and business

analysts in-house. It would have separate staff for research and development (R&D) and operations. Its *mode of operation* would be more proactive with respect to technology. That is, it would be constantly evaluating business needs and finding appropriate technology solutions that would make the organisations operations more efficient than its competitors.

Table 4.6 summarises the implications of the extremes of the role of the IT function.

Table 4.6: Summary of implications of the Role of an IT function with respect to three aspects of the IT function

Role of the IT function	Strategic Focus	Resources	Mode of Operation
Pure utility	Cost Efficiency Administration	Outsource development Efficient call-centre Strong SLA skills No R & D	Reactive with respect to technology. Administrative efficiency. Efficient routing of problems to external vendors. Maximise lifespan of existing technology.
Pure Business Partner	Innovation Effectiveness Competitive performance	In-house developers In-house testers In-house business analysts R & D division	Proactive with respect to technology. Constantly evaluating business needs and finding appropriate technology solutions. Focus on rapidly getting technology to market.

Therefore, in general, the implications on the IT function for the two extreme roles of IT are vast. However, it is possible for an IT function to exist in a mixed role tending towards one of the extremes.

The managerial implications for the organisation under investigation could be interpreted as follows. Firstly, IT management should confirm the utility role with executive management. It could be that executive management is not aware that the IT function, in this context, is perceived as performing a utility role. It is even possible that there is incomplete awareness amongst IT managers that they are operating as a utility. Therefore a consensus needs to be established whether IT should continue as a mainly utility role or whether some mixed role is

required in the future. Given the literature indication of the increased importance of the role of the IT function, if it is decided that IT should remain mainly as a utility service it must be understood that the shortage of skilled technical staff in-house, especially in a very technology-dependent environment, could impact negatively on response times to operational issues and accuracy of problem detection. If it is decided that IT is required to move away from the utility role in the direction of business partner, new functions need to be strategized, staffing needs to be amended accordingly, which should eventually result in a change in the way IT operates.

Therefore the *role of the IT function* has significant managerial repercussions, mainly in the areas of strategy, resources and mode of operation of IT.

4.8.3. STUDY LIMITATIONS

One of the limitations of this type of study is that, because it is tightly related to the context, not all the results can be directly generalised. What can be generalised, however, is the use of the role of the IT function as an antecedent variable to alignment, the methodology of measurement and analysis, and the interpretation of the results for improving alignment.

Another limitation of the study was that for the function demographic split there was no way of determining the populations of each functional group. It was therefore not possible to control stratification of respondents. The results did, however, show that the demographic splits had no influence on the perceived role of the IT function. Therefore, if there is any error due to the function sample sizes not being representative of the function populations the worst impact would be that some deeper detail in the understanding of these dynamics would have been missed.

4.8.4. RECOMMENDATIONS FOR FUTURE RESEARCH

The literature in the field of business and IT alignment has shown that the link to firm performance is well established and that the literature is abundant with the different factors and approaches of alignment (Chapter 3). Therefore future research in the field of business and IT alignment should continue with how make implementation more successful by directing focus to the deeper dynamics involved in applying alignment theory to the context in which it is applied. As a progression on the role of the IT function as an antecedent to alignment, future research could focus on variables that may be dependent on it, such as the *mode of operation of IT, resources of IT* and *strategy of IT* and the interplay of these variables. Also, validation and expansion of the measures of the *role of the IT function,* would provide a foundation for establishing it as an important variable that could be used in practice to give strategic direction to managers.

4.8.5. CONCLUSION

The contribution of this article is that it re-defines the *role of the IT function* variable and establishes it as a fundamental variable in contextualizing the alignment of business and IT. It further provides an inductive way, based on the required IT services of an organisation, to determine the role of IT function of an organisation, rather than simply declaring that the IT function is a strategic business partner or utility service provider. Determining the role of the IT function is seen as a crux point for other related decisions associated with alignment, such as, resources, mode of operation, and strategy of IT. It is suggested that a lack of clarity of the role of the IT function could lead to inconsistent operational behaviour, confusion and a general loss of strategic focus. In order to rectify such situations, managers and researchers need to firstly know that the variable exists, name it as issue so that others can focus on it and, finally, find ways to use it to improve the alignment of business and IT. It is hoped that this paper has started this quest!

CHAPTER 5: PAPER 3 - ANTECEDENT RELATIONSHIPS IN BUSINESS AND INFORMATION TECHNOLOGY (IT) ALIGNMENT

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5.1. ABSTRACT

The alignment of business and IT has proven to be a difficult state to attain and maintain. Literature suggests that the solution may lie in the context within which alignment is attempted, in particular, in the relationships amongst the antecedents of alignment. Therefore, the main purpose of this paper is to establish the *mode of operation* and *sourcing* option *of the IT function* as antecedents to alignment and show how they how they are related to a previously identified antecedent, the *role of the IT function.* Furthermore, this paper attempts to show how these antecedents could be used to reach a point of stability that would facilitate alignment within the context of a particular organisation. The research methodology started with a review of the literature to identify related antecedents and was followed with a survey that was deployed within a particular organisation to measure the *mode of operation* and *sourcing option of the IT function*. The results were used to identify states of stability and anomaly of the IT function. The findings showed that, within the organisation observed that *current* mode of operation of the IT function was measured as being *reactive* but that *ideally* it is expected to be *proactive*. The *current* sourcing option of IT was *outsourcing* whereas the *ideal* sourcing option was measured as *in-house staff*. The role of the IT function for this organisation was measured as *utility*. It was found that expectation of a *proactive mode of operation* together with a *utility role* puts the organisation in an *anomalous* state. One of the limitations of this type of study is that, because it is tightly related to the context, not all the results can be directly generalised. What can be generalised, however, is the identification of the *mode of operation*, *sourcing option* and the *role of the IT function* as antecedent variables to alignment, their relationships and the use of these relationships to strategize towards a point of stability.

5.2. INTRODUCTION

The alignment of IT strategies to the goals of the organisation has long been a very sought after state to achieve, promising amongst other benefits, superior *firm performance*, *competitive advantage*, *organisational growth* and *IT credibility* (Chapter 3). At the same time it has also proven a very difficult state to achieve in practice that has eluded practitioners for several decades (Karpovsky & Galliers, 2015:1). The review carried out in chapter 3, concluded that the body of knowledge on business and IT alignment, provided sufficient theoretical basis for implementation of alignment, and that the reason for the persistence of the alignment problem must lie in the application of theory to practice, or contextualizing the problem.

Chapter 4 showed that there was evidence in the literature of problem-solving theory that linked the *context* of a problem and its solution. That is, a problem is more likely to be solved if all the elements of the context of the problem are taken into consideration. Seeing that the context of the alignment problem lies in the environment within which alignment is being practiced, it followed naturally to consider shifting the focus of the business-IT alignment problem to the environmental *antecedents* of alignment. Chapter 4, therefore, also introduced of the role of the IT function within the organisation as a fundamental antecedent to business and IT alignment. Chan and Reich (2007:311), after a review of the field business and IT alignment, also came to the conclusion that the antecedents were important to the alignment problem. They recommend that future researchers, not only identify the antecedents of alignment, but also explore the relationships between them. In an attempt to fill this gap, this study therefore introduces two other antecedent variables that are closely related to the role of the IT function, namely, the *mode of operation of the IT function* and the *sourcing option of the IT function*.

The mode of operation of the IT function, within this study, is defined as the degree of responsiveness with which the IT function executes its functions. The variable can vary on a continuum with two extremes; on the one end completely *reactive* and on the other end completely *proactive*. The *reactive mode* of operation refers to an IT function that only supplies IT services if and when it is demanded by business. The *proactive mode* of operation refers to an IT function that attempts to hedge the time delay between technology discovery and technology use. New technologies are often discovered through experimentation in research and development (R&D) facilities and usually takes some time before the prospective use of a new technology is realised in business. In order to harness the benefits of a new technology, *before* its competitors, an organisation needs to be continuously researching technologies, and matching it to its business processes and prospective market opportunities. Seeing that technology research is expensive, and that the dependency on technology may vary across different businesses, it is clear that the *mode of operation of the IT function* should be dependent on business strategy, and the role of the IT function mandated by the organisation.

The other antecedent to the alignment of business and IT introduced in this study is the *sourcing option of IT*. Within this study the *sourcing option of IT* is defined as the location of core IT skills relative to the host organisation. An IT function can have its core IT skills such as infrastructure support, software development, and desktop support either kept *in-house* or *outsourced*. Keeping core IT skills in-house results in faster response times to IT issues, but also requires having to maintain a career path for IT professionals within the organisation (Bagchi, Kirs, Udo, & Cerveny, 2015:108). Outsourcing core IT skills relieves the organisation of maintaining a career path for IT professionals, but comes at the expense of generally slower response times and higher temporary costs, when there are IT issues. It is clear, therefore, that the IT sourcing option is dependent on the IT strategy of the organisation. In particular, it affects the *mode of operation* and the *role of the IT function*.

The main purpose of this article is to establish the *mode of operation* and *sourcing* option *of the IT function* as antecedents to alignment, show how they are related to the role of the IT function, and finally, how they could be used to reach a point of stability that would facilitate alignment within the context of a particular organisation. In particular, are there combinations of the antecedents that set the boundary conditions for a clear alignment strategy and are there combinations that hamper alignment? In order to answer these primary questions, the following detailed research questions, with respect to the sample organisation, need to be answered:

- What is the *current* perception of the mode of operation of the IT function and is it different from what the organisation would *ideally* want it to be?
- Do the *current* perceptions of the mode of operation of the IT function vary across position and division?
- Do the *ideal* perceptions of the mode of operation of the IT function vary across position and division?
- Should IT be outsourced or kept in-house?
- Do resource sourcing preferences vary across the *position and division*?

Since the *context* of alignment was of prime importance, this study was scoped to a particular organisation. The units of observation were therefore the employees within the organisation. The demographic splits on this population were *position and division*. The *position* demographic included categories of managerial, technical, administrative, or combinations thereof. The *division* demographic had two options, namely, IT division or client division.

The rest of the article is structured into four parts. First, the literature on business-IT alignment is reviewed showing the shift of focus to antecedents. This is followed by a description of the research methods. Next, the results are presented. Finally, the article concludes with a discussion of the findings including its implications and directions for future research.

5.3. BUSINESS AND IT ALIGNMENT – AN ELUSIVE PROBLEM

As mentioned in chapter 3, the alignment of business and IT is a long-standing problem. Furthermore, a sustainable solution of this problem has eluded many practitioners in the field for at least two decades. However, the literature shows that alignment is *consistently* a top-ranking issue for Chief Information Officers (CIOs) and technology managers every year (Castellanos & Correal, 2013:61; Huang & Hu, 2007:173; Reich & Benbasat, 2000:81).

The reason for the longevity of business-IT alignment problem and consistency with which it appears on the to-do lists of IT managers is hypothesized to be two-fold (Chapter 3). On the one hand, achieving a state of business and IT alignment is deemed to be difficult (Lepmets *et al.*, 2012:1448; Silva *et al.*, 2007:232; Tallon, 2007:230). For example, Norton (2002:13) explains that IT has a more difficult time aligning to the business strategy than other business functions because technology is complex and difficult to understand. He further elaborates that much of IT infrastructure is difficult to link to applications and projects, and therefore, difficult to justify to business executives. Lepmets (2012:1448) mentions that software systems have become large and inter-connected making it difficult to question the purpose and goals. On the other hand, despite these difficulties, there is the allure of superior business performance that keeps researchers and practitioners hopeful that alignment could help their situation (Cao & Hoffman, 2011:1127; Chen, 2010:9; Garg & Pellissier, 2005:33; Singh & Woo, 2009:177). These studies all provide empirical evidence that alignment of business and IT leads to superior firm performance. It is the quest to overcome these difficulties and the allure of superior performance that are responsible for the longevity of the business-alignment problem. However, under perfect conditions, these two opposing drivers should not exist together. It therefore appears that there is a distinct disparity between what researchers find in their studies and what practitioners are experiencing in practice.

5.4. CONTEXT – POSSIBLE KEY TO THE ALIGNMENT PROBLEM

Chapter 3 reviewed the field of business-IT alignment with the intent of determining whether the field was mature enough for practitioners to implement. The conclusion made was that the field was mature enough and that the disparity must come from difficulties in applying theory to practice or, in particular, applying theory to the *context* of the problem.

Chapter 4 also found that there is a theoretical link, in problem-solving theory, between the *context* of a problem and its solution. Kokinov and Yoveva (1996:1) explains that in typical problem solving it is taken for granted that one starts with a clear problem description and that little attention is paid to causal entities in the environment that might influence the problem-solving process. Jonassen (2000:68) points out that problems in everyday and

professional contexts are embedded in those contexts and therefore requires the problem-solver to construct a problem space that includes relevant information from the context. Augier *et al.* (2001:125) mentions that studies on how firms solve complex problems suggest that context and contextualization are central elements of problem-solving. They further elaborate that unstructured and complex problems are created, shaped, and solved in the process of choosing, and that it is in this process that context emerges and transforms. It is therefore quite clear that the context of a problem is of significant importance to problem-solving. In the application of our business-IT alignment problem this finding could suggest a reasonable solution to the disparity between theory and practice mentioned above. That is, the reason that the application of many alignment theories has been unsuccessful in practice stems from a lack of focus on context (Karpovsky & Galliers, 2015:1).

5.5. ANTECEDENTS – THE IMPLEMENTATION OF CONTEXT

Focussing on the context of the business-IT alignment problem effectively shifts focus onto the *antecedents* of the alignment problem. That is, those variables that would facilitate giving the practitioner a clearer view of the *context* within which business and IT alignment needs to be applied. Chapter 4 attempted to establish the role of the IT function within the organisation as one of the fundamental antecedents to the problem of aligning business and IT. Chan and Reich (2007:311), after their review of the field of business and IT alignment, also mention that researchers should focus on the antecedents. They further point out that rather than merely listing the antecedents, they encourage researchers to explore the relationships among them. Van der Zee and de Jong (1999:154) express a similar view as Chan and Reich (2007:311) mentioning that a future challenge is to explicitly understand the prerequisites of business-IT alignment in terms of culture, skills, and responsibilities.

5.5.1. MODE OF OPERATION OF THE IT FUNCTION

In the vein of determining antecedents to the business-IT alignment problem and, in particular, those that are related to the role of the IT function, this study defines the mode of operation of the IT function. The mode of operation of the IT function is defined, within this study, as the degree of responsiveness with which the IT function executes its functions. It may vary on a continuum with two extremes; on the one end completely *reactive* and on the other end completely *proactive*. The introduction of the mode of operation of the IT function as an antecedent to alignment can be justified in two ways; the first based on a previous study and the other based on logical reasoning.

A study by Tan (1995:171) found a relationship between the *type of strategy* of an organisation, the organisation's *view of the IT function,* and the *responsiveness of the IT function*. He found that if the organisation had an aggressive business strategy then it was more likely to view the IT function as a strategic partner. Furthermore, if the IT function was seen as a strategic partner it was more likely to be more responsive. Chapter 4 defined the

role of the IT function antecedent variable as the mandate given by the host organisation to the IT function. The role of the IT function could range from *utility service provider* to *strategic business partner*. The role of the IT function is therefore very similar to Tan's *view of the IT function* since the *mandate* given by the organisation is essentially how it *views* the role of the IT function. The mode of operation of the IT function antecedent defined in this study is similar to Tan's *responsiveness of the IT function* since the *mode of operation* has to do with how the IT function responds or reacts to business requests. This would imply a relationship between the *role of the IT function* and the *mode of operation of the IT function*. Based on Tan's theory it could therefore be predicted that if the role of the IT function was that of a *strategic business partner* the *mode of operation of the IT function* would be *proactive*. Conversely, if the role of the IT function was that of a *utility* service provider then the *mode of operation of the IT function* would be *reactive*.

The other way of introducing of the mode of operation of the IT function as an antecedent that is related to the *role of the IT function* is through logical reasoning. For instance, if the role of the IT function within the organisation is that of a *utility* service provider, then IT services is not seen as a core function of the organisation. The IT function would, therefore, only be mandated to supply basic services at low cost and on-demand only. It would then make business sense for IT to behave in a *reactive* manner since, in such a scenario, the IT function would not have a research and development (R&D) division to proactively experiment with new technologies, as that would be considered as wasting financial resources when there is no direct business demand for it.

Conversely, if the *role of the IT function* is that of a *strategic business partner*, it would probably be involved with business in strategy-making, it would constantly be performing R&D on new technologies and *proactively* matching these technologies to the needs of the organisation. Hence, if the role of the IT function is that of a *strategic business partner*, the mode of operation of the IT function is likely going to be *proactive*.

In practice the mode of operation of the IT function therefore impacts directly on the service level agreements (SLAs) between IT and its client functions. It also impacts on the IT function's ability to capitalize on the opportunities presented in new innovative technologies and their ability to apply them to the business context.

5.5.2. SOURCING OPTION OF IT

In keeping with Chan and Reich's (2007:311) condition of focussing on related antecedents and Van der Zee and De Jong's (1999:154) condition of considering antecedents in terms of culture, skills and responsibilities, this study introduces the *sourcing option of IT* as an antecedent to business-IT alignment. The King (2006:35) case study shows how aspects of the utility role of IT, for example, have very natural consequences on the sourcing option of

IT. For instance, in this case, when it was found that IT costs were becoming too high, the organisation replaced their outsourced programming company in favour of strategic sourcing. We see here, how the focus on cost (an aspect of the role of IT) has an effect on sourcing option of IT (outsourcing). Within this study the *sourcing option of IT* refers to the location of IT skills relative to the host organisation. That is, should core IT skills, in particular, with respect to infrastructure, software development, and desktop support be housed within the organisation or outside it?

There has always been an on-going debate between business and IT managers about whether IT services should be outsourced or kept in-house. Many believe that, since IT is often not a core function of the organisation, it should be outsourced. Others believe that if the business is highly dependent on technology then IT should be kept in-house. Many believe that outsourcing is cheaper than keeping IT staff in-house in the long run. That is, even though outsourced staff is more expensive when compared to the salaries of in-house staff, outsourced services are only temporary. Others believe that most times outsourced staff is used continuously because business demand of IT is continuous and therefore outsourcing would be more expensive. Many believe that outsourced staff can bring in superior technical skills into the organisation. Others believe that their lack of contextual knowledge of the business of the organisation results in much more expensive blunders. The responsiveness of an external vendor to IT problems in a timeous manner, especially when they are servicing other organisations, is also a concern. It is therefore safe to say that the sourcing issue can be very complex and dependent on the context.

The *sourcing option of IT* is clearly related to both the above-mentioned antecedents of the *role of the IT function* and the *mode of operation of the IT function*. For instance, if the core IT skills such as infrastructure support, software development, and desktop support are outsourced, then the IT function would effectively be composed of administrative staff. Such an IT function will automatically be forced into the role of a *utility* service provider since it will only be capable of the administrative tasks such as routing technical issues to outside vendor companies. By default it would also be forced into a *reactive mode of operation* since its responsiveness to technical matters would be dependent on the responsiveness of the outsourced vendor company. There is also little chance of proactively matching strategic business requirements and innovative technologies as an R & D division is non-existent. These relationships with the *role* and *mode of operation of the IT function* therefore make the *sourcing of option of the IT function* a very influential antecedent in the problem of aligning business and IT.

5.6. RESEARCH DESIGN AND METHODOLOGY

Table 5.1 summarises the research design of the section of this study that pertains to this article.

Table 5.1: Research Design

Component	Description
Problem	The alignment of business and IT has proven to be a difficult state to attain and maintain. We know from previous studies that the solution may lie in the antecedents to the problem of business and IT alignment, the most fundamental of which is the role of the IT function.
Research question	What other antecedents to the business and IT alignment problem exists and how are they related to the role of the IT function?
Context	Managing an IT function within an organisation
Hypotheses	H_{1o}: There is no difference between current and ideal modes of operation. H_{1a}: There is a difference between current and ideal modes of operation. H_{2o}: The mode of operation does not vary across position of the employee. H_{2a}: The mode of operation varies across position of the employee. H_{3o}: The mode of operation does not vary across division. H_{3a}: The mode of operation varies across division. H_{4o}: The predominant sourcing option is outsourcing. H_{4a}: The predominant sourcing option is in-house. H_{5o}: The sourcing option does not vary across position of the employee. H_{5a}: The sourcing option varies across position of the employee. H_{6o}: The sourcing option does not vary across division. H_{6a}: The sourcing option varies across division.
Phenomenon Investigated/ Unit of	Mode of operation of the IT function

Component	Description
analysis	Sourcing option of the IT function
Unit of observation	Employee
Method	Electronic survey
Logic linking the data to the propositions	The appropriate values, for the business, of the antecedents of *role of the IT function*, *mode of operation of the IT function,* and *sourcing option of the IT function* can be measured by surveying the employees of the organization. The values of these antecedents can then provide the boundary conditions for an IT strategy, that is aligned to business, but that also takes into consideration the current and desired states of the IT function.
Criteria for interpreting the findings	Plot the *role of the IT function* and the *mode of operation of the IT function* on the role-mode plane (Figure 5.2). If organization falls in anomalous quadrants, use the preferred *sourcing option of IT* to determine which stable state to strive for.

5.6.1. SAMPLING AND DATA COLLECTION

As this article is based on a section of a larger study, and the sampling and data collection was done once for the whole study, the sampling and data collection for this article is the same as mentioned in sections 4.6.1 and 4.6.2.

5.6.2. MEASURES

The mode of operation of the IT function

The mode of operation of the IT function within the organisation measured the degree of proactivity with which the IT function performed its activities. The construct could vary on a continuum with extremes that ranged from *reactive* to *proactive*. To determine whether the respondent perceived the mode of operation of the IT function as a *reactive* or a *proactive*, three main services of IT were chosen. The three services were maintaining existing systems, enhancing system functionality and procuring new systems. The measure included

a Likert scale with five levels; 1 meaning reactive and 5 proactive. Two statements for each of the three services were presented. One statement for each service required the respondents' *current* view towards the service and the other required their *ideal* view.

It was also a concern of the researcher that the response to a question that blatantly asked whether IT was reactive or proactive might be influenced by differing norms and attitudes towards IT. Therefore, in order to disguise the question while, at the same, assuring that each respondent had the same context in mind, two scenarios of behaviour were described on each end of the Likert scale; the left scenario indicating reactivity and the right indicating proactivity. Figure 5.1 shows an example with reference to the service of maintaining existing systems.

<table>
<tr><td rowspan="4">Scenario A:

Business functions will contact IT when there is a problem. IT just needs to timeously attend to problem if and when it happens.</td><td colspan="5">Current</td><td rowspan="4">Scenario B:

IT should be continuously monitoring systems and proactively suggest changes that avoid problems before they happen.</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr>
<tr><td colspan="5">Ideal</td></tr>
</table>

Figure 5.1: **Example of Likert scale measuring proclivity towards a reactive or proactive mode of operation**

Demographic variables

The demographic variables that were measured were *position and division*. *Division* broadly classified whether the respondent was IT staff or a client of IT. The *position* demographic classified respondents into managers, technical staff, administrators or combinations thereof.

5.7. FINDINGS

5.7.1. CURRENT AND IDEAL MODES OF OPERATION

The results presented in Tables 5.3 to 5.5 contain Kappa statistics that show a degree of agreement between two variables. For this reason Table 5.2 is presented to show Kappa statistic ranges and how they can be interpreted.

Table 5.2 - Interpretation of Kappa (Viera & Garrett, 2005:360)

Kappa	Agreement
<0	Less than chance agreement
0.01-0.20	Slight agreement
0.21-0.40	Fair agreement
0.41-0.60	Moderate agreement
0.61-0.80	Substantial agreement
0.81-0.99	Almost perfect agreement

Maintaining systems:

The Kappa statistic in Table 5.3 of approximately 0.13 indicates only a slight agreement between *current* and *ideal* perspectives of the mode of operation of the IT function with respect to maintenance of systems (see Table 5.2 for interpretation of Kappa values).

Table 5.3 - Mode of Operation: Maintaining systems

Kappa Statistic: 0.1299		Ideal			
	Number (%)	Reactive	Undecided	Proactive	Totals (current)
Current	Reactive	22 (6.79)	19 (5.86)	106 (32.72)	147 (45.37)
	Undecided	6 (1.85)	17 (5.25)	62 (19.14)	85 (26.23)
	Proactive	3 (0.93)	2 (0.62)	87 (26.85)	92 (28.40)
	Totals (ideal)	31 (9.57)	38 (11.73)	255 (78.70)	324 (100.00)

Only 26.85% consistently agree, both currently and ideally, that the IT function operates proactively with respect to maintaining systems. Almost 80% (78.70) believe that IT should, ideally, operate proactively. The main differences come from almost the 50% (32.72%+19.14%) of respondents who believe that IT is currently reactive (or are undecided) but ideally prefer it to be proactive.

Enhancing systems:

The Kappa statistic of 0.09 in Table 5.4, just as in Table 5.3, shows only slight agreement between current and ideal perspectives of the mode of operation of the IT function with respect to enhancement of systems.

Table 5.4 - Mode of operation of the IT function: Enhancing systems

Kappa Statistic: 0.0915		Ideal			
	Number (%)	Reactive	Undecided	Proactive	Totals (current)
Current	Reactive	17 (5.25)	12 (3.70)	93 (28.70)	122 (37.65)
	Undecided	7 (2.16)	21 (6.48)	72 (22.22)	100 (30.86)
	Proactive	10 (3.09)	6 (1.85)	86 (26.54)	102 (31.48)
	Totals (ideal)	34 (10.49)	39 (12.04)	251 (77.47)	324 (100.00)

Similar to maintenance of systems, only one quarter (26.54%) consistently agree, both currently and ideally, that the IT function operates proactively with respect to enhancement of systems. Almost 80% (77.47%) believe that IT should, ideally, operate proactively. The main differences come from the almost 50% (28.70%+22.22%) of respondents who believe that IT is currently reactive (or are undecided) but ideally prefer it to be proactive.

Procuring systems:

The Kappa statistic of 0.14 in table 5.5 also shows only a slight agreement between current and ideal perspectives of the mode of operation of the IT function with respect to procurement of systems.

Table 5.5 - Mode of operation of the IT function: Procurement of systems

Kappa Statistic: 0.1432		Ideal			
	Number (%)	Reactive	Undecided	Proactive	Totals (current)
Current	Reactive	14 (4.32)	19 (5.86)	69 (21.30)	102 (31.48)
	Undecided	12 (3.70)	35 (10.80)	63 (19.44)	110 (33.95)
	Proactive	13 (4.01)	7 (2.16)	92 (28.40)	112 (34.57)
	Totals (ideal)	39 (12.04)	61 (18.83)	224 (69.14)	324 (100.00)

Similar to Tables 5.3 and 5.4, just over one quarter (28.40%), both currently and ideally agree, that the IT function operates proactively with respect to procurement of systems. Almost 70% (69.14%) believe that IT should ideally be proactive. The significant differences are attributed to the almost 40% (21.30%+19.44%) who believe that IT is currently reactive (or are undecided) but believe that it should ideally be proactive. The trend for procurement of systems is very similar to maintenance and enhancement of systems (Tables 5.3 and 5.4) except more respondents are currently undecided than those that believe IT is currently reactive. Form the results in tables 5.3 to 5.5 null hypothesis H_{1o} is rejected and the alternate hypothesis H_{1a} is accepted. That is, there is a significant difference of current and ideal perceptions of the mode of operation of the IT function.

5.7.2. CURRENT MODE OF OPERATION ACROSS POSITION AND DIVISION

Table 5.6 shows the results of the ANOVA where the dependent variable is the *current mode of operation of the IT function* and the demographic factors are *position and division*.

Table 5.6: ANOVA – Current mode of operation of the IT function (DV) - Position and division (Factors)

Source for current rating	DF	F Value	Pr > F
Current Mode of Operation	2	5.93	0.0028
Current Mode of Operation * Position	10	0.55	0.8555
Current Mode of Operation * Division	2	0.33	0.7186
Source for ideal rating	**DF**	**F Value**	**Pr > F**
Ideal Mode of Operation	2	5.81	0.0032
Ideal Mode of Operation * Position	10	1.65	0.0879
Ideal Mode of Operation * Division	2	0.63	0.5332

The demographic factors of *position and division* had no influence on measurements of the *current* mode of operation (p-values of 0.8555 and 0.7186, respectively). Similarly, the demographic factors of *position and division* had no influence on the *ideal* mode of operation of IT (p-values of 0.0879 and 0.5332, respectively). Therefore the null hypotheses H_{2o} and H_{3o} cannot be rejected. That is the current mode of operation does not vary across position or division.

5.7.3. SOURCING OF CORE SERVICES: OUTSOURCE OR IN-HOUSE

Table 5.7 indicates that over the entire sample there is a very clear preference for keeping all IT services in-house. Therefore the null hypothesis H_{4o} is rejected and the alternate hypothesis H_{4a} is accepted. That is, the predominant sourcing option is in-house.

Table 5.7 - Resources of IT: Preference of sourcing options

Variable	Mean	Median
Infrastructure Specialists	4.05	5.0
Software Developers	3.74	4.0
IT Support	4.01	5.0
Technical Focus	4.16	5.0

Note: 1=Outsource, 5=In-house

5.7.4. SOURCING OF CORE SERVICES ACROSS POSITION AND DIVISION

Table 5.8 shows the results of the ANOVA where the dependent variable is the *resources of IT* and the demographic factors are *position and division*.

Table 5.8: ANOVA – Resources of IT (DV) - Position and division (Factors)

Source	DF	F Value	Pr > F
Resources of IT	2	5.78	0.0032
Resources of IT * Position	10	1.33	0.2099
Resources of IT * Division	2	8.40	0.0003

The *position* demographic had no influence on the resources of IT (p-value of 0.2099) but the *division* demographic did (p-value of 0.0003).

Tables 5.9 shows the results of an ANOVA that further explores the interaction of the *divisional* factor on the *resources of IT* by determining which of the resources of IT, namely, *infrastructure specialists*, s*oftware developers* and *desktop support* are affected by divisional affiliation. It compares the variances in each of the resource pairs. Therefore the null hypothesis H_{5o} cannot be rejected (the sourcing option does not vary across position). However, the null hypothesis H_{6o} is rejected and the alternate hypothesis H_{6a} is accepted (the sourcing option does vary across division)

Table 5.9: ANOVA of resource pairs

Source – infrastructure vs developers	DF	F Value	Pr > F
Mean	1	9.83	0.0019
Position	5	0.83	0.5305
Division	1	0.49	0.4839
Source – developers vs desktop support	**DF**	**F Value**	**Pr > F**
Mean	1	0.03	0.8573
Position	5	1.79	0.1135
Division	1	11.75	0.0007
Source – infrastructure vs desktop support	**DF**	**F Value**	**Pr > F**
Mean	1	10.02	0.0017
Position	5	1.19	0.3118
Division	1	12.43	0.0005

The resource pair of *infrastructure specialists* and *software developers* are not significantly affected by either demographic factor; position or division (p-values of 0.5305 and 0.4839, respectively).

The resource pair of *software developers* and *IT support* is affected by the *division* demographic only (p-value of 0.0007).

Similarly, the resource pair consisting of *infrastructure specialists* and *IT support,* is also affected by the *division* factor (p-value of 0.0005).

The magnitude and direction of this interaction of the *division* factor is presented in Table 5.10 and is observable through the means and mean differences for the *resources of IT* with respect to *division*.

Table 5.10: Means of Resources of IT per Division

Resources	Client divisions	IT division
Infrastructure Specialists	4.04	4.12
Software Developers	3.72	3.86
IT Support	4.08	3.61
Mean differences		
Infrastructure - Developers	0.32[a]	0.26[a]
Infrastructure - Support	-0.04[a]	0.51[b]
Developers - Support	-0.36[a]	0.25[b]

Note: Mean differences with different superscripts represent significant differences in trend between Client and IT divisions.

Comparing the preference of keeping *infrastructure specialists* and *software developers* in-house it can be noted that although the preference is higher for infrastructure specialists than software developers, the difference in means is in the same proportion and direction for the client functions and the IT function. However, when comparing *infrastructure specialists* and *IT support* as well as *software developers* and *IT support*, differences in means are in opposite directions. That is, *client functions* have a higher preference to keep *IT support* in-house whereas the IT function has a higher preference to keep *infrastructure specialists* and *software developers* in-house.

5.8. DISCUSSION

Business and IT alignment has proven to be an elusive problem. Recent studies have alluded to approaching a sustainable solution by shifting the focus of the problem to the antecedents of business-IT alignment. This paper therefore started out with the purpose of establishing the *mode of operation* and *sourcing* option *of the IT function* as antecedents to alignment, showing how they relate to the role of the IT function and how they could be used to reach a point of stability that would facilitate alignment within the context of a particular organisation. The academic importance of this study lies in changing the focus of the alignment problem to the antecedents of alignment and their relationships. The practical importance stems from the use of these theories in solving the alignment problem in the contexts in which they occur.

5.8.1. SUMMARY OF FINDINGS

In the context of the organisation being observed, the results show that the *mode of operation* of the IT function is *currently* a *reactive* mode of operation and that they would *ideally* prefer a *proactive* mode of operation. Furthermore, these findings are not affected by the demographics of *division* or *position*. That is, these findings are unanimous across both IT and client staff (division demographic) as well as across managerial, technical and administrative staff (position demographic). The finding that IT should *ideally* operate *proactively* is contradictory to the philosophy within the organisation of only supplying a product/service if there is a clear business demand for it. The *proactive* mode of operation is also contradictory to the finding that the role of the IT function within this organisation was unanimously measured as a *utility role* (Chapter 4). It therefore appears that the organisation is an anomalous state. On the one hand it is given the mandate of a *utility* role which should be focussed on low-cost, on-demand, generic IT services with no R & D capability to research new innovative technologies. On the other hand it is expected to operate in a *proactive* mode.

The results with respect to the resource preferences for IT show that, over all demographic splits, staff would generally prefer IT services to remain *in-house* and that IT should have a technical focus. This is contradictory to the way that the IT function is currently operating

since *outsourcing* is the predominant sourcing option used within the organisation and there is also an administrative focus. With respect to the demographics, the *function* demographic had no influence on the results. However, across the *division* demographic some differences did emerge about *which* IT resources are more preferred than others. It appears that although both client and IT staff would prefer all IT services to be in-house, the client divisions have a higher preference to keep *IT support* in-house while IT would prefer to have *infrastructure* and *software development* in-house. This is consistent with the client attitude that they are not so much concerned with how IT gets the job done but that IT should be available to provide support when there is an interruption to business. There appears to be a belief that having infrastructure and software development in-house will support the primary need of efficient IT support.

5.8.2. MANAGERIAL IMPLICATIONS

The managerial implications of this study can be explained at a *generic* level and at a level *specific to the context* of the organisation in this study.

Figure 5.2 below demonstrates the *generic* use of the antecedents the *role of the IT function* and *mode of operation of the IT function* in practice.

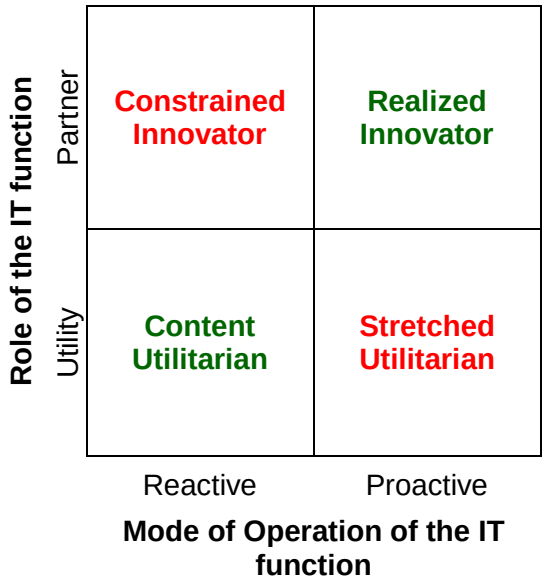

Figure 5.2: The Role of the IT function versus Mode of Operation of the IT function [own compilation]

Figure 5.2 plots the role of the IT function against the mode of operation of the IT function on a 2-dimensional plane showing the different combinations of these antecedents. The bottom half represents IT mandated a *utility* role; hence an IT function that falls in the lower hemisphere is termed a *utilitarian*. The top half represents IT mandated a *business partner* role. Since the business partner role requires an IT function to continuously match innovative technologies with the needs of business, an IT function that falls in the upper hemisphere is termed an *innovator*. The *mode of operation* variable splits the plane into a *reactive* behaviour on the left half and a *proactive* behaviour on the right half. This splits the plane into four quadrants with two stable states, the *content utilitaria*n and *realized innovator*, and two anomalous states, the *constrained innovator* and the *visionary utilitarian*.

Content Utilitarian:

An IT function in the *bottom left* quadrant is characterised by being mandated a *utility* role and by operating in a *reactive* manner. Since the utility role entails providing basic IT services on-demand and at low cost, a reactive mode of operation would be expected. An IT function that is behaving as expected, and is content with this mode of operation, is termed a *Content Utilitarian*.

Realized Innovator:

An IT function in the *top right* quadrant is characterised by being mandated a *strategic partner* role and by operating in a *proactive* manner. The *strategic partner* role implies that the IT function is included in strategic planning and is mandated to seek out innovative technology to support these strategies. If the IT function manages to gear itself to constantly match innovative technology with the strategic needs of the organisation then it has realised its potential of being an innovator; hence the label *Realised Innovator*.

Stretched Utilitarian:

An IT function in the *bottom right* quadrant is one that has being mandated to a *utility* role but attempts, or is expected, to operate *proactively*. The utility role means supplying basic IT services on-demand at low cost. Such and IT function would therefore be administratively focussed and have outsourced core technical services. Operating proactively would therefore be difficult to achieve since response to technical issues is totally dependent on the schedule of the technical vendor. Furthermore, the lag time between technology discovery and technology implementation would not be mitigated as there is no R&D division. It would therefore be “stretching” the capabilities of the IT function to expect a proactive response. The *Stretched Utilitarian* is therefore an anomalous state.

Constrained Innovator:

An IT function in the top left quadrant is one that has been mandated a *strategic partner* role but is operating in a *reactive* manner. That is, the IT function is expected to seek out innovative technologies and match them to business strategy but fails to do so in a proactive manner. The reason for the reactive mode of operation may often be related to the sourcing option of the IT function’s core services. If the IT function has elected to outsource its core services then the reactive mode of operation is due to a sourcing constraint. If its core services are in-house then the reactive mode of operation is by choice (self-restrained). The *Constrained Innovator* is therefore an anomalous state.

Therefore the anomalous states of *Stretched Utilitarian* and *Constrained Innovator* are both defined by sourcing options that are inappropriate for the combination of *role* and *mode of operation of the IT function*.

The managerial implications in the specific context of the organisation examined in this study would start by first plotting its IT function on the role-mode plane and analysing the way it is sourcing its core services. From the summary of results the organisation is clearly mandated a *utility* role, but is expected to operate *proactively*. This would make it a *Stretched Utilitarian*. Since its sourcing option is mainly outsourcing it would make it difficult for such an IT function to satisfy the expectation of a *proactive* mode of operation. However, being able to see their situation clearly IT managers and executive managers can now strategize ways to reach one of the two stable states. They could either campaign to curb the proactive expectation and move towards a *Content Utilitarian* state or change their sourcing model to keep core IT services in-house, facilitating R&D, innovation and basically move towards a *Realized Innovator* state. However, based on the finding that ideally the desired sourcing option was measured to be *in-house* it would be advisable for this particular organisation to strive for the *Realised Innovator* state to satisfy the proactive expectation. The organisation would therefore need to re-negotiate the mandate of the IT function to a business partner and increase its complement of technical staff such as infrastructure specialists and software developers and possibly introduce an R&D division.

5.8.3. LIMITATIONS

A limitation of the study was that for the function demographic split there was no way of determining the populations of each functional group. It was therefore not possible to compute minimum samples of each functional group. If there is any error due to the function sample sizes not being representative of the function populations the worst impact would be that some deeper detail in the understanding of the dynamics could have been missed.

5.8.4. RECOMMENDATIONS FOR FUTURE RESEARCH

Future research should further explore the relationships between these alignment antecedent variables as they clarify alignment strategies that follow. There are several permutations of relationships between the *role*, *mode of operation* and *sourcing of the IT function* that can be investigated. For instance, it could be said that the role of the IT function could explain the mode of operation of the IT function, suggesting that the *role of the IT function* could possibly play a mediating role in the relationship between *mode of operation of the IT function* and *alignment strategy*. Another relationship might be considering the *sourcing of option of the IT function* as a slowly changing variable, or even a constant, as changing staff compliment is usually not a quick change that could be made to an

organisation. This then leaves only two variables to consider. Yet another permutation, and perhaps a long-term view, is to deliberately ignore the current resource level within the organisation, strategically decide what the desired *role* and *mode of operation of the IT function* should be and then work to building a resource compliment to meet that goal.

5.8.5. CONCLUSION

The *role*, *mode of operation* and *sourcing option of the IT function* are therefore related to each other in a way that explains why an IT function operates the way it does. Especially in large organisations, or organisations with many levels of management hierarchy, it does not take much for managers to lose sight of the selected stance of the IT function within the organisation. This leads to managers having vastly different opinions on how the IT function should be run and therefore also leads to endeavours that are counter-productive. It is hoped that the naming, measuring, and modelling of the aspects that make up this stance of IT, will make it easier to communicate and follow.

CHAPTER 6: PAPER 4 - A FRAMEWORK FOR DEVELOPING A FIRM-SPECIFIC BUSINESS AND INFORMATION TECHNOLOGY (IT) ALIGNMENT STRATEGY

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6.1. ABSTRACT

The literature confirms that despite significant research in the field of business-IT alignment, achieving a state of alignment has proved difficult to attain in practice. It also shows that there is no generic alignment strategy that works for all organisations and that the solution may lie in applying theory to the firm. Therefore the main purpose of this paper is to provide a framework for developing a firm-specific business-IT alignment strategy. In this process the study introduces and defines four alignment attributes of an organisation that need to be ascertained by an appropriate methodology. These four attributes, together with the framework developed in this study, are used to determine the appropriate alignment perspective of the Strategic Alignment Model (SAM). The application of the process was demonstrated on a case organisation. The findings show that for the case organisation the four alignment attributes led to the *Service Level* perspective of SAM. The main contribution of this study lies in the (1) definition of the four attributes of alignment, (2) the considerations that need to be taken when selecting an appropriate methodology and (3) the framework that links the four alignment attributes to the appropriate SAM perspective.

6.2. INTRODUCTION

In the field of IT management, the alignment of business and IT has long been a much desired goal. However, it appears that although business-IT alignment is a desired state, it is also elusive (Tallon, 2007:228; Valorinta, 2011:46; Silva, Figueroa & González-Reinhart, 2007:233). After reviewing the field of business-IT alignment, it was concluded that the difficulties of implementation must be due to difficulties in applying theory to the context of the firm.

To this end, the literature shows that the four perspectives of the Strategy Alignment Model (SAM) of Venkatraman, Henderson, and Oldach (1993:143) have made some inroads into creating such a firm-specific alignment strategy. However, no practical framework has been found on how an organisation could objectively associate itself with one of these four perspectives of the SAM. This paper attempts to address this lack by introducing four *alignment attributes* of an organisation and a mechanism of linking them to each of the four perspectives of the SAM.

The four *alignment attributes* of an organisation defined within this study consist of (1) the *role of the IT function*, (2) the *mode of operation* of the IT function, (3) the *strategic focus areas* within the organisation and (4) the *alignment leader*.

Within this study, the *role of the IT function* is defined as the mandate imposed on the IT function by the organisation in which it operates. It is based on two extreme views of an IT function; a *utility* view and a *business partner* view. The utility view of an IT function sees the IT function as a supplier of basic services such as network infrastructure, setting up email, and installing off-the-shelf software. The term *utility* stems from utility services, such water and electricity, which are normally procured at low-cost and on demand and that does not create strategic differentiation from competitors. The *business partner* view is one in which top management recognises that technological innovation cannot be turned on and off like a tap, and that it emerges as technologists are in close interaction with business strategists and operational personnel (Venkatraman *et al.*, 1993:139). Such a management view builds an IT function with the skills to create and maintain custom-suited systems, and usually invests heavily in research and development (R&D). In practice the role of the IT function is a variable that exists on a continuum that may be any combination of these two extremes.

The *mode of operation* of the IT function is defined as the degree of responsiveness with which the IT function executes its functions. It can be *reactive* or *proactive*. The *reactive mode* of operation refers to an IT function that supplies IT services only if they are demanded by business. Typically, the *proactive mode* of operation refers to an IT function that attempts to hedge the time delay between technology discovery and technology use. New technologies are often discovered through experimentation in R&D facilities, and it

usually takes some time before the prospective use of a new technology is realised in business.

The *strategic focus areas* refer to areas, or levels, within the organisation to which the IT function should focus its alignment strategy. It is from this particular area that the IT function would typically derive the goals that it needs to align to. The literature shows that attempts have been made to align IT with top-level (corporate-level) mission statements (Peak, Guynes & Kroon, 2005:635), divisional-level mission statements (Martin , Gregor & Hart, 2005:37), business processes (Tallon, 2007:227) and the technology horizon (Aerts, Goossenaerts, Hammer & Wortmann, 2004:781). The *strategic focus area* could depend on the *role* of IT function within the organisation and its required *mode of operation*.

The *alignment leader* refers to who (between IT and business) should take the lead with respect to alignment strategy. This variable derives from a dynamic of leadership indecisiveness that exists particularly in technology management. Generally, organisational strategy is communicated one-way, from top-level business strategists to support divisions, such as IT, below (Huang & Hu, 2007:179; Weis & Thorogood, 2011:30). However, particularly in competitive environments that are based on technology, new and innovative technology can change the way business is done. In such cases, IT needs to go against the norm and suggest to top-level business managers what the new strategy should be. Depending on the *role* and *mode of operation* of the IT function, the practice of over-riding the norm may be difficult to implement.

In support of the main purpose of this paper, to provide a framework to develop firm-specific alignment strategy, the research question that needs to be answered is “How can contextual considerations of an organisation, in the form of the four attributes of alignment, be used to enhance the application of the SAM?”

The rest of this paper is structured in four parts. First, the theory on business-IT alignment is reviewed, culminating in the components involved in operationalising the alignment strategy construct. This is followed by a description of the research design and methods. Next, the findings are presented. Finally, the paper concludes with a discussion of the theoretical and managerial implications of the findings and directions for future research.

6.3. BUSINESS AND IT ALIGNMENT

6.3.1. ALIGNMENT - ELUSIVE BUT DESIRED

The consistent alignment of business and IT has been eluding IT practitioners for many years (Brown, 2007:1157; Smaczny, 2001:797; Tallon, 2007:228). Valorinta (2011:55) puts the earliest attempt to align business and IT at nearly four decades ago; other researchers mention between two and three decades. Irrespective of the duration of the problem, researchers and practitioners have not given up on attempts to solve it. The question that naturally follows is: If research into business and IT alignment has been around for so long, why is it so elusive in practice? This research proposes that differences in *context* and difficulties in applying theory to practice have contributed to the elusiveness of successful implementation of alignment in practice.

6.3.2. CONTEXT AND THE PATH TO ANTECEDENTS

The theory of problem solving suggests that there is a relationship between the context of a problem and its solution (Augier, Shariq & Vendelø, 2001:125; Jonassen, 2000:68; Kokinov & Yoveva, 1996:1). This relationship provides a possible new angle for looking at the business-IT alignment problem. That is, that the business-IT alignment problem should perhaps be treated in the *context* in which the problem exists.

Focusing on the context of the business-IT alignment problem, in essence, requires looking at variables that contribute to the definition of the problem by setting the boundary conditions. These variables can therefore be seen as *antecedents* to the alignment problem. This research introduced the *role*, *mode of operation* and *sourcing option of the IT function* as three antecedent variables to the problem of business-IT alignment.

6.4. THE ANTECEDENTS OF ALIGNMENT

The three antecedent variables to business and IT alignment, introduced in this study, are the *role*, *mode of operation* and *sourcing option* of the IT function. The *role* and *mode of operation,* defined in the introduction, are two of the *four alignment attributes* that are used in the framework to determine the appropriate SAM perspective of the organisation. However there is a third antecedent variable, the *sourcing option* of the IT function, which influences the antecedents of *role* and *mode of operation*. The *sourcing option* of the IT function can be seen as a *mediator* variable to the *role* and *mode of operation* of IT as it may explain the values they have.

The *sourcing option* of the IT function is defined within this study as the location of core IT skills relative to the host organisation. An IT function can either keep its core IT skills *in-house*, or they may be *outsourced*. The mediator influence of the *sourcing option* on *role* and *mode of operation* of IT comes from two perspectives that can be taken with respect to the

sourcing option of IT, namely, a *resource-based view* and a *strategic view*. The *resource-based view* works on the premise that the organisation's current resources define or limit its capabilities. If the organisation does not have technical staff, such as software developers and infrastructure specialists, the *role of IT* will have to be a *utility* role and its *mode of operation* is set as *reactive*. The *strategic view* works from the premise that, for the particular business that the organisation is performing, strategic managers decide on the *role* and *mode of operation* that would suit the organisation. If the organisation does not have the required personnel, they are hired over a period of time so that organisation can reach the capability level it is aiming for. Therefore the selected perspective of the organisation with respect to *sourcing of IT* can explain the *role* and *mode of operation of IT* selected for an organisation.

6.5. ALIGNMENT STRATEGY COMPONENTS

The alignment strategy components include the latter two alignment attributes mentioned in the introduction, namely, the *strategic focus areas* and the *alignment leader*.

6.5.1. STRATEGIC FOCUS AREAS

One of the first issues to consider when strategizing an alignment approach is to determine which level of the organisation to target in order to derive the goals of alignment. Within this study, these areas within the organisation are termed the *strategic focus areas*. Historically, when it comes to strategy making, top-level mission statements have always been a favourite source for analysis (Reich & Benbasat, 2000:81). However, researchers found that in many organisations corporate mission statements were not precisely defined or, in cases when they were defined, they were not effectively communicated throughout the organisation (Abu-Musa, 2010:258). Other researchers believe that, more often than not, IT directly supports business functions rather than the corporate levels, and therefore business function mission statements would represent more appropriate goals. Gyampoh-Vidogah, Moreton & Proverbs (2003:157) mention that most functional departments have their own data structures, suggesting that they would therefore have different IT requirements. Yet others believe that IT is uniquely different from other support functions in that it has the potential to change the way work is done within the organisation. IT should therefore focus on business process re-engineering, which is the discipline of analysing business processes and finding ways to streamline and automate inefficient processes (Tallon, 2007:227). There are those that believe that IT, not only has the potential to change the way work is done within the organisation, but that it could even change the way business is done in the industry. Therefore, IT should be deriving its strategic focus areas from new and innovative technologies (Aerts *et al.*, 2004:782). Often this might require the organisation to have a research and development (R&D) division, although this might not always be practical, depending on the size and context of the host organisation.

Therefore, within the context of the host organisation, determining the appropriate focus areas could provide the IT function with valuable information on its alignment approach. Summarising the literature provides the following options for deriving strategic focus areas: (1) analysing top-level mission statements; (2) analysing division-level mission statements; (3) analysing business processes; (4) monitoring new and innovative technologies.

6.5.2. ALIGNMENT LEADER AND THE FOLLOWER-LEADER CONUNDRUM

Information Technology (IT) was originally introduced to business to facilitate efficiency in filing, record-keeping and several back-end processes. However, since then business has seen the potential of IT to create strategic differentiation, and therefore, competitive advantage (Baker, 2005:9; Chen *et al.*, 2008:366; Huang & Hu, 2007:173; Kashanchi & Toland, 2006:340; Kearns & Lederer, 2003:265; Venkatraman *et al.*, 1993:139). New and innovative technologies are constantly emerging and rapidly evolving (Cao & Hoffman, 2011:1127; Ferneley & Bell, 2006:234). Early adoption and patenting of emergent technology has the potential to become a source of a "blue ocean" strategy for a competitive organisation (Rebón, Ocariz, Gerrikagoitia, & Alzua-Sorzabal, 2015:66). Therefore, although IT generally plays the role of a support function to business, it is in the unique position of potentially changing business strategy. Since the IT function is closer to the technology horizon, it is incumbent on the IT function to take the lead and suggest to business any technological innovations that could create strategic differentiation. This dual role of the IT function of sometimes being the follower and sometimes the leader presents a unique management conundrum. Who should lead and when?

Within this study, the *alignment leader* can be either business or IT. It is important for the alignment practitioner to be cognisant of the follow-leader conundrum and determine the alignment leader as early as possible. The *alignment leader* forms the fourth alignment attribute that is required to determine the appropriate SAM perspective.

6.5.2.1. The components of the alignment strategy construct and the alignment leader

Since the *alignment leader* is the division that would be leading alignment strategy, some structure was required on which the operationalization of *alignment leader* could be based. This structure was provided by the strategic alignment construct. The literature shows that the strategic alignment construct is often composed of elements which are known factors that promote business and IT alignment. C*ommunication* between business and IT is often seen in the literature as an important factor of alignment. For this reason researchers have also used communication as a component of the alignment construct (Brodbeck *et al.,* 2009:5-32; Cumps *et al.*, 2009:119; De Haes & Van Grembergen, 2009:624; Hartung *et al.*, 2000:289; Huang & Hu, 2007:173; Jorfi *et al.*, 2011:79; Kilov & Sack, 2009:98; Luftman *et al.*, 2006:20; Tarafdar & Qrunfleh, 2010:108; Valorinta, 2011:47; Wong *et al.*, 2012:490). The other component that is dominant in the strategic alignment construct is *integrated strategic*

planning between business and IT (Brodbeck *et al.*, 2009:7; Bush *et al.*, 2009:447; Cao & Hoffman, 2011:1127; Chen *et al.*, 2008:366; De Vries, 2010:17; Gutierrez *et al.*, 2009:197; Huang & Hu, 2007:173; Newkirk *et al.*, 2008:198; Peak *et al.*, 2005:635). The third component of the strategic alignment construct found in the literature was *congruence of the visions of business and IT* (Reich & Benbasat, 2000:81; Wong *et al.*, 2012:493).

Within this study these three components of the strategic alignment construct were used to determine who (between business and IT) should lead with respect to communication, integrated planning and congruence of visions. The dominant leader with respect to these components of the alignment strategy construct was considered to be the alignment leader.

6.6. EXTENDING THE STRATEGIC ALIGNMENT MODEL (SAM)

Although the SAM is arguably the most cited model in the field of business and IT alignment, it is necessary to describe the model in order to show how the antecedents and the components of alignment strategy link to the four perspectives of SAM.

Figure 6.1 is an illustration of SAM. The model was developed when it was realised that IT had the potential to be more than a back-office support function, and could rather play a more strategic role within the organisation (Venkatraman *et al.*, 1993:139).

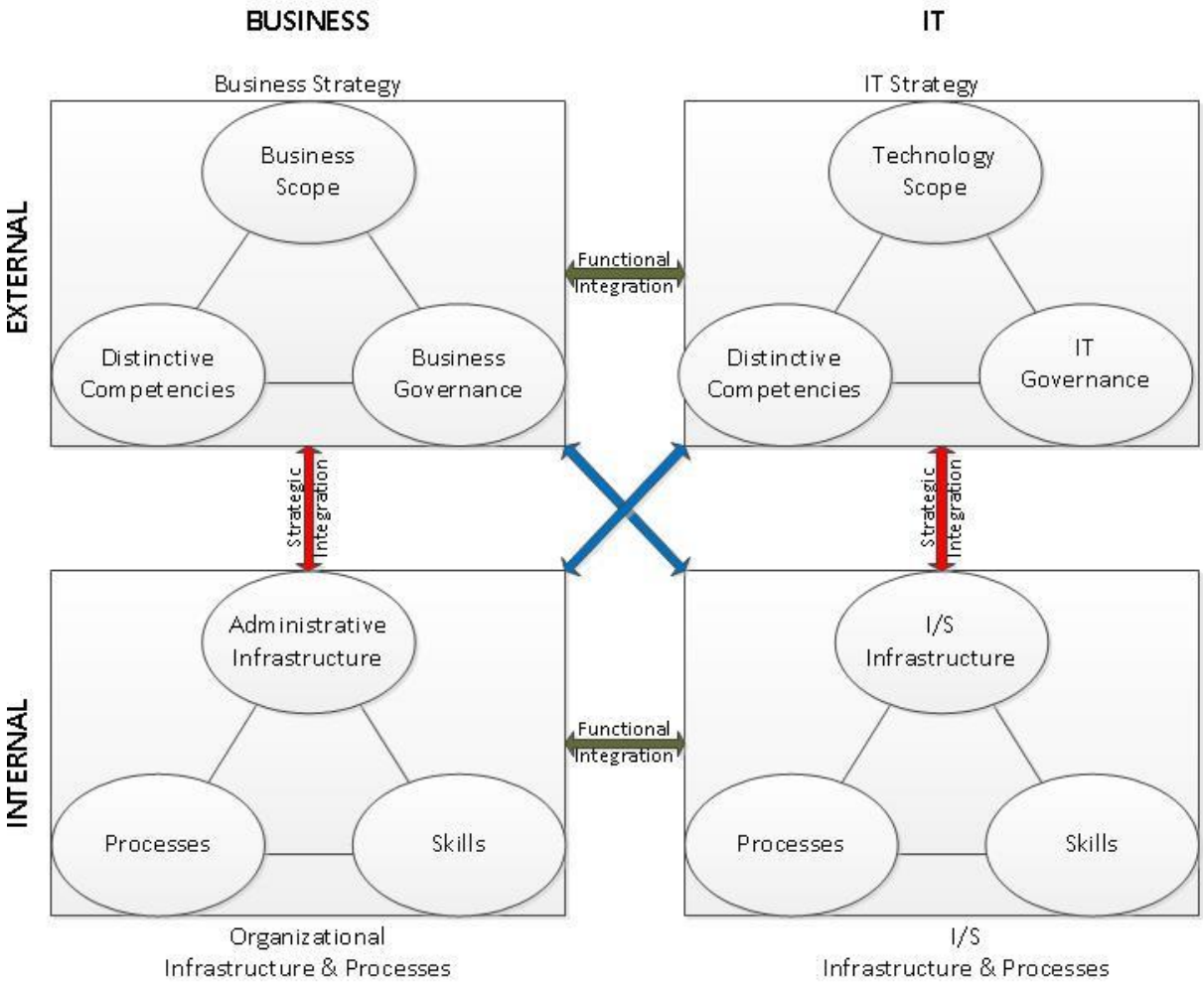

Figure 6.1: The Strategic Alignment Model (SAM) (Henderson & Venkatraman, 1989:14)

The model proposes to integrate business and IT in two dimensions: the *strategic* dimension (shown vertically) and the *functional* dimension (shown horizontally). *Strategic integration* therefore involves integrating *internal* infrastructure and processes with *external* strategies. *Functional integration* involves integrating *business functions* with *IT functions*. The result is a two-dimensional plane of conceptualising an organisation that is split into four domains: (1) *business strategy*; (2) *IT strategy*; (3) *organisational infrastructure and processes;* and finally (4) *IT infrastructure and processes*. Each of the four domains is further split into three components. The two strategy domains involve the interplay of *scope*, *distinctive competencies* and *governance*. The two internal domains involve the interplay of *infrastructure*, *processes* and *skills*.

As mentioned, SAM attempts to keep the organisation simultaneously aligned across the strategic dimension and function dimension. However, within this framework, there are several scenarios or *perspectives* that may arise that result in different strategies. Figure 6.2 illustrates the four dominant alignment perspectives that may arise.

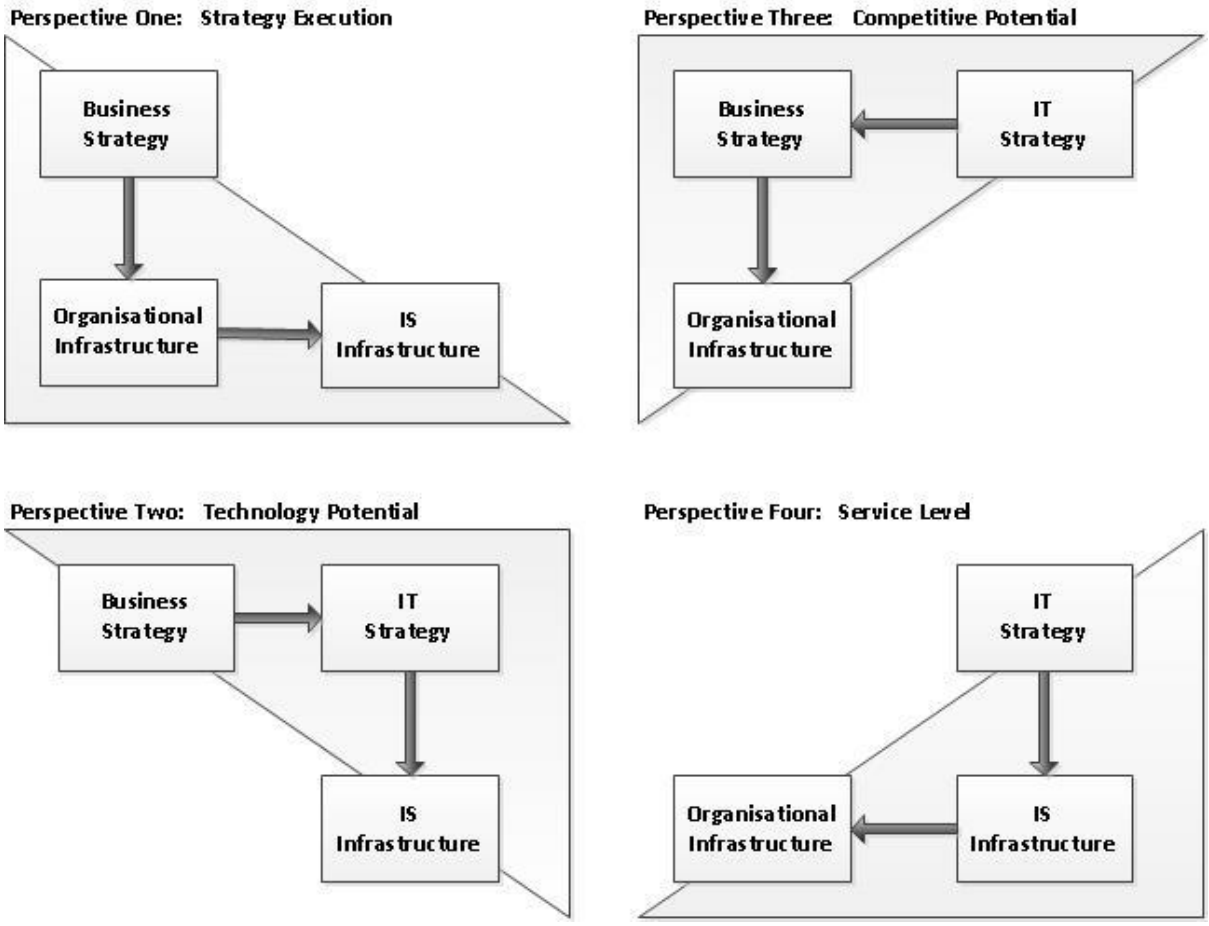

Figure 6.2: The four perspectives of SAM (Venkatraman et al., 1993:143)

Venkatraman *et al.* (1993:143) explain that each perspective consists of a triad made up of three of the four domains of SAM in Figure 6.1. Furthermore, each perspective covers both the business and IT domains and the internal and external domains. The two perspectives on the left of Figure 6.2 are driven by *business strategy,* while the two perspectives on the right are driven by *IT strategy*.

6.6.1. PERSPECTIVE ONE: STRATEGY EXECUTION

Venkatraman *et al.* (1993:142) describe this perspective as the classic view of strategy, characterised by a business strategy that drives the organisational infrastructure. IT therefore aligns its infrastructure so that it can support the organisational infrastructure.

6.6.2. PERSPECTIVE TWO: TECHNOLOGY POTENTIAL

This perspective is characterised by a scenario where business strategy provides a direct specification to IT strategy. The main difference when compared with Strategy Execution is

that IT infrastructure is not constrained by organisational infrastructure (Venkatraman *et al.*, 1993:142).

6.6.3. PERSPECTIVE THREE: COMPETITIVE POTENTIAL

This perspective is characterised by the exploitation of emergent technologies that have the potential to change business strategy (Venkatraman *et al.*, 1993:143). The IT function directs business strategy and attempts to exploit new innovative technologies by continuously staying focused on technology.

6.6.4. PERSPECTIVE FOUR: SERVICE LEVEL

This perspective entails an IT strategy that is focused on creating a world-class IT infrastructure within the organisation (Venkatraman *et al.*, 1993:144). Figure 6.2 shows that IT strategy impacts internally on IT infrastructure. The IT function is the driver of change but its influence is only internal, not strategic, and the focus is on efficiently satisfying the demands of business.

6.7. RESEARCH DESIGN AND METHODOLOGY

Table 6.1 summarises the research design of the section of this study that pertains to this article.

Table 6.1: Research Design

Component	Description
Problem	The literature shows that there is no generic alignment strategy that works for all organisations and that the solution may lie in applying theory to the context of the organisation.
Research question	How can contextual considerations of an organisation and its IT function be used to enhance the application of the SAM?
Context	Business-IT alignment
Propositions	1: The antecedent variables of the *role*, *mode of operation* of the IT function together with the *strategic focus areas* and *alignment leader* form the four basic *alignment attributes* that could be used to map to the appropriate SAM perspective. 2: The alignment practitioner needs to find an objective way to

Component	Description
	determine the four *alignment attributes* and, together with the framework developed in this study, determine the appropriate SAM perspective.
Phenomenon Investigated/Unit of analysis	Firm-specific alignment attributes
Unit of observation	Employee in a case organisation
Method	Electronic survey
Logic linking the data to the propositions	Measuring the four *alignment attributes* can provide insight into how firm-specific considerations of alignment can improve SAM application.
Criteria for interpreting the findings	A useful application of the framework in the case organisation which confirms its current status.

The empiric part of this study has to do with obtaining a sense of the four *alignment attributes* for a particular organisation. Therefore, some methodology is required to objectively measure or access them within the organisation. With regard to the methodology used to achieve this, the study aims to provide guidance rather than be prescriptive about a methodology that could vary according to context of the organisation. The assumption being made is that the context is defined by time, place and circumstance and a fixed methodology is prone to failure if the context is not considered. The guidance of this study, with regard to methodology, therefore lies mainly in the *considerations* that were made to ascertain the four *alignment attributes* within the case organisation.

The first consideration that should be made is that the method should be simple enough to be implemented by a general IT manager in his day-to-day activities. This narrows down the list of methodologies to interviews of employees of the organisation or some kind of survey method. The *interview method* generally allows for more depth of discussion as the interviewer and interviewee can both ask for clarification if anything is not clear. The *survey method* provides a quicker mechanism to capture information but the analysis requires more skill.

In the case organisation, the survey method was selected due to the consideration that its staff compliment at the time was 1659 employees. The *survey method* facilitated a larger sample of the population within the shortest time. In a small organisations, the *interview method* may be more appropriate.

6.7.1. CONSIDERATIONS SPECIFIC TO THE MEASUREMENT OF THE FOUR ATTRIBUTES

6.7.1.1. Role of the IT function

The *role of the IT function* had to do with whether organisation viewed the IT function as a *utility* service provider or a *business partner.* The consideration that would have to be made here is that these terms would have different connotations to different employees. The instrument used in the study therefore presented the respondent with utility-type services and business partner-type services that IT performed.

6.7.1.2. Mode of operation of the IT function

The *mode of operation* of the IT function measured whether IT was required to behave *reactively* or *proactively* to business demands. The consideration to be made here is that instinctively most people would want IT to respond *proactively* and would see no situation where IT should respond reactively. However, in many organisations where IT is not a core function, or generally non-competitive environments, the high cost of IT services results in viewing IT as an expense that needs to be tightly controlled (Alter, 2008:40). In such situations, business executives would require that IT should respond only when there is a clear business demand (reactively). The instrument therefore presented the respondent with two tangible scenarios or situations; one depicting a reactive situation and one depicting a proactive situation.

6.7.1.3. Strategic focus areas

The strategic focus areas involved the areas, within the organisation, that would be most viable for IT to derive the goals to which it should align itself. The question with regard to this attribute could be asked in a very straight forward manner, as there is little chance of the respondent being biased to a particular response.

6.7.1.4. Alignment leader

This attribute tries to ascertain whether business or IT would be the most viable leader of alignment in the particular business of the organisation. This set of questions could also be asked in a straight-forward manner.

6.7.2. METHODOLOGY IMPLEMENTED IN THE CASE ORGANISATION

As mention in 5.6.1, the sampling and data collection was done once for the whole study and, therefore, the sampling and data collection for this article is the same as mentioned in sections 4.6.1 and 4.6.2.

Analysis of the data captured included mainly simple descriptive statistics. However, for the analysis of differences of groups Friedman analysis was selected as the most appropriate statistical test for this type of data. The Friedman two-way analysis of variance by ranks test is particularly appropriate for ordinal-level data (Sheldon, Fillyaw & Thompson, 1996:221).

6.8. FINDINGS

6.8.1. ROLE OF THE IT FUNCTION

Table 6.2 provides a measure of the perception of *role of the IT function* within the case organisation.

Table 6.2: The role of the IT function

IT Service	Mean	Standard Deviation	Median
Network infrastructure + desktop support (US)	4.15[a]	0.95	4.5
Creation + maintenance of custom software (PS)	3.77[b]	1.02	4.0
Procurement of software (MS)	3.51[c]	0.99	4.0

Note:

Friedman p-value < 0.0001 indicating some means differ significantly.
Those means that differ significantly are represented by different superscripts.

Table 6.2 shows that the key *role of the IT function* within the case organisation is to provide the *utility* services of network infrastructure and desktop support. A significantly lower need for *partner* services such as creation and maintenance of custom software was perceived within the organisation (superscripts a and b). The *mixed* service of software procurement was seen as the least significant role (superscript c).

6.8.2. MODE OF OPERATION OF THE IT FUNCTION

Table 6.3 accesses the preferred *mode of operation* of the IT function of the case organisation by presenting to the respondent a *reactive* scenario and a *proactive* scenario with respect to different IT services.

Table 6.3: Mode of operation of the IT function

Mode of operation with respect to IT services	Mean	Standard Deviation	Median
Maintaining existing systems	4.17[a]	1.17	5.0
Enhancing system functionality	4.14[a]	1.15	5.0
Procuring new systems	3.96[a]	1.22	4.0

Note:

Friedman p-value of 0.0968 (> 0.05) indicating no significant difference.
Those means that differ significantly are represented by different superscripts.

Table 6.3 shows that, within the case organisation, a *proactive* response to IT services is required to all IT services. The p-value of the Friedman analysis shows that perception is consistent across all three services presented (superscript a for all three services).

6.8.3. STRATEGIC FOCUS AREAS

Table 6.4 provides an indication of what employees of the case organisation believe to be the most feasible approach to alignment within the case organisation. In particular, to determine the level within the organisation that could be targeted by IT to source its goals of alignment.

Table 6.4: **Source of finding focus areas**

Strategic Focus Area	Mean	Standard Deviation	Median
Top-level mission statements	3.60[a]	1.06	4.0
Business function mission statements	3.80[a]	1.04	4.0
Business processes	4.27[b]	0.94	5.0
New technologies	4.41[b]	0.90	5.0
None (Just react efficiently)	2.18[c]	1.34	2.0

Note:
Friedman p-value < 0.0001 indicating some means differ significantly.
Different superscripts indicate means that are significantly different.

Of all the strategic focus areas, analysis of *Business processes* and *New technologies* are jointly regarded as the most relevant sources in the case organisation from which the IT function should derive its strategic goals (superscript b). Analysis of *Top-level mission statements and Business function mission statements* are jointly regarded as having a lower feasibility (superscript a).

6.8.4. LEADER OF ALIGNMENT STRATEGY

Table 6.5 provides a sense of the perception within the case organisation about who, between business and IT, should take the lead with respect to alignment strategy. Three dominant components of the alignment strategy construct were used to operationalise alignment strategy, namely, strategic planning, communication of strategy and alignment of strategic visions. For each of these strategic alignment components respondents were asked to select whether business or IT should lead the process.

Table 6.5: Alignment leadership with respect to components of the strategy construct

Leadership with respect to components of the strategy construct	Mean	Standard Deviation	Median
Strategic planning			
Business includes IT in planning sessions	4.07[a]	1.10	4.0
IT includes Business in planning sessions	3.91[a]	1.03	4.0
Keep planning separate	2.22[b]	1.21	2.0
Communication of strategy			
IT leads communication	4.29[c]	0.89	4.5
Business leads communication	4.37[c]	0.80	5.0
No communication necessary	2.22[d]	1.35	2.0
Alignment of strategic vision			
IT leads alignment of vision process	4.27[e]	0.84	4.0
Business leads alignment of vision process	4.03[f]	1.03	4.0
No alignment of visions necessary	2.59[g]	1.31	3.0

Note:
Friedman p-value < 0.0001 indicating some means differ significantly. Different superscripts indicate means that are significantly different.

Overall there is a slight tendency to let IT lead alignment efforts within the case organisation. With respect to strategic planning and communication of strategies there appears to be no preference as to who should lead (superscripts a and c). However, with respect to alignment of visions Table 6.5 shows that *IT leading* the congruence-of-visions process is preferred over *business leading* this process (superscripts e and f).

6.9. DISCUSSION

As we have said, the literature has shown that practitioners in the field of IT management have been having difficulty in applying business-IT alignment research to practice. To this end, this study started off by defining a process to enable an alignment practitioner to develop a firm-specific alignment strategy. In particular, the study develops a framework that uses alignment attributes about the organisation, such as, *role* and *mode of operation* of the IT function together with assessments of the *strategic focus area* and *alignment leader* to determine one of the four alignment perspectives of the SAM. To demonstrate the use of the framework it was applied to a case organisation.

6.9.1. SUMMARY OF FINDINGS OF THE CASE ORGANISATION

Table 6.6 summarises the alignment attributes of the case organisation that can be used to map a path to the most appropriate of the four SAM perspectives.

Table 6.6: Summary of findings for the case organisation

Attribute	Value
Role of IT	Utility
Mode of operation of IT	Proactive
Strategic focus area	Business Processes and New Technology
Leader of alignment strategy	IT

Table 6.6 shows that within the case organisation the *role of the IT function* is generally perceived as a *utility* service provider. That is, an IT function that provides basic IT services such as providing a stable network infrastructure and desktop support. Employees of the case organisation, generally, do not believe that there is a need for IT to create innovative software that could change the way business is done.

The required *mode of operation* of the IT function in this environment is *proactive*. That is, IT is required to foresee system problems rather than letting them happen and reacting to them.

The most feasible *strategic focus area,* within the case organisation, from which the IT function could derive its goals of alignment, is found to be *business processes* and *new technology*. From the *utility* role, IT is not required to create new technology but rather to be aware of which of the available technologies can improve existing business processes. The focus area is then effectively just *business processes* since IT's strategy should be based on just improving business processes.

The *alignment leader*, within the case organisation, is found to be only slightly on the side of the IT function. However, the finding is consistent with the rest of the alignment attributes. For instance, the *utility* role of the IT function means that it does not have a business partner

relationship with the organisation. The *proactive* mode of operation in this scenario means that IT should operate in "auto mode". The strategic focus area for IT being *business processes,* rather than corporate or divisional missions, further emphasises that IT is not seen as a strategic function within the host organisation. It therefore stands to reason that leadership of alignment of business and IT would not be high on the agenda of business strategy and that IT would have to lead such alignment efforts.

6.9.2. THE FRAMEWORK LINKING ALIGNMENT ATTRIBUTES TO SAM PERSPECTIVE

The managerial implications of this study can be found on two levels: a theoretical level that impacts on research in the field of business-IT alignment; and a level specific to the context of the case organisation.

6.9.2.1. The framework at a theoretical level

From a theoretical viewpoint, Figure 6.3 illustrates the framework from a high-level.

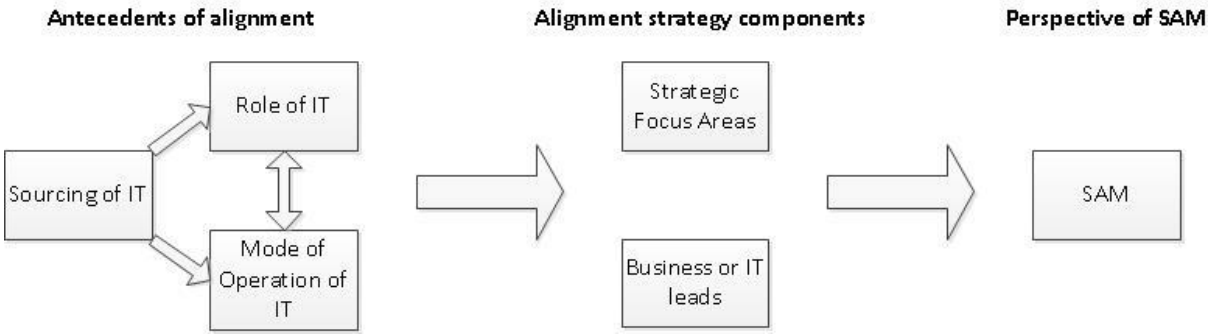

Figure 6.3: Framework for contextualising the Strategic Alignment Model (SAM) [Own compilation]

The framework suggests a process that starts with evaluating the *antecedents of alignment* that set the rigid boundary conditions of the problem. This is followed by determining *alignment strategy components*. Together these variables are used to determine the appropriate perspective of the SAM.

As mentioned in the discussion of the antecedents of alignment, the *sourcing option* of the IT function can be seen as a mediator variable and that it can be viewed from two perspectives: a *resource-based view* or a *strategic view*. Whichever perspective of the *sourcing option* of the IT function exists within the organisation, the fundamental antecedents of *role* and *mode of operation* of the IT function need to be determined.

Once the fundamental antecedents of alignment are defined, the *alignment strategy components* such as the *strategic focus areas* and the *alignment leader* (or *driver*) of the alignment process (business or IT) need to be determined. Together these variables help to determine the appropriate SAM perspective for the organisation. Figure 6.4 superimposes the four main *alignment attributes* (antecedents and strategy components) over the four perspectives of SAM.

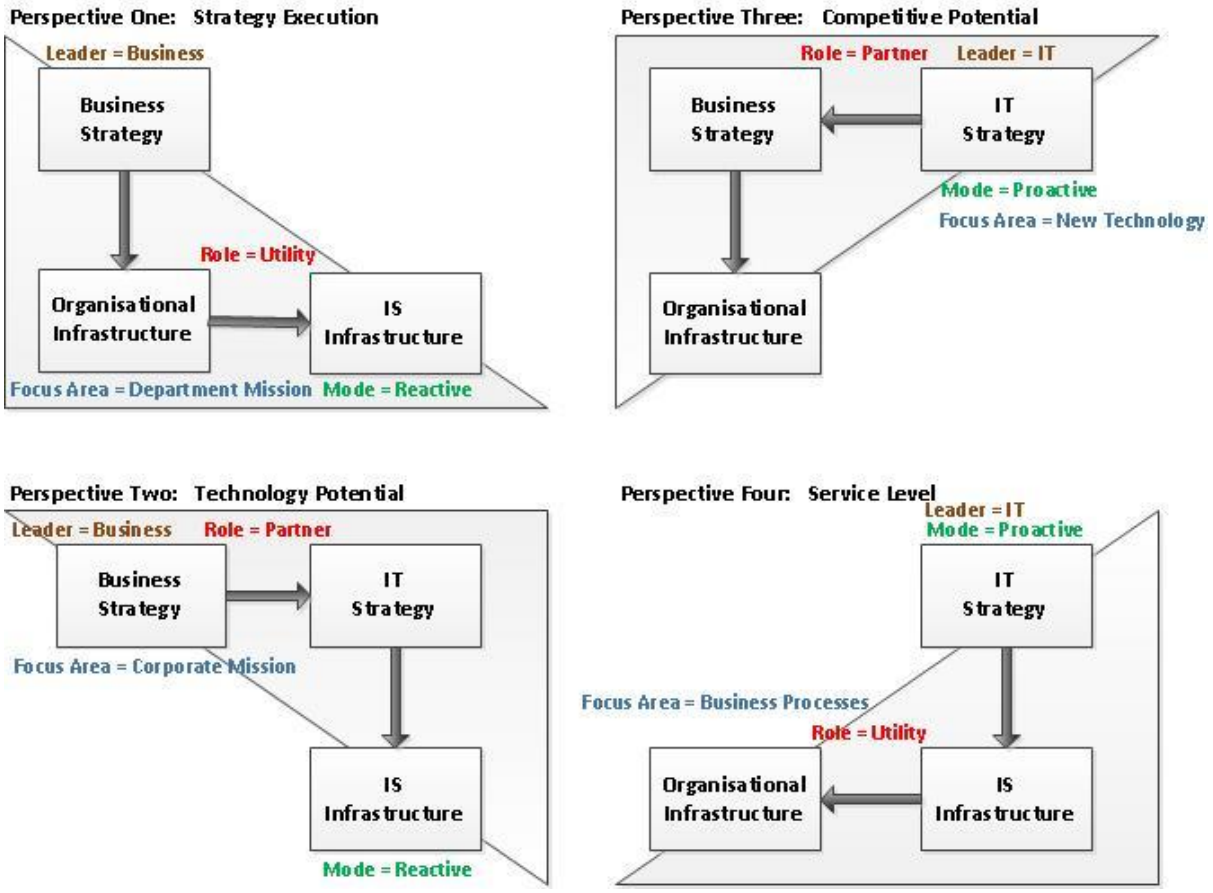

Figure 6.4: The four perspectives of SAM with the four alignment attributes superimposed

Following is an explanation of Figure 6.4. In particular, the four alignment attributes are interpreted for each SAM perspective.

Perspective One (Strategy Execution):

Role: In this perspective business strategists do not interact with IT at a strategic level. They influence the business's organisational infrastructure which, in turn, may require the services of IT to execute its instructions. Therefore the *role of the IT function* is *utility* since its mandate is to facilitate and support business operations.

Mode: The IT function is not required to proactively perform R&D into innovative technologies. It just needs to respond to the demands of business operations. Therefore the *mode of operation* is *reactive*.

Focus Area: In order for IT to develop its strategy it needs to focus on strategies of business functions that it is supporting. Hence its *strategic focus area* should be *divisional missions*.

Leader: The *leader* in any alignment efforts would typically be *business*.

Perspective Two (Technology Potential):

Role: In this perspective business sees the potential of technology to improve its competitive advantage. It therefore interacts with IT as a *business partner*.

Mode: Business knows which technologies the IT should be involved in to further its competitive advantage. The IT function therefore *reacts* to the technology direction requested by the business.

Focus Area: This type of organisation knows where it needs to be strategically and is aware of what technologies would assist its strategy. It would therefore be wise for IT focus on the *corporate mission* of such an organisation.

Leader: The leader or driver of the alignment process would typically be *business*.

Perspective Three (Competitive Potential):

Role: In this business environment competitive advantage through innovative technology is very important. However, business is aware that IT is more likely to spot innovative technologies that could change the way that business is done. Such an organisation typically invests heavily in R&D and allows IT to suggest changes to the way business can be done based on new technologies. IT interacts with business in a strategic level and IT is seen as a *business partner*.

Mode: IT behaves *proactively* suggesting business direction through technology.

Focus Area: The IT function focuses on *new technologies* that could create a “blue ocean” strategy rather than being confined by current business strategy.

Leader: The IT function typically leads the alignment process.

Perspective Four (Service Level):

Role: In this scenario business does not interact with IT on a strategic level. IT is *not* one of the core functions of the organisation and therefore is given little to no strategic direction from business. The role of IT is *utility*.

Mode: The IT function needs to be self-motivated to improve its performance. It therefore *proactively* instantiates improvements, to its own infrastructure, with the intent of positively influencing business infrastructure.

Focus Area: The IT function examines current *business processes* for possible improvements.

Leader: Since IT gets very little strategic direction from business, IT would typically have to lead any alignment efforts.

Table 6.7 summarises the theoretical discussion of Figure 6.4 and essentially provides a link between the four alignment attributes and one of the four perspectives of SAM.

Table 6.7: Link between the four alignment attributes and strategy perspectives of SAM

Role[a]	Mode[a]	Focus Area[b]	Leader[b]	Strategy perspective[c]
Utility	Reactive	Divisional missions	Business leads	Strategy Execution
Business Partner	Reactive	Corporate Mission	Business leads	Technology Potential
Business Partner	Proactive	Innovative Technologies	IT leads	Competitive Potential
Utility	Proactive	Business Processes	IT leads	Service Level

Note: a=antecedents, b=alignment strategy components, c=from Figure 6.4 (The four perspectives of SAM)

Using the four alignment attributes and Table 6.7 the practitioner can logically map a path to the appropriate SAM perspective for the organisation.

6.9.2.2. The framework applied to the case organisation

The managerial implications in the specific context of the case organisation can now be examined. Table 6.6 summarised the findings of the four alignment attributes of the case organisation. The *role of the IT function* within this organisation was determined to be that of a *utility* service provider; the *mode of operation* of the IT was found to be *proactive;* the *strategic focus area* was found to be *business processes;* the *leader* of alignment was *IT*. Table 6.7 shows that all four criteria are met by the last row which maps to the "Service Level" perspective of SAM.

Therefore, as described by Venkatraman *et al.* (1993:144) for a *Service-level* perspective, this organisation should strive to create a self-sufficient, high-performing IT infrastructure within the organisation. IT strategy should impact internally on IT infrastructure, which should

in turn benefit organisational infrastructure. Therefore the *driver* for the IT function's strategy will have to be *IT itself*. It will need to *focus* on analysing *business processes* and thereby arrange *IT infrastructure* around alignment with these business processes. The IT function of such an organisation should not expect much from the corporate level in the way of strategy direction. This concurs with the existing general attitude towards the IT function within the case organisation.

6.9.3. LIMITATIONS

As mentioned in the methodology, the determination of the four attributes of alignment (role, mode of operation, focus area and alignment leader) could be achieved, in practice, by simpler, and possibly more accurate methods, such as discussions or interviews with staff members. However, this method may not always be practical depending on the size of the organisation. The case organisation had a staff compliment of 1659 which made the interview method impractical if one wanted the "group think" of organisation with respect to the four attributes. The electronic survey method, used in this study, simplified the process of capturing the perceptions of more employees. However, this method requires the alignment practitioner to have some statistical analysis discipline. Although the analysis used in this study was mostly simple descriptive statistics, care should be taken when determining significant differences of the non-parametric data on an ordinal scale produced by Likert type instruments. For this reason the Friedman test was used instead of the Analysis of Variance (ANOVA).

6.9.4. RECOMMENDATIONS FOR FUTURE RESEARCH

Future research in business-IT alignment should continue in the vein of providing frameworks that provide practical value to implementers of strategic alignment. Frameworks could also include mechanisms that contextualise the solution to fit a particular organisation. This particular study focused on a particular organisation to extract the deeper dynamics involved in business-IT alignment. It is hoped that future research would also empirically test the four alignment attributes established in this study across a larger scope.

6.9.5. CONCLUSION

The framework developed in this study, together with the definitions of the four attributes of alignment, can be used to provide a structured mechanism for practitioners of business-IT alignment to evaluate and assimilate information about alignment in their organisations. This would lead them to the appropriate SAM perspective and could result in a more focused business-IT strategy, naturally appropriate for the particular context within which the organisation operates. It is hoped that this tool will make a positive contribution the effectiveness of IT alignment efforts in organisations.

CHAPTER 7: CONCLUSION

Contents:

7.1 Summary of Findings

7.2 Conclusions

7.3 Summary of the Contributions of this Study

7.4 Suggestions for Future Research

This study started off trying to address the persistent problem of determining how to align business and IT. The literature alluded to the possibility that the elusiveness of a consistent solution is due to a lack of focus on the application of theory to the context of the organisation. Therefore the main purpose of this study has been to shift the focus of the quest for business and IT alignment to the *context of the organisation*: in particular, to provide a guiding framework for business and IT managers that could lead them to a firm-specific alignment strategy.

The study was divided into four papers, each progressively contributing towards the development of this guiding framework. The first paper (Chapter 3) reviewed the theory of the field of business and IT alignment with a focus on its ability to sustain implementation of business and IT alignment. The second paper (Chapter 4) introduced the *role of the IT function* within the organisation as a fundamental antecedent variable to business and IT alignment. The third paper (Chapter 5) introduced the *mode of operation of the IT function* and the *sourcing option selected by the IT function* as two other antecedent variables to business and IT alignment. It also showed the relationships between these antecedent variables and how they could be used to achieve a state of stability for the IT function. The fourth paper (Chapter 6) reported on how four alignment attributes of an organisation can be used to arrive at an appropriate SAM perspective. Finally, this chapter attempts to encompass all this information to create a framework for guiding managers to select an appropriate alignment strategy for their organisation.

7.1. SUMMARY OF FINDINGS

Table 7.1 shows the summary of the findings with respect to the antecedent and strategic alignment variables for the case organisation.

Table 7.1: Summary of findings of antecedent and strategic alignment variables

Antecedent	Desired Value
Role of the IT function	Utility
Mode of operation of IT function	Proactive
Sourcing option of IT function	In-house
Strategic Focus Areas	Business Processes
Leadership of Strategic Alignment	Tending towards IT leading

Within the case organisation, the desired *role of the IT function* was measured to be that of a *utility* service provider. That is, although within the organisation there exist many systems that are custom-designed for the business, the general concern of the employees was that these systems be up and running at a low cost and on demand. There is generally little concern for the need for innovative custom-developed software.

The desired *mode of operation* of the IT function within the case organisation is *proactive*. That is, the IT function is required to be proactive about technology and suggest to business the most current advancements in technology. Systems should be updated as the business changes, without business having to specifically demand it. This mode of operation is generally contradictory to the *utility* role given to the IT function, since a utility service provider is not usually geared for research and development (R&D). A utility IT function is also not generally allowed to spend financial resources on anything that is not directly related to the bottom line, and R&D falls into this category.

The recommended manner of deriving strategic focus areas within the case organisation is to analyse existing *business processes,* rather than analysing corporate and division-level *mission* and *vision* statements. This indicates that the organisation is not explicitly directing the IT function about what its goals should be. The IT function is expected to derive its goals implicitly through grounded techniques. That is, it should be alert to what emerges on the technology horizon and be able to apply it to existing business processes.

With regard to who should lead alignment, there is a slight tendency to let the IT function lead the alignment process. As mentioned in chapter 6 this finding is consistent with the other 3 alignment attributes.

7.2. CONCLUSIONS

The conclusions of this study are structured around the research objectives, and finally the thesis statement, mentioned in the introduction of this study.

7.2.1. THE ROLE OF THE IT FUNCTION

The first two research objectives of this study had to do with the *role of the IT function* within the organisation.

The first objective was to introduce *role of the IT function* as a prerequisite or antecedent variable to the alignment process. Chapter 3 showed the need for a focus on the alignment context by reviewing the field of business and IT alignment and establishing that the theory base was abundant enough to support implementation of alignment and that the persistence of the problem could lie in the application of theory to the firm. Chapter 4 introduced the *role of the IT function* as the most fundamental firm-specific variable in the alignment problem. The basis for this reasoning was that *context,* in the business alignment problem, predominantly referred to the particular *organisation*. As such, one could conclude that before one attempts to align an IT function with a business, the most fundamental question

would be, “How does the organisation view the role of the IT function?” Hence the role of the IT function was defined as the mandate given to the IT function by the organisation in which it operates.

The second objective was to determine the *role of the IT function* for the case organisation. As mentioned in the summary of findings, the required *role of the IT function* for the business environment within the case organisation was predominantly that of a *utility* service provider. This finding is generally not what one would expect of an organisation that operates in the financial sector and that is heavily IT-dependent. The case organisation is also unique in the sense that it is the only one of its kind in the country. It would therefore be expected that such an organisation would require custom-developed systems, rather than generic systems associated with utility IT services, to meet its unique needs.

This conclusion for the case organisation, however, is supportive of a trend identified by Tan (1995:171) relating the type of business strategy of the organisation to the *role of the IT function* within the organisation. He found that if the organisation had an aggressive business strategy it was more likely to view the IT function as having a business-partner role. Conversely, if the organisation had a non-competitive business strategy it was more likely to view the IT function as having a more supportive role (utility service role). The case organisation definitely falls into the non-competitive category because it is the only one of its kind within the country and it is not profit-driven.

7.2.2. THE MODE OF OPERATION OF THE IT FUNCTION

The second set of research objectives of this study had to do with the *mode of operation of the IT function* within the organisation.

The first objective of this pair was to introduce the *mode of operation of the IT function* as an antecedent variable to business and IT alignment. Paper 3, continuing in the vein of Paper 2 on the subject of antecedents to the alignment process, introduced *mode of operation of the IT function* as an antecedent variable that had a relationship with the *role of the IT function*. The *mode of operation of the IT function* was defined, within this study, as the degree of responsiveness with which the IT function executes its functions. The values of this variable were defined as varying on a continuum with extremes that ranged from a *reactive* mode of operation, on one extreme, to a pro*active* mode of operation on the other. Although fundamental, and seemingly obvious, the lack of an agreed understanding of the *mode of operation of IT the function* can lead to many contradictory IT management decisions. Much of the confusion with regard to the *mode of operation of the IT function* stemmed from its relationship with the *role of the IT function*. At first view many would argue “Why would one ever require an IT function to respond reactively at all?” IT should always respond proactively. However, this expectation can sometimes conflict with the IT function*’s role*

within the organisation, since an IT function mandated with a *utility role* can only *react* to new technology, since it does not have the financial, nor technical, resources to adopt new technology because of its *administrative* focus. The conclusion that could be arrived at is that the introduction the *mode of operation of the IT function* brings to the fore this often overlooked relationship with the *role of the IT function*.

The second objective to do with the *mode of operation of the IT function* was to measure the desired mode of operation for the case organisation's IT function. As mentioned in the summary of findings the desired *mode of operation of the IT function* for the business environment, within the case organisation, was predominantly *proactive*. This finding demonstrates that it is quite plausible that an organisation may mandate its IT function with a *utility role* while still expecting a *proactive* mode of operation. One can conclude that such a situation could arise for the following reasons. The first is that there might be a complete lack of cognisance of the relationship between *role* and *mode of operation* mentioned above. That is, an IT function with a *utility role* (which is administratively focused) would not be able to respond *proactively* to changes in the environment because it would not have the financial freedom or the technical expertise to change technical systems. The second reason could be that the relationship might be understood, but that it might not be clear what the *role* and the expected *mode of operation* of the IT function are within the organisation. Either reason could very effectively lead to confusion and derail efforts to develop an alignment strategy between business and IT.

7.2.3. THE SOURCING OPTION OF THE IT FUNCTION

The third set of research objectives of this study had to do with the *sourcing option of the IT function* within the organisation.

The first objective of this pair was to introduce the *sourcing option of the IT function* as an antecedent variable to business and IT alignment. This variable was introduced with the *mode of operation of the IT function* in Chapter 5 as one of the antecedents closely related to the *role of the IT function*, introduced in Chapter 4. Within this study the *sourcing option* of the IT function was defined as the location of the core IT skills relative to the host organisation. *Core IT skills* referred to infrastructure specialists, software developers and desktop support. Their *location relative to the host organisation* could essentially be in-house (within the host organisation) or outside the host organisation (outsourced). The logical relationship between the *sourcing option* of the IT function and the *mode of operation* of the IT function is that the sourcing option would impact on response times of the IT function to business operations. For example, if core IT skills were outsourced, the IT function would have to engage with an outside vendor company to address operational issues, which would generally take longer than if the organisation had dedicated staff, in-house, to address such issues. The logical relationship between the *sourcing option* and the *role of the IT function* stems from strategic decisions made by executive management about how important IT is to the business and how involved they want to be with IT matters. For example, if the IT

function is mandated to have a *utility role,* the understanding is that the business is not heavily dependent on IT, and therefore it would not make financial sense to maintain the career paths of technical specialists in-house. The IT function would therefore be administratively staffed to route calls to outside technical specialists. Therefore the *sourcing option of the IT function* is logically related to both the *role of the IT function* and the *mode of the IT function* in a very intimate manner.

The second objective to do with the *sourcing option of the IT function* was to measure the desired sourcing option for the case organisation's IT function. As mentioned in the summary of findings, the desired *sourcing option* of the IT function for the case organisation was unanimously *in-house*. This is contradictory to the *utility role* mandated to the IT function, but supportive of the desired *proactive mode of operation* of the IT function. It stands to reason, then, that managers in such an environment of mixed signals would be in a state of confusion. Figure 5.2 plots the *role of the IT function* and the *mode of operation of the IT function,* creating a two-dimensional plane with four quadrants that summarise the situation. The case organisation was found to be in an *anomalous state* termed "Stretched Utilitarian" since it would be stretching the capabilities of a *utility* IT function to expect it to operate *proactively.* The utility role that has been propagated through the IT function has also resulted in a reduction of technical staff, making it more difficult to achieve the *proactive* expectation.

Therefore the conclusion that could be arrived at, with respect to the three antecedent variables of *role*, *mode of operation* and *sourcing option* of the IT function is that they *can* exist in states that contradict each other, and are therefore potentially counter-productive for the purposes of alignment (anomalous states). In such states management of both IT and business may be working against each other without being aware of it. Furthermore, these variables can affect each other over time, because of factors such as the loss of technical staff as the utility role is felt throughout IT. It is therefore important that practitioners of business and IT alignment be aware of the existence of these antecedent variables, and determine their values for the organisation under consideration, as they are prerequisites for alignment between business and IT.

7.2.4. STRATEGIC FOCUS AREAS

The *strategic focus areas* were defined as the areas within the organisation from which the IT function could derive the organisational goals with which it should align its activities. The findings of Chapter 6 showed that, within the case organisation, the appropriate *strategic focus area* was *business processes,* as opposed to the traditional *corporate* and *divisional mission* statements.

The conclusion that could be arrived at with regard to strategic focus area is that the case organisation is not an environment where business is explicitly prescriptive about the technology it uses. This is consistent with the *utility role of the IT function* for the case organisation since, unlike IT in a business-partner role, the utility IT function is seldom involved in corporate strategy making. The IT function will therefore find little direction from the organisation's mission statements. The organisation would prefer the IT function to be *self-directing,* by analysing business processes within the organisation and matching them to the appropriate new technologies on the technology horizon.

7.2.5. LEADER OF ALIGNMENT STRATEGY

In a traditional corporate structure, all divisions generally take their lead from executive management. However, as mentioned in the discussion of *strategic focus areas*, a utility IT function, as in the case organisation, receives little strategic direction from corporate strategists. In such a situation, it stands to reason that there may be confusion about who should lead tasks associated with strategic alignment, such as strategic planning, communication of strategic information and alignment of visions.

The findings of chapter 6 with respect to *strategic planning* showed that over the sample of the case organisation as a whole there was general consensus that it did not matter who led strategic planning of technology, as long as it was done. However, among the findings of the function demographic, an interesting dynamic was found to be at play. *Managerial* staff believe that *IT should lead* strategic planning with regard to technology, while *technical* and *administrative* staff believe that *business should lead* strategic planning, as it has done traditionally, and still does in many other functions. The argument that IT should lead strategic planning of technology stems from the view that technology is complex and ever-changing and therefore IT strategy is best left to technologists. The argument that business should lead strategic planning of technology stems from the view that even though technology is complex, it needs to be related to business needs if it is to be of value to the organisation. The former argument is based on a practical response to the complexity and rapid evolution of technology. The latter argument is based on the norm of how business is traditionally done. This *practicality* versus *norm* dynamic is the source of confusion with regard to the strategic planning of IT. The question as to why *managers*, in particular, see the practicality of upsetting the norm of leadership direction, while others do not, is an interesting one and is left for future research. For the purposes of the case organisation it is important to be aware that the dynamic exists and that it needs to be mitigated by policy or at least by setting a rule of business engagement with regard to strategic planning of IT.

The finding of chapter 6 with regard to *communication* of strategic information between business and IT in the case organisation was that it did not matter who led communication as long as sufficient communication existed between the two environments.

The finding of chapter 6 with regard to who should initiate the effort to keep the visions of business and IT congruent was that the IT function should be the initiator of this effort. This point of view is based on the understanding that if new technology is discovered it is probably IT that would see its relevance to the business and then alert business about adopting it. The view is contradictory to the norm of business determining strategic direction and passing that information down to IT. However, it is consistent with the utility view of the role of the IT function, which holds that there is little strategic involvement of IT in corporate strategy.

As shown in Table 6.6 and the discussion in 6.9.1 overall the alignment leader will have to be IT rather than business.

7.2.6. THE FRAMEWORK

The final research objective of this study was to show how the antecedents of alignment, together with the alignment strategy components, can lead to the appropriate SAM perspective and form the basis of an alignment strategy for business and IT.

Figure 6.3 and Table 6.7 summarise the core of the framework of alignment suggested in this study. Figure 6.3 gives an overview of the process, illustrating that the first step is to understand the antecedent variables of the *role of the IT function*, the *mode of operation of the IT function* and the *sourcing option of the IT function* for the organisation. The next step would be to evaluate the alignment strategy components of *strategic focus area* and *leader of alignment strategy*. Finally, using Table 6.7, one could arrive at the appropriate SAM perspective.

For the case organisation, the three steps of the framework are discussed and illustrated below.

Step 1: Evaluate and understand the antecedents

For the case organisation the *role of the IT function* was determined to be that of a *utility* service provider. The desired *mode of operation of the IT function* was found to be *proactive*. The preferred *sourcing option of the IT function* was found to be *in-house* staff. As mentioned in the discussion of the antecedents of alignment (section 6.4), the *sourcing option* of the IT function can be seen as a mediator variable and that it can be viewed from two perspectives: a *resource-based view* or a *strategic view*. Since the case organisation has limited in-house specialists we are dealing with the strategic view. That is, the

preference of having specialists in-house can only be satisfied if more specialists are employed. This will also facilitate the proactive mode of operation.

Figure 7.1 shows the four possible combinations of *role* and *mode of operation,* with the case organisation's combination highlighted.

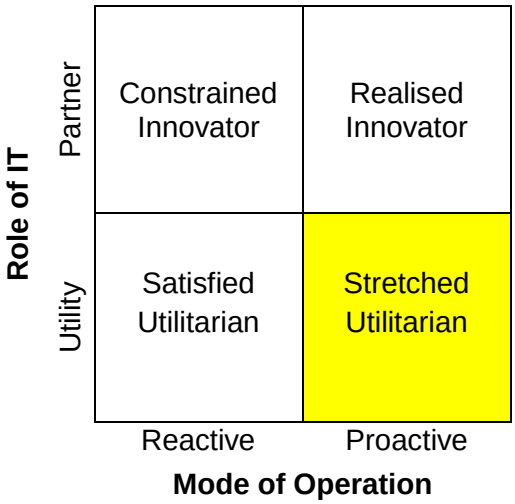

Figure 7.1: Role versus Mode of Operation

The case organisation's combination of a *utility* role and *proactive* mode of operation is termed "Stretched Utilitarian", since utility IT functions are usually characterised by a shortage of skilled technical resources, a predominance of administrative staff and the lack of R&D facilities. These characteristics make it difficult for the IT function to operate *proactively* with respect to technology. Furthermore, the *utility role* is set by *corporate mandate,* while *mode of operation* is set by the *type of business*. Changing the *role of the IT function* therefore requires changing the minds of corporate executives about the degree to which they want to be involved with technology. Since this may be contradictory to their strategic plans, and has a significant impact on human resources, changing the *role of the IT function* within the organisation can be a significantly challenging variable to change. The *mode of operation of the IT function* is usually a consequence of the business in which the organisation operates and is influenced by various factors in the business operations. Both these antecedent variables are outside the scope of manipulation of IT managers and therefore they act as hard boundary conditions in that they have a constraining effect on the number of viable strategic options for the IT function.

Step 2: Evaluate and understand the alignment strategy components

The *strategic focus area* for the case organisation was found to be *analysis of business processes*. The *strategic focus areas* are the areas that the IT function should focus on in order to derive its strategic goals for alignment. Depending on the type of business of the organisation, the degree of involvement of IT in corporate strategy may vary significantly. It can therefore *not* be assumed that IT would find its alignment goals in the corporate or divisional missions. As with the case organisation, the IT function has to use more *grounded* techniques such as analysing business processes to *discover* the goals of alignment.

The *leadership* with respect to the alignment strategy in the case organisation is mainly in the hands of the IT function.

Figure 7.2 shows the four possible combinations of *strategic focus area* and *leader of alignment strategy*, with the case organisation's combination highlighted.

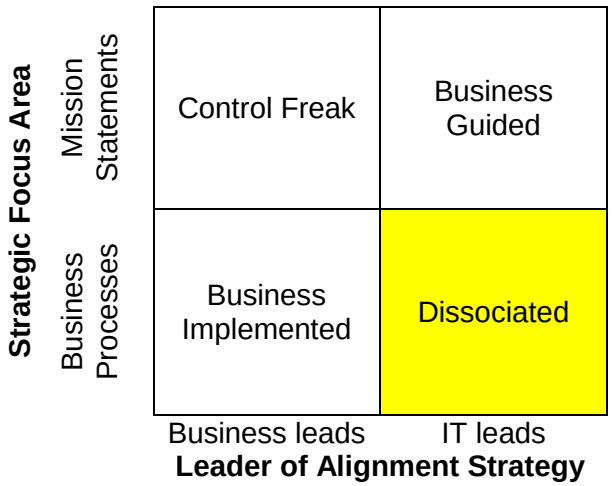

Figure 7.2: Strategic Focus Area versus Leader of Alignment Strategy

It shows that within the case organisation there is a tendency to let IT *discover* its own goals by analysing business processes and to let IT *lead* efforts of aligning business and IT. The attitude of the organisation towards alignment could be described as *dissociated*.

Step 3: Determine the appropriate SAM perspective

For the case organisation, from Figure 6.4 and Table 6.7, the four alignment attributes of the organisation are *utility* role, *proactive* mode of operation, *business processes* as focus area and *IT* as the alignment leader all map to the *Service Level* SAM perspective. The *utility* role and focus on *business processes* emphasise that the impact of IT strategy will be *internal*.

The *proactive* mode of operation and *IT* as the alignment leader emphasise that *IT strategy* will drive the alignment process.

Figure 7.3 shows the four perspectives of SAM characterised by the driving strategy for alignment (business or IT) and the level impacted on (internal or external).

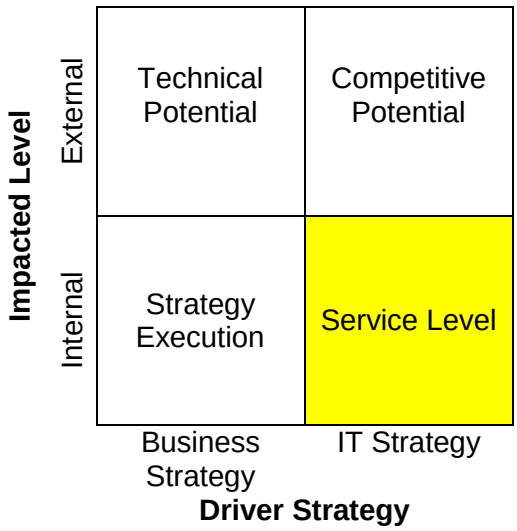

Figure 7.3: The four perspectives of SAM linked to Table 6.7

This combination of an *IT driving strategy* and an *internal focus* leads one to the *Service Level* perspective of the SAM. As described in the discussion of the four alignment perspectives of SAM (paper 4), the *Service Level* perspective is characterised by striving to create a world-class IT infrastructure within the organisation. IT strategy should impact internally on IT infrastructure, which should, in turn, impact positively on organisational infrastructure. The IT function of such an organisation should not expect much from the corporate level in the way of strategy direction.

The summary of the three steps of this framework is encapsulated in Figure 6.3.

7.3. SUMMARY OF THE CONTRIBUTIONS OF THIS STUDY

The contribution of this study includes the introduction of the *role of the IT function*, the *mode of operation of the IT function* and the *sourcing option of the IT function* as antecedent variables to the process of aligning business and IT within an organisation. The study also demonstrates the measurement and interpretation of these variables as boundary conditions to alignment strategy.

The study has also introduced the *strategic focus areas* and *leadership of strategic alignment components* as variables that are a consequence of the boundary values of the antecedent variables. The study further demonstrates how the *strategic focus areas* and *leadership of strategic alignment* can be measured for a case organisation and used as inputs to the determination of the appropriate Strategic Alignment Model (SAM) perspective for the organisation.

In essence this study provides a structured approach to arriving at the appropriate SAM perspective for a particular organisation, using inputs that are particular to the context of the organisation. This structured approach is encapsulated in a framework depicted by Figure 6.3. It is hoped that once practitioners of business and IT alignment have determined the appropriate SAM perspective, implementation of the SAM will be much more seamless. In this sense this study can be seen as an extension of SAM.

Apart from its link to the SAM, this study contributes to the drive for developing a business strategy that is firm-specific and useful to the practitioner of business management in his or her particular situation.

However, one of the limitations of this type of study is that, because it is tightly related to the context of the organisation, not all the results can be directly generalised. What can be generalised, however, is the identification of the four attributes of alignment, the methodology of their measurement and the *logical* links amongst these variables.

7.4. SUGGESTIONS FOR FUTURE RESEARCH

The suggestions for future research are in three directions.

The first direction for future research has to do with generalising the relationships across organisations. Within this study no claims of causality were made between variables, as the focus was on introducing the antecedent variables (role, mode and sourcing option of the IT function) and variables of strategic alignment (strategic focus area and leadership of strategic components). The variables were measured in a case organisation and logical decisions were made based on these measurements. However, an interesting topic for future research would be to determine whether the role-mode combination was related to the focus area-leadership combination and in turn related to the SAM perspective. That is, would an organisation with a role-mode combination of “stretched utilitarian” be linked to a focus area-leadership combination of “dissociated” across all organisations? In this study each variable was measured separately. However, if the relationship could be established

empirically across organisations, then practitioners could make decisions on SAM perspective directly from the role-mode combination.

The second direction for future research would be to determine the general rules about which of the three antecedents sets the others. For example, if one took the resource-based-view, the sourcing option would determine the *role* and *mode of the IT function*. Thus, if the organisation had only administrative and management staff, it would only be capable of playing the utility role, and would be limited to a reactive mode of operation. In such a scenario, the role and mode are set by resource constraints. In a competitive environment, on the other hand, corporate strategists may decide that their organisation should be a technology leader. In such a scenario, they could be setting the *role of the IT function* as that of a business partner and require a proactive *mode of operation*. If there was any lack of technical resources, they would employ more as part of their strategy. This dynamic is supported by Tan (1995:171), who found that if an organisation had an aggressive business strategy it was more likely to view the IT function as a business partner. Therefore, the addition of business strategy as an antecedent to alignment and its influence on the other antecedents of alignment would be an avenue for future research that would contribute to the understanding the relationships of the antecedents of alignment.

The third direction for future research is related to the strategic focus area and strategy leadership combinations that could be a source of management confusion, as they challenge the norms with regard to the direction of strategic leadership. This dynamic, referred to as the *practicality versus norm dynamic* in 7.2.5, and the *follower-leader conundrum* in Paper 4, has to do with determining when it is *practical* that IT should lead strategy and when the *norm* of business leading the strategy should be followed. A deeper understanding of the rules associated with this dynamic would greatly contribute to the quest to align business and IT.

This study started off by trying to address the problem of aligning business and IT and suggested that a significant factor contributing towards the difficulty of implementing alignment in practice stemmed from a lack of focus on context and, in particular, a lack of cognisance of variables that precede the alignment problem. Within this study, these fundamental variables have been identified, defined and measured for a case organisation. Furthermore, logical interpretations of these variables have been offered and encompassed in a framework to lead the alignment practitioner to the appropriate SAM perspective for the organisation. With this information, the alignment practitioner should have the basic information required to develop an effective firm-specific alignment strategy for the organisation.

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ANNEXURE A

< Company logo removed for anonymity >

University of Pretoria
Pretoria 0002 Republic of South Africa
http://www.up.ac.za
Department of Business Management
Economic and Management Sciences Building

A study on the alignment of business and Information Technology

Dear respondent,

The following questionnaire is part of a research study to investigate the role and expected mode of operation of IT within the <organisation name> as precursors to aligning the IT function's strategies to the goals of the organisation.

Participation is completely voluntary; however your participation would be highly valued as it would provide a clearer picture of the distribution of IT expectation across the organisation which would result in a more harmonised relationship between IT and IT client functions.

By participating in this survey,

- I, the respondent, hereby consent to take part in the research study;
- I understand that data gathering will be confidential; and
- That results of the study will be made available.

Please note that the survey asks for your opinion as a member of your department/division within the <organisation name>. There are therefore no right or wrong answers. Your individual responses will not be shown to your superiors or anyone else. By filling in the electronic survey your inputs will be directly and anonymously inserted into a database from which they will be analysed statistically as a whole.

Thank you for spending your valuable time to complete this questionnaire and working towards a better work environment. Without your input this research would not be possible.

To access the survey **click here**.

Sudesh Naidu
Senior Information Technologist
Business Systems and Technology Department
Tel: 012-3133611

Study Leader:
Prof Marius Pretorius
Department of Business Management
University of Pretoria
Marius.Pretorius@up.ac.za

SECTION A: BUSINESS DEMOGRAPHICS

A1. How would you describe your main function (s)?

Mainly management (>80%)	1
Mainly technical (>80%)	2
Mainly administrative (>80%)	3
Equal portions managerial and technical	4
Equal portions managerial and administrative	5
Equal portions technical and administrative	6

A2. Is your divsion a client of the IT function or are you part of the IT function?

Client function	1
IT function	2

SECTION B: ROLE OF IT

*The following statements require your opinion on your IT function's **key** role within the Bank. Note **Current** refers to the current role of IT and **Ideal** refers to what the role should be in the ideal situation.*

B1. IT's KEY function is to provide a reliable NETWORK INFRASTRUCTURE for systems in the Bank.

	Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
Current	1	2	3	4	5
Ideal	1	2	3	4	5

B2. IT's KEY function is to provide TECHNICAL (DESKTOP) SUPPORT for systems in the Bank.

	Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
Current	1	2	3	4	5
Ideal	1	2	3	4	5

B3. IT's KEY function is to PROCURE systems (off-the-shelf) for the SARB.

	Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
Current	1	2	3	4	5
Ideal	1	2	3	4	5

B4. IT's KEY function is to CREATE custom-suited systems for the SARB.

	Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
Current	1	2	3	4	5
Ideal	1	2	3	4	5

B5. IT's KEY function is to MAINTAIN custom-suited systems for the SARB.

	Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
Current	1	2	3	4	5
Ideal	1	2	3	4	5

B6. Rank IT's key role:

Network Infrastructure	
Desktop Support	
Procurement of off-the-shelf systems	
Creating custom systems	
Maintaining custom systems	

SECTION C: MODE OF OPERATION

*The following statements require your opinion about your IT function's **mode of operation.** That is, the manner you would expect IT to interact with you or your division. For each of the three situations two scenarios are presented. The closer you are to each scenario represents your preference for it.*

C1. With regard to **maintaining of existing systems**:

Scenario A:						**Scenario B:**
Business functions will contact IT when there is a problem. IT just needs to timeously attend to problem if and when it happens.	Current					IT should be continuously monitoring systems and proactively suggest changes that avoid problems before they happen.
	1	2	3	4	5	
	1	2	3	4	5	
	Ideal					

C2. With regard to **enhancing system functionality**:

Scenario A:						**Scenario B:**
Business functions will determine when and what should be changed. IT should just facilitate the implementation.	Current					IT should constantly be aware of business needs and suggest enhancements as technological innovation presents itself.
	1	2	3	4	5	
	1	2	3	4	5	
	Ideal					

C3. With regard to **procurement of new systems:**

Scenario A:						**Scenario B:**
Business functions are more capable than IT at finding software that is most suited to their field. IT should just provide the infrastructure for the system to run on.	Current					IT should constantly be aware of business needs. They should select solutions that are appropriate for business and which fits-in well with existing IT infrastructure.
	1	2	3	4	5	
	1	2	3	4	5	
	Ideal					

SECTION D: RESOURCES OF IT

*The following statements require your opinion of the **type of resources IT should keep**.*

D1. With regard to **infrastructure specialists (networks and servers):**

Scenario A: The SARB should **outsource infrastructure specialists**.	1	2	3	4	5	**Scenario B:** The SARB should keep a workforce of skilled **infrastructure staff in-house**.

D2. With regard to **software developers**:

Scenario A: The SARB should **outsource developers**	1	2	3	4	5	**Scenario B:** The SARB should keep a workforce of skilled **developers in-house**.

D3. With regard to **IT support**:

Scenario A: The SARB should **outsource support** to an external support centre.	1	2	3	4	5	**Scenario B:** The SARB should keep its **support centre in-house**.

D4. With regard to the **technical level of IT staff**:

Scenario A: The SARB IT staff should be more **administratively focussed**. They should efficiently log issues and pass the technical issues to technical vendors to resolve.	1	2	3	4	5	**Scenario B:** The SARB IT staff should be **technically focussed**. They should have technical foresight in preventing problems and the capability to address them speedily if they do occur.

The following statements require your opinion on whether outsourcing or in-house staff would do better, in general, in the following situations.

D5.

	In-house staff	Outsourced company
1. Create new systems quickly	☐	☐
2. Maintain or enhance existing systems quickly	☐	☐
3. Which do you believe is more cost-effective?	☐	☐
4. Understanding context of the business and interpreting business requirements	☐	☐

SECTION E: ALIGNMENT STRATEGY

Approach to deriving focus areas:

*The following statements (E1-E5) require your opinion about the **approach** that the IT function should use that would be most effective in aliging itself to the needs of the Bank.*

E1. IT should break-down or analyse the TOP-LEVEL mission and vision statements of the Bank as it is an effective way for it to derive strategic focus areas that would result in value for my division.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

E2. IT should break-down or analyse the mission and vision statements of BUSINESS FUNCTIONS as an effective way for it to derive strategic focus areas that would result in value for my division.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

E3. Mission and vision statements are not explicit enough. IT should rather analyse BUSINESS PROCESSES within the Bank and map systems to processes.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

E4. IT's value to the Bank is that it 'understands' technology. It should therefore constantly explore NEW TECHNOLOGIES to find innovative ways to help other business functions.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

E5. IT is a support function. Therefore there is no need for IT to strategize; it should simply focus on problems as they arise.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

E6. **Rank options E1-E5:**

Analyse top-level mission statements	
Analyse divsional mission statements	

Analyse business processes	
Continually research latest technologies	
Just efficiently react to problems at hand	

Planning:

*The following statements (E7-E9) require your opinion about the **mechanisms** that could be used to align **planning** between business units and IT.*

E7. Business units should include IT managers in their strategic planning sessions so that they can provide input on whether technology can provide solutions to business problems.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

E8. Each business unit should rather dedicate a resource as a business analyst who continuously documents and monitors operations. These business analysts should then be invited to IT strategic planning sessions.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

E9. Planning between business units and IT should be kept separate.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

Communication of Current Objectives:

*The following statements (E10-E12) require your opinion about the **communication of objectives** between IT and business units.*

E10. IT should regularly communicate its objectives to each business unit to ensure there is a mutual understanding of current objectives.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

E11 Business units should regularly present their objectives to IT and IT should indicate whether they can help meet these objectives.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

E12. Regular communication of objectives between business units and IT provides no real value.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

Congruence of IT Vision:

*The following statements (E13-E15) require your opinion about the **congruence** of the **visions of IT and business units**.*

E13 IT should, at least annually, show business units how its vision is congruent with those of the business units.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

E14 IT and business unit visions should be congruent but it adds no value to make a deliberate effort to point it out.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5

E15 The IT function's vision has nothing to do the visions of the business units.

Strongly Disagree	Partially Disagree	Neutral	Partially Agree	Strongly Agree
1	2	3	4	5