The impact of environmental uncertainty on business–IT alignment:

A study in Sri Lanka

By

Padukkage Don Kaushal Amitha Kumara

A thesis
submitted to the Victoria University of Wellington
in fulfilment of the requirements for the degree of
Doctor of Philosophy in

Information Systems

Victoria University of Wellington

2016

Abstract

Despite the widely held belief that organisational performance can be enhanced through the alignment of information technology (IT) and business strategy, alignment remains a top concern for IT and business executives. This means that the challenges of attaining strategic alignment have not been overcome. Environmental uncertainty, in particular, is one of the key challenges to achieving strategic alignment.

Organisations continually adapt their strategies due to rapid changes in the market, technology and regulations. Either the business strategy changes and the IT strategy has to adapt to remain in alignment, or new IT emerges and business and IT strategies have to be revised to seize opportunities. Changes in the regulations can also have a significant impact on organisational strategy. Uncertainty increases the difficulty of understanding the environment and places executives in a challenging situation with regard to strategic decision making. It is thus important for executives to develop an understanding of the effect of environmental uncertainty on strategic alignment.

This issue has received little attention in the alignment literature. The literature presents mixed arguments on the effect of environmental uncertainty on strategic alignment. There is literature which explain the implications of the antecedents of strategic alignment; however, it does not consider these antecedents in the context of a highly uncertain environment. Hence, the objective of this research is to identify the extent of the impact of environmental uncertainty on strategic alignment and to determine how this affects the impact of other antecedents.

This research adopts a post-positivist approach. Using the perspectives of the resource-based theory and the knowledge-based view of the firm, a conceptual model is presented which examines the impact of antecedents and environmental uncertainty on strategic alignment. Three antecedents – shared domain knowledge, relationship management, and prior IS success – were selected as key antecedents. Environmental uncertainty was also proposed as an antecedent. This research assumes that the effect of these antecedents on strategic alignment is mediated by two managerial practices: communication and planning connection. Based on data collected from 212 organisations in Sri Lanka, the conceptual model is tested against the research

objective. As a developing country, Sri Lanka has a highly turbulent environment and thus provides a suitable setting in which to examine the impact of environmental uncertainty on strategic alignment. Partial Least Squares structural equation modelling is used to test the conceptual model.

The results reveal that environmental uncertainty has a positive impact on strategic alignment and that it is mediated by managerial practices. All the antecedents were also found to have a positive effect on managerial practices. As a managerial practice, planning connection has the stronger influence on strategic alignment, while communication plays a contingent role in the alignment process. Moreover, organisation size also has an influence on the alignment process. The relative influence of antecedents and environmental uncertainty differs between SMEs and large organisations. This suggests that the mechanisms used to attain strategic alignment vary by organisational size.

The findings contribute to the literature and practice of strategic alignment in several ways. One of the contributions is the introduction of environmental uncertainty as an antecedent to strategic alignment and the identification of the influence of three sources of uncertainty: market uncertainty, technological uncertainty and regulatory uncertainty. Another contribution is a theoretical explanation of the strategic alignment process using the resource-based theory and the knowledge-based view of the firm. Further, this research extends the validity of the alignment process to a developing country context. From the practitioners' point of view, this research provides valuable guidance about aligning IT strategy with business strategies in an uncertain environment. Moreover, this research provides prescriptive insights for attaining business–IT alignment for both SMEs and large organisations.

Key words: Strategic Alignment, Antecedents, Environmental Uncertainty, Firm Size.

Acknowledgements

I would like to express my sincere gratitude and appreciation to the people who helped me during this research.

I would like to extend my sincere gratitude and appreciation to my primary supervisor, Dr Janet Toland and secondary supervisor, Associate Professor Val Hooper. Thank you for the generous support, the guidance, the humour and for being extraordinary mentors. You not only provided outstanding supervision, you also offered me encouragement and practical support to overcome the difficult situations in this journey. Your kindness, knowledge, and friendship played a vital role throughout my PhD journey. I will never forget this journey.

I would also like to thank Emeritus Professor Sid Huff, who was the primary supervisor during the early stages of this research, for providing valuable insights and important initial direction in this research. Deep appreciation is also expressed to Emeritus Professor Pak Yoong and Dr Philip Calvert for direction in the proposal stage of this research as well as Professor Benoit Aubert, Professor Anne Goulding, Dr Dan Dorner, Dr Mary Tate, and Dr Chern Li Liew for their advice, encouragement, and support.

I give special thanks to the other academic and administrative staff in School of Information Management (SIM) and the SIM PhD cohort, especially Jean Grant and Usha Varatharaju for all their administrative support and encouragement and Prudence Walker who provided guidance and support to gain confidence in academic writing. My thanks also go to Jackie Bell for proofreading my thesis.

I also acknowledge my wife Kethmini for her love, patience and never-ending support, and my parents and sisters, extended family and friends for being supportive throughout this process despite the physical distance.

I also wish to acknowledge the great support of Professor Sampath Amaratunga, Dr Dushyantha Kulatunga, Dr Malkanthi Samarasinghe and other academic and non-academic staff from the University of Sri Jayewardenepura, Sri Lanka.

Contents

List of figures

List of tables

CHAPTER 01: INTRODUCTION

This chapter provides an introduction to the thesis and explains the motivation for the research undertaken. The research gap is then presented. Then, the research questions and objectives are set out, and the methodological approach is summarised. Finally, the research significance and the thesis outline are presented.

1.1 Research background

In many organisations, information technology (IT) has become crucial for the operational support, sustainability, and growth of business (Drnevich & Croson, 2013; El-Masri, Orozco, Tarhini, & Tarhini, 2015; Wu, Straub, & Liang, 2015). This pervasive use of technology has created a dependency on proper integration of IT with business. Failure to do so is believed to be the cause of failure of many IT initiatives (Chen, Mocker, Preston, & Teubner, 2010). Particularly in the case of enterprise-wide information system (IS) initiatives, alignment with the strategic objectives of the organisation is the most significant challenge for modern organisations (Ravishankar, Pan, & Leidner, 2011).

Business–IT alignment, also referred to as strategic alignment, facilitates the application of IT in an appropriate and timely way and in harmony with business goals, objectives, strategies and needs (Luftman & Brier, 1999; Van de Wetering, 2016). It is a collaborative process between business and IT executives which enables them to search for opportunities for embedding IT in business (Choe, 2003). Strategic alignment is generally rooted in contingency theory assuming that the effectiveness of organisations is a result of the fit between organisational characteristics and contingencies that surround the organisation (Henderson & Venkatraman, 1993). This fit is crucial in order to support strategies within an organisation (Chan, Huff, Barclay, & Copeland, 1997). It can aid organisations in the acquisition and development of IT resources and capabilities, necessary for competitive positioning (Ravishankar et al., 2011).

This enduring importance of strategic alignment has generated a large body of alignment literature. Different perspectives have been used to define strategic

alignment (Reich & Benbasat, 1996), to achieve strategic alignment (Chan, Sabherwal, & Thatcher, 2006; Hu & Huang, 2006; Reich & Benbasat, 2000), and to explore outcomes of strategic alignment (Chan et al., 2006; Wu, Straub, et al., 2015; Yayla & Hu, 2012; Zelenkov, 2015). The literature also suggests numerous antecedents that contribute to strategic alignment (Chan et al., 2006; Hu & Huang, 2006; Luftman & Brier, 1999; Reich & Benbasat, 2000). Despite the identification of antecedents and processes, attaining strategic alignment remains a challenge (Luftman et al., 2012; Preston, 2014; Schlosser, Beimborn, Weitzel, & Wagner, 2015; Silvius, Waal, & Smit, 2009).

1.2 Research motivation

One of the most widely accepted assumptions in IS literature is that organisational performance can be enhanced through the alignment between IT and the organisation's business strategies (Avison, Jones, Powell, & Wilson, 2004; Cao, Baker, & Hoffman, 2012; Chan & Reich, 2007b; Chan et al., 2006; Henderson & Venkatraman, 1993; Pearlman & Baker, 2005; Yayla & Hu, 2012). Business–IT alignment enhances organisational performance in many ways: by maximising the return on IT investments, by helping to achieve competitive advantage through IS and by providing direction to react to new opportunities (Avison et al., 2004; Henderson & Venkatraman, 1993; Nelson & Cooprider, 1996; Schlosser et al., 2015; Tan & Gallupe, 2006; Wu, Straub, et al., 2015).

However, from the practitioners' point of view, achieving the proper strategic alignment is problematic (Campbell, Kay, & Avison, 2005). Many CEOs view alignment of IT with business as one of the major challenges (Gerow, Thatcher, & Grover, 2015; Preston, 2014; Schlosser et al., 2015; Shah, 2012) and it has remained among the top concerns of both business and IT executives for over two decades (Gerow et al., 2015; Lai, 2001; Luftman & Ben-Zvi, 2010; Luftman & McLean, 2004; Luftman et al., 2012; Rosa, 1998). Environmental uncertainty, in particular, has been found to be one of the key challenges to achieving strategic alignment (Chan, 2002; Luftman, 2003; Sabherwal & Kirs, 1994; Zelenkov, 2015).

The environment is considered an external controller of an organisation. Organisations are considered as open systems that have interactions with their surrounding environment (Berglund & Sandström, 2013; Katz & Kahn, 1978). Organisations depend on the external environment to obtain critical resources (Berglund & Sandström, 2013). Further, external factors such as competitors and regulatory agencies have a certain degree of autonomy in relation to influencing internal organisational activities (Berglund & Sandström, 2013; Pfeffer & Salancik, 1978). Therefore, organisations are forced to act under conditions of restricted freedom (Berglund & Sandström, 2013).

While organisations depend on the environment for critical resources, the environment is considered to be unreliable as it is beyond the control of organisations (Berglund & Sandström, 2013). Moreover, the environment continuously shapes and reshape due to the rapid changes in market and technology (Chi et al., 2005; Porter, 2001; Zelenkov, 2015). Therefore, either the business changes and information systems have to adapt to remain in alignment with the evolving organisations' needs, goals, and strategies (Vessey & Ward, 2013), or new information technologies emerge and business goals and strategies have to be revised to utilise the opportunity (Henderson & Venkatraman, 1993; Zelenkov, 2015). Even after an organisation has achieved alignment, the environment continues to change, whether slowly or rapidly. Thus, an organisation needs to continually fine-tune their alignment to accommodate ongoing environmental changes. However, rapid chages in the environment create unpredictability and uncertainty (Calantone, Garcia, & Droge, 2003), making it important for managers to develop an understanding of the effect of environmental uncertainty on strategic alignment.

Therefore, from the academic perspective as well as from a practitioner's perspective, it is important to develop an understanding of the impact of environmental uncertainty on strategic alignment and identify which antecedents can be of most assistance when attempting to achieve strategic alignment in the context of a highly complex and dynamic environment. Despite its importance, theory-based empirical research on the relative importance of the antecedents affecting strategic alignment still remains an area with insufficient research (Wu, Straub, et al., 2015). This provides the motivation

for the research to fill this gap in the knowledge by investigating the capabilities of antecedents to ameliorate the impact of environmental uncertainty on strategic alignment.

1.3 Research gap

A variety of approaches to achieving strategic alignment have been proposed in the literature. One of the approaches is to discover how certain critical antecedents interact to create conditions that enable or inhibit strategic alignment (Reich & Benbasat, 2000). The literature indicates two categories of antecedents relevant to strategic alignment: antecedents directly under the control of the organisation such as shared domain knowledge, planning sophistication, and prior IT success (Chan et al., 2006; Reich & Benbasat, 2000); and antecedents external to the organisation such as external IT expertise (Hussin, King, & Cragg, 2002) and environmental uncertainty (Chan & Reich, 2007b).

Although numerous antecedents have been proposed, shared domain knowledge, prior IS success, and relationship management have been identified as key antecedents which create the necessary conditions for alignment to occur (Chan & Reich, 2007b; Chan et al., 2006; Hu & Huang, 2006; Reich & Benbasat, 2000). The literature suggests that these antecedents influence managerial practices – communication between business and IT executives, and the connection between business and IT planning processes – and consequently influence strategic alignment (Hu & Huang, 2006; Reich & Benbasat, 2000). Therefore, by examining each antecedent in an organisational context, executives are better able to design appropriate strategies to support managerial practices and consequently achieve strategic alignment (Hu & Huang, 2006; Reich & Benbasat, 2000; Yayla & Hu, 2009).

However, as an external factor, environmental uncertainty increases the difficulties in understanding and responding to the environment, and places executives in a challenging situation with regard to strategic decision making (Galliers & Leidner, 2014; Zelenkov, 2015). Some of the information required to make comprehensive decisions may not be available in an uncertain environment (Fredrickson & Mitchell, 1984; Galliers & Leidner, 2014). This lack of information together with the

unpredictability of environmental variables can result in ambiguity and cause serious mistakes in decision making (Xu & Koronios, 2005), resulting in a lack of coordination between IT and business units and potentially conflicting unit goals (Sabherwal & Kirs, 1994). Therefore, environmental uncertainty creates unfavourable conditions for the alignment of IT strategies with business strategies (Sabherwal & Kirs, 1994).

Despite the general scholarly agreement that the external environment should be taken into consideration (Chan et al., 2006; Yayla & Hu, 2012) the number of studies explicitly investigating the effect of environmental uncertainty on strategic alignment is small. Insufficient understanding of the impact of environmental uncertainty can affect the efficiency of the organisation's internal practices, and make it difficult for executives to adopt effective strategies to cope with uncertainty (Engau & Hoffmann, 2009). It is important for executives to increase their understanding of the role antecedents play in ameliorating the influence of environmental uncertainty on managerial practices which pertain to strategic alignment. Therefore, there is value in studying how environmental uncertainty affects the managerial practices and how this in turn affects the impact of other antecedents on strategic alignment.

Environmental uncertainty is often caused by changes in markets, technologies and the regulatory environment (Bstieler, 2005; Engau & Hoffmann, 2009). Thus, the literature describes three sources of uncertainty: market uncertainty, technological uncertainty, and regulatory uncertainty.

Market uncertainty refers to the unpredictability of rapid and significant changes in the market as well as instability and complexity (Bstieler, 2005). As complexity increases, executives fail to evaluate the environment effectively due to their bounded rationality (Yayla & Hu, 2012). The rationality of executives' decisions is limited by the information they have and the finite amount of time they have to make a decision (Bazerman & Moore, 2008). The instability and complexity of the market environment reduces the information available for managerial decisions (Fredrickson & Mitchell, 1984; Galliers & Leidner, 2014). Further, a high rate of environmental change challenges managers to adopt new requirements and strategies frequently. Market uncertainty is therefore one of the most challenging factors for strategic decision making (Galliers & Leidner, 2014; Zelenkov, 2015). Previous studies have largely

considered only market uncertainty (Chan et al., 2006; Sabherwal & Kirs, 1994). Attempting to capture the effect of environmental uncertainty by focusing only on market uncertainty has prevented detection of the effects of the two other kinds of uncertainty.

Rapid changes in, and complexity of, technology create unpredictability and uncertainty of technology (Bstieler, 2005; Calantone et al., 2003). In the contemporary business environment, organisations increasingly rely on IT for competitiveness and survival in the marketplace (Chan et al., 2006). IT has been considered a strategic tool to help gain competitive advantage (Choe, 2003). The focus for gaining competitive advantage has shifted from the management of internal resources to selecting and developing technology-driven business models (Teece, 2007; Teece, Pisano, & Shuen, 1997). Thus, technological uncertainty may have a significant effect on IT strategies (Calantone et al., 2003; Chang & Park, 2013; Gelderman, Semeijn, & Mertschuweit, 2016).

Similarly, changes to existing regulations and new regulations which are enforced at national and industry level increasingly expose organisations to regulatory uncertainty (Engau & Hoffmann, 2009). This refers to the unpredictability of rapid and significant changes in regulations and policies, together with instability and complexity of regulations and policies (Bstieler, 2005; Engau & Hoffmann, 2009). Regulatory uncertainty is a critical issue for business since being unaware of regulatory changes might have severe consequences for organisations (Hoffmann, Trautmann, & Hamprecht, 2009). The literature also argued that regulatory changes create challenges, since many organisations seize new opportunities from regulatory changes (Mechanic, 2012). A better understanding of the influence of uncertainty enables executives to improve their strategic decision making and manipulate antecedents more appropriately to achieve alignment. Therefore, it is important to study not only the effect of market uncertainty but also the effect of technological and regulatory uncertainty on strategic alignment. This research thus extends the work performed by other researchers by exploring market uncertainty, technological uncertainty and regulatory uncertainty as external antecedents which affect strategic alignment.

As suggested by Reich and Benbasat (2000), this research proposes communication and planning connection as two managerial practices which pertain to strategic alignment. Reich and Benbasat (2000) suggest that higher levels of communication and planning connection increase the alignment between IT and business strategies. This argument is further empirically validated by two succeeding studies (Hu & Huang, 2006; Yayla & Hu, 2009) and thus, use of Reich and Benbasat's model (2000) provides an empirically validated basis for evaluating the impact of environmental uncertainty on communication and planning connection. After reviewing the literature, this research includes shared domain knowledge, prior IS success and relationship management as the internal antecedents of alignment (Chan & Reich, 2007b; Chan et al., 2006; Hu & Huang, 2006; Reich & Benbasat, 2000). Further, this research focuses on developing countries, where the environment has been characterised as highly turbulent (Badri, Davis, & Davis, 2000; Iakovleva, Kolvereid, & Stephan, 2011). Overall, this research further informs strategies to improve strategic alignment by focusing on how antecedents can be best manipulated to achieve strategic alignment.

The next section presents the research objectives and questions for the research.

1.4 Research goal

The research questions are:

RQ1: How does environmental uncertainty affect the managerial practices which pertain to strategic alignment?

RQ1a: How does environmental uncertainty affect communication in the context of strategic alignment?

RQ1b: How does environmental uncertainty affect planning connection in the context of strategic alignment?

RQ2: What is the effect of internal antecedents on the managerial practices in an uncertain environment?

RQ2a: How do internal antecedents affect communication in an uncertain environment?

RQ2b: How do internal antecedents affect planning connection in an uncertain environment?

In answering the research questions this study aims to:

RO1: determine the effect of environmental uncertainty on the managerial practices which pertain to strategic alignment;

 RO1a: determine the effect of environmental uncertainty on communication;

RO1b: determine the effect of environmental uncertainty on planning connection;

RO2: determine the effect of the internal antecedents on the managerial practices which pertain to strategic alignment in an uncertain environment;

RO2a: determine the effect of the internal antecedents on communication in an uncertain environment;

RO2b: determine the effect of the internal antecedents on planning connection in an uncertain environment.

1.5 Research strategy

The research strategy was developed to achieve the research objectives and to answer the research questions. The strategy consists of three phases.

In the first phase, a study of the research phenomena was carried out and used to conceptualise the research model. In this phase, relevant literature was reviewed to explore the research phenomena to be able to accurately capture fundamental concepts of this research. The literature review on strategic alignment, antecedents, and environmental uncertainty provided the relevant body of knowledge for the development of a conceptual model and associated hypotheses.

The second phase aimed to develop a research design for the study. A post-positivist research approach informed the methodological approach for this research. The constructs were defined and the initial items were adapted from the literature. This was followed by an instrument refinement process which was carried out through a pre-test and a pilot survey.

The third phase aimed to find the answers to the research questions through the testing of the research hypotheses. A large survey of CEOs in a range of different industries in Sri Lanka was carried out. Partial Least Squares structural equation modelling was used to test the conceptual model. Both measurement and structural models were evaluated using Smart PLS 3.0. This included discussion of the results, documenting the contributions to theory and practice, limitations and further research opportunities.

1.6 Significance of the research

The significance of this research lies in the potential value it offers to academics and practioners. Each is explained below.

1.6.1 Academic value of the research

From an open systems perspective, scholars have investigated the interactions between organisations and their surrounding environment (Berglund & Sandström, 2013; Miller, 1992; Miller & Friesen, 1983). The open systems perspective suggests that organisations are influenced by their environment. However, the research which has been carried out shows mixed results (Chan et al., 2006; Sabherwal & Kirs, 1994; Yayla & Hu, 2012) and has consistently failed to find empirical support for the effect of environmental uncertainty on strategic alignment. Therefore, this research contributes to the body of knowledge by providing new insight into the effect of environmental uncertainty on alignment in two ways. Firstly, this research explicitly provides insights on the potential influences of environmental uncertainty on strategic alignment and secondly, it assesses how influences of environmental uncertainty affect the impact of other antecedents on strategic alignment.

Although there has been significant research on strategic alignment emphasising the antecedents of alignment, most of the studies have been largely subjective and exploratory (Aggarwal, 2010; Yayla & Hu, 2009). This research presents a comprehensive quantitative assessment of the effect of the major antecedents on strategic alignment, thereby providing confirmatory evidence of the effect of the antecedents.

The strategic alignment body of knowledge is mainly biased to the developed country context. Most of the empirical evidence has been based on studies conducted in countries such as the USA and Canada. Only a few studies have been done in developing countries. Organisations in developing countries generally experience higher environmental uncertainty than organisations in developed countries (Iakovleva et al., 2011). Further, the differences between developed and developing countries such as available infrastructure, and social and cultural issues are less likely to support generalising the findings from developed countries to developing countries (Kapurubandara & Lawson, 2006; Kartiwi & MacGregor, 2007). Therefore, investigation of the strategic alignment phenomenon in a developing country context with a sound research approach again contributes to knowledge.

This research also helps to extend the theoretical understanding of the alignment process. One of the limitations of alignment research is that it is not rich in the use of theories and relies heavily on strategic management literature (Chan & Reich, 2007b). The literature further suggests investigating the relationship between knowledge management and alignment (Chan & Reich, 2007b; Kearns & Sabherwal, 2007). The alignment process presented in this study is a collaborative process of knowledge integration between business and IT executives. The process also facilitates greater alignment by utilising the unique internal resources. Therefore, this research provides a theoretical explanation of strategic alignment using the knowledge-based view of the firm and the resource-based theory.

1.6.2 Practitioner value of the research

This research addresses one of the top concerns of CIOs (Luftman et al., 2012). Further, both business and IT managers often look for guidance that will enable them to cope with uncertainty (Delmas & Tokat, 2005). From a practitioner's perspective, this research provides better guidance towards aligning IT strategy with the business strategy in an uncertain business environment. Specifically, this research provides insights on how environmental uncertainty influences the strategic alignment process and how antecedents and managerial practices can help practitioners to attain and sustain strategic alignment. Therefore, managers can utilise the research findings to improve their understanding of the influences of environmental uncertainty with

respect to strategic alignment and to manipulate antecedents more appropriately to achieve and sustain strategic alignment.

The following section explains the format of the remaining chapters in this thesis.

1.7 Thesis outline

This chapter has outlined the motivation for the research, research objectives and questions, and the contributions to literature and practice. The remainder of this thesis consists of six chapters. Chapter 2 is a literature review of the relevant literature with the purpose of establishing the theoretical boundaries and foundations of this research. Chapter 3 details the proposed research model and it ends with the development of research hypotheses. Chapter 4 describes the research methodology and the research design that were used to address the research objectives and to answer the two research questions. Chapter 5 presents the evaluation of the measurement and structural models as well as the findings of the main survey. Chapter 6 provides a discussion of the overall research results. Finally, chapter 7 discusses the research contributions, limitations, and conclusions.

CHAPTER 02: LITERATURE REVIEW

In this chapter, the literature review is presented for the purpose of establishing the theoretical foundation of this research. The literature review synthesises relevant research and theory, exposes gaps and identifies the issues that are significant to the research. The chapter begins by reviewing the core concepts of strategic alignment and discusses its importance for organisations. Then, a review of previous studies of antecedents in the strategic alignment literature is presented. The final section focuses on studies that investigate environmental uncertainty. In the summary section, key outcomes of the literature review are presented.

2.1 Introduction

Strategic alignment is seen as the degree of fit between business strategy and IT strategy in an organisation (Yayla & Hu, 2009). It has been studied extensively over the last three decades (Baets, 1992; Baker, Jones, Qing, & Jaeki, 2011; Chan et al., 1997; Chan & Reich, 2007b; Gerow et al., 2015; Henderson & Venkatraman, 1993; Nath, 1989; Sabherwal & Chan, 2001; Sabherwal & Kirs, 1994; Sardana, Terziovski, & Gupta, 2016). The primary focus of the literature to date has been assessing whether, and how, aligning the business and IT creates value for organisations (Chan & Reich, 2007b; Dulipovici & Robey, 2013; Gerow et al., 2015).

One reason for this persistent concern with alignment is that IT[1] executives continue to identify alignment as a top management issue (Luftman & Derksen, 2014; Luftman et al., 2012; Preston, 2014; Van de Wetering, 2016) . This interest is apparent in industry publications targeted at CEOs. Journals such as CIO Magazine and InformationWeek frequently publish dedicated articles on the challenges of achieving and sustaining IT alignment (Coltman, Tallon, Sharma, & Queiroz, 2015; Moore, 2012). This interest is also evident in CIO discussion forums such as such as LinkedIn's 'CIO Network' group. The group continually revisits alignment and views

---

[1] Both terms 'IT' and 'IS' are used in this research. The term 'IS' is used to indicate strategy(ies), i.e IS strategy(ies). Following common usage of business, the term of 'IT' is used to indicate unit and executives, i.e, IT unit and IT executives.

it as a major challenge that concerns CIOs (Gerow et al., 2015; Preston, 2014; Shah, 2012). Due to this on-going concern of IT executives, consulting groups such as Gartner continue to survey organisations about strategic alignment (McKendrick, 2011). Further, technology group blogs also show their concerns about how to align IT with business needs and processes (Gerow et al., 2015; Rosa, 2015).

Consistent with the practitioners' concerns, academics also frequently emphasise the positive aspects of strategic alignment (Chan & Reich, 2007b; Chan et al., 2006; Gerow et al., 2015; Yayla & Hu, 2012). The academic literature suggests that aligned organisations use IT more effectively to support overall business objectives. Therefore these organisations exploit more opportunities to gain sustainable competitive advantage and achieve higher profits (Avison et al., 2004; Cumps et al., 2009). Over the last three decades, academics have conducted research describing strategic alignment, building empirical evidence on how to achieve alignment, and exploring the positive effects of alignment on performance.

Given that alignment is a broad area of research with overlapping definitions, the following subsections provide an overview of core concepts related to strategic alignment within the context of this research. They present a review of the academic literature on the concept of strategic alignment, the processes to achieve strategic alignment, and the antecedents, outcomes and challenges of strategic alignment.

2.2 Strategic alignment

The concept of alignment arises from the notion that organisations should attempt to 'align', or 'fit' their organisational resources to the competitive context in which the organisation is situated (Baker et al., 2011). Alignment refers to the "degree to which the needs, demands, goals, objectives, and/or structure of one component are consistent with the needs, demands, goals, objectives, and/or structure of another component" (Ravishankar et al., 2011, p. 40). Alignment between various organisational components is seen as a key to improved organisational performance (Henderson & Venkatraman, 1993). As IT increasingly assumes strategic roles in organisations, strategic alignment is seen as the degree of fit between business strategy,

IT strategy, business infrastructure, and IT infrastructure (Henderson & Venkatraman, 1993).

Strategic alignment has been defined and measured in a multiplicity of ways. It has mainly been considered as an organisational-level construct and it has been named using a variety of terms. It has been called fit (Chan et al., 1997; Sabherwal & Chan, 2001; Yayla & Hu, 2012), convergence (Oh & Pinsonneault, 2007), bridge (Ciborra, 1997), fusion (Smaczny, 2001), integration, support (Reich & Benbasat, 2000), linkage (Kearns & Lederer, 2000), aligned (Bicocchi, 2013; Gerow et al., 2015), in harmony with (Campbell et al., 2005), matched with, complement each other, contingent upon, congruent with, synergy, or co-aligned (Chan & Reich, 2007b; Coltman et al., 2015). Further, these terms have been used to investigate alignment between several different aspects of business and IT including business strategies, plans, processes, and infrastructures with associated IT aspects such as IT strategies, plans, capabilities, and infrastructures. As a result of this, strategic alignment has been defined in a variety of ways.

Reich and Benbasat (1996) defined strategic alignment as the "degree to which the information technology mission, objectives, and plans support and [are] supported by the business mission, objectives, and plans" (p. 56). They focused on the 'support' between "business and IT mission, objectives, and plans". Kearns and Sabherwal (2007) defined alignment in terms of 'aligning' and focused on strategic IT plans and business strategies. Their definition was "the extent to which the strategic IT plan is aligned with the business strategy" (Kearns and Sabherwal, 2007, p. 133). Similarly, Chan et al. (1997) described alignment as the fit between business strategic orientation and IS strategic orientation (p. 126), whereas Palmer and Markus (2000, p. 242) stated that alignment is "using IT in a way consistent with the firm's overall strategy". Conceptually, researchers have failed to converge on a consistent definition of strategic alignment (Preston & Karahanna, 2009).

This inconsistency in definitions of strategic alignment is also present in the practitioner literature. Practitioners have described alignment as business and IT working together to reach a common goal (Campbell, 2005). Similarly, Abraham (2006) described alignment using a rowing analogy: strategic alignment is everyone

rowing in the same direction. Further, practitioners have also indicated that 'IT systems/applications' need to be aligned with 'business needs' (Bicocchi, 2013; Gerow et al., 2015). These practitioners' descriptions have clear meanings, although they do not refer to the goals, strategies and plans which are mentioned in many academic definitions. Because of their lack of precision, practitioners' descriptions have failed to articulate what exactly comprises good alignment and how it might be measured (Chan & Reich, 2007b). Good alignment refers to "the organisation applying appropriate IT in given situations in a timely way, and that these actions stay congruent with the business strategy, goals, and needs" (Chan & Reich, 2007, p. 300).

2.2.1 Theoretical perspectives on strategic alignment

Strategic alignment studies have generally adopted a contingency theory perspective to explain that the degree of alignment is contingent on identified factors (Bergeron, Raymond, & Rivard, 2004; Coltman et al., 2015). Contingency theory assumes that efficient organisation structures vary with organisational contextual factors, such as technology and the environment (Ismail, Zainuddin, & Sapiei, 2015; Weill & Olson, 1989). It further implies that the effectiveness of certain managerial techniques is contingent on the organisation's context and structure (Lawrence & Lorsch, 1986; Waterhouse & Tiessen, 1978). The contextual factors include technology (Mann & Watson, 1984; Srinivasan, 1985), organisational size (Carter, 1984), organisational structure (Gordon & Miller, 1976; Tushman & Nadler, 1978), organisational strategy (Vitale, Ives, & Beath, 1986), task uncertainty (Harel & McLean, 1985) and environment (Benson, Parker, & Zoryan, 1985; Lawrence & Lorsch, 1986; Pyburn, 1983; Weill & Olson, 1989).

These contextual factors can be classified into external and internal factors (Haldma & Lääts, 2002). In the literature, the main external contextual factors investigated are external environment and the national culture. The relevant internal contextual factors are technology, structure, organisational size and organisational strategy. Contingency theory assumes that a better 'fit' among contextual factors leads to higher organisational performance, whereas a lack of fit leads to lower performance (Weill & Olson, 1989).

Contingency theory is one of the fundamental theories in IS research (Henderson & Venkatraman, 1993; Mann & Watson, 1984; Sabherwal & King, 1992; Teo & King, 1997; Weill & Olson, 1989). IS studies have investigated the fit between contingency factors and IS characteristics. Contingency factors of interest to IS research were strategy, structure, size, environment, technology, task and individual characteristics (Weill & Olson, 1989). IS studies hypothesised that a fit between these contingency factors and IS variables such as management, implementation and development would lead to higher performance.

One of the seminal studies in the alignment literature is the Strategic Alignment Model (SAM) (Henderson & Venkatraman, 1993). The SAM is based on contingency theory and assumes that fit between four domains of strategic choice leads to higher performance. The SAM outlines the four domains: business strategy, IT strategy, organisational infrastructure and process, and IS infrastructure and process. Business–IT alignment refers to the appropriate and timely fit between two or more of these components such that management of the business and IT remain in harmony (Chan & Reich, 2007b; Gerow et al., 2015; Luftman & Brier, 1999). The SAM describes how organisations' alignment of these four fundamental components of strategic choice helps them to realise the full potential of IT.
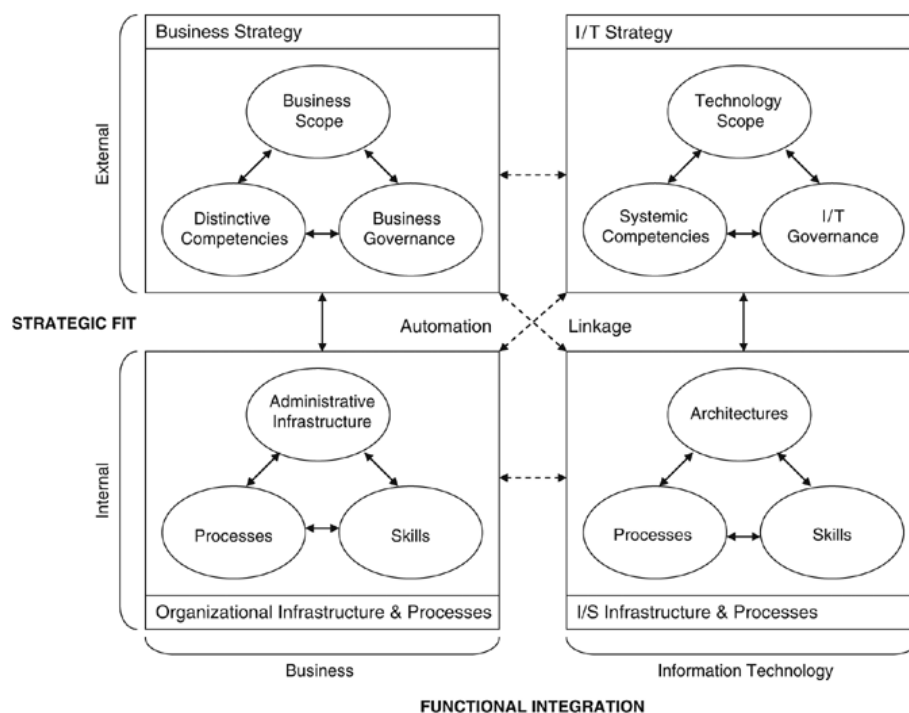
Figure 1: Strategic alignment model (Henderson & Venkatraman, 1993, p. 476)

Henderson and Venkatraman (1993) conceptualised two types of alignment: strategic fit and functional integration. Strategic fit refers to the alignment of the external domain (business and IT strategies) with the internal domain (business and IT infrastructure). Functional integration refers to the integration of the business and technology domains. Within the functional integration context, Henderson and Venkatraman (1993) proposed that an organisation can achieve two types of integration between IT and the business domain: operational integration and strategic integration. Operational integration links the organisational infrastructure and processes with IT infrastructure and processes and was defined as "coherence between the organisational requirements and expectations and the delivery capability within the IS function" (p. 478). Strategic integration links the business strategy and IT strategy, and is defined as the "capability of IT functionality to both shape and support business strategy" (p. 477).

Different researchers have focused on different parts of the Henderson and Venkatraman (1993) model and conceptualised and investigated the various forms of alignment between business strategy, IT strategy, organisational structure and IT structure. For instance, Chan et al. (1997) and Tan and Gallupe (2006) focused on the link between business strategy and IT strategy, while Raymond et al. (1995) focused on the link between organisational structure and IT structure. Some other researchers focused on the simultaneous integration of business strategy, IT strategy, business infrastructure, and IT infrastructure (Porra, Hirschheim, & Parks, 2005). However, the majority of the studies in the alignment literature have focused on strategic integration, which is the link between business strategy and IT strategy (Baets, 1992; Campbell et al., 2005; Cao et al., 2012; Chan et al., 1997; Chan et al., 2006; Chen, 2010; Hussin et al., 2002; Preston & Karahanna, 2009; Pyburn, 1983; Reich & Benbasat, 1996, 2000; Yayla & Hu, 2009).

Contingency theory has yielded significant theoretical insights into strategic alignment. However, researchers have also paid attention to other theories such as the Resource-Based theory (RBT) and the knowledge-based view of the firm to explain the strategic alignment phenomenon.

With the RBT, strategic alignment is considered as a process of developing unique internal resources (Reynolds & Yetton, 2015). The RBT posits that organisations compete on the basis of unique corporate resources that are valuable, rare, difficult to imitate, and non-substitutable by other resources (Barney, Ketchen, & Wright, 2011; Bharadwaj, 2000; Kozlenkova, Samaha, & Palmatier, 2014). The RBT relies on two fundamental assumptions. First, organisations own different bundles of resources (Kozlenkova et al., 2014; Peteraf & Barney, 2003). This resource heterogeneity assumption implies that some organisations are more skilled in accomplishing certain activities, because they possess unique resources (Peteraf & Barney, 2003). The second assumption is resource immobility, which is the difficulty of trading resources across organisations. This allows the benefits from heterogeneous resources to persist over time (Kozlenkova et al., 2014). A resource-based theory proposes that if an organisation possesses valuable resources and if other organisations find it too costly or difficult to imitate these resources, then the organisation controlling these resources is likely to generate sustainable competitive advantage (Barney & Hesterly 2012).

Information technology is equally available to all organisations and thus, advantage occurs only when the technology is used to leverage organisation resources in some inimitable way (Kearns & Lederer, 2003; Vitale et al., 1986). The RBT argues that unique management processes, such as the strategic alignment process, can be inimitable. Therefore, strategic alignment has been considered as a process that assimilates and uses information in a superior manner, giving the potential for creating a sustainable competitive advantage. The strategic alignment process is unique to the organisation and combines business and IT resources in order to support business objectives (Kearns & Lederer, 2003).

Further, RBT suggests that the extent to which IT creates greater value is conditional on synergies between IT and other organisational resources (Melville, Kraemer, & Gurbaxani, 2004; Nevo & Wade, 2010). The value created through a synergistic relationship between components cannot be created by a component in isolation (Melville et al., 2004). Therefore, IT can facilitate synergistic outcomes such as organisational performance only when it is used in conjunction with other

organisational resources (Nevo & Wade, 2010). Strategic alignment helps IT to connect with business and support the organisation's performance.

Building on the RBT, the knowledge-based view of the firm considers knowledge a distinctively unique resource (Kogut & Zander, 1992) and views "the organisation as a dynamic, evolving, quasi-autonomous system of knowledge production and utilization" (Spender, 1996, p.59). Knowledge integration is a focal aspect of the knowledge-based view of the firm. The knowledge-based view of the firm suggests that the "primary reason for the existence of the firm is its superior ability to integrate multiple knowledge streams, for the application of existing knowledge to tasks as well as for the creation of new knowledge" (Kearns & Sabherwal, 2007, p. 132). Therefore, the primary role of the organisation and the essence of organisational capability is the integration of knowledge (Grant, 1996a; Kearns & Sabherwal, 2007).

Based on the knowledge-based view of the firm, Kearns and Sabherwal (2007) proposed a model for strategic integration between business and IT which is illustrated in Figure 2. The model illustrates three components of knowledge integration: knowledge content, the knowledge integration process and the outcome of knowledge integration. They argued that the top managers' knowledge of IT provides the required knowledge content for the process. Two knowledge integration processes – participation of business and IT managers in each other's strategic planning processes – lead to the outcome of strategic alignment.
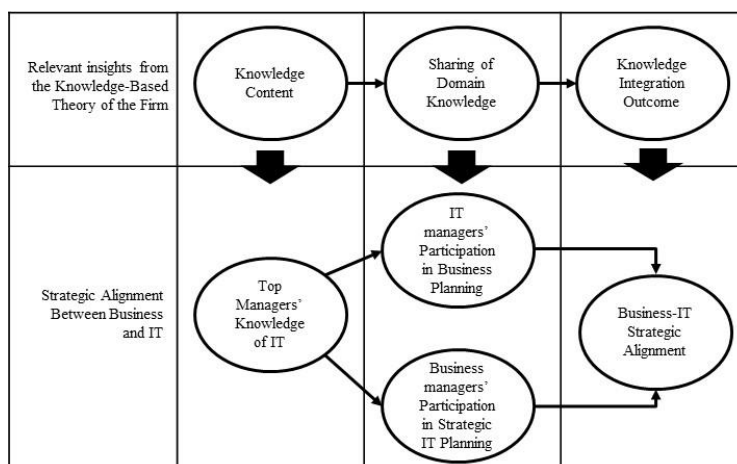
Figure 2: A knowledge-based view of strategic integration between business and IT (Kearns & Sabherwal, 2007, p. 134)

Despite the theoretical perspectives, researchers also suggested other different perspectives to examine strategic alignment. Those perspectives are discussed in the following section.

2.2.2 Strategic alignment: Different perspectives

Some of the studies have considered strategic alignment as an organisational-level phenomenon while other have considered it as a business process-level phenomenon and thus two perspectives – the firm-oriented perspective and process-oriented perspective – were apparent in the literature. Similarly, strategic alignment can be seen as a process as well as a state or an outcome. In the literature, alignment has been seen both as a construct to be measured at a single point in time and as a process to be understood over time.

Firm-oriented perspective vs. process-oriented perspective: Strategy can be examined from two viewpoints: content (what an organisation's strategy is) and process (how organisations implement strategy). The content of strategy can be similar across organisations (Snow & Hambrick, 1980; Tallon, 2008). For instance, multiple organisations in an industry can have a low-cost strategy. However, the mix of processes through which the strategy is executed is unique (Barney & Clark, 2007). Due to this duality, two perspectives – firm-oriented and process-oriented – appear in the alignment literature.

The firm-oriented perspective focuses on investigating the organisation as a whole rather than its business processes. The firm-oriented perspective views the content aspect of the strategy and assesses to what extent IT strategies are aligned with firm-level business strategies. The majority of strategic alignment studies take the firm-oriented perspective (e.g., Chan et al., 2006; Yayla & Hu, 2009, 2012).

Tallon (2008) proposes a process-oriented perspective to strategic alignment as opposed to the traditional firm-oriented perspective. The process-oriented perspective visualises business strategy as a series of business processes in the value chain. This perspective views alignment as the link between IT and business activities which are process-level manifestations of how firm-level strategies are executed (Tallon, 2008, p. 255). This approach argues that the firm-oriented perspective ignores the reality that

organisations deploy IT to support specific business processes (Ray, Muhanna, & Barney, 2005; Tallon, 2008) and thus the important process-level effect of IT can be ignored (Barua, Kriebel, & Mukhopadhyay, 1995). Therefore, Tallon (2008) conceptualised strategic alignment across five primary value-chain processes: supplier relations, production and operations, product and service enhancement, sales and marketing support, and customer relations.

Process perspective vs. outcome perspective: Strategic alignment may be approached from a process or an outcome perspective (Chan et al., 1997; Reich & Benbasat, 2000). Outcome research involves looking at realised strategies, while process research involves investigating planning activities (Gutierrez, Orozco, Papazafeiropoulou, & Serrano, 2008; Reich & Benbasat, 2000).

An outcome/state perspective involves alignment as a fixed output, and variance or factor models have been developed to explain how alignment can be achieved by manipulating a number of antecedents. The outcomes can then be observed and quantified (Brown & Magill, 1994; Preston & Karahanna, 2009; Reich & Benbasat, 2000). For instance, Reich and Benbasat (2000, p. 82) define (intellectual) alignment as "the state in which a high quality set of inter-related IT and business plans exist". A formal planning process helps to achieve such a state of alignment.

However, many studies of alignment have emphasised that alignment is a process rather than an end state (MacDonald, 1991; Papp, 1999; Rondinelli, Rosen, & Drori, 2001). The process perspective focuses on the integration of IT and business as a process or journey that can never be completely achieved (Chan & Reich, 2007b). This perspective is concerned with planned activities which are performed dynamically through the iterative process of achieving alignment (Gutierrez et al., 2008).

Static vs. dynamic approaches to alignment: Researchers also have used the static approach and the dynamic approach to investigate strategic alignment. The static approach to strategic alignment measures the degree of alignment for an organisation at a given point in time and evaluates it as high or low relative to other organisations (Baker et al., 2011; Wu, Straub, et al., 2015). Several static measures such as matching,

profile deviation, and covariation have been used to measure the strategic alignment at a particular point in time (Baker et al., 2011; Chan & Reich, 2007b).

The dynamic approach to alignment assumes that alignment is an enduring competency of achieving alignment rather than achieving alignment at given point in time (Baker et al., 2011; Pelletier & Raymond, 2014). Continuous alignment over time indicates an organisation's competency to achieve strategic alignment throughout a long period (Baker & Jones, 2008; Baker et al., 2011). Therefore, the literature suggests that repeated measurements of strategic alignment of an organisation indicate an enduring, sustainable competency and thus, a dynamic approach measures the strategic alignment by taking repeated measures of alignment at multiple points in time (Baker et al., 2011).

Apart from the different perspectives, two dimensions of strategic alignment have been suggested in the literature.

2.2.3 Two dimensions of strategic alignment

Researchers have examined alignment mechanisms in an attempt to understand how organisations can best achieve alignment. Two approaches can be seen in the research literature. The first concentrates on examining the strategies, structure, and planning methodologies in organisations (Chan et al., 1997; Pyburn, 1983; Reich & Benbasat, 1996). The second investigates the actors in organisations, examining their behavioural aspects and mutual understanding of strategies and planning (Reich & Benbasat, 2000; Yayla & Hu, 2012). The two approaches are referred to as the intellectual dimension and the social dimension (Horovitz, 1984; Reich & Benbasat, 2000).

As mentioned above, the intellectual dimension of alignment has been defined as "the state in which a high-quality set of interrelated IT and business plans exists" (Reich & Benbasat, 2000, p. 82). Research into the intellectual dimension is more likely to concentrate on the strategic plans and on planning methodologies (Campbell et al., 2005; Reich & Benbasat, 1996). Intellectual alignment consists of formal mechanisms and processes of achieving alignment such as strategic planning, business enterprise

modelling, use of tools and administrative governance arrangements and processes (Martin, Gregor, & Hart, 2005).

The social dimension of alignment has been defined as "the state in which business and IT executives within an organisational unit understand and are committed to the business and IT mission, objectives, and plans" (Reich & Benbasat, 2000, p. 82). This dimension concentrates on the behavioural aspect of human actors in the alignment process (Chan & Reich, 2007a; Sha, Cheng, Pan, & Teoh, 2011). It is more likely to focus on the people involved in the creation of alignment (Chan & Reich, 2007b; Reich & Benbasat, 2000). Research into the social dimension examines the business and IT executives' values, communication with each other, executives' mutual understanding of each other's domain and ultimately mutual understanding of each other's strategies and plans (Hu & Huang, 2006; Nelson & Cooprider, 1996; Reich & Benbasat, 2000; Yayla & Hu, 2009).

Besides the identification of the importance of strategic alignment, a stream of research has emerged to investigate the antecedents. They also provide prescriptive guidance on how to achieve alignment. Antecedents contributing to strategic alignment are explained in the following section.

2.3 Antecedents of strategic alignment

The strategic alignment literature discloses numerous factors that enable strategic alignment as well as those that hinder it (Aggarwal, 2010; Brown & Magill, 1994; Kearns & Sabherwal, 2007; Luftman, Papp, & Brier, 1999; Preston & Karahanna, 2009; Sabherwal & Chan, 2001). For instance, Luftman et al. (1999) found that the most important enablers of alignment are senior executive support for IT, IT involvement in strategy development, IT understanding of the business, business/IT partnership, well-prioritised IT projects and IT demonstrating leadership. Similarly, they suggested that the factors such as IT/business lacking close relationships, IT not prioritising well and IT failing to meet its commitments, work as inhibitors of strategic alignment. However, in the research literature greater emphasis has been placed on the enabling factors (Aggarwal, 2010; Brown & Magill, 1994; Hu & Huang, 2006; Hussin et al., 2002; Kearns & Sabherwal, 2007; Preston & Karahanna, 2009; Reich &

Benbasat, 1996, 2000; Sabherwal & Kirs, 1994) rather than on the inhibitors (Luftman, Papp, & Brier, 1999).

Factors that contribute to alignment have been called various names in the literature, such as enablers (Luftman, Papp, & Brier, 1999), facilitators (Sledgianowski, Luftman, & Reilly, 2006), success factors (Teo & Ang, 1999) and antecedents (Campbell et al., 2005; Chan & Reich, 2007b; Chen, 2010). Factors in these categories are summarised in Table 1. However, different categories often include similar factors. For instance, shared domain knowledge has been categorised as an antecedent, precondition, success factor and facilitator.

Table 1: Categorisation of factors

Factor	**Categorisation**	**Source(s)**
Shared domain knowledge	Antecedent	Reich and Benbasat (2000), Chan et al. (2006), Chen (2010), Yayla and Hu (2009), Hu and Huang (2006)
	Precondition	Chan (2002)
	Success factor	Teo and Ang (1999)
	Facilitator	Sledgianowski et al. (2006)
Successful IT history	Antecedent	Reich and Benbasat (2000), Chan and Reich (2007), Yayla and Hu (2009), Hu and Huang (2006)
	Enabler	Luftman et al. (1999)
	Influencer	Kearns and Sabherwal (2007)
Communication between business and IT executives	Antecedent	Campbell et al. (2005), Chan and Reich (2007), Ariyachandra and Frolick (2008), Chen (2010)
	Precondition	Chan (2002)
	Enabler	Luftman, et al. (1999)

	Current practice	Reich and Benbasat (2000), Hu and Huang (2006)
	Driver	Yayla and Hu (2009)
Integrated planning (connection between business and IT plan)	Antecedent	Chan and Reich (2007), Chen (2010)
	Precondition	Chan (2002)
	Enabler	Luftman et al. (1999)
	Current practice	Reich and Benbasat (2000), Hu and Huang (2006)
	Influencer	Kearns and Sabherwal (2007)
	Driver	Yayla and Hu (2009)
Planning sophistication	Antecedent	Chan et al. (2006)
	Success factor	Teo and Ang (1999)
Relationship between business and IT executives	Antecedent	Chan and Reich (2007), Hu and Huang (2006), Hu and Huang (2006)
	Enabler	Luftman et al. (1999)
	Success factor	Teo and Ang (1999)
IT leadership	Antecedent	Chan and Reich (2007)
	Enabler	Luftman et al. (1999)
	Success factor	Teo and Ang (1999)
IT involvement in strategic development	Enabler	Luftman et al. (1999)
	Pre-conditions	Chan (2002)
	Success factor	Teo and Ang (1999)

In the literature, these different categorisation terminologies are often used in line with the purpose of the research objectives. Enablers represent all factors that help to improve strategic alignment. Other alternative terms for enablers that have been used

in the literature are success factors (Teo & Ang, 1999), influencers (Kearns & Sabherwal, 2007) and facilitators (Sledgianowski et al., 2006). Some of the enablers such as managerial commitment to alignment are established by organisations for the purpose of achieving alignment. Others are existing enablers which are commonly referred to as antecedents. Antecedents are pre-conditions that need to exist before alignment can occur (Reich & Benbasat, 2000). However, an antecedent is not specifically established for achieving alignment. It exists irrespective of alignment. For instance, prior IS success is not specifically achieved by organisations for the sake of alignment. It exists irrespective of whether alignment is sought or not. Similarly, some of the enablers are mediating factors between antecedents and alignment and commonly referred to as drivers (Yayla & Hu, 2009) or managerial practices (Reich & Benbasat, 2000). For instance, planning connection is a driver which mediates the positive effect of antecedents such as shared domain knowledge and relationship management on alignment. Therefore, study of antecedents allowed the researcher to investigate how organisations' existing factors enable strategic alignment through drivers of alignment, which is the primary focus of this research.

In the literature, antecedents were categorised as either background antecedents or foreground antecedents (Chan & Reich, 2007b; Teo & Ang, 1999). Background or invisible antecedents include corporate culture, shared knowledge, and prior experience with IT (Hu & Huang, 2006; Reich & Benbasat, 2000). Foreground antecedents are visible behaviours that influence alignment. Foreground antecedents include leadership approaches, planning processes, and communication styles (Baker, 2004; Chan & Reich, 2007b; Yayla & Hu, 2009). However, some of these antecedents overlap and are interdependent. A list of antecedents identified in the literature is provided in Appendix A.

The sections that follow will explain the antecedents and the models suggested in the literature for attaining strategic alignment.

2.4 Historical development of research on antecedents

With the identification of the positive effect of strategic alignment on organisational performance, research has tried to identify how to achieve and sustain alignment.

Initial studies focused on identification of antecedents that help to achieve alignment. Later, scholars focused on fully understanding the alignment process, and providing prescriptive guidance on how to achieve alignment. Several models were proposed in the literature.

The literature has explored various antecedents of strategic alignment. Even during the 1980s, scholars were searching for antecedents influencing alignment. For example, Pyburn (1983) reported that the style of senior management decision making, the volatility of the business and the applications development portfolio, the complexity of the IT organisation and management tasks, and the status and physical location of the IS manager influenced planning practices and consequently the degree of alignment between business and IT plans. Later, Sabherwal and Kirs (1994) identified organisational integration and IT management sophistication as enablers of alignment. Similarly, Chan (2002) found that communication, business and IT planning connection, and business executives' commitment to IS positively influence alignment. Another study done by Hussin et al. (2002) found similar factors which includes IT sophistication, CEO's commitment to IS and external IT expertise.

Researchers such as Luftman et al. (1999) and Teo and Ang (1999) examined the relative importance of various critical success factors (CSF) for aligning IT plans with business plans. CSFs are those factors that management need to pay special attention to in order to enhance the likelihood of successful IT planning alignment (Rockart, 1978; Teo & Ang, 1999). Teo and Ang (1999) found that top management commitment to the strategic use of IT, IT management knowledge about business, and top management confidence in the IT department were the top three CSFs. In another qualitative study, Luftman et al. (1999) identified similar enabling factors for achieving and sustaining alignment. These studies managed to identify the relative importance of various critical success factors by ranking the factors. However, these studies failed to identify how these factors interact to create strategic alignment.

In an early attempt, Chan and Huff (1993) suggested three steps – awareness, integration and alignment – for achieving strategic alignment. Firstly, organisations need to increase the awareness of IS executives regarding the business of their organisation. Secondly, organisations need to integrate operational plans with IS plans.

Finally, the last step is the alignment, which is concerned with the integration of IS with an organisation's fundamental strategies and core competencies.

Later, Reich and Benbasat (1996) attempted to discover how certain critical factors interact to create conditions that enable alignment. They found that timing, decision making and communication used during IT and business planning processes were potential antecedents influencing strategic alignment. They argued that these antecedents eventually led to a better understanding between IT and business executives with regard to the business and IT objectives and plans. Later, Kearns and Sabherwal (2007) confirmed this argument and proposed that IT managers' and business managers' participation in the planning process increases the knowledge integration that enables strategic alignment.

In a later study, Reich and Benbasat (2000) proposed a framework for studying strategic alignment. They identified shared domain knowledge and successful IT history as two antecedents of strategic alignment. Further, they suggested that the effects of antecedents were mediated by two managerial practices: communication between business and IT executives and connection between business and IT planning in an organisation. They validated this model using data gathered from 10 business units in three Canadian insurance organisations. In another qualitative study Luftman et al. (1999) identified similar antecedents for achieving strategic alignment. The antecedents were senior executive support for IT, IT executives' understanding of business and involvement in strategy development, and a close relationship between IT and business executives.
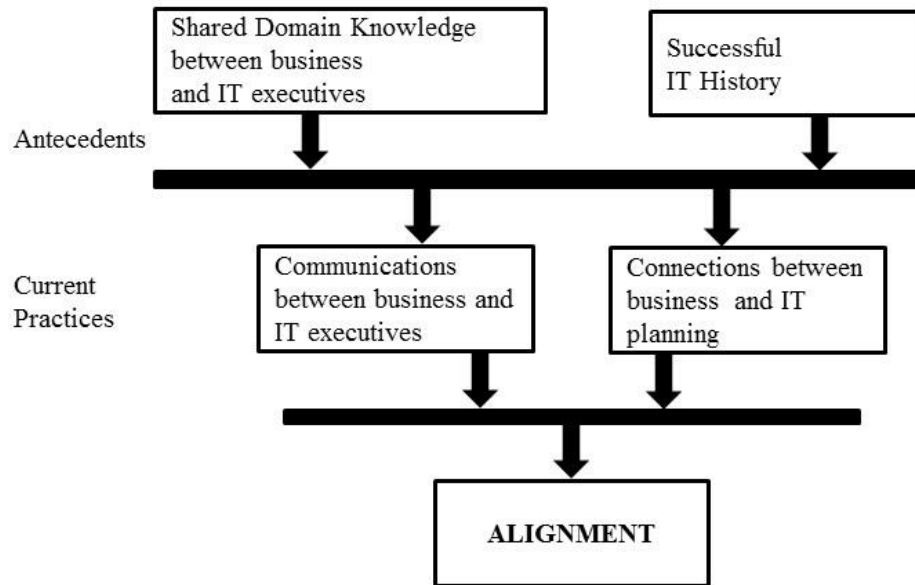
Figure 3: Strategic alignment model (Reich & Benbasat, 2000, p. 85)

Later Hu and Huang (2006) extended Reich and Benbasat's (2000) model by proposing relationship management as an additional antecedent of alignment and the balanced scorecard as a tool for achieving, managing and sustaining such alignment. They argued that an active relationship between IT and business executives contributes to alignment through enhanced communication between business and IT managers, and business–IT planning connection. Further, they argued that relationship management has a positive influence on both shared domain knowledge, and perception of successful IT history. The balanced scorecard contributes to the alignment of IT and business strategies by acting as a platform for the communications between IT and business managers, and by strengthening the connections between IT and business planning. Although this study confirmed the Reich and Benbasat alignment model, a quantitative validation of the extended alignment model was not part of the study.
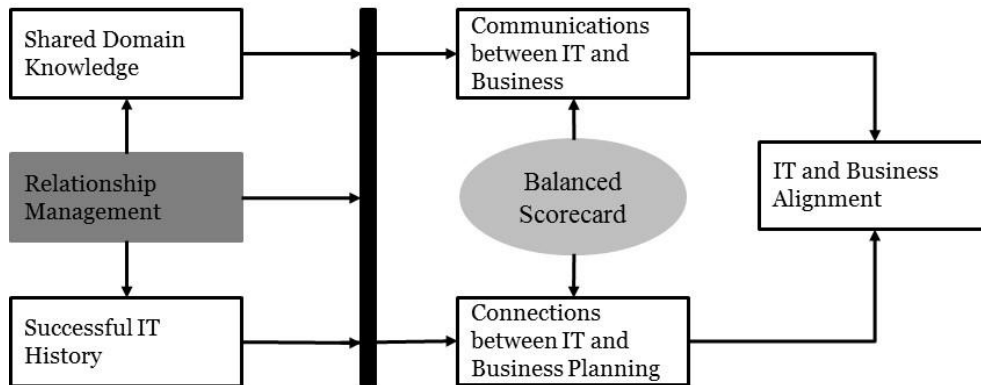
Figure 4: Strategic alignment model (Hu & Huang, 2006, p. 31)

Yayla and Hu (2009) attempted to empirically validate the antecedents of strategic alignment, adapting a similar model to Reich and Benbasat's and Hu and Huang's strategic alignment models. They identified IT unit structure (centralisation, formalisation), shared domain knowledge, successful IT history and relationship management as antecedents of alignment and confirmed the effects of all antecedents except centralisation. Further they revealed that the effects of these antecedents were mediated by the level of connection between IT and business planning and the level of communication between IT and business managers, and that the effect of connection was about twice that of communications. The model was tested using quantitative data gathered from 169 Turkish organisations.

[Antecedents of Alignment]   [Drivers of Alignment]
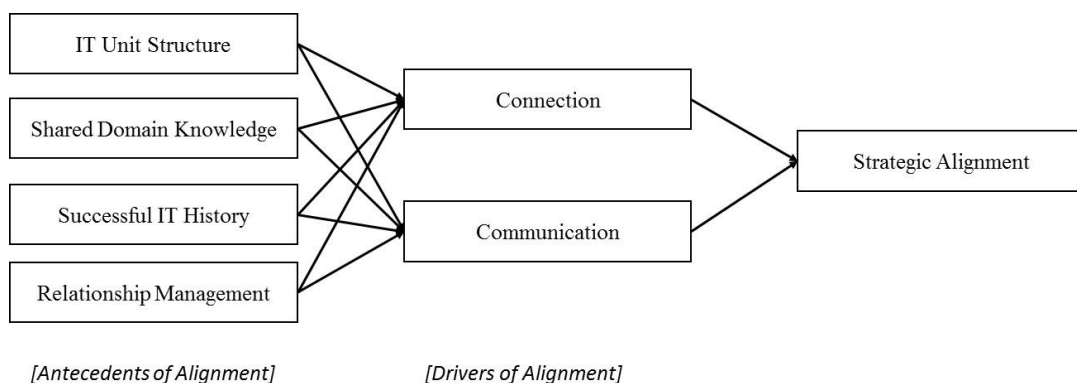
Figure 5: Strategic alignment model (Yayla & Hu, 2009, p. 3)

Another study done by Chan et al. (2006) also produced a model with five antecedents of alignment: planning sophistication, shared domain knowledge, prior IS success, organisational size and environmental uncertainty. Empirical validation of the model revealed that only organisational size, prior IS success, and shared domain knowledge

are significant determinants of alignment. The study claimed that large organisations have more resources to invest in aligning business and IT strategies than their smaller counterparts and thus, this model has limited insights for small organisations. For a small organisation without any prior IS success the only antecedent is shared domain knowledge. Therefore, this model can be considered a less comprehensive model.

Lastly, Kearns and Sabherwal (2007) proposed a model based on the knowledge-based view of a firm. They proposed that IT and business managers' participation in the planning process increases knowledge integration and thus enables strategic alignment. However, this model only considered the IT and business managers' participation in the planning process and thus is not a comprehensive model to explain the overall alignment process.

The antecedents of strategic alignment have been investigated using both qualitative and quantitative methods. Qualitative studies help the researcher to gain deep understanding of a specific research phenomena. However, quantitative assessments are required to confirm the theory that is developed through qualitative studies. Therefore, one of the shortcomings of the previous studies is the lack of quantitative validation. Similarly, the modern role of IT in an organisation has changed considerably since these models were conceptualised. IT is now a more embedded feature of organisations. IT changes strategies, organisation culture, organisation structure, management processes, work and the work place (Ahmad, 2015; Drnevich & Croson, 2013; Hashemi, Monfaredi, & Masdari, 2013). Recent technological developments such as cloud computing and network technologies enable virtual organisation structures and digital business models (Ahmad, 2015; MacKechnie, 2015). Most importantly, IT is the core technology which provides organisations with the opportunity to analyse specific data and plan their business trajectory accordingly (Ahmad, 2015).Therefore, these studies may provide less meaningful guidance for understanding strategic alignment in today's business environment, in particular, insights for attaining alignment in a highly technology-oriented, dynamic and complex business environment. Finally, as demonstrated in Table 2, the data for most of the studies were collected from developed countries. The majority of those studies were

conducted in the USA and Canada; thus the validity and applicability of the findings in other countries are uncertain.

Table 2: Selected studies that investigate antecedents of strategic alignment

Author(s)	Category	Methodology	Sample and Country(ies)
Pyburn (1983)	Qualitative	Descriptive analysis of survey data	8 organisations
Chan and Huff (1993)	Quantitative	Multiple regression	170 North American companies
Sabherwal and Kirs (1994)	Quantitative	Multiple regression	244 US academic institutions
Reich and Benbasat (1996)	Qualitative	Interviews and written documents	3 Canadian insurance firms (10 separate business units)
Luftman et al. (1999)	Qualitative	Descriptive analysis of survey data	Over 500 US firms during 1992-1997
Teo and Ang (1999)	Qualitative	Descriptive analysis of survey data	Senior IS executives in 600 firms
Reich and Benbasat (2000)	Qualitative	Interviews and written documents	3 Canadian insurance firms (10 separate business units)
Chan (2002)	Qualitative	Interviews and written documents	3 US firms and 5 Canadian firms
Hussin et al. (2002)	Quantitative	Cluster analysis	256 UK small manufacturing firms
Chan et al. (2006)	Quantitative	Structural equation modelling	164 US firms, 62 Canadian firms and 244 US academic institutions
Hu and Huang (2006)	Qualitative	Interviews, written documents and case study	1 US firm
Kearns and Sabherwal (2007)	Quantitative	Structural equation modelling	269 US firms
Yayla and Hu (2009)	Quantitative	Partial Least Squares analysis	169 Turkish firms

2.5 Strategic alignment and organisational performance

Another focus of strategic alignment research is the impact of alignment on organisational performance. The literature largely supports the positive effect of alignment on organisational performance (Chan et al., 1997; Kearns & Lederer, 2003; Sabherwal & Chan, 2001; Sabherwal & Kirs, 1994; Van de Wetering, 2016). For instance, Das, Zahra, and Warkentin (1991) showed that organisations that aligned business and IT plans outperformed those who did not. Greater alignment led to reduced IT planning problems and increased IT contributions to organisational performance (Teo & King, 1997).

Alignment is seen to support an organisation in many ways. Strategic alignment has been reported as a potential factor to improve return on IT investment (Chan et al., 2006; Sabherwal & Chan, 2001; Teo & King, 1997). It leverages the effect of IT investment by facilitating rational investment in IT and preventing unwise spending (Byrd, Lewis, & Bryan, 2006). Thus, this enables organisations to maximise the return on IT investments (Chan et al., 2006; Henderson & Venkatraman, 1993; Yayla & Hu, 2012). When organisations are strongly aligned and IT managers have a good understanding of the business objectives, IT investment is more likely to target business priorities effectively (Rockart, Earl, & Ross, 1996).

Many CEOs view alignment as a tool that can be used to help build competitive advantage for their organisations (Cao et al., 2012). Organisations are less likely to be competitive if their business and IS strategies are not aligned (Avison et al., 2004; Cao et al., 2012; Reich & Benbasat, 1996). Competitive advantage through IT only occurs if an organisation leverages IT resources in some inimitable way (Kearns & Lederer, 2003; Vitale et al., 1986). Strategic alignment is an internal process and it can be unique. Therefore, strategic alignment has been considered an important source of sustainable competitive advantage (Powell, 1992).

While the majority of the research emphasises the positive relationship between alignment and performance, some research has found aligned organisations report no improvement, or even a decline, in performance (Benbya & McKelvey, 2006; Palmer & Markus, 2000; Tallon, 2003; Tallon & Pinsonneault, 2011). In these studies,

researchers argue that organisations can fall into a rigidity trap where tight or inflexible links between business and IT can delay or impede an organisation's ability to respond quickly to environmental change. This rigidity may occur due to the time and cost of the strategy-development process. Further, the formal nature of alignment also prevents quick responses to environmental change (Chen et al., 2010; Gerow et al., 2015; Tallon, 2007). The influence of environment on strategic alignment is explained in the following section.

2.6 The environment (Environmental uncertainty)

The external environment of an organisation consists of many forces which are beyond the control of management, creating challenges, opportunities and threats for organisations (Chi, 2009; Reynolds & Yetton, 2015; Ward, Duray, Keong, & Sum, 1995). Markets become more competitive and uncertain due to the new entrants with new products. Competitors continuously introduce new products and services while customers are more knowledgeable and becoming more selective in their choices of products and services. Similarly, rapid changes in information technology and capabilities increase complexity and uncertainty. Furthermore, governments are passing more and more legislation regulating organisations. All of these alter the business structure and competitive position, affect emerging new businesses, and, as a result, continuously shape and reshape the business environment (Porter, 2001).

The external environment is thus an important consideration for internal operations in an organisation. Many scholars have investigated the interactions between organisations and their environments from an open systems perspective. An open system can be defined as a system that allows interactions between the focal subject or organisation and its surrounding environment (Berglund & Sandström, 2013; Katz & Kahn, 1978). An open systems perspective suggests that organisations are influenced by their environment. Organisations depend on the external environment to obtain critical resources in order to perform and survive in the market. Further, external factors such as competitors and regulatory agencies have a certain degree of autonomy in relation to influencing internal organisational activities (Berglund & Sandström, 2013; Pfeffer & Salancik, 1978). Therefore, the open systems perspective assumes that

organisations are forced to act under conditions of restricted freedom (Berglund & Sandström, 2013). Moreover, organisations tend to serve those actors that provide them with resources. Customers, suppliers and stakeholders can be regarded as such actors who exercise significant indirect control over an organisation (Christensen, 1997). The environment can be considered an external controller of an organisation.

A variety of issues concerning the environment have been studied in the IS literature. For instance, the 'effectiveness of strategic IS planning under environmental uncertainty' (Newkirk & Lederer, 2006a, 2006b) and 'environmental uncertainty and strategic application of IS' (Choe, 2003). Environmental factors such as competition, complexity of the market and uncertainty have been studied and identified as driving forces for strategic use of IS and strategic planning (Chi et al., 2005; Choe, 2003; Kearns & Lederer, 2004). Understandably, executives view the influence of uncertainty as one of the most difficult aspects of IS strategic planning (Lederer & Mendelow, 1986). It can cause managers to adopt new strategies and tactics more frequently (Bstieler, 2005; Calantone et al., 2003). Similarly, findings from the literature suggest that organisations can deal with environmental uncertainty by increasing internal information processing capabilities (Chan et al., 2006).

Further, the literature states that in order to take advantage of opportunities, management must find a proper fit among key variables including environment, strategy, and technology (Kearns & Lederer, 2004; Lawrence & Lorsch, 1986). Organisations can obtain competitive advantages over rivals and prevent them from gaining advantages through strategic use of IS applications (Choe, 2003; Sabherwal & King, 1992). A suitable match between the environment and strategy is required for better organisational performance (Kearns & Lederer, 2004). Thus, the external environment is considered a powerful factor (Chenhall, 2006). The two most commonly researched factors of the external environment are market competition and perceived environmental uncertainty.

In the IS literature, environmental uncertainty has been used as a core variable to measure the environment (Chan et al., 2006; Choe, 2003; Miller, 1993; Sabherwal & Kirs, 1994; Yayla & Hu, 2012). Environmental uncertainty refers to the unpredictability of environmental variables that have an impact on an organisation's

performance (Miller, 1993). In the strategic alignment literature, environmental uncertainty has been considered as an enabler and an inhibitor, as well as a moderator of strategic alignment.

2.6.1 Environmental uncertainty and strategic alignment

A few studies in the alignment literature have focused on environmental uncertainty (Chan et al., 2006; Newkirk & Lederer, 2006b; Sabherwal & Kirs, 1994; Yayla & Hu, 2009). They suggest that environmental uncertainty is likely to influence alignment since uncertainty increases the difficulties in understanding the environment and places managers in a challenging situation with regard to decision making and strategy development (Johnson & Lederer, 2005; Rosa, 2015; Xu & Koronios, 2005). In the alignment literature, environmental uncertainty has mostly been referred to as unpredictability of, lack of information on, or inability to understand developments and changes in the external environment. It has been defined in various ways in the alignment literature. For instance, Newkirk and Lederer (2006b) and Sabherwal and Kirs (1994) defined environmental uncertainty as the difference between the information needed to perform a task and the information available, whereas Yayla and Hu (2012, p. 378) defined it as "the amount of unpredictability, the degree of instability, and the demand for information in decision making".

In general, the findings from the literature have been mixed with regard to the impact of environmental uncertainty on strategic alignment. It has been identified as enabling (Chan et al., 2006; Kearns & Lederer, 2004), inhibiting (Sabherwal & Kirs, 1994) and moderating (Newkirk & Lederer, 2006b; Yayla & Hu, 2012) strategic alignment. Further, as illustrated in Table 3, environmental uncertainty has been defined in different ways and measured using different dimensions.

Sabherwal and Kirs (1994) suggested environmental uncertainty was an inhibitor of strategic alignment. They postulated that the lack of necessary information in uncertain environments disturbs the harmony in organisations, and thus inhibits alignment. The study's argument was based on educational industry data and environmental uncertainty was measured using five items: competition, demand, external funds, government actions and interference.

Chan et al. (2006) expanded the definition of uncertainty by considering both the rate of change and the unpredictability of change. They considered the degree of change and the instability of the environment in addition to the lack of necessary information. Environmental uncertainty was measured using three items. They argued that managers are more likely to rely on IT in high uncertainty environments and suggested that environmental uncertainty may therefore work as an enabler of strategic alignment. Another study (Kearns & Lederer, 2004) found that environmental uncertainty positively influences strategic alignment. Environmental uncertainty was referred to as the heterogeneity which is "the external threat posed by diversity in customer buying habits, product lines, and the nature of competition" (Kearns & Lederer, 2004, p. 904). However, neither of the approaches to environmental uncertainty, either as an inhibitor or as an enabler, was further empirically validated.

Newkirk and Lederer (2006b) investigated the effect of different IS planning phases on the success of IS planning (e.g., achieving alignment), finding that the effect of IS planning on success (strategic alignment) is moderated by environmental uncertainty. Five dimensions of uncertainty – changeability, unpredictability, heterogeneity, scarcity and competition – were used to conceptualise environmental uncertainty. They found only competition, changeability and unpredictability moderate the relationship between IS planning phases and the success of IS planning. Yayla and Hu (2012) examined environmental uncertainty as a moderator of the effect of strategic alignment on performance. They conceptualised environmental uncertainty as a three-dimensional construct: heterogeneity, dynamism, and hostility as suggested by Miller and Friesen (1983). They found overall support for environmental uncertainty moderating the effect of alignment on organisational performance and that high uncertainty enhances the positive effect while low uncertainty weakens the positive effect.

The mixed results regarding the effect of environmental uncertainty on strategic alignment could be due to the different conceptualisations of environmental uncertainty (Dess & Beard, 1984; Ward et al., 1995) or the failure to distinguish the different types of managers' experiences of environmental uncertainty (Milliken, 1987).

Table 3: Selected alignment studies that investigate the environmental uncertainty

Author(s)	Environmental uncertainty	Dimensions	Finding
Sabherwal and Kirs (1994)	The difference between the information needed to perform a task and the information available (p. 305)	Competition, demand, external funds, government actions and interference	Inhibitor of alignment between CSFs and IT capability
Kearns and Lederer (2004)	The external threat posed by diversity in customer buying habits, product lines, and the nature of competition (p. 904)	Heterogeneity	Enabler of alignment of the IT plan with the business plan
Chan et al. (2006)	The degree of change and instability in the firm's environment, and the usefulness of data related to the current state of the environment, potential impact of developments, and strategic options available (p. 30)	Demand, competition and regulations / legislation	Enabler of strategic alignment
Newkirk and Lederer (2006b)	The difference between the amount of information required to perform a task and the amount of it already possessed by the organisation (p. 381)	Changeability, unpredictability, heterogeneity, scarcity and competition	Moderator of the impact of strategic IS planning on strategic IS planning success
Yayla and Hu (2012)	The amount of unpredictability, the degree of instability, and the demand for information in decision making, making it an important determinant of organisational structure (p. 376)	Heterogeneity, dynamism and hostility	Moderator of the impact of strategic alignment on organisational performance

2.6.2 Conceptualisations of environmental uncertainty

Research on environmental uncertainty has encompassed two perspectives. One perspective has focused on the attributes of external forces such as complexity, dynamism, and munificence (Dess & Beard, 1984). A second perspective has focused on sources of environmental uncertainty such as the market, technology and regulatory agencies (Bstieler, 2005; Hoffmann et al., 2009).

The literature which focuses on the attributes of external forces has used different sets of dimensions to conceptualise environment uncertainty. Some researchers have proposed one dimension – munificence (March & Simon, 1958), others two dimensions – heterogeneity and dynamism (Thompson, 1967), and others multiple dimensions – concentration, heterogeneity, stability, turbulence, capacity and consensus (Aldrich & Pfeffer, 1976). However, Dess and Beard (1984) conducted an empirical study and suggested a three-dimensional classification of the business environment: complexity, dynamism, and resource availability. These three dimensions were considered the most critical characteristics of the business environment with respect to decision making (Chi, 2009; Keats & Hitt, 1988; Lawless & Finch, 1989). Furthermore, scholars such as Sharfman and Dean (1991) and Ward et al. (1995) have suggested that use of multiple dimensional attributes of the business environment enables researchers to more comprehensively measure and understand the environment.

The second perspective has focused on the sources of the environmental uncertainty. These sources represent the groups external to the organisation that impinge on its activities and includes customers, competitors, suppliers and regulatory agencies (Ward et al., 1995). Scholars have suggested that environmental uncertainty is often caused by changes in markets, technologies and the regulatory environment (Bstieler, 2005; Engau & Hoffmann, 2009). Thus, literature illustrates three sources of uncertainty: market uncertainty, technological uncertainty and regulatory uncertainty. Market uncertainty refers to the unpredictability of rapid and significant changes in, and the instability and complexity of, market (Bstieler, 2005). Technological uncertainty refers to the unpredictability of rapid and significant changes in technology, and the complexity of that technology (Bstieler, 2005). Regulatory uncertainty refers

to the unpredictability of the actions of regulatory agencies which create and enforce regulations (Engau & Hoffmann, 2009).

Scholars such as Miles and Snow (1978) and Milliken (1987) suggested that broad conceptualisations of environmental uncertainty may not be particularly useful. Executives choose strategies by analysing opportunities and threats arising from specific areas of the business environment (Bourgeois, 1980b). For instance, executives choose competitive strategies such as cost leadership and product differentiation by analysing the components of the market such as competitors, new entrants, buyers and suppliers. Further, environmental analysis tools such as Porter's five forces model (1991) and PEST analysis (Aguilar, 1967) are also based on component-based environmental analysis. Therefore, it is more meaningful to focus on the individual influence of each source of uncertainty on alignment, as this will enable executives to make more appropriate strategic decisions.

Further, Milliken (1987) suggested that not only is it important to understand what the source of environmental uncertainty is, it is also important to understand the type of environmental uncertainty experienced by the executives. While specifying the source of uncertainty identifies the domain of the environment which the executive is uncertain about, specifying the type of uncertainty explains the nature of the uncertainty being experienced by executives.

2.6.3 Managers' experience of environmental uncertainty

The literature illustrates that managers can experience three types of uncertainty: state uncertainty, effect uncertainty and response uncertainty (Freel, 2005; Liao & Gartner, 2006; Milliken, 1987).

State uncertainty is also referred to as perceived environmental uncertainty (Freel, 2005; Liao & Gartner, 2006; Milliken, 1987). Uncertainty about the state of the environment means that one does not understand how components of the environment might be changing. Executives experience state uncertainty when they perceive the organisational environment, or a particular component of that environment, to be unpredictable (Milliken, 1987). It has been defined as "the inability to understand or to predict the state of the environment due to a lack of information or a lack of

understanding of the interrelationships among environmental elements" (Liao & Gartner, 2006, p. 25).

Effect uncertainty is associated with the uncertainty of the impact of environmental changes on organisations. It has been defined as an inability to predict what the consequences of environmental changes will be on the organisation (Freel, 2005; Liao & Gartner, 2006). Executives' experience of effect uncertainty involves uncertainty about whether a change in the environment will have an impact on the organisation at all, as well as uncertainty about the nature, severity, and timing of that impact (Milliken, 1987).

Executives' experience of response uncertainty occurs during formulation of a response to an environmental threat. Response uncertainty is associated with attempts to understand what response options are available to the organisation and how useful each might be (Milliken, 1987). It has been referred to as a lack of knowledge of response options and an inability to predict the likely consequences of a response choice (Freel, 2005; Milliken, 1987).

Out of these three types of uncertainty, perceived environmental uncertainty has been considered the motivator for the administrative process of organisations (Bourgeois, 1980b). Scholars argue that if managers perceive an environment to be uncertain then they are likely to make decisions to avoid the consequences of that uncertain environment (Achrol, Reve, & Stern, 1983; Freel, 2005; Miller, 1988). Therefore, managers' perceptions of environmental uncertainty (state uncertainty) have been considered more important in determining or influencing organisational action (Bourgeois, 1980b; Freel, 2005).

2.7 Summary of the literature

The literature review has presented an overview of the various themes that surround the main inquiry of this research. This section summarises the main findings and explains the key insights which were used for the development of a conceptual model. The literature review facilitated identifying a process of achieving strategic alignment

and the attributes of four main groups of constructs – strategic alignment, antecedents, managerial practices and environmental uncertainty.

Sections 2.1 and 2.2 summarised the concept of strategic alignment. Indications are that organisations cannot be competitive if their business and IS strategies are not aligned, yet achieving strategic alignment continues to be a major concern for executives. There is no single, universally accepted definition of strategic alignment and there is no one best way to establish strategic alignment in an organisation. The literature has also shown that strategic alignment may be viewed as a process or as an outcome. A process perspective is concerned with planned activities which are performed dynamically through the iterative process of achieving alignment (Gutierrez et al., 2008). The state perspective views alignment as a fixed outcome which can be achieved by the manipulation of a number of antecedents (Reich & Benbasat, 2000).

Similarly, strategic alignment can be studied either by examining strategies, structures and planning methods, or by focusing on actors in organisations, examining their values, communication with each other, and ultimately their understanding of each other's domains (Reich & Benbasat, 2000). These two approaches are referred to as the intellectual and social dimensions of strategic alignment (Reich & Benbasat, 2000). Both the intellectual and social dimensions are necessary for comprehensive understanding of alignment mechanisms and obtaining meaningful management implications (Reich & Benbasat, 1996). However, the social dimension of strategic alignment facilitates an understanding of behaviours of the actors in strategic alignment and thus, it is suitable for this research since the aim is to study the social perspectives of alignment.

Three theories – the contingency theory, the RBT and the knowledge-based view of the firm – have been used in alignment studies. Alignment studies generally adopted contingency theory to explain that the degree of alignment is contingent on identified factors (Bergeron et al., 2004). However, strategic alignment focuses on the internal unique resources and creates value through synergies between IT and business resources (Melville et al., 2004; Nevo & Wade, 2010). According to the RBT strategic alignment is a synergic effect of business and IT resources that is gained through inimitable processes. Further, strategic alignment is a collaborative process between

business and IT executives and thus, it can be considered as a knowledge integration process. Within the alignment process, both business and IT executives share their knowledge to reach better alignment between IT and business strategies. The strategic alignment process consists of three basic components of knowledge integration: knowledge content, the knowledge integration process and the outcome of knowledge integration. Therefore, both the RBT and the knowledge-based view of the firm have been selected as theoretical lenses to explain the strategic alignment process.

Sections 2.3 and 2.4 summarised the antecedents of strategic alignment and facilitated the identification of antecedents and managerial practices pertaining to strategic alignment. Numerous antecedents that contribute to strategic alignment are disclosed in the literature. However, three antecedents – shared domain knowledge, relationship management and prior IS success – emerged as key antecedents (Hu & Huang, 2006; Reich & Benbasat, 2000; Yayla & Hu, 2009). These three antecedents facilitate managerial practices and thus indirectly influence strategic alignment (Hu & Huang, 2006; Reich & Benbasat, 2000; Yayla & Hu, 2009). The managerial practices that are particularly relevant are communication between business and IT executives, and the connection between business and IT planning processes (Hu & Huang, 2006; Reich & Benbasat, 1996, 2000; Yayla & Hu, 2009).

Section 2.5 of the literature review identified the consequences of strategic alignment and its enduring importance to organisations. Strategic alignment helps organisations use IT resources effectively to support business strategies, thus enabling organisations to maximise the impact of IT investments, integrate IT and business processes, and increase competitiveness, agility and profitability. Therefore, organisations that align business and IT strategies outperformed those who did not. This enduring importance justifies the study of antecedents that affect strategic alignment.

Section 2.6 reviewed environmental uncertainty and its impact in the context of strategic alignment. Though previous studies have investigated the impact of environmental uncertainty on strategic alignment, they have produced mixed results. Environmental uncertainty has been considered as an inhibitor as well as an enabler of strategic alignment. The reason for these mixed results may be the failure to distinguish the different sources and the types of environmental uncertainty. With regard to the

sources of uncertainty, environmental uncertainty is often caused by changes in markets, technologies and the regulatory environment (Bstieler, 2005; Engau & Hoffmann, 2009). Previous alignment studies have not considered the level of the impact of each source of uncertainty. Further, the literature highlighted the need for conceptualising environmental uncertainty by considering executives' experience of uncertainty. Executives experience three types of uncertainty: state, effect and response uncertainty. State uncertainty, also referred to as perceived uncertainty, is crucial in strategic planning since it inspires executives to make strategic decisions to avoid the consequences of uncertainty (Achrol et al., 1983; Freel, 2005). Further, it is important to distinguish between the types of uncertainty to ensure the clarity of the results.

Finally, previous studies have considered the direct effect of environmental uncertainty (positive and negative) on strategic alignment and fell short of providing consistent empirical support for their arguments. External factors such as environmental uncertainty affect internal organisational activities (Berglund & Sandström, 2013) such as strategic decision making and strategic use of IS (Bourgeois, 1980a; Chi et al., 2005; Freel, 2005; Kearns & Lederer, 2004) and thus, it can be expected that uncertainty has an impact on communication and planning connection. However, thus far, none of the alignment studies has explicitly considered the impact of environmental uncertainty on managerial practices in the context of strategic alignment.

Key themes from the literature review were used for the development of the conceptual research model illustrated in chapter 3.

CHAPTER 03: CONCEPTUAL MODEL AND RESEARCH HYPOTHESES

This chapter describes the development of the conceptual model and research hypotheses that were used to guide this study. The chapter starts by presenting the conceptual model. Then, a discussion of each construct and the development of hypotheses are presented.

3.1 Conceptual model

The conceptual model shown in Figure 6 was developed in three stages. Firstly, literature was reviewed to understand the research phenomenon and strategic alignment process. Secondly, components of the strategic alignment process, i.e., managerial practices and antecedents, were identified. Finally, proposed relationships between constructs and research hypotheses were established.

This study examined the effects of four antecedents on strategic alignment, three of which – shared domain knowledge, relationship management and prior IS success – are adapted from prior empirical research on strategic alignment (Hu & Huang, 2006; Reich & Benbasat, 2000; Yayla & Hu, 2009). Each of the cited studies identified shared domain knowledge, prior IS success, and relationship management as key antecedents of strategic alignment. These three antecedents facilitate managerial practices and thus indirectly influence strategic alignment (Hu & Huang, 2006; Reich & Benbasat, 2000; Yayla & Hu, 2009). Managerial practices that are particularly relevant are communication between business and IT executives, and the connection between business and IT planning processes (Hu & Huang, 2006; Reich & Benbasat, 1996, 2000; Yayla & Hu, 2009). All these antecedents are internal to the organisation.

The fourth antecedent, environmental uncertainty, is proposed as an external antecedent to strategic alignment. Business executives view the influence of uncertainty as one of the most difficult aspects of IS strategic planning (Lederer & Mendelow, 1986). It can work as an inhibitor of business–IT alignment (Sabherwal and Kirs 1994) and can cause managers to adopt new strategies and tactics more frequently (Bstieler, 2005; Calantone et al., 2003). In all, frequent communication between executives and the planning processes play a critical role. Based on these

arguments this research proposed that environmental uncertainty influences both communication between business and IT executives and connection between business and IT planning processes. Each of the constructs and their hypothesised relationships are more fully described in the following discussion.
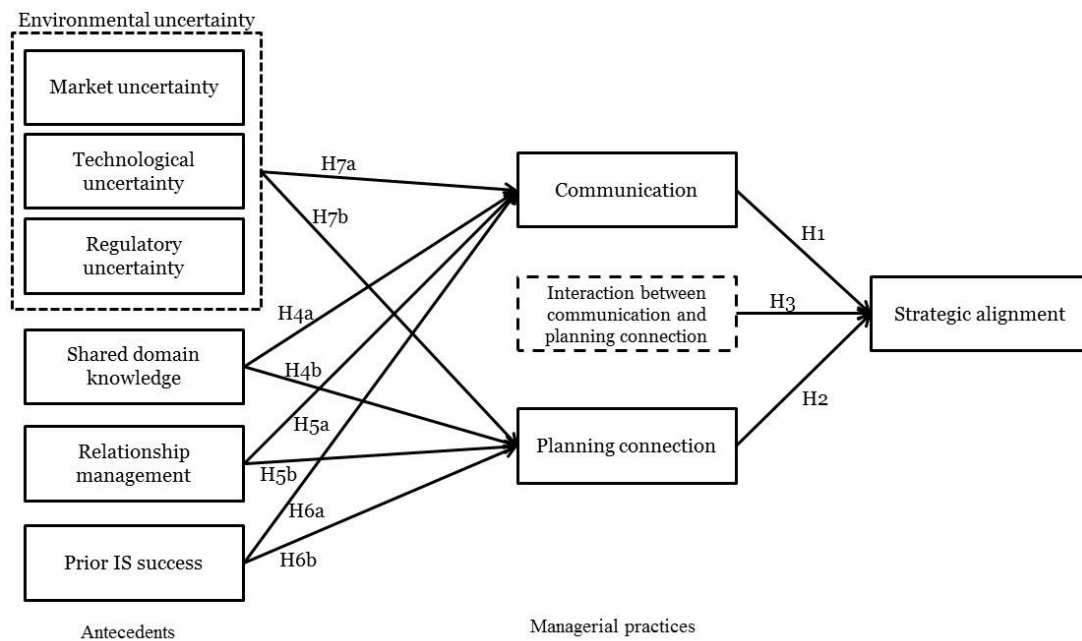
Figure 6: Proposed research model

The knowledge-based view of the firm and RBT provided the theoretical background for this model. According to the knowledge-based view, organisations are capable of integrating multiple knowledge streams for the creation of new knowledge (Grant, 1996a, 1996b). The proposed alignment process in Figure 6 is a collaborative process between business and IT executives. The process facilitates the integration of business and IT executives' knowledge to achieve strategic alignment. The proposed alignment process consists of the three components of knowledge integration: knowledge, integration process and outcome.

Knowledge refers to the existing knowledge. Antecedents including environmental uncertainty represent the different types of knowledge. For instance, shared domain knowledge represents the business knowledge of IT executives and IT knowledge of business executives (Reich & Benbasat, 2000). Similarly, perceived environmental uncertainty represents limited knowledge of environment (Chan et al., 2006) while

relationship management brings about understanding the knowledge of the other group (Nahapiet & Ghoshal, 1998). Prior IS success represents the experience and the knowledge gained through successful IT implementation. Communication and planning connection facilitate the sharing of business and IT knowledge. Communication enables the exchange of knowledge and information between business and IT executives. Similarly, planning connection provides a cross-functional interface to share the knowledge in a formal strategic planning activity. Finally, the outcome of the knowledge integration process is the better alignment of IT strategy with business strategy.

Knowledge is a unique resource for an organisation (Kearns & Sabherwal, 2007). The resource-based theory suggests that organisations need to foster processes that are inimitable and leverage core resources (Grant, 1991; Kearns & Lederer, 2003; Kozlenkova et al., 2014; Reynolds & Yetton, 2015). Strategic alignment is such a process (Kearns & Lederer, 2003; Reynolds & Yetton, 2015). It combines business and IT resources in order to support business objectives (Kearns & Lederer, 2003). Further, IT creates greater value and is conditional on synergies between IT and other organisational resources (Melville et al., 2004; Nevo & Wade, 2010). The process assists IT to create more value in conjunction with business resources. Two capabilities – communication and planning – facilitate combining IT and business resources. Therefore, with the resource-based theory, the alignment process can be seen to create a superior outcome (strategic alignment) through the utilisation of internal unique resources and synergies between IT and business resources. The relevant insights from the knowledge-based view and the RBT are presented in Figure 7.
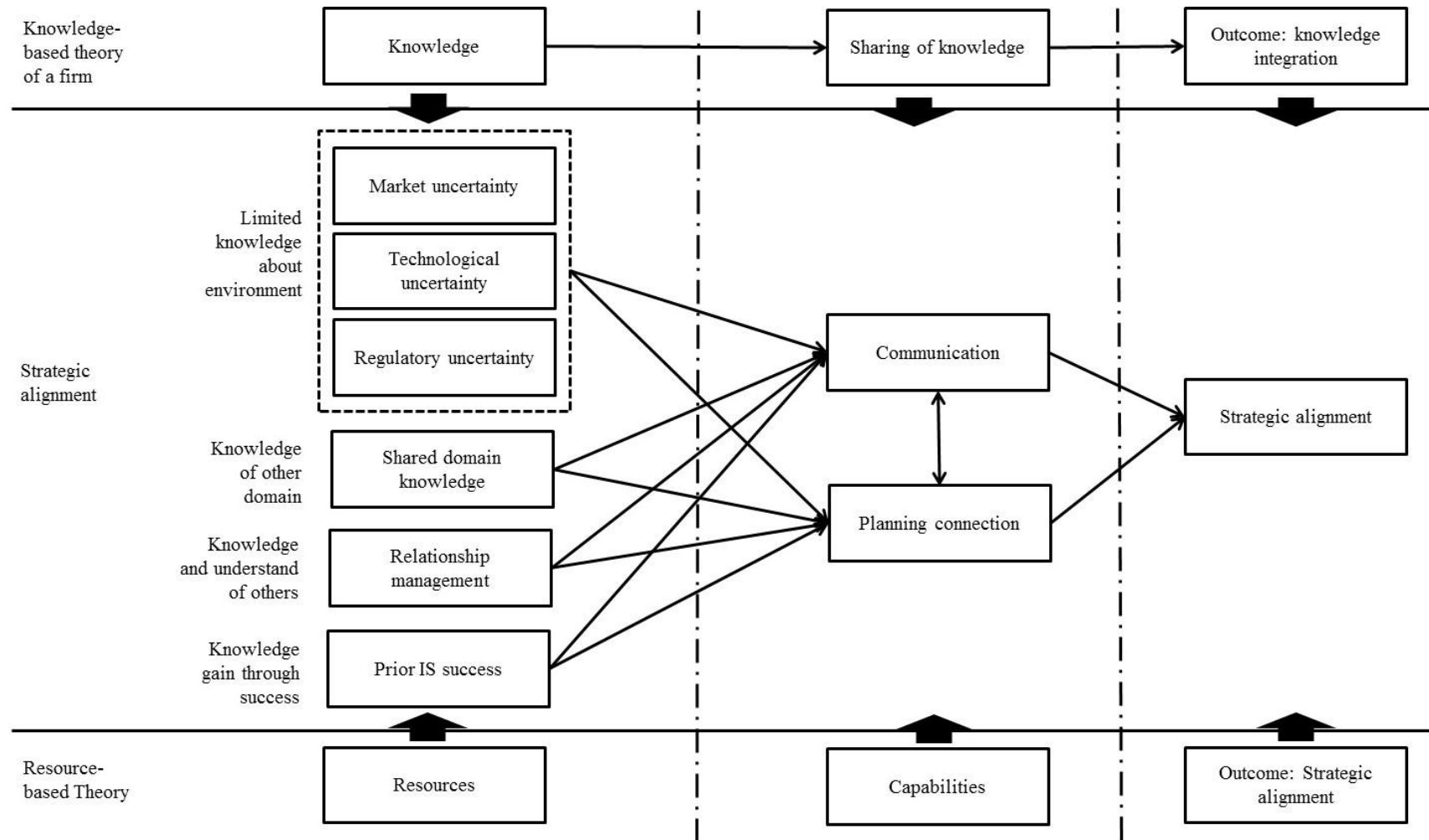
Figure 7: Theoretical representation of the proposed research model

3.2 Model constructs and research hypotheses

In this section the research model is further explained. The role of each construct in the alignment process and its reference to the literature are discussed. Then, the expected relationships between constructs are stated in the form of research hypotheses.

3.2.1 Strategic alignment

As discussed in chapter 2, strategic alignment is a broad concept with multiple definitions, two dimensions and two approaches. The purpose of this research was to study the behavioural aspect of strategic alignment and thus the research focused on the social dimension of strategic alignment which emphasises actors, values, communication and understanding. In this research strategic alignment refers to "the extent to which the IT mission, objectives, and plans support and are supported by the business mission, objectives, and plans" (Reich & Benbasat, 2000, p. 82). This definition details and articulates exactly what comprises good alignment and how it might be measured. In this context strategic alignment is treated as a point or state which is achieved by manipulating a number of antecedents, i.e., during the strategic alignment process. However, the use of Reich and Benbasat's definition has been criticised. The argument raised was the difficulty of measuring alignment in SMEs in situations where visible strategic planning does not exist (Tarhini, Al-Dmour, & Obeidat, 2015). However, recent research studies suggest that most SMEs do have some form of formal strategic planning (Cheng, Kadir, & Bohari, 2014; Hin, Kadir, & Bohari, 2013) and thus, Reich and Benbasat's definition is appropriate for measuring strategic alignment even in SMEs.

3.2.2 Communication between business and IT executives

Communication between business and IT executives is one of the two key managerial practices in the alignment process (Hu & Huang, 2006; Reich & Benbasat, 1996, 2000; Yayla & Hu, 2009). Communication involves sharing and exchanging information between parties for the purpose of coordination and mutual understanding. Communication can be defined as a process through which individuals share and create information in order to reach a mutual understanding (Johnson & Lederer, 2005).

Johnson and Lederer (2005) pointed out that frequent communication between business and IT executives has several benefits including increasing common understanding of an organisation's business and IT functions, motivating top management to use IT for competitive advantage, and achieving strategic IT–business alignment. Increasing communication frequency improves awareness among managers regarding IT innovations and their impact on the organisation (Massey et al., 2001) . This awareness leads to mutual understanding of the strategic role of IT in the organisation (Johnson & Lederer, 2005) and collective action to find out how IT can help the organisation to achieve its goals (Pearlman & Baker, 2005).

On the other hand, a lack of communication can create difficulties for IT executives in identifying business management's objectives (Johnson & Lederer, 2005) leading to an information gap between business and IS executives (Edmondson, Roberto, & Watkins, 2003). This, in turn, decreases the effectiveness of decision makers (business and IS executives) through failure to examine the full consequences of alternatives (Edmondson et al., 2003). However, frequent communication reduces the information gap and minimises misunderstandings by providing an opportunity for both parties to increase the clarity of communication exchanges (Fisher, Maltz, & Jaworski, 1997).

Researchers have recognised that communication helps to improve strategic alignment (Earl & Feeny, 1994; Johnson & Lederer, 2005; Luftman & Brier, 1999). For instance, Earl and Feeny (1994) reported that increasing communication between business and IT executives helps improve strategic alignment. Similarly Reich and Benbasat (2000), Hu and Huang (2006) and Yayla and Hu (2009) proposed that communication between business and IT executives would affect the level of strategic alignment.

Therefore, this research proposes that,

Hypothesis 1:   Communication between business and IT executives positively influences strategic alignment

3.2.3 Connection between the business and IS planning processes

Connection between the business and IT planning processes is the second key managerial practice in the alignment process (Hu & Huang, 2006; Reich & Benbasat, 1996, 2000; Yayla & Hu, 2009). Planning refers to "the discipline and vision to foresee

problems and opportunities within a turbulent and complex environment" (Raghunathan & Raghunathan, 1991, p. 126). Planning aims to coordinate the efforts of organisational members, and establish dialogue and lines of communication among various organisational subgroups (business and IT) (Segars & Grover, 1999). The IS planning process is the transformation of business strategy into IS strategy in order to define the role of IS in the organisation. It involves activities such as defining the purpose of IS, analysing the internal and external environments, and identifying IS strategies to assist the organisation in executing its business strategies (Lederer & Sethi, 1998).

IS researchers believe that for strategic IS planning to be effective, it must involve the integration of IS planning and business planning (Teo & King, 1996). The connection between business and IS planning captures the degree of integration between the business and IS planning processes. Integrated planning refers to both IS and business plans being developed and ratified simultaneously (Reich & Benbasat, 2000) and interactively (Teo & King, 1996); business and IT executives both being present during the planning; and IT being considered significant in changing the basis of competition (Reich & Benbasat, 2000). A comprehensive integrated planning process coordinates the planning efforts (Segars & Grover, 1999) and brings business and IT executives together repeatedly in an attempt to manage technology (Chan et al., 2006). Participation in each other's planning process creates cross-functional interfaces between business and IT which enable the sharing of experiences, opinions, and viewpoints through conversations (Argote, McEvily, & Reagans, 2003).

The IS strategy is less likely to be aligned to the business strategy when the organisation lacks a formal planning process (Chan et al., 2006; Lederer & Mendelow, 1987; Wang & Tai, 2003). Strategic IS planning needs to refer to the business objectives. When IT units do not refer to business objectives, their contribution to the organisation may be limited (Pearlman & Baker, 2005). Higher levels of integration provide an effective way for IT executives to identify top management's objectives (Lederer & Mendelow, 1987) and lead to better understanding of the role of the IT function and contribution of IT to the organisation (Teo & King, 1996).

In the alignment literature, planning connection has been considered an important enabler of strategic alignment. Scholars such as Reich and Benbasat (2000), Hu and Huang (2006) and Yayla and Hu (2009) have demonstrated the positive association between higher levels of planning integration and strategic alignment. Therefore, building on these theoretical arguments, this research proposes that,

Hypothesis 2:   Connection between business and IT planning processes positively influences strategic alignment

Interaction between communication and planning connection

Two kinds of participation – business executives' participation in strategic IT planning, and IT executives' participation in strategic business planning – can be seen in the strategic planning process (Kearns & Sabherwal, 2007; Premkumar & King, 1994). In integrated planning, business and IT executives are both present and develop business and IT plans simultaneously and interactively (Reich & Benbasat, 2000; Teo & King, 1996). Therefore, this process creates cross-functional interfaces enabling socialisation, and joint activities (Kearns & Sabherwal, 2007) leading to the establishment of dialogue and lines of communication between the two groups (Segars & Grover, 1999).

Simultaneously, IT planning involves activities such as defining the purpose of the IT, analysing the internal and external environments, and identifying IT strategies to assist the organisation in executing its business strategies (Lederer & Sethi, 1998). Thus, IT strategic planning requires increased interaction between different executives and the interpretation of various views from organisational interest groups (Ruohonen, 1991). Communication enables information sharing and mutual understanding (Johnson & Lederer, 2005), and thereby facilitates the integration of different views and cooperation among IT and business groups (Bai & Lee, 2003).

Therefore, this research proposes that,

Hypothesis 3:   Interaction between communication and planning connection positively influences strategic alignment

3.2.4 Shared domain knowledge

Shared domain knowledge captures the IT knowledge of business managers and the business knowledge of IT managers (Preston & Karahanna, 2009; Reich & Benbasat, 2000). It can be defined as the "ability of IT and business executives, at a deep level, to understand and be able to participate in the other's unique key processes and to respect each other's unique contribution and challenges" (Reich & Benbasat, 2000, p. 89). Shared domain knowledge is positively associated with rational decision making and it is considered one of the critical factors of strategic decision making (Ranganathan & Sethi, 2002).

When business and IT executives are knowledgeable about each other's areas of knowledge, they are more likely to develop a shared understanding and vision (Chan et al., 2006; Enns, Murray, & Huff, 1997), and achieve improved linkages between objectives and actions (Reich & Benbasat, 2000). Cohen and Levinthal (1990) reported that shared understanding (knowledge) improves communication. Conversely, a lack of shared understanding increases information asymmetry, and results in inaccurate interpretation of messages across groups (business and IT), ultimately leading to intergroup conflicts (Nelson & Cooprider, 1996). Thus, lack of knowledge of each other's domains has been reported as one of the top inhibitors of communication (Feeny, Edwards, & Simpson, 1992).

Similarly, in the research literature, shared domain knowledge has been considered an antecedent to strategic alignment (Reich & Benbasat, 2000) and has been reported as having a positive influence on communication (Chan et al., 2006; Hu & Huang, 2006; Reich & Benbasat, 2000). Thus,

Hypothesis 4_a: Shared business and IT domain knowledge positively influences communication between business and IT executives

Shared domain knowledge has also been considered a critical success factor for the integration of business and IT plans (Teo & Ang, 1999). If top managers have knowledge of IT, it creates an opportunity for IT managers to participate in business planning and for business executives to participate in IT planning (Kearns & Sabherwal, 2006-7). Furthermore, if IT executives have strong business knowledge, it enables them to convince business executives that they understand business goals and

processes and are trying to help them achieve those goals (Bassellier & Benbasat, 2004). An understanding of each other's domain is more likely to lead to the establishment of an effective IT–business relationship (Bassellier & Benbasat, 2007; Feeny & Willcocks, 1998) and a tendency to share risks and responsibilities in common activities (Bassellier & Benbasat, 2007). Further, Reich and Benbasat (2000) and Hu and Huang (2006) reported the positive influence of shared domain knowledge on the connections between business and IT planning processes. Thus,

Hypothesis 4$_b$: Shared business and IT domain knowledge positively influences the connections between business and IT planning processes

3.2.5 Relationship management

Relationship management is the "extent to which parties (business and IT executives) have the orientation or behavioural tendency to actively cultivate and maintain close working relationships" (Smith, 1998, p. 79). Relationships between business and IT executives are an important factor for IT success in an organisation (Feeny et al., 1992; Hu & Huang, 2006). On-going relationships facilitate executives' engagement in knowledge creation and knowledge exchange (Hatzakis, Lycett, Macredie, & Martin, 2005; Nahapiet & Ghoshal, 1998; Ohlsson, Han, & Hultin, 2016) leading to a better understanding of business and technological requirements (Jones, Taylor, & Spencer, 1995; Rockart et al., 1996; Watson, 1990). Furthermore, these relationships enable business and IT executives to work together (Jones et al., 1995; Rockart et al., 1996; Watson, 1990) and share the risks and responsibilities of the strategic use of IT in the organisation (Ross, Beath, & Goodhue, 1998).

Business executives have frequently emphasised the critical role of relationships in achieving strategic alignment (Chan, 2002). A strong relationship between business and IT executives enhances the ability of IT to add value to the organisation (Earl & Feeny, 1994) and ensures the successful integration of business and IT strategies (Feeny et al., 1992; Luftman, Papp, & Brier, 1999). Scholars have suggested that a stronger relationship between business and IT executives improves the communication between them (Hu & Huang, 2006; Ohlsson et al., 2016; Yayla & Hu, 2009). Thus,

Hypothesis 5$_a$: Relationship management positively influences the communication between business and IT executives

A good relationship between business and IT has also been considered an enabler of business/IT planning integration (Feeny et al., 1992). Armstrong and Sambamurthy (1999), Hu and Huang (2006) and Yayla and Hu (2009) have all suggested that a stronger relationship between business and IT executives improves the connection between business and IS planning. Consequently,

Hypothesis 5$_b$: Relationship management positively influences the connections between business and IT planning processes

3.2.6 Prior IS success

Prior IS success refers to the perceptions of business executives with regard to the success of the IT unit in the organisation (Reich & Benbasat, 2000). Successful IT history gives credibility to the IT unit and creates a favourable perception of IT among top management (Chan et al., 2006; Hu & Huang, 2006; Luftman, Papp, & Brier, 1999; Reich & Benbasat, 2000; Yayla & Hu, 2009). It thus improves the connection between IT and other functional areas (Chan et al., 2006). On the other hand, failures negatively influence top management's on-going perceptions of IT as well as affecting how managers view new or future strategic IS opportunities (Chan et al., 2006; Martins & Kambil, 1999). Past failures reduce the credibility of the IT department (Reich & Benbasat, 2000) and pose a threat to the working relationship between IT and business executives by reducing the trust and support from users and management (Brown, 1991).

Prior IS success itself does not affect strategic alignment directly. However, the increased confidence of top management (Teo & Ang, 1999) and the higher credibility of the IT department (Yayla & Hu, 2009) enable IT executives to participate effectively in the strategic planning process and communicate effectively with business executives.

The confidence of top management in the capabilities of the IT department has been found to be a critical success factor for aligning IT plans with business plans (Luftman & Brier, 1999; Teo & Ang, 1999). Teo and Ang (1999) proposed that the confidence

of top management in IT increases their commitment to the strategic use of IT, resulting in them being more likely to allocate appropriate resources for planning and the development of IT applications. On the other hand, lack of IT management credibility discourages top managers from communicating their needs and problems (Pearlman & Baker, 2005) and, more importantly, from communicating their goals, objectives and plans (Lederer & Mendelow, 1989) thereby inhibiting strategic alignment (Luftman & Brier, 1999).

Therefore, this research proposes that,

Hypothesis 6_a: Prior IS success positively influences the communication between business and IT executives

Hypothesis 6_b: Prior IS success positively influences the connections between business and IT planning processes

3.2.7 Environmental uncertainty

Environmental uncertainty refers to the perceived unpredictability of environmental variables that have an impact on an organisation's performance (Miller, 1993). It represents the difference between the information needed to perform a task and the information available (Chan et al., 2006; Newkirk & Lederer, 2006b; Sabherwal & Kirs, 1994). The literature review (section 2.6.2) indicated three sources of environmental uncertainty: market uncertainty, technological uncertainty and regulatory uncertainty. Market uncertainty refers to the perceived unpredictability of rapid and significant changes in, and the instability and complexity of, market (Bstieler, 2005). Technological uncertainty refers to the perceived unpredictability of rapid and significant changes in, and the instability and complexity of, technology (Bstieler, 2005). Regulatory uncertainty refers to the perceived unpredictability of rapid and significant changes in, and the instability and complexity of, regulations and policies (Bstieler, 2005; Engau & Hoffmann, 2009). Conceptualising environmental uncertainty using only a single source may prevent the researcher from detecting the effect of its other sources. Thus, this research considered all three sources of environmental uncertainty using three first-order constructs.

Environmental changes cause managers to adopt new strategies and tactics frequently in challenging situations (Bstieler, 2005; Calantone et al., 2003; Yayla & Hu, 2012). Managers need more information in order to understand and assess the environment as well as make effective strategic decisions. However, some of the information required to make comprehensive decisions may not be available in an uncertain environment (Fredrickson & Mitchell, 1984). Lack of information can result in ambiguity and serious mistakes in decision making (Xu & Koronios, 2005), which adversely affect strategic planning (Johnson & Lederer, 2005). This may inhibit harmony among organisation units (IT and business) and lead to conflicting unit goals (Sabherwal & Kirs, 1994). Therefore, business executives view the influence of uncertainty as one of the most difficult aspects of IS strategic planning (Lederer & Mendelow, 1986). Sabherwal and Kirs (1994) revealed that environmental uncertainty works as an inhibitor of strategic alignment. An uncertain environment may affect communication and planning connection. Based on these arguments this research proposes that,

Hypothesis 7_a: Environmental uncertainty influences communication between business and IT executives

Hypothesis 7_b: Environmental uncertainty influences connection between the business and IT planning processes

3.3 Chapter summary

This chapter explained the development of the proposed research model. Based on the literature, the model was developed (see Figure 6) which consists of nine first-order constructs: strategic alignment, communication, planning connection, shared domain knowledge, prior IS success, market uncertainty, technological uncertainty and regulatory uncertainty. Each construct was defined and explained with reference to the relevant literature. Research hypotheses were developed to depict the relationships between various constructs. Each hypothesis was either derived from previous research on similar relationships, or from evidence in research suggesting a potential relationship between the constructs. It was also expected that these hypotheses would address the research questions. Hypotheses 1, 2, 3, 7a and 7b answered research

questions 1, 1a and 1b. Hypotheses 1, 2, 3, 4a, 4b, 5a, 5b, 6a and 6b answered research questions 2, 2a and 2b. A detailed research model with associated indicators is illustrated in Appendix B. Definitions of constructs are provided in Appendix C.

CHAPTER 04: RESEARCH METHODOLOGY AND DESIGN

A research methodology provides a systematic way to address research questions. It consists of the methodological approach to a study and a research design including methods for collecting and analysing data. This research took a post-positivist theoretical perspective and adopted a quantitative research method. This chapter commences with an explanation of the philosophical stance and theoretical perspective adopted in this research. Then the selection of a quantitative research method is justified. Next the research context and the sample frame of the study are described. Then, the three phases of the survey instrument development followed by the data collection process are discussed.

4.1 Research paradigm

A paradigm is a framework of ideas and beliefs through which an individual interprets the world and interacts with it. These beliefs include the nature of reality (ontology), how we gain knowledge about what we know (epistemology) and the philosophical stance (theoretical perspective) (Guba & Lincoln, 1994). These beliefs guide the researcher to develop the methodological approach for the study (Guba & Lincoln, 1994; Orlikowski & Baroudi, 1991).

The following subsections describe how each of the key elements of a research paradigm were applied in this research.

4.1.1 Research ontology and epistemology

Ontological considerations specify the nature of social entities and answer the question of what reality is. Reality can be viewed using two different positions: objectivism and constructivism. Objectivism is an ontological position that asserts the social phenomena and their meanings have an existence, external to actors and independent of an actor's experience (Bryman, 2012; Jonassen, 1991). It implies that the social phenomena confront us as external facts that are beyond our reach or influence (Bryman, 2012). Further, it assumes that we all share the same understanding (Jonassen, 1991).

In contrast, the constructivist view posits that realities are apprehended solely in multiple mental constructions that are socially and experimentally generated. It asserts the social phenomena and their meanings are continually being accomplished by actors. It claims that reality is a perception which is internally constructed in our minds (Bryman, 2012). Thus, the conception of reality is relative and specific to the actor who forms the mental construction (Jonassen, 1991).

The research ontology frames the research epistemology. Epistemology is concerned with the nature of knowledge and which knowledge can be obtained with proper methods of inquiry (Crolty, 1998; Iivari, Hirschheim, & Klein, 1998). An objectivist epistemology holds that "reality exists…understandings and values are considered to be objectified in the people we are studying...we can discover the objective truth" (Crolty, 1998, p. 8). In contrast, a constructivist epistemology posits that "meaning comes into existence in and out of our engagement with the realities in our world…meaning is not discovered, but constructed…different people may construct meaning in different ways, even in relation to the same phenomenon" (Crolty, 1998, p. 9).

As a method of knowledge inquiry, objectivist research relies on quantitative measurements to assess realities. Quantitative methods such as surveys or experiments and statistical analysis techniques are often used to compute generalisable results. Conversely, constructivist research – whose goal is to develop rich description and understanding about the reality – relies more on qualitative methods such as interviews and observation.

This research involved investigating the relationships among antecedents, managerial practices and business–IT alignment in an organisational context. In this research, the research phenomena were seen to be shaped by contextual factors. Organisations have rules and regulations and adopt standardised procedures for their operations. People are appointed to different jobs within a division of labour and they learn and apply the rules and regulations. An organisation is therefore a constraining force that acts on and inhibits its members (Bryman, 2012). Thus, the research phenomena were viewed as objective entities of reality and this research assumes an objectivist epistemology.

Further, this objectivist epistemology is supported by the prior business–IT alignment research (Chan et al., 2006; Gutierrez, Orozco, & Serrano, 2009; Yayla & Hu, 2009).

4.1.2 Theoretical perspective

The theoretical perspective is important to consider in a study since it informs the research methodology used to address the research problem (Creswell, 2003; Crolty, 1998). Creswell (2003) suggests four theoretical views for social science research. They are social constructivism, advocacy/participatory, pragmatism and post-positivism.

Social constructivism is often combined with interpretivism which claims that truth is subjective and dependent on one's perspective (Saunders, Lewis, & Thornhill, 2009). Social constructivism assumes that individuals seek understanding of the world in which they live and work by developing subjective meanings of their experiences with certain objects or things (Creswell, 2003, p. 8). The advocacy/participatory worldview holds that research inquiry needs to be intertwined with politics and a political agenda. Thus, the research contains an action agenda for reform that may change the lives of the participants, the institutions in which individuals work or live, and the researcher's life (Creswell, 2003, p. 9). Pragmatism focuses on the research problem instead of focusing on methods and uses all approaches available to understand the problem (Creswell, 2003, p. 10).

Post-positivism holds a deterministic philosophy in which causes probably determine effects or outcomes (Creswell, 2008, p. 7). The post-positivist research process has the following characteristics (Creswell, 2003):

- *Causes influence the outcome*: research aims to identify and assess the causes that influence the outcome;
- *Reductionism*: the intent of the research is to reduce the ideas into a small, discrete set of ideas to test, such as the variables that comprise hypotheses and research questions;
- *Empirical observation and measurement*: the knowledge that develops is based on careful observation and measurement of the objective reality that exists "out there" in the world; and

- *Theory verification*: there are laws or theories that govern the world, and these need to be tested or verified and refined so that we can understand the world.

This research took a post-positivist theoretical perspective because the theoretical perspectives of this research aligned with post-positivist characteristics. Firstly, this research intended to identify and assess the causes that influence the outcome. There was a need to examine the influence of antecedents including environmental uncertainty on strategic alignment (Chan et al., 2006; Reich & Benbasat, 2000; Yayla & Hu, 2009). Secondly, the research investigated the research phenomena and then reduced ideas into small, discrete variables to test hypotheses using the proposed research model. This was required to achieve the research objectives of this research. Thirdly, careful observation and measurement of the objective reality that exists "out there" was required to answer the research questions in this research. Thus, this research assumed that variables were independent of the researcher and the variables were objectively measured. Lastly, in order to address the research objectives, the research required testing and verification of the research model. Testing and verification of the research model would assist in better understanding the strategic alignment phenomenon. These justifications of this research closely aligned with the post-positivist theoretical perspective. Therefore, this research adapted a post-positivist theoretical lens to assess the research phenomena.

4.2 Research method

Research methods are the basis of the production of knowledge. The method guides the research by providing techniques to gather and analyse data through a defined plan of action. The research method should closely align with the research goals (Creswell, 2003; Crolty, 1998). There are three main methods for carrying out IS research: quantitative, qualitative and mixed method (Creswell, 2003).

With the quantitative approach, researchers primarily use post-positivist claims for the development of knowledge (Creswell, 2003). Typically a quantitative approach entails testing and validating theory based on the hypotheses generated from the existing literature (Creswell, 2003; Punch, 2013). This approach is associated with objective measures and collects data on pre-determined instruments that yield statistical data.

According to Creswell (2003), "if the problem is identifying factors that influence an outcome, the utility of an intervention, or understanding the best predictors of outcomes, then a quantitative approach is best" (p. 22).

Alternatively, a qualitative approach is one in which the researcher often generates knowledge based primarily on a constructivist perspective or advocacy/ participatory perspective (Creswell, 2003). The aim of the qualitative method is to develop a deep and rich understanding of human behaviours and the reasons behind them and it is linked to theory building (Gregor, 2006; Miles & Huberman, 1994) . This approach would be suitable for researchers investigating the way people feel about a certain phenomenon (Myers & Newman, 2007). According to Creswell (2003), "if a concept or phenomenon needs to be understood because little research has been done on it, then it merits a qualitative approach" (p. 22).

The mixed method approach is a combination of both quantitative and qualitative methods (Johnson & Onwuegbuzie, 2004; Kaplan & Duchon, 1988; Mingers, 2003). It employs inquiry strategies that involve collecting data either simultaneously or sequentially to best understand the research problem (Creswell, 2003). A mixed approach is best if a researcher wants to both generalise the findings to a population and develop a detailed view of the meaning of a phenomenon (Creswell, 2003).

A good methodological fit is required to generate rigorous and convincing research outcomes (Edmondson & McManus, 2007). Further, it is important to let the nature of the research, the research ontology, epistemology and theoretical perspective inform the research method (Crolty, 1998; Guba & Lincoln, 1994). This research's phenomena were viewed as objective entities of reality and thus, the research took the stance of objectivist epistemology. Further, this research adopted a post-positivist theoretical lens to assess the research problem. Post-positivist research typically involves a quantitative approach (Denzin & Lincoln, 2011) and thus, it made sense to adopt a quantitative approach in this research.

Additionally, the characteristics of this research suited the quantitative approach as suggested by Creswell (2003). Firstly, this research aimed to confirm a theory by testing and verification of the research model. There was sufficient existing knowledge

to develop a testable conceptual model. The literature was used as a guide for defining the constructs and establishing relationships between constructs. Therefore, secondly, this research aimed to identify the influence of the antecedents and the managerial practices on strategic alignment. Finally, the proposed model helped in understanding the alignment process through the best predictors of strategic alignment. Therefore, a quantitative method was implemented in this research. The researcher believes that the quantitative method served the purpose of this study.

4.3 Selection of a context (country) for the research

The objective of this research was to identify the extent of the impact of environmental uncertainty on strategic alignment, and to determine how this affects the impact of other antecedents on strategic alignment. The selection of a research context should be appropriate for the study. Therefore, to meet the objective of this study, Sri Lanka was selected as the research context. The justification for the selection is explained below.

All organisations experience some degree of environmental uncertainty at some point (Calantone et al., 2003). However, organisations in developing countries generally experience higher environmental uncertainty than organisations in developed countries (Iakovleva et al., 2011). The environment in developing countries is considered less stable and is often marked by considerable turbulence (Iakovleva et al., 2011). Government regulations and political factors play a significant role in the economy and significantly influence economic activities (Badri et al., 2000). Therefore, developing countries provide an appealing setting in which to examine the impact of environmental uncertainty on strategic alignment and to examine how this affects the impact of other antecedents on strategic alignment.

In Sri Lanka, major economic indicators indicate that the economy has fluctuated sharply over the last few years (The Central Bank of Sri Lanka, 2014). For instance, Figure 8 indicates that Gross Domestic Product (GDP) growth, inflation, money supply and unemployment have changed markedly during the last six year period. The stability of a currency is an important factor for business investments; the continuous fluctuations of exchange rates in Sri Lanka demonstrates the instability of local currency (Jayasekara, 2016; The Central Bank of Sri Lanka, 2014), giving clear

indications of the market turbulence which creates an unpredictable and uncertain market environment for organisations.
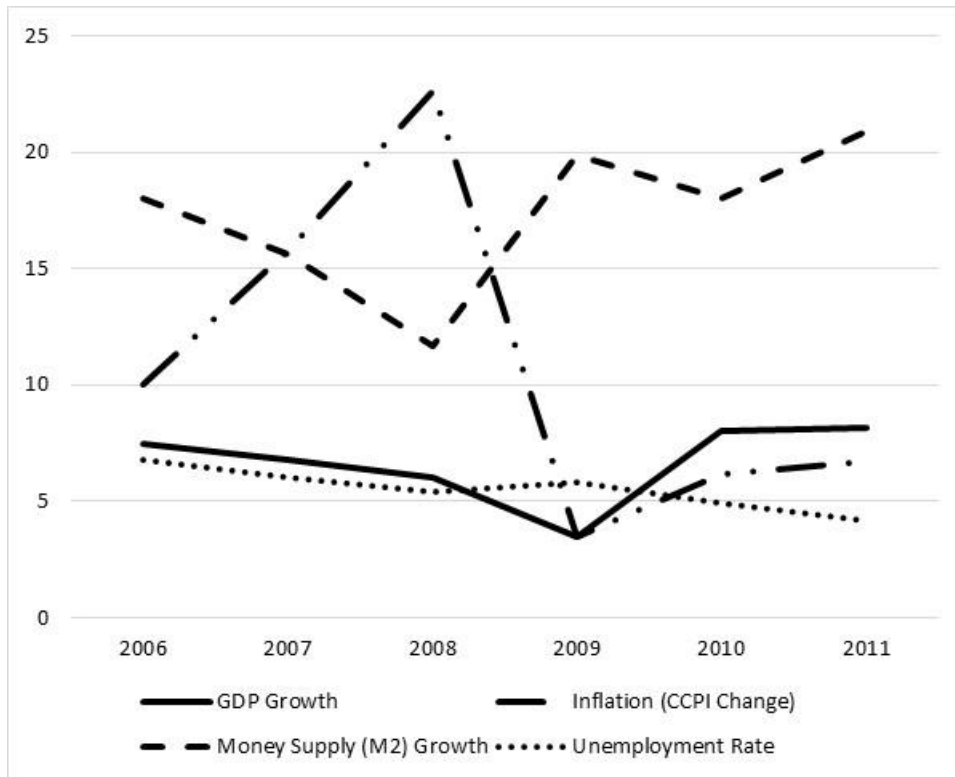
Figure 8: Key macroeconomic indicators of Sri Lanka

Source: Economic and social statistics in Sri Lanka - Central Bank of Sri Lanka (2012, p. 6)

Further, organisations in Sri Lanka are reluctant to follow national technology initiatives, even though the government encourages and facilitates the use of ICT by establishing national-level ICT plans such as the e-society and e-Sri Lanka initiatives (Information and Communication Technology Agency of Sri Lanka, 2014). Organisations are wary of following these government ICT plans as they tend to change frequently (Kapurubandara & Lawson, 2006). Further, factors such as a lack of simple procedures and guidelines, and rapid changes in technology standards have been regarded as major barriers to the advancement and expansion of ICT in Sri Lanka (Kapurubandara & Lawson, 2006; Peiris, Kulkarni, & de Silva Mawatha, 2015). Moreover, information technology is a highly dynamic field (Wu, Rosen, Wang, & Schaefer, 2015); rapid changes in technology and business applications create difficulties in understanding technology and the application of technologies in

organisations.Therefore, dynamic and rapid changes in technology create an unpredictable and uncertain technological environment for organisations.

Countries are ranked by the World Bank (2014) on the ease of doing business there. A high ranking means the regulatory environment is more stable and favourable to the initiation and operation of local organisations. Rankings are determined through aggregating the scores of 10 related topics, such as the ease of starting a business and obtaining credit. Sri Lanka was ranked 107th out of 189 countries as its regulatory environment was not favourable to the operation of organisations. Further, according to the global competitiveness report (2014), factors such as tax regulations, inefficient government bureaucracy, policy instability and government instability/coups are among the most problematic factors for doing business in Sri Lanka. These indicate high uncertainty in the regulatory environment in Sri Lanka.

Therefore, overall, the business environment of Sri Lanka provided indications of high uncertainty levels in all three aspects – market, technology and regulatory – and thus, Sri Lanka was selected as a research context. Further, although there were several countries that could be chosen for this research, the researcher's knowledge of the Sri Lankan business environment played a role in the final choice. Furthermore, the researcher's connection to Sri Lankan organisations and knowledge of Sri Lankan culture and local language facilitated the research. An additional motivating factor was the lack of empirical studies of strategic alignment in developing countries especially in Sri Lanka.

4.4 Sample frame and sample

The target of analysis for the survey was organisations operating in Sri Lanka. The sample frame consisted of 1,764 organisations in total, listed in the following four sources:

1   The directory of the Chambers of Commerce 2012
2   The bank and finance company register of the Central Bank of Sri Lanka
3   List of State Owned Enterprises
4   The company list of the Colombo Stock Exchange

Qualifying organisations were grouped into 13 industry sectors according to the Central Bank of Sri Lanka Industrial Classification codes (The Central Bank of Sri Lanka, 2014). Further, the sample frame consisted of all sizes of organisations – small, medium and large. Organisations can be grouped into small (between 1 and 50 employees), medium (between 51 and 300 employees) and large (more than 300 employees) organisations according to the World Bank (2009) classification. Table 4 provides the list of industry categories with total numbers of organisations and proportionate number of samples in each category.

Table 4: Structure of the sample frame and the sample

	Industry sector	Sample Frame	Sample
1	Agriculture, Livestock and Forestry	115	18
2	Banking, Insurance and Real Estate	294	45
3	Construction	28	4
4	Fishing	35	5
5	Electricity, Gas and Water	37	6
6	Government Services	265	40
7	Hotels and Restaurants	294	45
8	Manufacturing	361	55
9	Mining and Quarrying	33	5
10	Ownership of Dwellings	0*	0
11	Private Services	128	20
12	Transport and Communication	82	13
13	Wholesale and Retail Trade	92	14
	Total	1764	270

* Ownership of dwellings is an industry sector identified by the Central Bank of Sri Lanka for the GDP calculation. It refers to housing services provided by owner-occupiers and individuals who let out their residential properties. None of the four sources had records of ownership of dwellings. Further, these entities were not proper business organisations and thus, excluded.

Prior to data collection, it is important to determine the minimum sample size required to provide a sufficient level of statistical power for the research model. Barclay,

Higgins and Thompson (1995) suggested that in structural equation modelling a good rule is to have at least 10 times as many subjects as variables. Consequently IS researchers have frequently cited and justified 10 observations per indicator in setting a lower boundary for the adequacy of sample sizes (Chin & Newsted, 1999; Kotrlik & Higgins, 2001). The research model in this research contained nine first-order constructs and the sample frame consisted of all three types of organisations: small, medium and large. Thus, the sample size for this research was 270.

Hair et al. (2014) suggested that researchers who use the SEM-PLS data analysis technique could use Cohen's (1992) statistical power analysis to assess the minimum required sample size. This research has a maximum of 9 predictor constructs. Thus, using Cohen's statistical power analysis, a minimum of 154 samples is needed to achieve a statistical power of 80% for detecting effect size (f^2) values of at least 0.15 and at a 1% probability of error. Therefore, the data collection efforts were focused on achieving a minimum of 270 observations since it satisfies both criteria.

A stratified systematic sampling technique was used to select organisations. Firstly, all organisations listed in the sample frame were grouped into categories according to the Central Bank of Sri Lanka Industrial Classification codes and a proportionate number of sample organisations in each category was calculated. Then in each category, a proportionate number of sample organisations was selected using two steps. In step one, the first organisation was randomly selected from the list. Then in step two, the remaining organisations were selected by choosing every second organisation starting from the organisation which was selected in step one. These two steps were repeated for each category. This ensured that each of the categories, according to industry sector, were represented proportionally within the sample.

4.5 Research instrument development and operationalisation of the variables

In order to minimise measurement error and maximise the validity of the findings, it is important to use a reliable and valid research instrument (Churchill, 1979; Moore & Benbasat, 1991; Straub, Boudreau, & Gefen, 2004). Content validity, construct validity, and reliability are some of the essential evaluation criteria for instrument development (Gefen, Straub, & Boudreau, 2000).

Content validity is a qualitative evaluation of the extent to which the items of a construct actually capture its real nature (Gefen et al., 2000; Straub et al., 2004). According to Straub et al. (2004, p. 424), content validity concerns "the degree to which items in an instrument reflect the content universe to which the instrument will be generalized." Content validity of an instrument is normally established through adapting items from the previous literature and through a pre-test (Bryman, 2012; Saunders et al., 2009). A pre-test helps to eliminate measurement error caused by ambiguous wording or instructions, ensuring that all questions are appropriate and understood (Gefen et al., 2000). Further, the recommendations made by MacKenzie et al. (2011) were followed to established the content validity. Adapted items were assessed for whether each individual item as well as set of items collectively represents the content domain of the construct. All adapted items and definitions of constructs were presented to three IS scholars and they were asked to assess whether each adapted item as well as set of items collectively represents the definitions of constructs. Further, feedback on the items concerning wording, question order, visual design and navigation was obtained.

Construct validity assesses how well an instrument measures what it is supposed to measure (Straub et al., 2004). Construct validity is usually addressed by assessing both convergent and discriminant validity (Boudreau et al., 2001; Straub et al., 2004). These two components of construct validity verifies whether measurement items are homogeneous internally and sufficiently different from other measures (Straub et al., 2004). A pilot study helps to determine whether both convergent and discriminant construct validity are established. Average variance extracted (AVE) is used to access the convergent validity and correlations between constructs for the assessment of discriminant validity (Hair, Hult, Ringle, & Sarstedt, 2014; Straub et al., 2004).

Finally, reliability analyses the extent to which measurements are repeatable (Hair et al., 2014; Straub et al., 2004). The reliability is estimated using Cronbach's alpha (α) (Hair et al., 2014; Straub et al., 2004).

A reliable and valid research instrument for this research was developed through a three-phase instrument development process. In phase 01, suitable items, which had been validated according to their respective constructs in previous research, were

selected from the literature and adapted as necessary. In phase 02, a pre-test was conducted as part of content validation. Finally, in phase 03, a pilot study was conducted in order to identify items that may be problematic and to ensure that the instrument had acceptable measurement properties.

4.5.1 Phase 01: Development of the survey instrument

The respective literature for each construct was reviewed in order to generate the required items for the questionnaire. As mentioned above, suitable items were selected from the literature and adapted as necessary.

Scale items for strategic alignment

Strategic alignment was defined as "the extent to which the IT mission, objectives, and plans support and are supported by the business mission, objectives, and plans" (Reich and Benbasat, 2000, p. 82). Several approaches such as profile deviation (Chan & Reich, 2007b; Sabherwal & Chan, 2001), survey items (Preston & Karahanna, 2009; Yayla & Hu, 2009), qualitative assessments (Reich & Benbasat, 2000), typologies and taxonomies, fit models and mathematical calculations (Chan & Reich, 2007b) have been adopted to measure strategic alignment. This research intended to investigate the effects of antecedents and managerial practices on strategic alignment using a predictive conceptual model. Use of survey items facilitates determining the predictive power of the model as well as determining path coefficients and level of significance to confirm or reject the hypotheses associated with the conceptual model. Therefore, this research applied survey items to measure strategic alignment.

Drawing from the alignment literature (Kearns & Sabherwal, 2007; Segars & Grover, 1999; Yayla & Hu, 2012), strategic alignment was measured using four items. These items captured the extent to which the IT mission, objectives, and plans support and are supported by the business mission, objectives, and plans. Lower scale values indicated lower levels of strategic alignment and higher scale values indicated higher levels of strategic alignment.

Table 5: Scale items for the strategic alignment construct

	Please indicate how much you agree with the following statements regarding how IT and business strategies are aligned in your organisation: (1 = strongly disagree; 5 = strongly agree)	1	2	3	4	5
1	The IT plan contains detailed action plans/strategies that support the organisation's business objectives and strategies					
2	Major IT investments are prioritised by the expected impact on business performance					
3	The goals/objectives of IT are adapted to changing goals/objectives of the organisation					
4	IT-related opportunities are identified to support the strategic direction of the organisation					

Scale items for communication between business and IT executives

Communication was defined as "a process through which individuals share and create information in order to reach a mutual understanding" (Johnson & Lederer, 2005, p. 229). Communication between business and IT executives was measured using three items adapted from Becerra and Gupta (2003), Yayla and Hu (2009) and Smith et al. (1994). Three items measured the formal and informal communication frequency between business and IT executives and the level of use of various communication channels. These items were also conceptually in line with the previous studies which emphasise communication frequency and use of various communication channels as key characteristics of communication between business and IT executives (Hu & Huang, 2006; Johnson & Lederer, 2006; Reich & Benbasat, 2000; Teo & King, 1996). Lower scale values indicated a lesser degree of communication and higher scale values indicated a higher degree of communication.

Table 6: Scale items for the communication between business and IT executives construct

To what extent do you agree with the following statements describing communication between business and IT executives? (1 = strongly disagree; 5 = strongly agree)	1	2	3	4	5
5 Business and IT executives have frequent, direct, formal communications (e.g., meetings, business memo)					
6 Business and IT executives have frequent, direct, informal communications (e.g., face to face, telephone, email)					
7 Business and IT executives utilise various channels to communicate with each other (e.g., liaisons, task forces, steering meetings)					

Scale items for connection between business and IT planning

Connection between business and IT planning was defined as the degree of integration between the business and the IT planning processes (Hu & Huang, 2006; Reich & Benbasat, 2000). The degree of connection ranged from isolated planning to fully integrated/proactive planning (Reich & Benbasat, 2000). Fully integrated/ proactive planning refers to both IS and business plans being developed and ratified simultaneously (Reich & Benbasat, 2000) and interactively (Teo & King, 1996); business and IT executives both being present during the planning; and IT being considered significant in changing the basis of competition (Reich & Benbasat, 2000). Drawing from the IS literature (Reich & Benbasat, 2000; Teo & King, 1996, 1997; Yayla & Hu, 2009), the connection between business and IT planning was operationalised using four items that captured the characteristics of fully integrated/proactive planning processes. Lower scale values indicated a looser connection between business and IT planning and higher scale values indicated a stronger connection between business and IT planning.

Table 7: Scale items for the connection between business and IT planning construct

	To what extent do you agree with the following statements describing the connection between business and IT planning? (1 = strongly disagree; 5 = strongly agree)	1	2	3	4	5
8	Business and IT plans are developed together					
9	Business and IT plans are integrated					
10	Business and IT executives both participate in the strategic planning process					
11	Business and IT executives consider each other's input during the strategic planning process					

Scale items for shared domain knowledge

In the literature, one stream of research has conceptualised shared domain knowledge as the business and IT executives' understanding of the role of IT in the organisation (Nelson & Cooprider, 1996) and referred to "an understanding and appreciation among IT and business managers for the technologies and processes that affect their mutual performance" (Nelson & Cooprider, 1996, p. 411). Another stream has looked at cross-functional knowledge, by examining the business knowledge of IT executives and the IT knowledge of business executives (Reich & Benbasat, 2000). This stream conceptualises shared domain knowledge as the understanding of business concepts by IT executives and IT concepts by business executives (Armstrong & Sambamurthy, 1999; Preston & Karahanna, 2009), rather than understanding of the role of IT in an organisation. Both conceptualisations have been used in the alignment literature.

In this research, shared domain knowledge refers to the business knowledge of IT executives and the IT knowledge of business executives (Reich & Benbasat, 2000). It is defined as "the ability of IT and business executives, at a deep level, to understand and be able to participate in the other's unique key processes and to respect each other's unique contribution and challenges" (Reich & Benbasat, 2000, p. 89). Drawing from the alignment literature (Nelson & Cooprider, 1996; Yayla & Hu, 2009), shared domain knowledge was measured using four items. The items measured the understanding of the role of IT in the organisation and appreciation of each other's accomplishments. Lower scale values indicated less shared domain knowledge and higher scale values indicated more shared domain knowledge.

Table 8: Scale items for the shared domain knowledge construct

	To what extent do you agree with the following statements about the shared domain knowledge? (1 = strongly disagree; 5 = strongly agree)	1	2	3	4	5
12	IT executives have a good understanding of the organisation's business environment (problems, tasks, roles)					
13	Business executives have a good understanding of the organisation's IT environment (problems, tasks, roles)					
14	IT executives appreciate the accomplishments of the business executives					
15	Business executives appreciate the accomplishments of the IT executives					

Scale items for prior IS success

Prior IS success was defined as the perceptions of business executives with regard to the success of the IT unit in their organisation (Reich & Benbasat, 2000). Drawing from the alignment literature (Chan et al., 2006; Luftman, Papp, & Brier, 1999; Reich & Benbasat, 2000; Teo & Ang, 1999), overall perception of business executives with regard to the success of the IT unit in their organisation was measured using three items adapted from Chan et al. (2006). Lower scale values indicated a perception that IS is less successful and higher scale values indicated a perception that IS is very successful.

Table 9: Scale items for the prior IS success construct

	To what extent do you agree with the following statements about the success of IS? (1 = strongly disagree; 5 = strongly agree)	1	2	3	4	5
16	IT executives are kept informed about key business initiatives and plans					
17	Improved effectiveness of management decision making is due to information systems					
18	Introduction of new products and services is based on advances in information technology					

Scale items for relationship management

Relationship management was defined as the "extent to which parties (business and IT executives) have the orientation or behavioural tendency to actively cultivate and maintain close working relationships" (Smith, 1998, p. 79). The literature has suggested two characteristics of close working relationships: investing more time, and investing more effort to maintain relationships with each other (Hu & Huang, 2006). Thus relationship management was operationalised using four items that captured the investment of time and effort in relationship management. Items were adapted from Hu and Huang (2006) and Yayla and Hu (2009). Lower scale values indicated weaker relationship management and higher levels indicated stronger relationship management.

Table 10: Scale items for the relationship management construct

To what extent do you agree with the following statements describing how business and IT executives invest time and effort to maintain relationships with each other? (1 = strongly disagree; 5 = strongly agree)						
		1	2	3	4	5
19	Business and IT executives make an effort to maintain a better relationship with each other					
20	Business and IT executives invest time in managing relationships with each other					
21	Business and IT executives use liaisons to foster a good relationship					
22	Business and IT executives invite each other to their meetings to maintain a closer relationship between business and IT departments					

Scale items for environmental uncertainty

Environmental uncertainty referred to the unpredictability of environmental variables that have an impact on an organisation's performance (Miller, 1993). Scholars argued that if managers perceive an environment to be uncertain then they are liable to make decisions to avoid the consequences of that uncertain environment (Achrol et al., 1983; Freel, 2005; Miller, 1988). Therefore, managers' perceptions of environmental uncertainty have been considered more important than the actual environmental uncertainty (Freel, 2005). This study examined environmental uncertainty as a perceptual phenomenon.

Environmental uncertainty was formed using three first-order constructs: market uncertainty, technological uncertainty and regulatory uncertainty. Market uncertainty referred to the perceived unpredictability of rapid and significant changes in, and the instability and complexity of, market (Bstieler, 2005). Technological uncertainty referred to the perceived unpredictability of the complexity, and rapid and significant change of the technology (Bstieler, 2005). Regulatory uncertainty referred to the perceived unpredictability of rapid and significant changes in, and the instability and complexity of, regulations and policies (Bstieler, 2005; Engau & Hoffmann, 2009).

Environmental uncertainty may arise as a result of complexity and/or the dynamism in the environment. In the literature, environmental uncertainty has been conceptualised using two attributes: dynamism and complexity (Freel, 2005). The more complex and changeable the environment, the higher the level of environmental uncertainty (Damanpour, 1996). Managerial perceptions of environmental uncertainty are determined by "the predictability of conditions in the environment" (Freel, 2005, p. 50). Therefore, items captured information about these three characteristics (complexity, change and unpredictability) of environmental uncertainty. The items were adapted from Bstieler (2005), Miller (1993), and Sabherwal and Chan (2001). Lower scale values indicated a lower degree of uncertainty and higher scale values indicated a higher degree of uncertainty.

Table 11: Scale items for the market uncertainty construct

To what extent do you agree with the following statements describing the market environment your organisation is in? (1 = strongly disagree; 5 = strongly agree)						
		1	2	3	4	5
23	Our market environment is very dynamic and rapidly changing					
24	Our market environment is very unpredictable and hard to anticipate					
25	Our market environment is very complex					

Table 12: Scale items for the technological uncertainty construct

To what extent do you agree with the following statements describing the technology environment your organisation is in? (1 = strongly disagree; 5 = strongly agree)					
	1	2	3	4	5
26 Our technology environment is very dynamic and rapidly changing					
27 Our technology environment is very unpredictable and hard to anticipate					
28 Our technology environment is very complex technology					

Table 13: Scale items for the regulatory uncertainty construct

To what extent do you agree with the following statements describing the regulatory environment your organisation is in? (1 = strongly disagree; 5 = strongly agree)					
	1	2	3	4	5
29 Our regulatory environment is very dynamic and rapidly changing regulations/policies					
30 Our regulatory environment is very unpredictable regulations/policies and hard to anticipate					
31 Our regulatory environment (regulations/policies) is very complex					

In addition to the measurement items, questions covering demographic aspects of the respondents and participating organisations were also included. Items related to demographic are listed in the Table 14. Industry sector was identified based on the Central Bank of Sri Lanka Industrial Classification codes (The Central Bank of Sri Lanka, 2014). Ownership status consisted of four types – private, Government, semi-government and multinational organisations. Organisations owned by private individuals or groups were referred to as private organisations. Organisations owned by the government were referred to as government organisations. Organisations partially owned by private individuals or groups and the government were referred to as semi-government. Multinational organisations were owned by individuals or groups with two or more nationalities (The Central Bank of Sri Lanka, 2014).

Table 14: Scale items related to demographics

32	What industry does your organisation belong to?
33	What is the ownership status of your organisation?
34	How strategically important is information technology (IT) to your organisation's operations?
35	What percentage of your organisation's total capital expenditure is spent on IT per annum?
36	How many employees are there in your organisation?
37	Is the Head of IT a member of the top management team?
38	Number of years you have been in the CEO position
39	Number of years you have been in this organisation
40	How many years have you participated in strategic planning in this organisation?

A 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used to measure the nine constructs. The Likert (1932) scale is one of the most widely used instruments for measuring opinions, preferences, and attitudes. Both 5 and 7 scale points have been commonly used in IS research. There is no agreement on whether to use 5 or 7 scale points (Dawes, 2008; Leung, 2011). However, there is an opinion that 7-point scales may be optimal. Miller (1956) argued that the human mind has a span of absolute judgment that can distinguish about seven distinct categories, a span of immediate memory for about seven items, and a span of attention that can encompass about six objects at a time. This suggested that any increase in the number of response categories beyond six or seven might be pointless (Colman, Norris & Preston, 1997). Johns (2010) also confirmed that data from Likert items becomes significantly less accurate when the number of scale points drops below five or above seven. In IS literature, a 5-point scale rather than a 7-point scale was chosen for a number of reasons. One reason is that a 5-point scale appears to be less confusing and increases response rates (Chitiris & Paravantis, 2009; Babakus & Mangold, 1992; Devlin et al., 1993). More importantly, in terms of measurement quality such as reliability and validity, 5-point scales yield better quality data (Revilla, Saris, & Krosnick, 2013) and thus, Revilla et al. (2013) recommend using 5-point scales rather than 7-point scales. Further, Dawes (2008) empirically found that both a 5-point and a 7-point Likert scale produced the same mean score and thus had no significant effect on mean value based

techniques such as the partial least squares method which was the data analysis tool of this research. Therefore, 5-point Likert scales were used in this research.

A decision was made to do the survey in English since English is widely spoken in the country and is the main language used by the business community (Sri Lanka Tourism Development Authority, 2016). Further, English is commonly used as the language of surveys in Sri Lanka and there was no identified limitation due to the use of English as the language of the survey in recent studies (Abdul-Cader & Johar, 2015; Azeez, 2015; Sivalogathasan & Wu, 2015). Therefore, English was selected as the language of the survey.

4.5.2 Phase 02: Pre-test of the questionnaire

After the survey instrument was adapted from the literature, a survey pre-test took place as another step of content validation to ensure the survey was a proper representation of the phenomena (Straub, 1989). Another aim of the pre-test of the questionnaire was to ensure that the respondents understood the questions so that the researcher could accurately assess whether the questionnaire was being filled out properly (Collins, 2003). Pre-testing also helps assess whether the questions are actually understood by respondents, and whether the questions ask what the researcher thinks they are asking.

Five IS researchers individually evaluated the quality of the items of the survey instrument (Straub et al., 2004). IS PhD students were identified as being suitable participants for pre-testing the questionnaire. They had been involved in data collection in their own research and many of them had knowledge of quantitative research methods. The use of peer PhD students facilitated getting in-depth feedback about the questionnaire, and their recent experience helped to identify practical issues in the questionnaire.

They were asked to participate in an interview, and fill out the questionnaire, to give feedback on the survey items concerning wording, question order, visual design and navigation (Holland, Smith, Hasselback, & Payne, 2010). The purpose and the process of pre-testing were explained in the initial contact. Initial contacts were made by visiting them at their offices. The questionnaire booklet was presented to participants

a week prior to the interview. This allowed them sufficient time to go through the questionnaire prior to the interview.

All the interviews were held at the participants' offices. At the start of the interview, the participants were reminded of the aims and the process of the pre-test. Out of a total of five participants, three were asked to fill out the questionnaire first and give their views afterward. This was done to estimate how long survey completion was likely to take. The remaining two participants were asked to fill out the questionnaire and give their views while doing so. While the participants filled out the questionnaire, behavioural aspects such as facial expressions, skipping questions, and referring back to questions were observed and noted. All the comments were noted. Furthermore the start and end time of each interview were recorded. Each interview took about 30 minutes.

Most participants found the questions were well written and easily understood without problems. However, the comments that required attention are listed in Table 15, together with the way in which they were addressed.

Table 15: Pre-test queries and responses

Q. No	Question	Query	Response
5	Business and IT executives have frequent, direct, formal communications (e.g., meetings, business memos)	"Don't you consider the indirect communication?"	Changed to: 'Business and IT executives have frequent, formal communications (e.g., meetings, business memos)'
6	Business and IT executives have frequent, direct, informal communications (e.g., face to face, telephone, email)	"What is the answer if the company has informal and indirect communication?"	Changed to: 'Business and IT executives have frequent, informal communications (e.g., face to face, telephone, email)'
12	IT executives have a good understanding of the organisation's	"I had difficulties of understanding the	No action was taken as the term 'business environment' is a well

	business environment (problems, tasks, roles)	term: business environment". "Does it include external environment?"	understood term for CEOs.
13	Business executives have a good understanding of the organisation's IT environment (problems, tasks, roles)	"I had difficulties of understanding the term: IT environment".	No action was taken as the term 'IT environment' is a well understood term for CEOs.
16	Question: IT executives are kept informed about key business initiatives and plans Heading: To what extent do you agree with the following statements about the success of information systems?	"I read the heading of the question block as a 'success of information systems'. Wasn't sure this question goes with the heading".	Reword the heading as 'To what extent do you agree with the following statements about the success of the information technology department/unit?'
32	What industry does your organisation belong to?	"There may be a company not falling into one of these categories. Thus suggest you add "other" option by allowing participant to write a sector"	Add "Other .." option

Apart from the above queries, there were no further issues that required addressing. The questionnaire was thus amended accordingly and used for the pilot study. After the changes were made, the 40-item survey was used for the pilot study.

Since this research involved human participants, approval was requested from the Victoria University of Wellington (School of Information Management) Human Ethics Committee (HEC) to conduct both the pilot study and the survey. This was granted in March 2014. The approval letter is shown in Appendix D. The participants were assured of the confidentiality of the data and were asked for their consent. They were

informed that participation in the study was voluntary and that participants and their organisations will not be identified in any written report produced as a result of this research, including possible publication in academic conferences and journals. Further, they were given the opportunity to withdraw from the study before 31 August 2014. All material collected was kept confidential in locked storage, and was viewed only by the researcher and supervisors. A minor modification suggested for the survey was carried out prior to its distribution.

4.5.3 Phase 03: Pilot study

A pilot study is a preliminary study which enables a researcher to test the instrument before the final survey is administered (Boudreau, Gefen, & Straub, 2001). It aims to test the research instrument while increasing the possibility of a successful outcome (Van Teijlingen & Hundley, 2001). A pilot study helps the researcher to identify certain items that may be problematic (Straub, 1989) and helps to ensure that the instrument has acceptable measurement properties.

Saunders et al. (2009) suggested that a sample of a minimum of 10 respondents is sufficient for a pilot survey. A pilot survey sample is usually a subset of the intended, larger population of research survey participants (Sekaran, 2006). Therefore pilot participants need to meet the eligibility requirements of the survey and thus, CEOs in different industries were asked to participate in the pilot study.

The sample frame illustrated in section 4.4 was used to select organisations for the pilot study. A random sample of 12 organisations was selected for the pilot survey. A sample size of 12 allowed the selection of one respondent from each category. CEOs in each organisation were asked to participate in the pilot survey.

Initial contacts with CEOs were made through telephone calls and emails. The purpose of the survey, confidentiality assurance, and a promise of a copy of the results were mentioned in the call/email. Two CEOs declined to participate in the survey owing to operational pressure at the end of the financial year. Another two CEOs in the same category were randomly selected and they agreed to participate in the pilot survey.

For the pilot study, the same survey booklet which was intended to be used in the final research survey was used. The invitation letter, participant information sheet, consent form and questionnaire were emailed to those CEOs who agreed to participate in the survey. They were asked to fill out the questionnaire within two weeks and return the completed questionnaire together with the consent form to the researcher's email address (amitha.padukkage@vuw.ac.nz). Eight questionnaires were returned within two weeks. Reminder calls were made to those CEOs who had not returned the questionnaire within two weeks; they were asked to fill out the questionnaire as soon as possible.

A total of 12 questionnaires were returned and all of them were usable. All CEOs had been in their respective companies for at least two years. Six of them (50% of the sample) had more than five years' experience. The sample organisations comprised nine private organisations and three government organisations.

Pilot data was analysed using the IBM SPSS statistics package V23. Table 17 presents the summary of the statistical analysis. Confirmatory factor analysis was performed to investigate whether the set of observed variables were linearly related to the unobservable factors. Item loadings represent the degree to which the observed variables are related to the latent variables. AVE captures the amount of variance explained by the construct. The results indicated that the majority of the item loadings were above the acceptable level of 0.7 (Chin, 1998b). Only five items were found to have loadings below the level of 0.7.

One item loading of strategic alignment (SA1) was recorded as 0.407 while showing adequate reliability (α=0.684) and validity (AVE = 0.534) for the construct. Further, previous studies (Kearns & Sabherwal, 2007; Yayla & Hu, 2009) indicated high levels of reliability and validity of these items and thus, did not required any change to the items. The loading of RM4 (0.691) of the relationship management construct was very close to the 0.7 threshold. However, item SDK1 of the shared domain knowledge construct recorded a very low loading (0.150) and thus, after revisiting the relevant literature, an additional three items were added to the construct (see Table 16). A similar issue appeared with a regulatory uncertainty construct. The loading of RU1

was -0.151 and it's α was 0.418. By reviewing the literature RU1 was split into two questions.

Table 16: Added items for the shared domain knowledge construct

	Item	Sources
1	IT executives have a good understanding of key business initiatives and plans	(Nelson & Cooprider, 1996; Yayla & Hu, 2009)
2	Business executives have a good understanding of information technology developments	
3	Business and IT executives appreciate each other's accomplishments	

All AVE values were above the threshold of 0.5 (Hair et al., 2014) and thus demonstrated convergent validity for the constructs. Cronbach's alpha was used to test the reliability of the constructs. The Cronbach's alpha values ranged between 0.418 and 0.916, showing adequate scale reliability for the pilot study.

According to Fornell and Larcker (1981) constructs demonstrate discriminant validity when the latent construct shares more variance with its indicators than with any of the other constructs of the structural model. This means that the square root of the AVE of each latent construct should be greater than the highest correlation of the construct with any other constructs (Hair, Ringle, & Sarstedt, 2011; Hulland, 1999). The assessment of the discriminant validity of the constructs led to fully satisfactory results. As represented in Table 18, none of the constructs' cross-correlations (off-diagonal elements) exceeded the respective square root of each construct's AVE (diagonal elements).

Finally, the Pearson correlations between constructs shown in Table 18 indicate preliminary support for the expected relationships. Overall, the results of the pilot study were satisfactory and the questionnaire was amended accordingly for use as the final survey.

After the analysis of the pilot study data, participants in the pilot study were approached to capture practitioner insights from a wide skillset. They were asked to provide feedback on the wording, length, logic and overall usability of the survey. In particular, to address issues with the terms 'business environment' and 'IT

environment' in the previous pre-test, participants in the pilot study were asked to describe the two terms. All of them gave similar descriptions and demonstrated that both terms were well understood among CEOs.

Overall, the practitioners found the survey to be of a good length, clear, logical and easy to follow. The practitioners suggested making more spaces in which to tick on the relevant scale. This change was made accordingly. Further, they appreciated the initial contact prior to sending the survey. They suggested making an initial contact was appealing and captured their interest and participation. They greatly appreciated the objectives of the study. Finally, the survey was reviewed to ensure the survey was formatted properly and free of spelling and grammatical errors. After the changes were made, the survey consisted of 44 items and was used for the final survey.

Table 17: Internal consistency, indicator reliability, and convergent validity results for the pilot study

Construct	Code	Item	Item loading	AVE and α
Strategic alignment	SA1	1) The IT plan contains detailed action plans/strategies that support the organisation's business objectives and strategies	0.407	AVE = 0.534 α=0.684
	SA2	2) Major IT investments are prioritised by their expected impact on business performance	0.756	
	SA3	3) The goals/objectives of IT are adapted to changing goals/objectives of the organisation	0.821	
	SA4	4) IT-related opportunities are identified to support the strategic direction of the organisation	0.851	
Communication	COM1	5) Business and IT executives have frequent, formal communications (e.g., meetings, business memos)	0.924	AVE = 0.733 α=0.813
	COM2	6) Business and IT executives utilise various channels to communicate with each other (e.g., liaisons, task forces, steering meetings)	0.786	
	COM3	7) Business and IT executives have frequent, informal communications (e.g., face to face, telephone, email)	0.854	
Planning connection	CON1	8) Business and IT plans are developed together	0.876	AVE = 0.740 α=0.874
	CON2	9) Business and IT plans are integrated	0.865	

	CON3	10) Business and IT executives both participate in the strategic planning process	0.851	
	CON4	11) Business and IT executives consider each other's input during the strategic planning process	0.850	
Shared domain knowledge	SDK1	12) IT executives have a good understanding of the organisation's business environment (problems, tasks, roles)	0.150	AVE = 0.535 α=0.636
	SDK2	13) Business executives have a good understanding of the organisation's IT environment (problems, tasks, roles)	0.751	
	SDK3	14) IT executives appreciate the accomplishments of the business executives	0.917	
	SDK4	15) Business executives appreciate the accomplishments of the IT executives	0.844	
Prior IS success	PISS1	16) IT executives are kept informed about key business initiatives and plans	0.843	AVE = 0.768 α=0.835
	PISS2	17) Improved effectiveness of management decision making is due to information systems	0.893	
	PISS3	18) Introduction of new products and services is based on advances in information technology	0.875	
Relationship management	RM1	19) Business and IT executives make an effort to maintain better relationships with each other	0.961	AVE = 0.811

	RM2	20) Business and IT executives invest time in managing relationships with each other	0.959	α=0.916
	RM3	21) Business and IT executives use liaisons to foster good relationships	0.961	
	RM4	22) Business and IT executives invite each other to their meetings to maintain a close relationship between business and IT executives	0.691	
Market uncertainty	MU1	23) Our market environment is very dynamic and rapidly changing	0.735	AVE = 0.622 α=0.693
	MU2	24) Our market environment is very unpredictable and hard to anticipate	0.845	
	MU3	25) Our market environment is very complex	0.782	
Technological uncertainty	TU1	26) Our technology environment is very dynamic and rapidly changing	0.667	AVE = 0.650 α=0.712
	TU2	27) Our technology environment is very unpredictable and hard to anticipate	0.888	
	TU3	28) Our technology environment is very complex	0.853	
Regulatory uncertainty	RU1	29) Our regulatory environment is very dynamic with rapidly changing regulations/policies	-0.151	AVE = 0.584 α=0.418
	RU2	30) Our regulatory environment is very unpredictable and hard to anticipate	0.917	
	RU3	31) Our regulatory environment (regulations/policies) is very complex	0.939	

Table 18: Correlations between constructs for the pilot study

	Strategic alignment	Communication	Planning connection	Shared domain knowledge	Prior IS success	Relationship management	Market uncertainty	Technology uncertainty	Regulatory uncertainty
Strategic Alignment	**0.731**								
Communication	0.554*	**.856**							
Planning Connection	0.725**	0.561*	**.860**						
Shared domain knowledge	0.231	0.561*	0.394	**0.731**					
Prior IS success	0.409	0.731**	0.576*	0.650*	**0.876**				
Relationship management	0.596*	0.600*	0.559*	0.444	0.606*	**0.901**			
Market uncertainty	0.333	-0.051	0.279	0.193	0.215	0.201	**0.789**		
Technology uncertainty	0.208	0.270	0.552	0.147	0.541	0.676*	0.104	**0.806**	
Regulatory uncertainty	0.201	0.014	0.256	-0.081	-0.017	0.577*	0.101	0.143	**0.764**

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

** Correlation is significant at the 0.01 level (2-tailed).
Diagonal elements are the square roots of AVE

4.6 Data collection

The final data collection for the study was done through a large survey. The following subsections describe the survey process including the data collection approach, key informants and the data collection process.

4.6.1 Approach and key informants

Approach: Two common approaches to data collection have been applied in alignment research. These are the multiple informants approach and the single informant approach.

The multiple informants approach is used so that the researcher can obtain data on organisational properties such as alignment and communication from different informants. This approach improves validity in determining organisational properties since the researcher obtains data on the same organisational properties from the viewpoints of different people (Wagner, Rau, & Lindemann, 2010; Walker, Berry, & Avellaneda, 2015). It minimises deviations between the observed values and the true values of organisational properties (De Los Reyes, Thomas, Goodman, & Kundey, 2013; Wagner et al., 2010). Thus, it has been considered a reliable approach for data collection on organisational properties.

However, the majority of organisation-level research including strategic alignment research still relies on the other approach – the single informant approach – due to the practical constraints of the multiple informants approach (Kaufmann & Astou Saw, 2014; Malhotra & Grover, 1998; Wagner et al., 2010). The multiple informants approach often results in lower response rates (Kaufmann & Astou Saw, 2014). The procedure to collect information from multiple informants within the same organisation is complex and time consuming (Chandrasekaran, Recht, Parrilo, & Willsky, 2012; Kaufmann & Astou Saw, 2014). Organisational regulations may also need to be taken into account. These can include data secrecy policies or the need for approval by committees, such as the Board of Directors (Kaufmann & Astou Saw, 2014). Additionally, being one of multiple informants on one single issue might not be appealing to some informants and they might have questions such as 'don't you trust me to give you the right answer?' (Kaufmann & Astou Saw, 2014; Saunders et

al., 2009). Thus, this reduces the confidence of the informants and may lead to lower response rates. In addition, data analysis can be very complex due to aggregation issues. Furthermore, the researcher also consumes resources such as time and money that they could have used for gathering information in additional organisations (Wagner et al., 2010). Therefore, due to the practical constraints of the multiple informants approach, the single informant approach is often considered a more convenient and practical approach for data collection on organisational properties (Kaufmann & Astou Saw, 2014; Wagner et al., 2010).

The single informant approach is when the researcher obtains the data on organisational properties from a single informant. It is more likely to have a higher response rate and requires less time and money. However, the single informant approach may lead to systematic biases and random errors, and make data unreliable since the researcher obtains the data from only a single informant (Kumar, Stern, & Anderson, 1993; Wagner et al., 2010). For example, the views of CEOs may vary from CIOs' views because the organisational roles of both influence their interpretations of events (Kumar et al., 1993). However, the literature suggests two criteria to overcome this issue: (1) the key informant should be able and willing to share their knowledge with the researcher, and (2) they should occupy roles that make them knowledgeable about the issues being researched (Wagner et al., 2010). Therefore, the single informant approach has been used as a reliable data collection technique in strategic alignment research (Cui, Ye, Teo, & Li, 2015; Wu, Straub, et al., 2015; Yayla & Hu, 2012). This research also applied the single informant approach.

Key informants: Key informants can be chosen based on their position and experience. In alignment research, normally key informants have been high-ranking executives such as the CEO and CIO. Knowledge about the topics under investigation is the key criterion for selecting informants (Kearns & Sabherwal, 2007). Therefore, it is assumed that the CEO is more capable of assessing the items than the CIO since a CEO is involved in all managerial aspects of an organisation including strategic planning and has a holistic view of organisation activities. In addition, the CEO is less likely to be biased with regard to some of the measures in the research model such as prior IS success and strategic alignment. For instance, prior IS success in this research

is measured using the perceptions of business executives with regard to the success of the IT unit in their organisation. Therefore, the CEO is the ideal business executive to assess the success of the IT unit. Similarly, it is important that the key informants (CEOs) have been in an organisation long enough (minimum two years) to be aware of the strategic planning process in their organisations. Therefore, key informants' length of experience within the organisation was considered. Thus, targeted key informants were CEOs who have a sound knowledge and minimum two years' experience of the business and IT strategies, and strategic planning process.

4.6.2 The survey

A survey is a means of gathering information about the characteristics, actions, or opinions of a large group of people. In surveys, data are collected from a sample of individuals in a self-reporting format (Pinsonneault & Kraemer, 1993). This is the most common design for obtaining quantitative data. A number of advantages make the survey method a good choice for this study. Among them, a survey is cost effective and it has greater geographical scope compared to other techniques such as personal interviews. Also, it allows respondents to take more time to complete the survey. Therefore, the survey method was appropriate for the current study, since data collection involved a large number of respondents from several industry sectors.

In addition, this study intended to assess the impact of antecedents, including environmental uncertainty, on managerial practices and strategic alignment. Therefore, the independent and dependent variables were clearly defined. The proposed conceptual model with expected relationships was derived from the literature review. Therefore, the researcher decided to use a questionnaire as the data collection method, due to its appropriateness for the aims of the study as well as providing standardised information about the subjects being studied.

Paper based and online surveys are the two most popular survey methods. An online survey is more convenient and cost effective. Online survey tools such as Qualtrics and Survey Monkey facilitate monitoring the progress of the survey and transferring data directly to an Excel file and thus, data entry errors do not occur. However, this research was administered using a paper-based survey. Government sector

organisations require a formal request letter and a paper-based question in order to obtain approval for participation in the survey. Therefore, in order to facilitate this government sector requirement and to maintain the consistency of the survey, a paper-based survey was conducted. Additionally, a paper-based questionnaire is more noticeable, and participants may take it more seriously and this could help increase the response rate.

4.6.3 Data collection process

Data were collected through a self-administered questionnaire at one point in time. The questionnaires were printed on light-coloured paper and presented as a small booklet. The coloured paper was used in order to make it visually appealing and to distinguish it from other documents. All the documents – cover letter, consent form and the participant information sheet – were printed on good-quality paper in colour and presented like professional materials. A postage-paid, self-addressed return envelope also accompanied the documents.

Initial contact with the CEO in each organisation was made through an introductory telephone call or email. The purpose of the survey, confidentiality assurance, and a promise of a copy of the results were mentioned in the call/email in order to encourage participation. Then the questionnaire booklets were distributed with a formal invitation letter and a consent form. The cover letter was directly addressed to the CEO's name and all the materials were delivered to the office address. CEOs' names and the delivery addresses were printed on white envelopes. Both personal delivery and the postal delivery services were used to distribute the survey.

Due to the large number of questionnaires (810), distribution was processed in several batches. Each batch consisted of 200 (the last batch was 210) questionnaires and the same procedures were followed to dispatch all four batches. The researcher personally monitored the process to make sure that the dispatch of each questionnaire was treated equally and to maintain consistency. Two people helped to administer the questionnaires. They helped to put together the survey pack and arrange the posting process. All the instructions such as the order of documents were given to ensure the

consistency of each survey pack. They were not involved in any decision making activity.

Three weeks after the initial questionnaire dispatch, the first reminder letters were sent and follow-up calls were made to those who had not returned the completed questionnaire. Some of the participants asked for another copy of the questionnaire booklet and they were sent in the fourth week. The second reminder letters were sent and follow-up calls were made six weeks after the initial questionnaire dispatch, to those who had not returned the completed questionnaire. Data collection took approximately four months (July to October 2014). The questionnaire and other letters are provided in Appendix E.

A total of 810 invitations were distributed. At the end of the four-month data collection period, 230 questionnaires were returned, giving a response rate of 28%. Although the response rate is considered high for the target sample, it is important to note that most questionnaires were filled in by the respondent after the first reminder. When the questionnaires were returned, an identification number was assigned to each questionnaire and the results were entered in to a Microsoft Excel file by the researcher. Results were entered and data records were re-examined for accuracy. During the data entry process, the researcher did not come across any unclear responses. When data collection was finished, to further ensure that the data were entered correctly, the researcher conducted univariate data analysis. The data were analysed in terms of a frequency table, mean, variance and outliers. During this screening process no errors were found. Table 19 shows the industry sector of the participating organisations with the number of responses.

Table 19: Number of contacts and responses summary

	Industry sector	Sample Frame	Sample	No. of invitations	No. of responses	Response rate (%)
1	Agriculture, Livestock and Forestry	115	18	54	19	35%
2	Banking, Insurance and Real Estate	294	45	135	43	32%
3	Construction	28	4	12	6	50%
4	Fishing	35	5	15	1	7%
5	Electricity, Gas and Water	37	6	18	8	44%
6	Government Services	265	40	120	32	27%
7	Hotels and Restaurants	294	45	135	19	14%
8	Manufacturing	361	55	165	57	35%
9	Mining and Quarrying	33	5	15	3	20%
10	Ownership of Dwellings	0	0	0	0	0
11	Private Services	128	20	60	21	35%
12	Transport and Communication	82	13	39	12	31%
13	Wholesale and Retail Trade	92	14	42	9	21%
	Total	1764	270	810	230	28%

4.7 Chapter summary

Firstly, this chapter discussed some important decisions in regard to the methodological approach of this study. The research phenomena of this study were viewed as objective entities of reality and thus, this research assumed an objectivist epistemology. Since the theoretical perspectives of this study aligned with post-positivist characteristics, this research took a post-positivist theoretical perspective. As

a research method, the selection of a quantitative research approach for this research was justified.

Secondly, this chapter outlined the data collection process. A paper-based questionnaire survey was used to collect data for the study. Reliable and valid questionnaire items were developed through a three-phase process: Phase 01 – item adoption from the research literature, Phase 02 – content validation through a pre-test, and Phase 03 – validity and reliability assessment through a pilot study. After the three phases, the final questionnaire booklets were printed and used for the final survey.

The context of this research was organisations in Sri Lanka. CEOs in 12 different industry sectors were asked to participate in the survey. CEOs were selected as the key informants since they have an overview of the business operations and have less bias towards some research concepts such as prior IS success. The sample frame consisted of registered organisations in Sri Lanka in 12 different industry sectors. A stratified random sampling technique was used to select the required sample of 270 for the study. The data collection process started with an introductory call or email to the target participants. Then the questionnaire booklet and the other documents were delivered to the participants. In total, 810 questionnaires were dispatched and 230 were returned, recording a 28% response rate. However, 18 questionnaires were incomplete for most of the variables. As recommended by Creswell (2003), these questionnaires were eliminated from the data analysis and 212 responses were retained.

CHAPTER 05: DATA ANALYSIS AND RESULTS

The purpose of this chapter is to present the analysis and the results of the survey. The survey data was analysed to test the conceptual model. This included several steps. This chapter commences with a presentation of demographics about the survey respondents and dataset characteristics. Structural Equation Modelling (SEM), the technique used in analysing the survey data, is explained next. Then in-depth evaluations of both the measurement model and the structural model in SEM are presented. The measurement model was assessed to make sure that it has satisfactory levels of validity and reliability. Afterwards, the structural model was evaluated. In this step, research hypotheses were tested through examining the statistics of the relations among the latent variables.

5.1 Respondent demographics

Demographics are the characteristics of a population. Demographic analysis gives an overview of the respondents and helps to identify the demographic representation of the respondents. The data relating to respondents' demographics were tabulated to gain a better understanding of them (Sekaran, 2006). The respondents' demographic profiles were grouped according to industry, organisation size, ownership, capital expenditure on IT and level of strategic importance of IT as shown in Table 20.

The survey was distributed to a wide range of industries to ensure external validity of the study. External validity is the extent to which the results of a study can be generalised to other situations (Sekaran, 2006). Distribution to a wide range of industries ensures the sample variance required for generalisability of findings (McGrath & Brinberg, 1983; Sekaran, 2006). The first section of Table 20 shows the industry sector of the participating organisations. Manufacturing organisations represented 25% of the sample. This was followed by Banking, Insurance and Real Estate (18.9%) and Government Services (13.7%) organisations. With regard to the organisation's size, more than half of the sample (58%) consisted of large

organisations[2]. The remainder was distributed between medium organisations (32.1%) and small organisations (9.9%). Further, more than half of the organisations (65.1%) were owned by the private sector[3]. The organisations owned by the Government sector comprised 16.5%, followed by multi-national (12.3%) and semi-government (6.1%). In relation to the total capital expenditure on IT, a large majority of the organisations (90.1%) had spent less than 30% on capital expenditure on IT, while 48.6% spent less than 10%. The majority of organisations (60%) identified IT as strategically very important for their operations, while the remaining 40% identified IT as strategically important. None of the organisations identified IT as not important. Further, the Head of IT was a member of the top management team in a large majority (75%) of organisations.

Table 20: Demographic profile of the responding organisations

Demographic variable	Categories	No. of responding organisations n=212	% of responding organisations
Industry[4]	Agriculture, Livestock and Forestry	18	8.5%
	Banking, Insurance and Real Estate	40	18.9%
	Construction	6	2.8%
	Fishing	1	0.5%
	Electricity, Gas and Water	8	3.8%
	Government Services[5]	29	13.7%
	Hotels and Restaurants	15	7.1%
	Manufacturing	53	25.0%

[2] Organizations were grouped into small (no of employees between 1 and 50), medium (no of employees between 51 and 300) and large (no of employees more than 300) organizations according to the World Bank organization sizes classification 2009 (The World Bank, 2009).

[3] Ownership of the organisations was represented by four categories – fully owned by the private sector, fully owned by the Sri Lankan Government, partially owned by the private sector and Sri Lankan Government and lastly, fully owned by the foreign or multinational sector.

[4] Organisations were grouped into several industry sectors according to the Central Bank of Sri Lanka Industrial Classification codes (2014).

[5] Specific sector organisations owned by the government were grouped with relevant sectors. For example, government banks were grouped into the Banking, Insurance and Real Estate category. All the other service organisations owned by the government such as education and health were grouped into government services.

	Mining and Quarrying	3	1.4%
	Ownership of Dwellings	0	0.0%
	Private Services	20	9.4%
	Transport and Communication	11	5.2%
	Wholesale and Retail Trade	8	3.8%
Organisation size	Small	21	9.9%
	Medium	68	32.1%
	Large	123	58.0%
Ownership	Private	138	65.1%
	Government	35	16.5%
	Semi-Government	13	6.1%
	Multi-national	26	12.3%
Capital expenditure on IT	0-10%	103	48.6%
	11-20%	61	28.8%
	21-30%	27	12.7%
	31-40%	13	6.1%
	Over 40%	8	3.8%
Level of strategic importance of IT	Not important	0	0.0%
	Important	85	40.0%
	Very important	127	60.0%
The Head of IT is a member of the top management team	Yes	157	74.0%
	No	55	26.0%

The survey participants were also asked to indicate their years of experience as the CEO as well as experience in strategic planning. The demographic profile of key informants is summarised in Table 21. The majority of the CEOs (58.5%) had two to five years' experience while 25% of participating CEOs had five to ten years' experience. The remaining 16.5% of CEOs had more than ten years' experience.

Further, half of the CEOs (50.0%) had worked in the organisation for five to ten years. The remaining 28.8% had two to five years' experience while 21.2% had more than ten years' experience. With regard to experience in strategic planning, the majority of the CEOs (46.2%) had five to ten years' experience while 37.8% of participating CEOs had more than five years' experience. The remaining 16% of CEOs had two to five years' experience. These demographic details provided adequate assurance that the respondents had the necessary knowledge and expertise to correctly judge their organisations' strategic planning process.

Table 21: Demographic profile of key informants

Demographic variable	Categories	No. of respondents N=212	% of respondents
Experience as CEO	2 or less than 5 years	124	58.5%
	5 or less than 10 years	53	25.0%
	More than 10 years	35	16.5%
Total work experience in the organisation	2 or less than 5 years	61	28.8%
	5 or less than 10 years	106	50.0%
	More than 10 years	45	21.2%
Experience in strategic planning	2 or less than 5 years	34	16.0%
	5 or less than 10 years	98	46.2%
	More than 10 years	80	37.8%

5.2 Verifying data characteristics

Several tests were performed to examine the data collecting issues, if any. Since the empirical data were collected using questionnaires, identifying and reporting the data collection issues is essential before the subsequent analysis. The primary data collection issues that need to be examined include common method variance, missing values and non-response bias (Hair et al., 2014).

5.2.1 Common method variance

Common method variance refers to the variance that is attributable to the measurement method rather than to the constructs the measures represent (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Such method variance is problematic since it can inflate the estimates of parameters in a model, and can potentially lead to erroneous conclusions (Gefen, Straub, & Rigdon, 2011). Four main sources – common rater effects, item characteristics effects, item context and measurement context effects – can result in common method variance (Malhotra, Kim, & Patil, 2006; Podsakoff et al., 2003). Regardless of its source, common method variance can have a confounding effect on the empirical analysis (Podsakoff et al., 2003). This is possible especially when self-reported questionnaires are used in which the same person responds to all the items in a single questionnaire at the same point in time (Malhotra et al., 2006).

As this research used self-reported surveys, there was potential for the common method variance problem. One of the methods to investigate common method variance is via Harman's one-factor test (Igbaria, Zinatelli, Cragg, & Cavaye, 1997; Podsakoff et al., 2003). In Harman's one-factor test, all indicators of all constructs in the study are factored into one general factor. If this general factor accounts for a large amount of the variance, this signals the existence of a substantial amount of common method variance. In this research, the Exploratory Factor Analysis (EFA) with unrotated solution resulted in ten factors with eigen values higher than 1, and the most covariance explained by one factor was 27%. A single factor did not emerge and did not account for the majority of the variance.

However, Podsakoff et al. (2003) note that Harman's reliability decreases as the number of variables increases and suggest avoiding Harman's one-factor test. They strongly recommended designing the questionnaire itself to reduce common method variance and to apply more reliable statistical controls such as the common latent factor test and marker variable method.

This study applied the suggested recommendations for questionnaire design, including avoiding ambiguity of items, protecting respondent anonymity and separation of scale items used to measure a construct from scale items relating to other constructs. As

Podsakoff et al. (2003) suggest, these steps should help reduce the common method variance. Further, the effect of common method variance was tested using a common latent factor test. In this test, the standardised regression weights of the model with the common latent factor are compared with the standardised regression weights of the model without the common latent factor. If there are large differences (greater than 0.2), this indicates the existence of a substantial amount of common method variance (Malhotra et al., 2006). In this research, differences of regression weights were less than 0.2 and thus, common method variance did not exist. Therefore, both results from Harman's one-factor test and the common latent factor test indicated strongly that common method variance is not a threat to the validity of the findings.

5.2.2 Non-response bias

Non-response bias refers to the bias that exists when those who respond to a survey are different from those who did not respond in terms of demographic or attitudinal variables (Sax, Gilmartin, & Bryant, 2003). Researchers have taken one of two approaches: a comparison of respondents and a sample of non-respondents, or comparison of the responses of early and late responders (Hutchison, Tollefson, & Wigington, 1987; Sax et al., 2003). A comparison of the returns of respondents and a sample of non-respondents is not usually feasible in most research. Therefore, the second approach is usually used to test for non-response bias. Comparison of the responses of early and late responders is based on the assumption that respondents who respond late are more likely to resemble non-respondents (Armstrong & Overton, 1977). Researchers compare two subsamples of 50 to 60 responses and determine whether significant differences exist between the two sets of responses (Churchill, 1979; Field, 2009).

In this research, two subsamples consisting of the first and last 50 responses were used to assess non-response bias. The two subsamples were then compared using a two-tailed t-test at 5% significance level (Field, 2009). Out of the 35 measurement items, only one item (RU2) presented some degree of significant response difference between the two groups. Thus, the results of this test indicated that non-response bias was not a concern for the dataset.

5.2.3 Missing values

Missing data is often a problem in social science research, especially when the data are collected through a survey. Missing data occurs when a respondent either purposely or inadvertently fails to answer one or more questions. Since this research used a paper-based survey as the data collection method, the likelihood of incomplete responses was very high. Therefore, the consolidated data were assessed for the presence of missing values. By going through the cases, 23 questionnaires were detected as incomplete.

Statistical interpretation is valid only if the missing data are Missing Completely at Random (MCAR). Little (1988) proposed a statistical test to analyse the missing values. MCAR assumes that the missing data is independent of both the observed and the unobserved data (Little, 1988). Little's MCAR Test in SPSS was used to analyse the missing values. The result was non-significant (Sig. = 0.995); thus the data were missing randomly. However, out of the 23 incomplete questionnaires, 18 were incomplete for most of the variables. As recommended by Creswell (2003), these questionnaires were eliminated from the data analysis. The remaining five questionnaires were retained for the data analysis since most of the questionnaires had only one missing value. Ultimately, 212 responses were considered for the analysis.

The data analysis software which was used in this analysis, Smart PLS 3.0, offers three ways of handling missing values: mean value replacement, case-wise deletion and pairwise deletion. In mean value replacement, the missing values of an indicator variable are replaced with the mean of valid values of that indicator. Hair et al. (2014) recommend using mean value replacement when there are less than 5% of values missing per indicator. An alternative option is the removal of all cases from the analysis that include missing values in any indicator. This can dramatically diminish the number of observations in the dataset. Since this research meets the criterion of less than 5% of values missing per indicator, mean value replacement was used in the data analysis.

5.3 SEM technique: Partial least squares

Structural Equation Modelling (SEM) was used to analyse the survey data and test the research hypotheses. SEM is a second generation statistical method which enables a researcher to answer a set of interrelated research questions by modelling the relationships among multiple independent and dependent constructs simultaneously (Gefen et al., 2000; Lowry & Gaskin, 2014). It is more powerful than the first generation multivariate techniques which can only measure a single relationship at a time (Gefen et al., 2000; Hair et al., 2014).

SEM has been described as a combination of exploratory factor analysis and multiple regression. It is more of a confirmatory technique, but it can also be used for exploratory purposes (Schreiber, Nora, Stage, Barlow, & King, 2006). The SEM model contains two inter-related models – the measurement model and the structural model. The measurement model describes the latent variables that the model will use, and assigns observed variables to each. The structural model then describes the causal relationships among these latent variables (Hair et al., 2014).

Two distinct techniques are available in SEM: covariance-based analysis (e.g. employed in AMOS) and component-based analysis, commonly referred to as partial least squares (e.g. employed in Smart-PLS) (Hair et al., 2014; Lowry & Gaskin, 2014). These two techniques differ in terms of their objectives, underlying statistical assumptions, and the nature of fit statistics they produce (Gefen et al., 2000; Hair et al., 2014). Covariance-based SEM is primarily used to confirm or reject theories, while, partial least squares SEM is primarily used to develop the theories in exploratory research (Hair et al., 2014). Each is appropriate for different research needs.

PLS was chosen to analyse the survey data collected in this research for several reasons. The overall research goal played a vital role in determining the technique. PLS is recommended for research that is exploratory or an extension of an existing theory (Hair et al., 2014; Hair et al., 2011). This research intended to extend theory by exploring the influence of environmental uncertainty on strategic alignment. In addition, PLS techniques are usually more efficient for addressing complex structural models with many constructs and many indicators (Hair et al., 2014). This research

consisted of a complex structural model with 9 constructs and 35 indicators. Further, the nature of the environmental uncertainty construct was exploratory and there was no guarantee about the normality of the collected data. PLS is recommended in such situations and does not require normal distribution. In contrast, the normal distribution is one of the essential assumptions of covariance analysis. Finally, the sample size, although quite large (212), might not be large enough to conduct covariance analysis for the proposed research model, especially for group comparisons.

PLS is a composite-based approach to SEM that that consists of two stages. In the first stage observed variables are combined as composites; in the second the composites are used in regression analysis (Hair et al., 2014; Henseler et al., 2014). Some literature claims that the purpose of the composites remains ambiguous (Rönkkö, McIntosh, Antonakis, & Edwards, 2016) and composites reduce the impact of measurement error (Gefen et al., 2011; Rönkkö et al., 2016). However, recent literature, with empirical evidence, suggests that modelling constructs as composites is a more realistic approach to measurement, since it explicitly considers the proxy nature of construct measures (Henseler et al., 2014; Rigdon, 2012; Sarstedt, Hair, Ringle, Thiele, & Gudergan, 2016; Schirmer, Ringle, Gudergan, & Feistel, 2016; Schlägel & Sarstedt, 2016) and thus, the PLS technique was used to analyse the survey data.

5.4 Validation and measurement of environmental uncertainty as a second-order construct

In this research, environmental uncertainty was treated as a higher (second)-order construct and was formed using three first-order constructs: market uncertainty, technological uncertainty and regulatory uncertainty.

The literature illustrates four main types of higher-order construct modelling: reflective-reflective, reflective-formative, formative-reflective and formative-formative (Becker, Klein, & Wetzels, 2012; Hair et al., 2014; Jarvis, MacKenzie, & Podsakoff, 2003; Wetzels, Odekerken-Schröder, & Van Oppen, 2009). These models have two components. The higher-order component captures the most abstract entity, i.e. environmental uncertainty in this research. Lower-order components capture the sub-dimensions of the abstract entity, i.e. market uncertainty, technological

uncertainty and regulatory uncertainty in this research. Each type of higher-order construct model is characterised by different relationships between the higher-order construct and the lower-order constructs as well as the constructs and their indicators. For instance, the reflective-reflective type represents a reflective relationship between higher-order construct and the lower-order constructs, whereby each of the constructs is measured by reflective indicators (Hair et al., 2014).

As suggested by Hair et al. (2014), the reflective-reflective type was used to define the environmental uncertainty construct. In the reflective-reflective type, the lower-order constructs are reflectively measured constructs that can be distinguished from each other but are correlated (Becker et al., 2012). In this research, three lower-order constructs were distinguished from each other and they were measured using sets of reflective indicators. The relevant collinearity (VIF) statistics were 1.593 for market uncertainty, 1.688 for technological uncertainty, and 1.487 for regulatory uncertainty. However, the correlation matrix indicated correlations between constructs, and thus the reflective-reflective type was used to define the environmental uncertainty construct.

Further, the literature proposes two approaches to validate a second-order construct. Lohmoller (1989) suggests a procedure called "Hierarchical Component Model Repeated Indicators Approach" to measure the higher-order constructs. In this approach, a second-order construct is directly measured by using the observed variables for all the first-order constructs. It means that all the indicators associated with first-order constructs are repeated in the second-order construct. The prerequisite for the use of this approach is that all the indicators of the constructs are reflective (Chin, 2010).

The second approach is a "two-step approach". In the first step, the latent variable scores are estimated in the model without the second-order construct. Then the derived latent variable scores are used as indicators of the second-order construct (Chin, 2010). The first-order latent variable scores can be computed by either averaging the indicators' scores of each latent variable (Croteau & Bergeron, 2001) or by using the latent variable scores provided during the first step of the PLS analysis without the second-order constructs (Ciavolino & Nitti, 2013). This procedure has the advantage

of being able to calculate the second-order constructs with reflective indicators as well as formative indicators (Reinartz, Krafft, & Hoyer, 2004).

This research used the two-step approach to measure environmental uncertainty. Three latent variables (market uncertainty, technological uncertainty and regulatory uncertainty) scores were estimated in the model without the second-order construct. Then the derived latent variable scores were used as indicators of the second-order construct (environmental uncertainty).

5.5 Measurement of interaction between communication and planning connection

An integrated planning process creates cross-functional interfaces, establishing dialogue and lines of communication between the business and IT groups (Kearns & Sabherwal, 2007; Segars & Grover, 1999). Meanwhile, communication enables information sharing and mutual understanding (Johnson & Lederer, 2005), and thereby facilitates the integration of different views among IT and business groups (Bai & Lee, 2003). Therefore, this research proposed that there is an interaction effect between communication and planning connection.

The literature suggests three approaches for measuring interaction: the product indicator approach, the two-stage approach and the orthogonalising approach (Hair et al., 2014; Henseler & Chin, 2010; Little, Bovaird, & Widaman, 2006; Rigdon, Ringle, & Sarstedt, 2010). The product indicator approach uses all possible pair combinations of the indicators of the latent variables. In the two-stage approach, firstly, the latent variable scores are estimated in the model without the interaction term. Then the derived latent variable scores are used as indicators of the interaction term. The orthogonalising approach uses residuals that are calculated by regressing all possible pairwise product terms of the indicators of two relevant latent variables on all indicators of the latent variable. These residuals serve as indicators of the interaction term in the structural model (Hair et al., 2014; Rigdon et al., 2010).

Henseler and Chin (2010) compared approaches for modelling interactions in terms of point estimate accuracy, statistical power, and prediction accuracy and recommended

the use of the orthogonalising approach. Therefore, this research used the orthogonalising approach to measure the interaction between communication and planning connection.

5.6 Measurement model evaluation

The procedures implemented to evaluate the measurement model followed guidelines associated with PLS analysis (Hair et al., 2014; Hair et al., 2011; Henseler, 2012; Ringle, Sarstedt, & Straub, 2012). All the measures that were implemented for evaluating the measurement model are explained following section.

5.6.1 Criteria for measurement model evaluation

Indicator reliability was assessed by examining the outer loadings of the measurement items (Hair et al., 2014). Item loadings represent the degree to which the observed variables are related to the latent variables (Sekaran, 2006). A common rule of thumb is to retain the items which have outer loadings of greater than 0.70 (Gefen & Straub, 2005; Hair et al., 2014; Straub et al., 2004). A loading of 0.70 implies that 50% of the variance in the observed variable is due to the item (Straub et al., 2004). Items with low loadings add little explanatory power to the model and they can deflate the path coefficients (Hulland, 1999). Therefore, it is recommended to remove items with outer loadings of less than 0.5 (Hair et al., 2011; Hulland, 1999; Ringle et al., 2012). Furthermore, items with loadings between 0.5 and 0.7 or insignificant loadings should also be considered for elimination (Hair et al., 2014). Hair et al. (2014), Henseler et al. (2009) and Ringle et al. (2012) recommend retaining items displaying loadings between 0.5 and 0.7, only eliminating items that substantially decrease the composite reliability of the corresponding construct and affect the content validity of the construct.

Internal consistency was assessed using composite reliability and Cronbach's alpha coefficient. It is an indication of the stability and consistency with which the instrument measures the concept (Saunders et al., 2009). A threshold of 0.70 was used to validate the reliability of measurement scales (Chin, 1998b; Fornell & Larcker, 1981; Hair et al., 2011; Nunnally & Bernstein, 1994; Werts, Linn, & Jöreskog, 1974; Wetzels et al., 2009).

After the assessment of reliability, the Average Variance Extracted (AVE) was used to evaluate the convergent validity for each construct (Chin, 1998b; Gefen & Straub, 2005; Hair et al., 2014; Straub et al., 2004; Wong, 2013). The AVE measures the amount of variance that is captured by the construct in relation to the amount of variance due to measurement error and should be greater than 0.5 (Chin, 1998b; Gefen & Straub, 2005). An AVE value of 0.5 or above signifies that the corresponding latent variable explains more than half of its indicators' variance (Hair et al., 2014).

The measurement model was also examined for collinearity, which refers to high correlations between the constructs (Hair et al., 2014). High collinearity inflates the estimates of parameters in a model as the error rates may increase, resulting in an inaccurate estimation of the loadings and the sign being reversed (Hair et al., 2014). Variance Inflation Factors (VIF) were used to assess collinearity. A VIF value of ≥ 5 indicates a potential collinearity problem (Hair et al., 2011).

Finally, discriminant validity, which refers to the extent to which a construct is truly distinct from other constructs (Hair et al., 2014) was evaluated through two measures: the correlations between main constructs, and cross-loadings. According to Fornell and Larcker (1981) constructs demonstrate discriminant validity when the latent construct shares more variance with its indicators than with any of the other constructs of the structural model. This means that the square root of the AVE of each latent construct should be greater than the highest correlation of the construct with any other constructs (Hair et al., 2011; Hulland, 1999). The second measure is the item cross-loadings. A rule of thumb is that an indicator's loadings with its associated construct should be higher than all its loadings with the other constructs of the model (Hair et al., 2014; 2011; Hulland, 1999).

5.6.2 Measurement model results

Assessing the measurement model began with examining the descriptive statistics of the data. Table 22 summarises the descriptive characteristics of the main constructs. The construct means ranged between 3.09 and 3.98 while standard deviations range from 0.698 to 0.876. Examination of the descriptive statistics revealed that the business and IT executives communicate frequently (mean=3.76, Std. Dev. 0.727) and have a

good relationship with each other (mean=3.56, Std. Dev. 0.715). Moreover, business and IT executives have shared domain knowledge (mean=3.5, Std. Dev. 0.698). Organisations in the sample perceive their IT units as successful (mean=3.59, Std. Dev. 0.764) and their IT and business planning are highly integrated (mean=3.52, Std. Dev. 0.836). Furthermore, organisations in the sample perceive a high level of uncertainty, especially market uncertainty (mean=3.61, Std. Dev. 0.868). Overall, organisations consider themselves to be achieving strategic alignment (mean=3.98, Std. Dev. 0.736).

Table 22: Descriptive statistics of main constructs

Construct	N	Min.	Max.	Mean	Std. Dev.
Strategic alignment	212	1.00	5.00	3.98	0.736
Communication	212	1.33	5.00	3.76	0.727
Planning connection	212	1.00	5.00	3.52	0.836
Shared domain knowledge	212	1.17	5.00	3.50	0.698
Relationship management	212	1.00	5.00	3.56	0.715
Prior IS success	212	1.33	5.00	3.59	0.764
Market uncertainty	211	1.00	5.00	3.61	0.868
Technological uncertainty	212	1.00	5.00	3.26	0.876
Regulatory uncertainty	212	1.00	5.00	3.09	0.819

The software, SmartPLS 3.0, was used to perform a confirmatory factor analysis. The assessments of indicator reliability, internal consistency, and convergent validity are summarised in Table 23.

Table 23: Internal consistency, indicator reliability, and convergent validity results for the constructs

Strategic Alignment					**Communication**				
CR=0.880 / α=0.820 / AVE=0.647					CR=0.862 / α=0.761 / AVE=0.676				
Item	Loading	Std. error	t-value	p-value	Item	Loading	Std. error	t-value	p-value
SA1	0.771	0.044	17.672	0.000	COM1	0.855	0.023	37.765	0.000
SA2	0.814	0.035	23.007	0.000	COM2	0.826	0.037	22.144	0.000
SA3	0.795	0.033	23.831	0.000	COM3	0.784	0.041	18.976	0.000
SA4	0.837	0.026	32.752	0.000					

Planning Connection					**Shared Domain Knowledge**				
CR=0.912 / α=0.872 / AVE=0.723					CR=0.906 / α=0.879 / AVE=0.579				
Item	Loading	Std. error	t-value	p-value	Item	Loading	Std. error	t-value	p-value
CON1	0.818	0.033	24.713	0.000	SDK1	0.738	0.039	19.148	0.000
CON2	0.841	0.026	32.773	0.000	SDK2	0.755	0.043	17.610	0.000
CON3	0.885	0.016	53.637	0.000	SDK3	0.804	0.026	31.190	0.000
CON4	0.856	0.025	34.690	0.000	SDK4	0.695	0.042	16.701	0.000
					SDK5	0.797	0.033	24.002	0.000
					SDK6	0.767	0.040	19.109	0.000
					SDK7	0.764	0.041	18.441	0.000

Prior IS Success					**Relationship Management**				
CR=0.820 / α=0.676 / AVE=0.604					CR=0.913 / α=0.872 / AVE=0.723				
Item	Loading	Std. error	t-value	p-value	Item	Loading	Std. error	t-value	p-value
PISS1	0.782	0.035	22.227	0.000	RM1	0.853	0.026	32.483	0.000
PISS2	0.816	0.033	25.067	0.000	RM2	0.884	0.022	41.112	0.000
PISS3	0.731	0.053	13.781	0.000	RM3	0.848	0.037	22.834	0.000
					RM4	0.815	0.033	24.769	0.000

Market Uncertainty					**Technological Uncertainty**				
CR=0.866 / α=0.770 / AVE=0.683					CR=0.899 / α=0.832 / AVE=0.748				
Item	Loading	Std. error	t-value	p-value	Item	Loading	Std. error	t-value	p-value
MU1	0.833	0.023	35.618	0.000	TU1	0.882	0.017	52.570	0.000
MU2	0.816	0.034	24.331	0.000	TU2	0.832	0.023	36.519	0.000
MU3	0.830	0.028	29.856	0.000	TU3	0.893	0.015	58.315	0.000

Regulatory Uncertainty				
CR=0.878 / α=0.814 / AVE=0.644				
Item	Loading	Std. error	t-value	p-value
RU1	0.761	0.037	20.625	0.000
RU2	0.889	0.016	55.729	0.000
RU3	0.814	0.030	26.808	0.000
RU4	0.737	0.043	17.056	0.000

Notes: CR: Composite reliability; α: Cronbach's alpha; AVE; Average Variance Extracted

The evaluation of the measurement model was performed using the following sequence of tests.

5.6.2.1 Indicator reliability

The outer loadings of the indicators were utilised to test for indicator reliability (Hair et al., 2014). The results indicated that the majority of the items' loadings are above the 0.7 threshold and all the loadings are statistically significant at the p<0.001 level. Only one item (SDK4) was found to have a loading below the 0.7 threshold. SDK4 was retained since the loading (0.695) was very close to the 0.7 threshold.

Overall all items relating to the nine constructs were accepted. The item loadings ranged between 0.695 and 0.893 and were statistically significant at the p<0.001 level. These results can also be considered as preliminary support for the convergent validity of the constructs.

5.6.2.2 Internal consistency (composite reliability)

All Cronbach's alpha coefficients and composite reliability scores were satisfactory and internal consistency (composite reliability) was demonstrated. As presented in Table 11, all the composite reliability scores were well above the 0.70 threshold (Chin, 1998b; Hair et al., 2014) while many Cronbach's coefficient alpha scores exceeded the 0.70 threshold recommended by Chin et al. (2003). Only the prior IS success construct had a slightly low Cronbach's alpha coefficient score at 0.676. The construct was examined to improve the Cronbach's alpha coefficient scores by deleting items. However, the deletion of an item did not improve the Cronbach's alpha coefficient score. Further, the alpha score was not far from the threshold and all items were thus considered for further analysis.

5.6.2.3 Convergent validity

The Average Variance Extracted (AVE) was examined to evaluate the convergent validity for each construct (Chin, 1998b; Gefen & Straub, 2005; Hair et al., 2014; Straub et al., 2004; Wong, 2013). The AVE values for all constructs were above the

threshold of 0.5 and demonstrated convergent validity. The size of the factor loadings is one other important consideration for convergent validity. High loadings on a factor indicate that they converge on a common point: the latent variable (Hair, Black, Babin, & Anderson, 2010). Majority of the items' loadings were above the 0.7 rule of thumb suggested by Hair et al. (2014) and were statistically significant at the $p<0.001$ level. Only SDK4 was found to have a loading (0.695) just below the 0.7. Therefore, all constructs demonstrated adequate convergent validity for subsequent analysis.

5.6.2.4 Multi-collinearity

Table 24 shows the VIF values of the exogenous constructs. The VIF values for exogenous constructs were less than 5. This indicates that there are no collinearity issues between the exogenous constructs.

Table 24: VIF values of exogenous constructs

Constructs	SA	COM	CON
COM	1.493		
CON	1.493		
MU		1.590	1.590
PISS		1.723	1.723
RM		1.795	1.795
RU		1.560	1.560
SDK		1.925	1.925
TU		1.891	1.891

5.6.2.5 Discriminant validity

The assessment of the discriminant validity of the constructs led to fully satisfactory results. As represented in Table 25, none of the constructs' cross-correlations (off-diagonal elements) exceeded the respective square root of each construct's AVE (diagonal elements). Further, the results in Table 26 show that each indicator's loadings with its associated construct are higher than all its loadings with the other constructs of the model, thus discriminant validity was demonstrated. Overall, both AVE analysis and examination of cross-loadings provided adequate statistical support for the discriminant validity of the main constructs.

Table 25: Correlations between main constructs

Constructs	COM	CON	MU	PISS	RM	RU	SA	SDK	TU
COM	**0.822**								
CON	0.575	**0.850**							
MU	0.195	0.190	**0.826**						
PISS	0.502	0.559	0.206	**0.777**					
RM	0.539	0.495	0.196	0.506	**0.850**				
RU	0.218	0.249	0.420	0.358	0.287	**0.803**			
SA	0.522	0.589	0.218	0.521	0.396	0.228	**0.804**		
SDK	0.552	0.521	0.135	0.564	0.618	0.139	0.526	**0.761**	
TU	0.260	0.325	0.585	0.305	0.295	0.549	0.311	0.217	**0.865**

Note 1: COM: Communication, CON: Planning Connection, MU: Market Uncertainty, PISS: Prior IS Success, RM: Relationship Management, RU: Regulatory Uncertainty, SA: Strategic Alignment, SDK: Shared Domain Knowledge, TU: Technological Uncertainty.

Note 2: Diagonal elements are the square roots of AVE.

Table 26: Cross-loadings of final survey items

Construct / Item	COM	CON	MU	PISS	RM	RU	SA	SDK	TU
COM1	**0.855**	0.517	0.176	0.477	0.506	0.176	0.446	0.495	0.209
COM2	**0.826**	0.434	0.124	0.363	0.385	0.135	0.406	0.475	0.185
COM3	**0.784**	0.462	0.180	0.392	0.430	0.226	0.434	0.390	0.248
CON1	0.522	**0.818**	0.147	0.431	0.448	0.233	0.435	0.437	0.299
CON2	0.521	**0.841**	0.142	0.500	0.484	0.219	0.512	0.444	0.263
CON3	0.476	**0.885**	0.208	0.501	0.362	0.208	0.523	0.470	0.320
CON4	0.439	**0.856**	0.146	0.464	0.391	0.189	0.527	0.419	0.222
MU1	0.253	0.257	**0.833**	0.324	0.195	0.332	0.332	0.189	0.529
MU2	0.070	-0.007	**0.816**	0.020	0.095	0.299	0.012	-0.015	0.406
MU3	0.138	0.181	**0.830**	0.127	0.182	0.402	0.153	0.130	0.498
PISS1	0.471	0.442	0.173	**0.782**	0.483	0.247	0.358	0.536	0.199
PISS2	0.408	0.467	0.167	**0.816**	0.362	0.283	0.484	0.384	0.207
PISS3	0.261	0.386	0.134	**0.731**	0.317	0.319	0.371	0.382	0.336
RM1	0.425	0.440	0.135	0.417	**0.853**	0.275	0.391	0.490	0.257
RM2	0.468	0.428	0.215	0.413	**0.884**	0.271	0.308	0.551	0.302
RM3	0.479	0.379	0.184	0.435	**0.848**	0.224	0.322	0.491	0.232
RM4	0.459	0.436	0.133	0.456	**0.815**	0.206	0.328	0.565	0.211
RU1	0.185	0.227	0.274	0.333	0.225	**0.761**	0.257	0.186	0.392
RU2	0.180	0.263	0.384	0.336	0.261	**0.889**	0.228	0.180	0.517
RU3	0.201	0.138	0.351	0.251	0.253	**0.814**	0.132	0.062	0.452
RU4	0.134	0.161	0.332	0.221	0.176	**0.737**	0.105	0.000	0.390
SA1	0.319	0.398	0.188	0.381	0.252	0.181	**0.771**	0.401	0.259
SA2	0.352	0.435	0.093	0.466	0.300	0.125	**0.814**	0.392	0.149
SA3	0.460	0.474	0.238	0.372	0.372	0.186	**0.795**	0.422	0.264
SA4	0.512	0.560	0.179	0.454	0.338	0.230	**0.837**	0.469	0.314
SDK1	0.492	0.428	0.093	0.438	0.455	-0.027	0.438	**0.738**	0.161
SDK2	0.394	0.333	0.002	0.376	0.369	0.003	0.322	**0.755**	0.090
SDK3	0.443	0.497	0.175	0.530	0.458	0.158	0.472	**0.804**	0.246
SDK4	0.335	0.313	0.120	0.378	0.409	0.221	0.296	**0.695**	0.183
SDK5	0.420	0.367	0.174	0.409	0.496	0.074	0.426	**0.797**	0.166
SDK6	0.398	0.366	0.017	0.380	0.537	0.162	0.365	**0.767**	0.133
SDK7	0.431	0.428	0.116	0.461	0.554	0.169	0.440	**0.764**	0.159
TU1	0.289	0.329	0.440	0.342	0.320	0.397	0.384	0.245	**0.832**
TU2	0.189	0.242	0.497	0.209	0.221	0.460	0.159	0.115	**0.893**
TU3	0.200	0.273	0.574	0.244	0.228	0.560	0.266	0.202	**0.869**

Note 1: COM: Communication, CON: Planning Connection, MU: Market Uncertainty, PISS: Prior IS Success, RM: Relationship Management, RU: Regulatory Uncertainty, SA: Strategic Alignment, SDK: Shared Domain Knowledge, TU: Technological Uncertainty.

5.7 Structural model evaluation

An assessment of the structural model was carried out to determine the significance of the paths and the predictive power of the model. The procedures and tests that were implemented to evaluate the model are described below.

5.7.1 Criteria for structural model evaluation

The path coefficients and their significance were used to confirm or reject the hypotheses associated with the conceptual model (Chin, 1998b; Hair et al., 2014). The strength of the relationships between constructs was evaluated by examining the coefficients' sign, value (magnitude) and significance. Chin (1998b) suggests that standardised paths should be at least 0.2 to be considered meaningful while above 0.3 is ideal. Further, Chin (1998b) mentions that a 0.1 path coefficient may demonstrate some empirical evidence of the relationship between constructs. Bootstrapping procedures were used to generate the significance level for each path coefficient.

The predictive power of the model was assessed using the coefficient of determination (R^2) value for the dependent constructs (Chin et al., 2003; Chin, 1998; Hair et al., 1998). Falk and Miller (1992) and Hair et al. (2014) suggest that the minimum level for an individual R^2 should be greater than a minimum acceptable level of 0.10. Further, they suggest comparing R^2 values to the following benchmark levels: 0.25 (weak), 0.5 (moderate), and 0.75 (substantial). These thresholds were used in this research to assess the strength of each dependant construct's coefficient of determination.

Path effect size was assessed using the F-test (f^2 effect size) which has been recommended when assessing a structural model using PLS (Hair et al., 2011; Henseler et al., 2009; Ringle et al., 2012). The F-test allows researchers to evaluate the incremental explanation of an independent variable on a dependent variable (Hair et al., 2011; Henseler et al., 2009). f^2 values of 0.02, 0.15, and 0.35 respectively correspond to small, medium, and large effects (Cohen, 1988). The effect size of each path was calculated as:

$$f^2 = \frac{R^2_{included} - R^2_{excluded}}{1 - R^2_{included}}$$

where $R^2_{included}$ represents the coefficient of determination of an endogenous variable (i.e., those constructs that are being explained in the model) including all exogenous variables (i.e., those constructs that explain another construct in the model), and where $R^2_{excluded}$ represents the coefficient of determination of the same endogenous variable excluding a given exogenous variable (Hair et al., 2014).

The model's predictive relevance was assessed using Stone's (1974) and Geisser's (1974) cross-validated redundancy measure Q^2. Positive Q^2 scores indicate that a model has predictive relevance while a negative Q^2 means a lack of predictive relevance (Chin, 2010; Fornell & Cha, 1994; Vinzi, Trinchera, & Amato, 2010). The Stone-Geisser Q^2 test was performed through a blindfolding procedure in Smart-PLS for evaluating the predictive relevance of the structural model.

The relative impact of the structural model for predicting the observed measures of an endogenous construct was assessed through the q^2 effect size (Chin, 1998a; Henseler et al., 2009; Ringle et al., 2012). q^2 values of 0.02, 0.15, and 0.35 are associated with small, medium, or large predictive relevance of the respective latent variable respectively (Henseler et al., 2009). The q^2 effect size of each of the hypothesised model paths was calculated as:

$$q^2 = \frac{Q^2_{included} - Q^2_{excluded}}{1 - Q^2_{included}}$$

Finally, a global goodness-of-fit (GoF) criterion was used to evaluate the quality of the model. GoF is the geometric mean of the average communality (equal to AVE in PLS path analysis) and the average R^2 of endogenous latent variables. GoF lies between 0 and 1, where a higher value represents better path model estimations. GoF scores of 0.1, 0.25, and 0.36 respectively correspond to small, medium, and large effect sizes.

$$GoF = \sqrt{\overline{R^2} * \overline{Communality}}$$

5.7.2 Structural model results

An assessment of the structural model was carried out to examine the model's predictive capabilities and the relationships between the constructs. Figure 9 and Table 27 present the summary of the structural model evaluation results. Table 28 describes the calculation of GoF.

Two managerial practices were found to explain 46% of the variance in strategic alignment. The four antecedents (SDK, RM, PISS and EU) were found to explain 40% and 41% of the variance in communication and planning connection respectively. The R^2 values were all above the recommended level of 0.10 (Falk & Miller, 1992), demonstrating appropriateness for examining the significance of the paths between these variables.

Communication and planning connection were each found to have a significant path to strategic alignment, respectively 0.273 ($p<0.01$) and 0.432 ($p<0.01$). The associated hypotheses were therefore all supported. Though the research proposed a positive interaction between communication and planning connection, it was found to have a negative significant effect (-0.229, $p<0.01$) on strategic alignment. Therefore, the associated hypothesis was rejected. Furthermore, three antecedents (SDK, RM and PISS) were found to have significant paths to both communication and planning connection. They were respectively 0.272 ($p<0.01$), 0.248 ($p<0.01$), and 0.195 ($p<0.01$) for communication and 0.219 ($p<0.01$), 0.166 ($p<0.05$), and 0.305 ($p<0.01$) for planning connection. The associated hypotheses were therefore all supported.

With regard to the external antecedent – environmental uncertainty – only the path to planning connection has a significant connection at 0.119 ($p<0.1$). Although the significance level is somewhat weak ($p<0.10$), this provides evidence for the positive impact of environmental uncertainty on planning connection. A common rule of thumb for significance level is a p-value greater than 0.05 (Hair et al., 2010; Hair et al., 2014). A p-value over 0.1 indicates no evidence for positive relationship (Sekaran, 2006). However, the literature suggests that a significance level at p greater than 0.1 shows evidence for positive relationship between constructs (Hair et al., 2010; Peng, Heim, & Mallick, 2014). In particular, if the effect size is smaller, it is necessary to consider significance level at p greater than 0.1 (Hair et al., 2010) which is relevant to this study.

As shown in the Table 27, some of the effect sizes are considered as small ($f^2 < 0.02$). Therefore, this research reports significant relationships at $p < 0.1$ together with all other significant relationships at $p < 0.05$ and at $p < 0.01$. The hypothesis associated with environmental uncertainty and planning connection was therefore partially supported ($p < 0.1$). Finally, the overall GoF was found to be large (0.536), providing strong evidence concerning the overall quality of the model.

*: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$
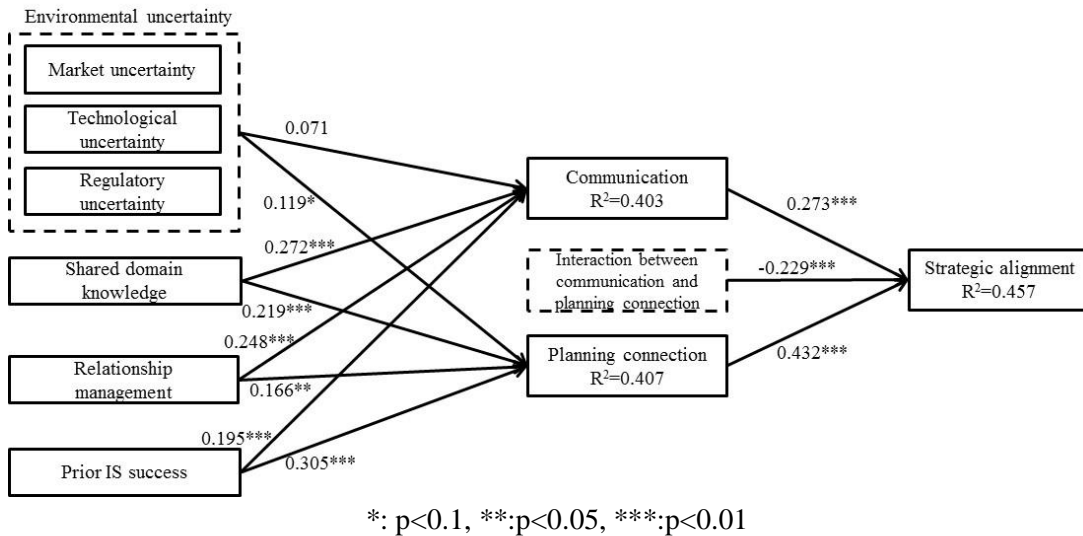
Figure 9: Structural model evaluation results

Table 27: Results summary of the structural model evaluation

Hypothesis		Path coefficient	Std. error	T-stat	Sig. (2-tailed)	Effect size f^2	Predictive relevance q^2
H1:	COM → SA	0.273	0.086	3.197	$p<0.01$	0.20	0.09
H2:	CON → SA	0.432	0.085	5.055	$p<0.01$	0.33	0.15
H3:	COM ↔ CON	-0.229	0.049	4.644	$p<0.01$	0.11	0.05
H4a:	SDK → COM	0.272	0.073	3.734	$p<0.01$	0.06	0.03
H4b:	SDK → CON	0.219	0.078	2.805	$p<0.01$	0.04	0.02
H5a:	RM → COM	0.248	0.079	3.139	$p<0.01$	0.06	0.03
H5b:	RM → CON	0.166	0.077	2.146	$p<0.05$	0.03	0.01
H6a:	PISS → COM	0.195	0.068	2.872	$p<0.01$	0.04	0.02
H6b:	PISS → CON	0.305	0.076	4.010	$p<0.01$	0.09	0.05
H7a:	EU → COM	0.071	0.066	1.066			
H7b:	EU → CON	0.119	0.068	1.752	$p<0.10$	0.02	0.01

Note: Calculations of f^2 and q^2 are provided in Appendix F.

Table 28: Global goodness-of-fit (GoF) statistics

Endogenous construct	AVE	R^2
Strategic alignment	0.647	0.457
Communication	0.676	0.403
Planning connection	0.723	0.407
Average	0.682	0.422
GoF	0.536	

5.8 Analysis of mediating effect

This research postulated that the communication and planning connection mediates the effect of antecedents on strategic alignment. A commonly used approach for analysing the mediating effect is the Sobel (1982) test, which examines the mediating effect by comparing the relationship between the all exogenous constructs and endogenous constructs with the relationship between the exogenous construct and endogenous construct including the mediating construct (Hair et al., 2014; Helm, Eggert, & Garnefeld, 2010). However this test relies on a normal distribution assumption, which does not usually hold for the indirect effect (Hair et al., 2014; Preacher & Hayes, 2004). Further, as the sample size becomes smaller, the Sobel test begins to lack statistical power (Preacher & Hayes, 2004). Therefore, Preacher and Hayes (2004) recommend a more rigorous bootstrap test that does not assume that the data are normally distributed. Further, bootstrapping can be applied for both simple and multiple mediator models (Hair et al., 2014). The bootstrapping approach also exhibits higher levels of statistical power compared with the Sobel test (Hair et al., 2014; Ledermann & Macho, 2015).

In this research, mediation effect analysis was conducted using the bootstrapping approach for multiple mediation suggested by Preacher and Hayes (2008). The 95% confidence interval of the mediation effect was obtained with 5000 bootstrapping sub samples. Mediation effect size was assessed using the variance accounted for (VAF) suggested by Hair et al. (2014). VAF determines the size of the mediating effect in relation to the total effect, i.e., mediation effect/(total effect + mediation effect). VAF values of >80%, between 80% to 20% and < 20% respectively correspond to full mediation, partial mediation and no mediation.

Table 29 presents the summary of the mediating effect analysis results. Environmental uncertainty was found to have no significant mediating effect on strategic alignment. Similarly, the mediating effect of shared domain knowledge and prior IS success through communication was identified as no mediation effect since the VAF value was less than 20%. All the other mediation effects found to have Partial mediation, recording VAF values between 20% and 80%. Therefore, overall results confirmed the mediating role of communication and planning connection.

Table 29: Results summary of the mediation effect analysis

Construct		Mediating Effect	P-Value	VAF	Mediation effect size
SDK	Total	0.304	p<0.05	35.35%	Partial mediation
	COM	0.108	p<0.05	16.23%	No mediation
	CON	0.196	p<0.05	26.09%	Partial mediation
PISS	Total	0.272	p<0.05	35.15%	Partial mediation
	COM	0.099	p<0.05	16.40%	No mediation
	CON	0.173	p<0.05	25.63%	Partial mediation
RM	Total	0.348	p<0.05	46.22%	Partial mediation
	COM	0.139	p<0.05	25.52%	Partial mediation
	CON	0.209	p<0.05	34.06%	Partial mediation
EU	Total	0.204			
	COM	0.074			
	CON	0.130			

5.9 Control variables

Beyond the main constructs in the model, other contextual factors can also influence strategic alignment. Thus, the effects of organisational size and ownership were investigated. Organisational size is a common control variable in research studies due to its potential influence (Chan & Reich, 2007b; Chan et al., 2006; Yayla & Hu, 2012). Organisational size could have an influence since small, medium and large organisations are fundamentally different from each other and that influences their internal business processes and the way organisations achieve their objectives. Similarly private sector organisations could be more likely to attempt to align IS with

business strategies than government organisations (Singh & Das, 2007). This, in turn, would deflate the correlations between constructs in the model.

ANOVA analysis was conducted to determine the potential influence of organisational size and ownership on the strategic alignment, communication and planning connection constructs. ANOVA analyses the mean differences and their significance level. This indicates whether or not the means of several groups are equal, and therefore generalizes the findings regardless of sub groups (Sekaran, 2006). The results of the ANOVA test are summarised in Table 30. These results show that the type of ownership does not have any effect on the dependent variables. Thus, the results of this study can be generalised regardless of the ownership of the organisations. However, organisational size has an influence on strategic alignment and communication. Therefore, SMEs and large groups are compared in section 5.9.

Table 30: ANOVA results for control variables

Control variable	F statistics		
	Strategic alignment	Communication	Planning connection
Organisation size	5.186 (p<0.002)	5.779 (p<0.001)	2.426 (p<0.067)
Ownership	1.925 (p<0.127)	0.917 (p<0.434)	1.056 (p<0.369)

5.10 Comparison between SMEs and large organisations

Analysis of two groups – SMEs and large organisations – consisted of two steps. In the first step, group-wise parameter estimates were generated through a separate measurement model and structural model evaluations for each subpopulation. In the second step, the significance of the estimated parameter differences between groups was evaluated. Keil et al. (Keil et al.) as well as Hair et al. (2014) propose the use of an unpaired samples t-test in order to test whether there is a significant difference between two group-specific parameters. They suggested comparing the parameter estimate of the first group with the parameter estimate of the second group. The test statistic was calculated as:

$$t = \frac{|p^1 - p^2|}{\sqrt{\frac{(n^{(1)} - 1)^2}{(n^{(1)} + n^{(2)} - 2)} \cdot se(p^{(1)})^2 + \frac{(n^{(2)} - 1)^2}{(n^{(1)} + n^{(2)} - 2)} \cdot se(p^{(2)})^2} \cdot \sqrt{\frac{1}{n^{(1)}} + \frac{1}{n^{(2)}}}}$$

This statistic follows a t-distribution with n[(1)]+n[(2)]-2 degrees of freedom. The subsample specific path coefficients estimates are denoted as $p^{(1)}$ and $p^{(2)}$, the size of the subsamples as n[(1)] and n[(2)], and the standard error of the parameters resulting from bootstrapping as $se(p^{(1)})$ and $se(p^{(2)})$ (Hair et al., 2014; Henseler, 2012).

Both small and medium organisations tend to be structured around function and use centralised governance structures to coordinate subunits while large organisations generally use decentralised governance structures (Gutierrez et al., 2009). Therefore, both small and medium organisations were grouped into one category and the dataset was split into two categories – SMEs and large organisations – and the evaluation of the measurement model and structural model were conducted separately.

5.10.1 Measurement model results for SMEs

The evaluation of the measurement model for the SMEs was performed using the same sequence of tests which were applied in the analysis of the full sample (in section 5.5). The assessments of indicator reliability, internal consistency, and convergent validity are summarised in Table 31. All composite reliability scores were above the 0.70 threshold, such ensuring internal consistency. Only the prior IS success construct had a slightly low Cronbach's alpha coefficient score at 0.648. The construct was examined to improve the Cronbach's alpha coefficient scores by deleting items. However, the deletion of an item did not improve the Cronbach's alpha coefficient score. Further, the alpha score was not far from the threshold.

The outer loadings of the indicators were all significant at p<0.001 while only one item (SDK4) had a loading below the 0.70 threshold. It is interesting to note that the same item had low loadings in all organisations. However, the item loading was above the acceptable level of 0.6 (Chin, 1998b). Therefore, SDK4 was retained in the analysis. The results provide support for the indicator reliability.

The AVE values for all constructs were above 0.5, demonstrating the convergent validity of the constructs. Multi-collinearity was assessed using the VIF values. As represented in Table 32, The VIF values for exogenous constructs had a VIF of < 5. This indicates that there are no collinearity issues between the exogenous constructs. The assessment of the discriminant validity led to fully satisfactory results. As represented in Table 33, the square root of each construct's AVE was found to be higher than the constructs' cross-correlations. Further, all cross-loadings (in Table 34) were found to be higher than each indicator's loadings with its associated construct, thus discriminant validity was demonstrated.

Table 31: Internal consistency, indicator reliability, and convergent validity results for the constructs by groups (all organisations, SMEs and large organisations)

	All organisations			SMEs			Large		
Item	Loading	Std. error	p-value	Loading	Std. error	p-value	Loading	Std. error	p-value
Strategic Alignment									
CR=0.880 / α=0.820 / AVE=0.647				CR=0.894 / α=0.842/ AVE=0.677			CR=0.853 / α=0.774 / AVE=0.594		
SA1	0.771	0.044	0.000	0.801	0.054	0.000	0.714	0.066	0.000
SA2	0.814	0.035	0.000	0.847	0.049	0.000	0.752	0.074	0.000
SA3	0.795	0.033	0.000	0.812	0.046	0.000	0.753	0.052	0.000
SA4	0.837	0.026	0.000	0.831	0.042	0.000	0.857	0.027	0.000
Communication									
CR=0.862 / α=0.761 / AVE=0.676				CR=0.862 / α=0.761 / AVE=0.675			CR=0.862 / α=0.758 / AVE=0.676		
COM1	0.855	0.023	0.000	0.835	0.041	0.000	0.868	0.032	0.000
COM2	0.826	0.037	0.000	0.802	0.072	0.000	0.853	0.030	0.000
COM3	0.784	0.041	0.000	0.827	0.046	0.000	0.740	0.066	0.000
Planning Connection									
CR=0.912 / α=0.872 / AVE=0.723				CR=0.920 / α=0.884 / AVE=0.742			CR=0.905 / α=0.860 / AVE=0.705		
CON1	0.818	0.033	0.000	0.838	0.032	0.000	0.801	0.055	0.000
CON2	0.841	0.026	0.000	0.845	0.043	0.000	0.839	0.034	0.000
CON3	0.885	0.016	0.000	0.888	0.027	0.000	0.882	0.021	0.000
CON4	0.856	0.025	0.000	0.875	0.035	0.000	0.835	0.036	0.000

Shared Domain Knowledge

	CR=0.906 / α=0.879 / AVE=0.579			CR=0.897 / α=0.866 / AVE=0.555			CR=0.913 / α=0.890 / AVE=0.601		
SDK1	0.738	0.039	0.000	0.725	0.066	0.000	0.747	0.043	0.000
SDK2	0.755	0.043	0.000	0.741	0.065	0.000	0.778	0.057	0.000
SDK3	0.804	0.026	0.000	0.784	0.039	0.000	0.818	0.034	0.000
SDK4	0.695	0.042	0.000	0.611	0.084	0.000	0.757	0.047	0.000
SDK5	0.797	0.033	0.000	0.801	0.055	0.000	0.791	0.042	0.000
SDK6	0.767	0.040	0.000	0.768	0.068	0.000	0.764	0.048	0.000
SDK7	0.764	0.041	0.000	0.768	0.068	0.000	0.768	0.044	0.000

Relationship Management

	CR=0.913 / α=0.872 / AVE=0.723			CR=0.931 / α=0.901 / AVE=0.772			CR=0.891 / α=0.837 / AVE=0.673		
RM1	0.853	0.026	0.000	0.872	0.036	0.000	0.831	0.036	0.000
RM2	0.884	0.022	0.000	0.908	0.033	0.000	0.866	0.024	0.000
RM3	0.848	0.037	0.000	0.899	0.028	0.000	0.792	0.072	0.000
RM4	0.815	0.033	0.000	0.835	0.054	0.000	0.789	0.036	0.000

Prior IS Success

	CR=0.820 / α=0.676 / AVE=0.604			CR=0.808/ α=0.648 / AVE=0.583			CR=0.830 / α=0.697 / AVE=0.622		
PISS1	0.782	0.035	0.000	0.751	0.063	0.000	0.814	0.041	0.000
PISS2	0.816	0.033	0.000	0.783	0.064	0.000	0.847	0.033	0.000
PISS3	0.731	0.053	0.000	0.757	0.090	0.000	0.697	0.065	0.000

	Market Uncertainty								
	CR=0.866 / α=0.770 / AVE=0.683			CR=0.875 / α=0.786 / AVE=0.699			CR=0.860 / α=0.758 / AVE=0.672		
MU1	0.833	0.023	0.000	0.811	0.043	0.000	0.852	0.024	0.000
MU2	0.816	0.034	0.000	0.869	0.036	0.000	0.773	0.052	0.000
MU3	0.830	0.028	0.000	0.828	0.043	0.000	0.832	0.032	0.000
	Technological Uncertainty								
	CR=0.899 / α=0.832 / AVE=0.748			CR=0.906/ α=0.844/ AVE=0.763			CR=0.894/ α=0.823/ AVE=0.739		
TU1	0.882	0.017	0.000	0.851	0.024	0.000	0.813	0.037	0.000
TU2	0.832	0.023	0.000	0.916	0.020	0.000	0.877	0.024	0.000
TU3	0.893	0.015	0.000	0.853	0.032	0.000	0.886	0.021	0.000
	Regulatory Uncertainty								
	CR=0.878 / α=0.814 / AVE=0.644			CR=0.915/ α=0.875/ AVE=0.729			CR=0.891/ α=0.837/ AVE=0.562		
RU1	0.761	0.037	0.000	0.816	0.042	0.000	0.697	0.060	0.000
RU2	0.889	0.016	0.000	0.915	0.019	0.000	0.861	0.027	0.000
RU3	0.814	0.030	0.000	0.873	0.036	0.000	0.760	0.051	0.000
RU4	0.737	0.043	0.000	0.806	0.049	0.000	0.666	0.070	0.000

Notes: CR: Composite reliability; α: Cronbach's alpha; AVE; Average Variance Extracted

Table 32: VIF values of exogenous constructs in the SME sector

Constructs	SA	COM	CON
COM	1.524		
CON	1.524		
MU		1.697	1.697
PISS		1.988	1.988
RM		2.114	2.114
RU		1.658	1.658
SDK		1.938	1.938
TU		2.016	2.016

Table 33: Correlations between main constructs in the SME sector

Constructs	COM	CON	MU	PISS	RM	RU	SA	SDK	TU
COM	**0.821**								
CON	0.587	**0.861**							
MU	0.120	0.089	**0.836**						
PISS	0.569	0.533	0.168	**0.764**					
RM	0.621	0.530	0.251	0.606	**0.879**				
RU	0.213	0.192	0.374	0.381	0.402	**0.854**			
SA	0.527	0.600	0.191	0.486	0.382	0.234	**0.823**		
SDK	0.541	0.551	0.118	0.576	0.605	0.097	0.521	**0.745**	
TU	0.166	0.237	0.591	0.296	0.329	0.584	0.315	0.157	**0.874**

Note 1: COM: Communication, CON: Planning Connection, MU: Market Uncertainty, PISS: Prior IS Success, RM: Relationship Management, RU: Regulatory Uncertainty, SA: Strategic Alignment, SDK: Shared Domain Knowledge, TU: Technological Uncertainty.

Note 2: Diagonal elements are the square roots of AVE.

Table 34: Cross-loadings in the SME sector

Construct / Item	COM	CON	MU	PISS	RM	RU	SA	SDK	TU
COM1	**0.835**	0.512	0.102	0.579	0.549	0.186	0.424	0.494	0.199
COM2	**0.802**	0.375	0.048	0.356	0.422	0.096	0.384	0.416	0.059
COM3	**0.827**	0.541	0.137	0.445	0.544	0.227	0.484	0.419	0.137
CON1	0.520	**0.838**	0.093	0.482	0.493	0.160	0.465	0.495	0.243
CON2	0.563	**0.845**	0.066	0.482	0.489	0.193	0.510	0.457	0.148
CON3	0.463	**0.888**	0.109	0.450	0.394	0.117	0.551	0.518	0.250
CON4	0.477	**0.875**	0.038	0.424	0.455	0.193	0.539	0.427	0.177
MU1	0.277	0.219	**0.811**	0.337	0.307	0.298	0.383	0.217	0.544
MU2	-0.061	-0.144	**0.869**	-0.020	0.101	0.253	-0.033	-0.040	0.412
MU3	0.044	0.102	**0.828**	0.064	0.195	0.375	0.080	0.087	0.505
PISS1	0.503	0.419	0.109	**0.751**	0.531	0.195	0.338	0.549	0.197
PISS2	0.473	0.416	0.151	**0.783**	0.459	0.338	0.438	0.360	0.178
PISS3	0.288	0.381	0.126	**0.757**	0.374	0.361	0.329	0.396	0.331
RM1	0.495	0.476	0.225	0.530	**0.872**	0.416	0.365	0.468	0.266
RM2	0.537	0.440	0.175	0.524	**0.908**	0.330	0.315	0.559	0.325
RM3	0.555	0.442	0.243	0.491	**0.899**	0.324	0.323	0.485	0.269
RM4	0.587	0.499	0.236	0.579	**0.835**	0.344	0.336	0.602	0.295
RU1	0.239	0.249	0.284	0.384	0.363	**0.816**	0.278	0.116	0.482
RU2	0.139	0.187	0.400	0.357	0.376	**0.915**	0.205	0.127	0.614
RU3	0.195	0.095	0.297	0.336	0.343	**0.873**	0.201	0.105	0.487
RU4	0.162	0.116	0.278	0.207	0.282	**0.806**	0.104	-0.042	0.381
SA1	0.326	0.418	0.145	0.315	0.143	0.141	**0.801**	0.385	0.221
SA2	0.384	0.482	0.102	0.428	0.286	0.132	**0.847**	0.398	0.195
SA3	0.500	0.521	0.202	0.437	0.440	0.198	**0.812**	0.471	0.274
SA4	0.499	0.538	0.175	0.409	0.354	0.278	**0.831**	0.452	0.332
SDK1	0.494	0.414	0.097	0.327	0.462	-0.070	0.387	**0.725**	0.075
SDK2	0.392	0.396	-0.001	0.407	0.296	-0.087	0.402	**0.741**	0.017
SDK3	0.394	0.471	0.161	0.389	0.423	0.087	0.406	**0.784**	0.189
SDK4	0.289	0.236	0.168	0.340	0.373	0.194	0.263	**0.611**	0.118
SDK5	0.417	0.419	0.186	0.478	0.500	0.060	0.450	**0.801**	0.153
SDK6	0.381	0.416	0.004	0.513	0.516	0.177	0.374	**0.768**	0.143
SDK7	0.422	0.468	0.027	0.541	0.562	0.191	0.406	**0.768**	0.126
TU1	0.325	0.339	0.516	0.406	0.393	0.450	0.382	0.226	**0.851**
TU2	0.057	0.157	0.478	0.211	0.230	0.480	0.206	0.070	**0.916**
TU3	0.051	0.124	0.551	0.157	0.238	0.596	0.234	0.113	**0.853**

Note 1: COM: Communication, CON: Planning Connection, MU: Market Uncertainty, PISS: Prior IS Success, RM: Relationship Management, RU: Regulatory Uncertainty, SA: Strategic Alignment, SDK: Shared Domain Knowledge, TU: Technological Uncertainty.

5.10.2 Measurement model results for large organisations

The evaluation of the measurement model for large organisations was performed using the same sequence of tests. As presented in Table 31, in many constructs, both composite reliability scores and Cronbach's coefficient alpha scores were well above the 0.70 threshold (Chin, 1998b; Hair et al., 2014) and the internal consistency of the constructs was demonstrated. Prior IS success had a slightly low Cronbach's alpha coefficient score at 0.697. The construct was examined to improve the Cronbach's alpha coefficient score by deleting items. However, the deletion of items did not increase the Cronbach's alpha coefficient score. Further, the alpha score was not far from the threshold point, and, thus, was considered for further analysis. The AVE values of all constructs were above the threshold value of 0.5, demonstrating the convergent validity.

Regarding the item loadings, majority of the items' loadings were well above the 0.70 threshold and significant at $p<0.001$. Only three items (PISS3: 0.697, RU1: 0.697 and RU4: 0.666) had loadings below the 0.70 threshold. However, the items' loadings were above the acceptable level of 0.6 (Chin, 1998b). Therefore, three items were retained in the analysis. Multi-collinearity was assessed using the VIF values. As represented in Table 35, The VIF values for exogenous constructs had a VIF of <5. This indicates that there are no collinearity issues between the exogenous constructs.

As shown in Table 36, the square root of each construct's AVE was found to be higher than the constructs' cross-correlations; thus, the discriminant validity of the constructs was demonstrated. None of the constructs' cross-correlations exceeded the respective square root of each construct's AVE. Further, the examination of indicator cross-loadings (in Table 37) also provided adequate statistical support for the discriminant validity of the main constructs.

Table 35: VIF values of exogenous constructs in the large organisation sector

Constructs	SA	COM	CON
COM	1.469		
CON	1.469		
MU		1.600	1.600
PISS		1.590	1.590
RM		1.684	1.684
RU		1.548	1.548
SDK		2.032	2.032
TU		1.782	1.782

Table 36: Correlations between the main constructs in large organisations

Constructs	COM	CON	MU	PISS	RM	RU	SA	SDK	TU
COM	**0.822**								
CON	0.565	**0.840**							
MU	0.242	0.272	**0.820**						
PISS	0.436	0.580	0.220	**0.788**					
RM	0.461	0.456	0.120	0.395	**0.820**				
RU	0.233	0.317	0.484	0.342	0.152	**0.750**			
SA	0.512	0.578	0.212	0.545	0.398	0.234	**0.771**		
SDK	0.559	0.494	0.133	0.555	0.628	0.185	0.535	**0.775**	
TU	0.326	0.396	0.571	0.302	0.255	0.527	0.296	0.261	**0.859**

Note 1: COM: Communication, CON: Planning Connection, MU: Market Uncertainty, PISS: Prior IS Success, RM: Relationship Management, RU: Regulatory Uncertainty, SA: Strategic Alignment, SDK: Shared Domain Knowledge, TU: Technological Uncertainty.

Note 2: Diagonal elements are the square roots of AVE.

Table 37: Cross-loadings in large organisations

Construct / Item	COM	CON	MU	PISS	RM	RU	SA	SDK	TU
COM1	**0.868**	0.516	0.215	0.376	0.457	0.175	0.446	0.485	0.202
COM2	**0.853**	0.481	0.179	0.362	0.352	0.177	0.433	0.519	0.282
COM3	**0.740**	0.388	0.206	0.338	0.321	0.231	0.381	0.363	0.334
CON1	0.522	**0.801**	0.181	0.387	0.406	0.313	0.412	0.388	0.343
CON2	0.486	**0.839**	0.196	0.508	0.482	0.250	0.523	0.433	0.351
CON3	0.488	**0.882**	0.294	0.546	0.326	0.317	0.487	0.426	0.381
CON4	0.406	**0.835**	0.236	0.492	0.317	0.189	0.509	0.409	0.255
MU1	0.216	0.284	**0.852**	0.293	0.056	0.381	0.239	0.147	0.507
MU2	0.173	0.111	**0.773**	0.050	0.090	0.351	0.059	0.003	0.402
MU3	0.203	0.248	**0.832**	0.164	0.152	0.453	0.198	0.153	0.484
PISS1	0.442	0.464	0.224	**0.814**	0.433	0.309	0.372	0.528	0.193
PISS2	0.338	0.514	0.165	**0.847**	0.234	0.224	0.520	0.406	0.223
PISS3	0.221	0.383	0.118	**0.697**	0.252	0.285	0.402	0.364	0.332
RM1	0.360	0.398	0.023	0.294	**0.831**	0.106	0.414	0.513	0.242
RM2	0.406	0.415	0.241	0.304	**0.866**	0.211	0.290	0.537	0.276
RM3	0.406	0.315	0.113	0.376	**0.792**	0.118	0.310	0.490	0.192
RM4	0.340	0.363	0.000	0.326	**0.789**	0.052	0.293	0.522	0.116
RU1	0.139	0.206	0.260	0.282	0.073	**0.697**	0.233	0.247	0.304
RU2	0.214	0.333	0.368	0.314	0.139	**0.861**	0.257	0.227	0.427
RU3	0.217	0.184	0.415	0.184	0.173	**0.760**	0.083	0.033	0.432
RU4	0.120	0.214	0.404	0.242	0.062	**0.666**	0.123	0.044	0.409
SA1	0.295	0.365	0.210	0.434	0.375	0.242	**0.714**	0.414	0.288
SA2	0.298	0.375	0.039	0.491	0.298	0.123	**0.752**	0.381	0.080
SA3	0.412	0.419	0.249	0.278	0.266	0.182	**0.753**	0.366	0.241
SA4	0.518	0.574	0.162	0.484	0.313	0.186	**0.857**	0.482	0.290
SDK1	0.482	0.439	0.073	0.535	0.438	0.023	0.483	**0.747**	0.231
SDK2	0.410	0.285	0.010	0.363	0.454	0.095	0.263	**0.778**	0.159
SDK3	0.474	0.517	0.172	0.648	0.490	0.239	0.537	**0.818**	0.286
SDK4	0.365	0.372	0.070	0.402	0.447	0.252	0.330	**0.757**	0.231
SDK5	0.419	0.312	0.144	0.338	0.490	0.094	0.387	**0.791**	0.167
SDK6	0.407	0.310	0.013	0.250	0.554	0.150	0.350	**0.764**	0.115
SDK7	0.446	0.381	0.202	0.376	0.542	0.146	0.483	**0.768**	0.188
TU1	0.235	0.309	0.337	0.264	0.226	0.345	0.357	0.254	**0.813**
TU2	0.290	0.314	0.515	0.205	0.217	0.453	0.115	0.150	**0.877**
TU3	0.309	0.392	0.593	0.305	0.218	0.542	0.297	0.267	**0.886**

Note 1: COM: Communication, CON: Planning Connection, MU: Market Uncertainty, PISS: Prior IS Success, RM: Relationship Management, RU: Regulatory Uncertainty, SA: Strategic Alignment, SDK: Shared Domain Knowledge, TU: Technological Uncertainty.

5.10.3 Structural model results for SMEs

Figure 10 and Table 38 present the summary of the structural model evaluation results for SMEs. The two managerial practices were found to explain 48% of the variance in strategic alignment. The four antecedents (SDK, RM, PISS and EU) were found to explain 46% and 40% of the variance in both communication and planning connection respectively. The R^2 values were all above the recommended level of 0.10 (Falk & Miller, 1992), showing their appropriateness for examining the significance of the paths between these variables.

Communication and planning connection were both found to have a significant path to strategic alignment, respectively 0.267 ($p<0.10$) and 0.443 ($p<0.01$). Only relationship management and prior IS success were found to have significant paths to communication: 0.383 ($p<0.01$), and 0.258 ($p<0.01$) respectively. Similarly shared domain knowledge, relationship management and prior IS success were found to have significant paths to planning connection: 0.290 ($p<0.01$), 0.201 ($p<0.10$) and 0.233 ($p<0.05$) respectively. Similarly, as for the full sample, interaction between communication and planning connection had a negative significant effect (-0.268, $p<0.05$) on strategic alignment and thus the proposed hypothesis for the positive impact of interaction between communication and planning connection on strategic alignment was rejected. Environmental uncertainty was found to have no significant influence on either communication or planning connection. Finally, the overall GoF was found to be large (0.56), providing strong evidence confirming the overall quality of the model.
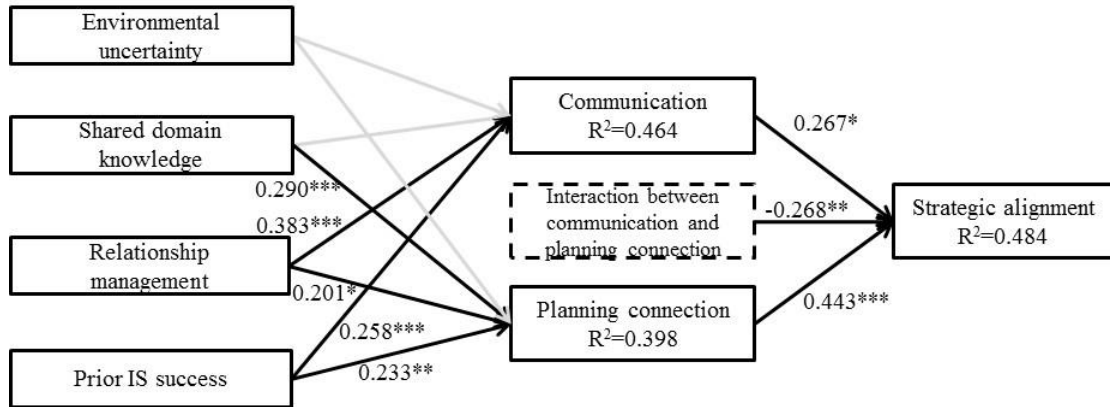
*: p<0.1, **: p<0.05, ***: p<0.01

Figure 10: Structural model evaluation results for the SME sector

Table 38: Results summary of the structural model evaluation of the SME sector

Hypothesis		Path coefficient	Std. error	T-stat	Sig. (2-tailed)	Effect size f^2	Predictive relevance q^2
H1:	COM → SA	0.267	0.151	1.770	p<0.10	0.24	0.08
H2:	CON → SA	0.443	0.138	3.209	p<0.01	0.38	0.17
H3:	COM ↔ CON	-0.268	0.107	2.503	p<0.05	0.15	0.05
H4a:	SDK → COM	0.170	0.109	1.566			
H4b:	SDK → CON	0.290	0.106	2.728	p<0.01	0.08	0.03
H5a:	RM → COM	0.383	0.108	3.540	p<0.01	0.13	0.06
H5b:	RM → CON	0.201	0.122	1.652	p<0.10	0.03	0.01
H6a:	PISS → COM	0.258	0.110	2.337	p<0.01	0.07	0.02
H6b:	PISS → CON	0.233	0.117	1.983	p<0.05	0.05	0.03
H7a:	EU → COM	-0.049	0.101	0.489			
H7b:	EU → CON	0.030	0.101	0.298			

Note: Calculations of f^2 and q^2 are provided in Appendix G.

Table 39: Global goodness-of-fit (GoF) statistics by groups (All, SME and Large)

Endogenous construct	All organisations		SME		Large	
	AVE	R^2	AVE	R^2	AVE	R^2
Strategic alignment	0.647	0..457	0.677	0.484	0.594	0.430
Communication	0.676	0.403	0.675	0.464	0.676	0.371
Planning connection	0.723	0.407	0.742	0.398	0.705	0.442
Average	0.682	0.422	0.698	0.449	0.658	0.414
GoF	0.536		0.560		0.522	

5.10.4 Analysis of the mediating effect for SMEs

The mediation effect analysis for large organisations was conducted using the bootstrapping approach for multiple mediation suggested by Preacher and Hayes (2008). The 95% confidence intervals of the mediation effect were obtained with 5000 bootstrapping sub samples. Table 40 presents the summary of the mediating effect analysis results. Environmental uncertainty was found to have no significant mediating effect on strategic alignment. Similarly, no mediating effect of shared domain knowledge and prior IS success through communication were identified since the VAF value was less than 20%. However, all the other mediation effects were found to have partial mediation, recording VAF values between 20% and 80% and thus, overall results confirmed the mediating role of communication and planning connection.

Table 40: Results summary of the mediation effect analysis of the SME sector

Construct		Mediating Effect	P-Value	VAF	Mediation effect size
SDK	Total	0.346	$p<0.05$	37.43%	Partial mediation
	COM	0.118	$p<0.05$	16.95%	No mediation
	CON	0.228	$p<0.05$	28.26%	Partial mediation
PISS	Total	0.361	$p<0.05$	39.94%	Partial mediation
	COM	0.127	$p<0.05$	18.97%	No mediation
	CON	0.234	$p<0.05$	30.12%	Partial mediation
RM	Total	0.423	$p<0.05$	51.65%	Partial mediation
	COM	0.177	$p<0.05$	30.84%	Partial mediation
	CON	0.247	$p<0.05$	38.35%	Partial mediation
EU	Total	0.211			No mediation
	COM	0.075			No mediation
	CON	0.136			No mediation

5.10.4 Structural model results for large organisations

Figure 11 and Table 41 present the summary of the structural model evaluation results for large organisations. The two managerial practices were found to explain 43% of the variance in strategic alignment. The four antecedents (SDK, RM, PISS and EU) were found to explain 37% and 44% of the variance in both communication and planning connection respectively. The R^2 values were all above the recommended level of 0.10 (Falk & Miller, 1992), showing their appropriateness for examining the significance of the paths between these variables.

Communication and planning connection were both found to have a significant path to strategic alignment, respectively 0.272 (p<0.01) and 0.424 (p<0.01). Shared domain knowledge was found to have a significant path to communication: 0.351 (p<0.01). Similarly, relationship management and prior IS success were found to have significant paths to planning connection: 0.195 (p<0.05), and 0.359 (p<0.01) respectively. Environmental uncertainty was found to have a significant influence on communication (0.149, p<0.10) as well as planning connection (0.210, p<0.05). The interaction between communication and planning connection had a negative significant effect (-0.208, p<0.01) on strategic alignment. Finally, the overall GoF was found to be large (0.52), providing strong evidence concerning the overall quality of the model.


*: p<0.1, **:p<0.05, ***:p<0.01
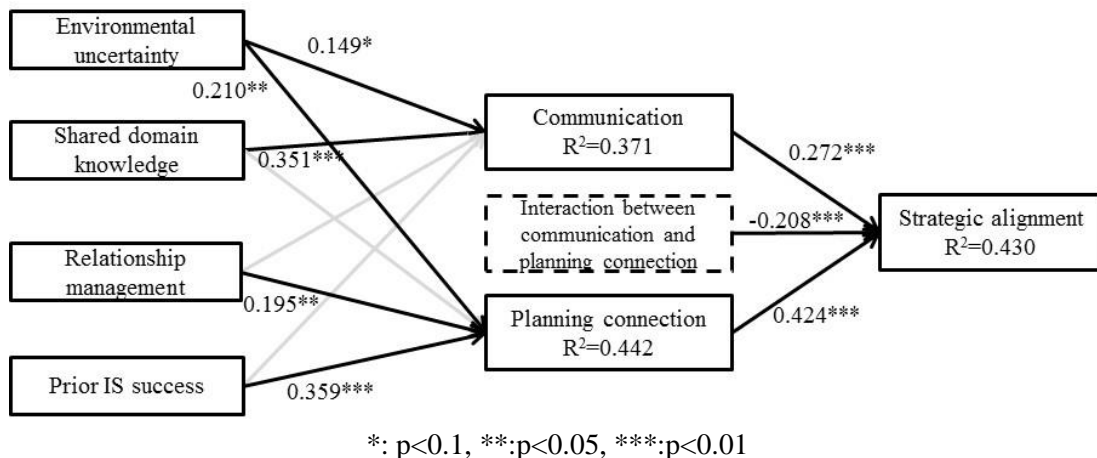
Figure 11: Structural model evaluation results for large organisations

Table 41: Results summary of the structural model evaluation for large organisations

Hypothesis		Path coefficient	Standard error	T-stat	Sig. (2-tailed)	Effect size f^2	Predictive relevance q^2
H1:	COM → SA	0.272	0.085	3.218	p<0.01	0.17	0.06
H2:	CON → SA	0.424	0.100	4.249	p<0.01	0.29	0.12
H3:	COM ↔ CON	-0.208	0.092	2.270	p<0.01	0.08	0.02
H4a:	SDK → COM	0.351	0.102	3.429	p<0.01	0.10	0.05
H4b:	SDK → CON	0.116	0.110	1.054			
H5a:	RM → COM	0.159	0.104	1.533			
H5b:	RM → CON	0.195	0.083	2.337	p<0.05	0.04	0.02
H6a:	PISS → COM	0.122	0.091	1.336			
H6b:	PISS → CON	0.359	0.103	3.489	p<0.01	0.14	0.06
H7a:	EU → COM	0.149	0.082	1.813	p<0.10	0.03	0.01
H7b:	EU → CON	0.210	0.092	2.288	p<0.05	0.07	0.03

Note: Calculations of f^2 and q^2 are provided in Appendix H.

5.10.6 Analysis of the mediating effect for large organisations

Table 42 presents the summary of the mediating effect analysis results. Shared domain knowledge and prior IS success through communication were identified as having no mediation effect since the VAF values were less than 20%. All the other mediation effects were found to have partial mediation, recording VAF values between 20% and 80%. Therefore, overall the results confirmed the mediating role of the communication and planning connection in the SME sector.

Table 42: Results summary of the mediation effect analysis of the large organisations

Construct		Mediating Effect	P-Value	VAF	Mediation effect size
SDK	Total	0.227	p<0.05	32.97%	Partial mediation
	COM	0.078	p<0.05	14.43%	No mediation
	CON	0.149	p<0.05	24.43%	Partial mediation
PISS	Total	0.229	p<0.05	32.51%	Partial mediation
	COM	0.086	p<0.05	15.33%	No mediation
	CON	0.143	p<0.05	23.10%	Partial mediation
RM	Total	0.270	p<0.05	42.10%	Partial mediation
	COM	0.104	p<0.05	21.80%	Partial mediation

	CON	0.167	p<0.05	30.97%	Partial mediation
	Total	0.278	p<0.05	43.16%	Partial mediation
EU	COM	0.095	p<0.05	20.53%	Partial mediation
	CON	0.183	p<0.05	33.38%	Partial mediation

5.10.5 Summary of hypotheses testing with a group comparison

The summarised results of hypotheses testing for the full sample, as well as for SMEs and large organisations are presented in Figure 12 and Table 43. The results reveal some interesting findings.

All the hypotheses except H3 and H7a were supported for the full sample. H3 (interaction between communication and planning connection positively influences strategic alignment) was rejected. However, a negative significant effect (-0.268, p<0.05) of interaction between communication and planning connection on strategic alignment was confirmed. H7a (environmental uncertainty influences communication between business and IT executives) was rejected. Overall, the findings showed that two managerial practices have a positive influence on strategic alignment, and the positive influence of antecedents on managerial practices. It is evident that environmental uncertainty positively influences planning connection.

There were differences between SMEs and large organisations as to which hypotheses were supported. For instance, hypothesis 4a – 'shared business and IT domain knowledge positively influences communication between business and IT executives' – was supported for large organisations, but not supported for SMEs. Similarly, H4b, H5a, and H6a were supported for SMEs but not supported for large organisations. The two hypotheses related to environmental uncertainty were supported only for large organisations. Neither of them was supported for SMEs. However, the two hypotheses related to the managerial practices (H1 and H2) were supported for both SMEs and large organisations. This result indicates that even though the two managerial practices are equally important for both SMEs and large organisations, the effects of antecedents on managerial practices vary by organisation type.

Finally, using the procedure suggested by Hair et al. (2014), unpaired samples t-tests were used in order to test for a significant difference between group-specific

parameters. The results are illustrated in Table 44. According to the results, path coefficient differences between SMEs and large organisations are significant. The path coefficient differences relating to the influences of communication on strategic alignment, planning connection on strategic alignment, and relationship management on planning connection were found to be significant at $p<0.05$, $p<0.1$ and $p<0.05$ respectively. This implies that the impact of antecedents and managerial practices are significantly different between SMEs and large organisations. Therefore, the method of achieving strategic alignment may differ between SMEs and large organisations.
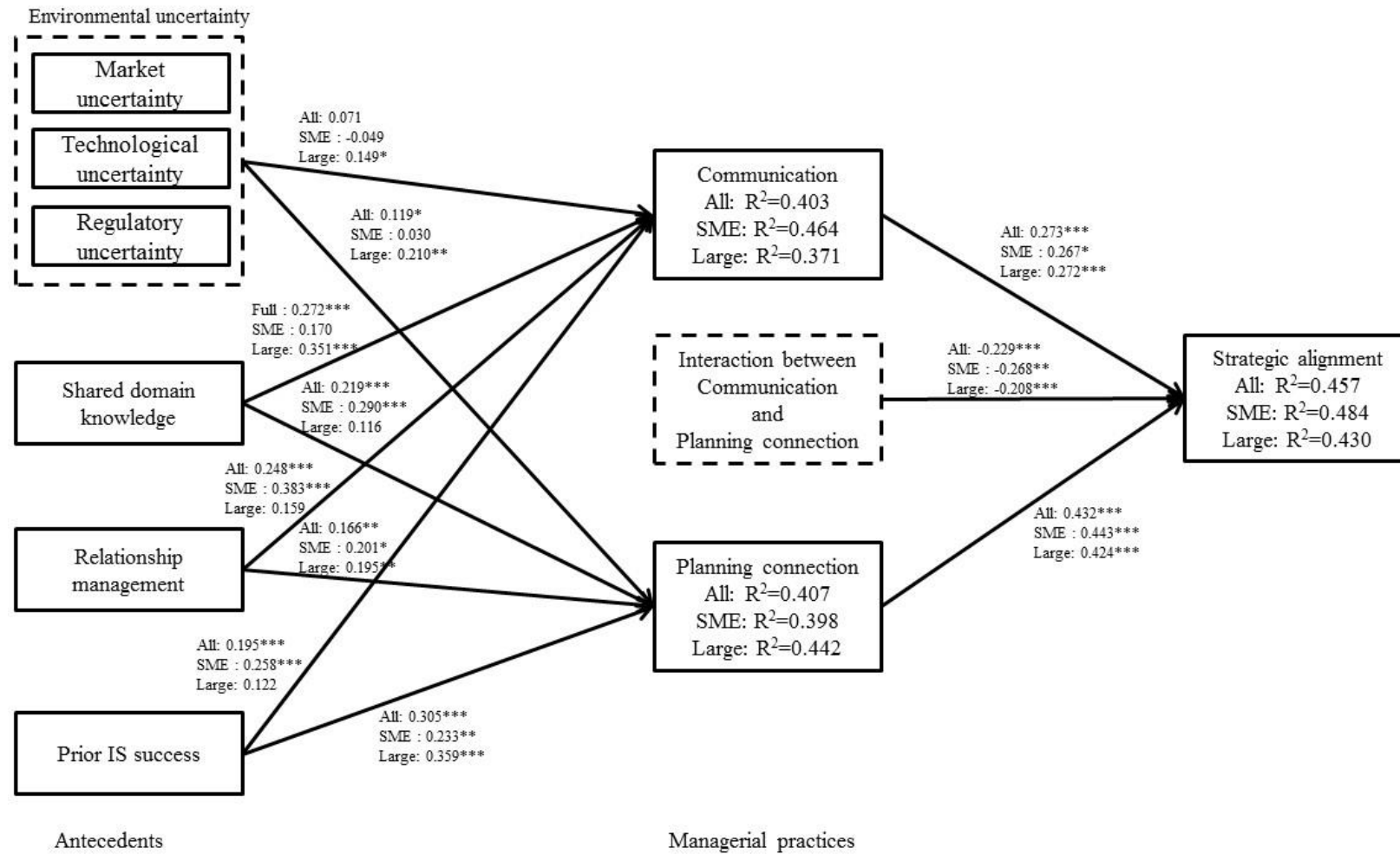
Figure 12: Structural model evaluation results – group comparison: All, SMEs and large organisations
*: p<0.10, **: p<0.05, ***: p<0.01

Table 43: Summarised results of hypotheses testing

Hypothesis		All organisations	SMEs	Large organisations
H1	Communication between business and IT executives positively influences strategic alignment	Supported	Partially Supported	Supported
H2	Connection between business and IT planning processes positively influences strategic alignment	Supported	Supported	Supported
H3	Interaction between communication and planning connection positively influences strategic alignment	Not Supported	Not Supported	Not Supported
H4a	Shared business and IT domain knowledge positively influences communication between business and IT executives	Supported	Not Supported	Supported
H4b	Shared business and IT domain knowledge positively influences the connections between business and IT planning processes	Supported	Supported	Not Supported
H5a	Relationship management positively influences the communication between business and IT executives	Supported	Supported	Not Supported
H5b	Relationship management positively influences the connections between business and IT planning processes	Supported	Partially Supported	Supported
H6a	Prior IS success positively influences the communication between business and IT executives	Supported	Supported	Not Supported
H6b	Prior IS success positively influences the connections between business and IT planning processes	Supported	Supported	Supported
H7a	Environmental uncertainty influences communication between business and IT executives	Not Supported	Not Supported	Partially Supported
H7b	Environmental uncertainty influences connection between the business and IT planning processes	Partially Supported	Not Supported	Supported

Note: Cells where hypotheses are supported (p<0.05) or partially supported (p<0.10) are shaded

Table 44: Summarised results of unpaired samples t-tests (SMEs and large organisations)

	Hypothesis	SMEs		Large		SME vs. Large		
		p1	se(p(1))	p2	se(p(2))	|p(1)-p(2)|	p-value (2-tailed)	Significance level
H1:	COM → SA	0.267	0.151	0.272	0.087	-0.005	0.000	**
H2:	CON → SA	0.443	0.138	0.424	0.100	0.019	0.052	*
H3:	COM ↔ CON	-0.268	0.107	-0.208	0.092	-0.060	0.545	
H4a:	SDK → COM	0.170	0.109	0.351	0.102	-0.181	0.832	
H4b:	SDK → CON	0.290	0.106	0.116	0.110	0.174	0.976	
H5a:	RM → COM	0.383	0.108	0.159	0.104	0.223	0.894	
H5b:	RM → CON	0.201	0.122	0.195	0.083	0.006	0.012	**
H6a:	PISS → COM	0.258	0.110	0.122	0.091	0.136	0.391	
H6b:	PISS → CON	0.233	0.117	0.359	0.103	-0.126	0.637	
H7a:	EU → COM	-0.049	0.101	0.149	0.082	-0.198	0.321	
H7b:	EU → CON	0.030	0.101	0.210	0.092	-0.180	0.756	
n		89		123				

Note: $p^{(1)}$ and $p^{(2)}$ are path coefficients of SMEs and large firms, respectively; $se(p^{(1)})$ and $se(p^{(2)})$ are the standard error of $p^{(1)}$ and $p^{(2)},$ respectively

*: $p<0.10$, **: $p<0.05$, ***: $p<0.01$

5.11 Effects of three sources of uncertainty on managerial practices

This research conceptualised environmental uncertainty using three first-order constructs: market, technological and regulatory uncertainty. Therefore, an analysis was conducted to identify the effect size of each source of uncertainty on managerial practices. As suggested by Edwards (2001) the effect size of each source of uncertainty on managerial practices was calculated by multiplying the loading of each source of uncertainty with the path from environmental uncertainty to managerial practices. Table 45 illustrates the loading of each source of uncertainty by groups and Table 46 illustrates the effect size and significance level.

Table 45: Loading of each source of uncertainty

	All organisations		SMEs		Large organisations	
Uncertainty	Loading	p-values	Path coefficient	p-values	Path coefficient	p-values
Market	0.778	0.000	0.740	0.000	0.813	0.000
Technology	0.869	0.000	0.880	0.000	0.858	0.000
Regulation	0.821	0.000	0.837	0.000	0.815	0.000

Table 46: Effects between three sources of uncertainty and managerial practices

	All organisations		SMEs		Large organisations	
Effect	Size	Sig. (2-tailed)	Size	Sig. (2-tailed)	Size	Sig. (2-tailed)
MU →COM	0.055		-0.036		0.121	p<0.10
MU →CON	0.093	p<0.10	0.022		0.171	p<0.05
TU →COM	0.062		-0.043		0.128	p<0.10
TU →CON	0.103	p<0.10	0.026		0.180	p<0.05
RU →COM	0.058		-0.041		0.121	p<0.10
RU →CON	0.098	p<0.10	0.025		0.171	p<0.05

In the full sample, all three sources of uncertainty – market, technological and regulatory – were found to have a significant effect on planning connection, respectively 0.093 ($p<0.10$), 0.103 ($p<0.10$) and 0.098 ($p<0.10$). The effects from the three sources of uncertainty on communication were insignificant. In the SMEs, none of the sources of uncertainty had an effect on communication and planning connection. In large organisations, market, technological and regulatory uncertainty were found to

have significant effects on both communication and planning connection. They were respectively 0.121 (p<0.10), 0.128 (p<0.10), and 0.121 (p<0.10) for communication and 0.171 (p<0.05), 0.180 (p<0.05), and 0.171 (p<0.05) for planning connection.

As discussed in section 5.8.1, the evaluation of the measurement model provided adequate construct validity and reliability to perform structural model analysis using three first-order constructs. Therefore, another analysis was conducted to identify the direct effect of each source of uncertainty, as an independent construct, on managerial practices. The structural model evaluation results indicated that none of the paths from three sources of uncertainty to managerial practices is significant. However, as a second-order construct, environmental uncertainty was found to have a positive effect on the managerial practices. Moreover, analysis showed the indirect effect of each source of uncertainty on managerial practices was significant (see table 46). Therefore, further analysis was conducted to identify whether there is any direct effect on the managerial practices if one source of uncertainty is considered at a time. Three separate structural model evaluations found some significant paths to the managerial practices. Therefore, the effects of market uncertainty, technological uncertainty and regulatory uncertainty were separately measured for all organisations, SMEs and large organisations. In particular, this was useful to identify whether there is any effect of uncertainty on the managerial practices in the SMEs. The summary of the results is given in Table 47. The full results are given in Appendix I.

Table 47: Relationships between three sources of uncertainty and managerial practices

Relationship	All organisations		SMEs		Large organisations	
	Path coefficient	p-values	Path coefficient	p-values	Path coefficient	p-values
MU →COM	0.075		0.080		0.141	0.094
MU →CON	0.082	0.097	0.100		0.147	0.072
TU →COM	0.069		-0.012		0.157	0.072
TU →CON	0.135	0.044	0.091		0.205	0.022
RU →COM	0.029		-0.050		0.092	
RU →CON	0.051		-0.004		0.135	

In the full sample, only market uncertainty and technological uncertainty were found to have significant paths to planning connection, respectively 0.082 (p<0.10) and 0.135

(p<0.05). The paths from the three types of uncertainty to communication were insignificant. Similarly, the path from regulatory uncertainty to planning connection was also insignificant. In the SMEs, none of the types of uncertainty had an effect on communication and planning connection. In large organisations, only the paths from regulatory uncertainty to communication and planning connection were insignificant. Market uncertainty and technological uncertainty were found to have significant paths to communication, respectively 0.141 (p<0.10) and 0.157 (p<0.10). Similarly, market uncertainty and technological uncertainty had significant paths to planning connection: 0.147 (p<0.10) and 0.205 (p<0.05) respectively.

5.12 Chapter summary

The data analysis started with the demographic analysis of survey respondents. The respondents were from a wide range of industries representing SMEs as well as large organisations. Prior to the evaluation of the conceptual model, the data were examined for the common method variance, non-response bias, and missing values. All the analysis were fully satisfied and the data were used for the subsequent analysis. Due to the exploratory nature of this study and few several other reasons, Partial Least Squares - Structural Equation Modelling technique was chosen for subsequent analysis. Both the measurement model and structural model were evaluated using the specific guideline and best practices associated with the PLS analysis. The measurement model specified the relationships between the constructs and their associated indicators. The structural model connected the various constructs together and guided the hypotheses testing. Except for one hypothesis, all the other hypotheses were accepted for the full dataset. However, there were differences between the two groups, SMEs, and large organisations, as to which hypotheses were supported. Finally, the overall GoF was found to be large, providing strong evidence confirming the overall quality of the model.

CHAPTER 06: DISCUSSION AND INTERPRETATION OF THE RESULTS

This chapter provides a detailed discussion of the results obtained in this research and provides an explanation of the key findings. The chapter begins with an overview of findings together with a theoretical explanation. This is followed by a discussion of the key managerial practices of strategic alignment. Then the role of antecedents in the alignment process is presented. Later, the chapter discusses how the relative importance of antecedents varies between SMEs and large organisations. The chapter concludes with a summary of the findings.

6.1 Overview

In line with the alignment literature as discussed in chapter 2, this research proposed communication between business and IT executives and business–IT planning connection as key managerial practices contributing to strategic alignment. Further, this research hypothesised that the effects of antecedents are mediated by these two managerial practices. These hypotheses were empirically tested in a quantitative study. The results obtained through statistical analysis provided empirical support for the research hypotheses and reflected similar findings in the alignment literature.

Firstly, this research supports the arguments raised by Reich and Benbasat (2000). They identified communication and planning connection as key management practices in the alignment process. They argued that mutual understanding between business and IT executives and shared common ideas gained through communication ensure that business IT capabilities are integrated into the business effectively. Similarly, they argued that the planning connection provides the necessary structural mechanism for successful implementation of IT. Shared domain knowledge and successful IT history were identified as antecedents to alignment. Other studies supporting the findings are those of Hu and Huang (2006) and Yayla and Hu (2009). Following Reich and Benbasat's (2000) arguments, they further highlighted the importance of those two management practices in the alignment process and introduced relationship management as a potential antecedent to strategic alignment. Overall, this research's findings agree with those studies.

All proposed hypotheses were supported with statistical evidence. Data analysis generated some interesting findings relating to the relative importance of managerial practices as well as antecedents in the process of business–IT alignment. All the findings are discussed in the following sub-sections.

6.2 Theoretical explanation of the research findings

The strategic alignment process presented in this research is a knowledge integration process between business and IT executives and thus the knowledge-based view of the firm helps to explain the findings of this research. The knowledge-based view of the firm views an organisation as a dynamic and evolving system of knowledge production and utilisation (Spender, 1996). Knowledge integration is a principal aspect of the knowledge-based view of the firm (Grant, 1996a). The theory suggests that organisations are capable of integrating multiple knowledge streams for the creation of new knowledge (Grant, 1996a, 1996b).

The three distinguishing components of knowledge integration are the knowledge, the integration process and the knowledge integration (outcome) (Kearns & Sabherwal, 2007; Okhuysen & Eisenhardt, 2002). The knowledge refers to the existing knowledge. The integration process involves the actions of group members by which they share their individual knowledge within the group and combine it to create new knowledge. In contrast, knowledge integration is the outcome of these processes, consisting of both the shared knowledge of individuals and the combined knowledge that emerges from their interactions (Okhuysen & Eisenhardt, 2002).

The alignment process presented in this research is a collaborative process between business and IT executives and consists of the three components of knowledge integration. Knowledge is a crucial component for this process and thus, antecedents of strategic alignment contribute existing knowledge to the process. Antecedents represent different types of knowledge. Shared domain knowledge consists of IT knowledge of business executives and business knowledge of IT executives (Reich & Benbasat, 2000). Perceived environmental uncertainty represents limited knowledge of the environment (Chan et al., 2006). Prior IS success represents the experience and the knowledge gained through successful IT implementation. Finally, relationship

management brings understanding and knowledge of the other group (Nahapiet & Ghoshal, 1998).

The associated knowledge integration processes are two managerial practices: communication between business and IT executives, and business–IT planning connection. The two practices facilitate knowledge integration between business and IT executives by enabling the exchange of information and knowledge through cross-functional communication and joint activities such as working together in the same planning process. Further planning connection characteristics such as participation of both business and IT executives create a cross-functional interface for collective learning.

The outcome of the process is greater business and IT alignment. Overall, the strategic alignment process is capable of integrating multiple knowledge streams – business and IT knowledge for the creation of new knowledge – and thus greater business–IT alignment. Two managerial practices facilitate this integration by establishing an interface to exchange information and knowledge between two groups.

Knowledge is a unique resource for an organisation. The strategic alignment process presented in this research uses knowledge and other resources such as communication, planning and group relationships in order to achieve business–IT alignment. Therefore, the resource-based theory also helps to explain the findings. The resource-based theory conceptualises an organisation as a bundle of resources and considers it as the basis for an organisation's competitive position (Barney & Clark, 2007; Barney et al., 2011; Kozlenkova et al., 2014; Wernerfelt, 1984). The resource-based theory suggests that the organisation's internal resources are the primary predictors of sustainable competitive advantage (Kozlenkova et al., 2014; Reynolds & Yetton, 2015; Wernerfelt, 1984). Therefore, organisations are advised to focus attention on developing internal resources and fostering processes that are inimitable (Grant, 1991; Kozlenkova et al., 2014; Vitale et al., 1986).

IT is equally available to all organisations and thus, advantages occur only when the IT is used in some inimitable way (Kearns & Lederer, 2003; Reynolds & Yetton, 2015; Vitale et al., 1986). Strategic alignment is an inimitable process. It is unique to the

organisation and combines business and IT resources in order to support business objectives (Reich & Benbasat, 1996). The alignment process presented in this research consists of several organisational internal resources such as shared domain knowledge, knowledge gained through prior IS success and knowledge of the environment. Similarly, relationship management is another social resource for an organisation. Capabilities such as communication and planning facilitate the combination of different business and IT resources, in particular knowledge, in order to align IT strategies with business strategies. The positive impact of antecedents on strategic alignment through managerial practices implies that the alignment process presented in this research facilitates the achievement of strategic alignment by combining organisational business and IT resources.

The resource-based theory also suggests that the value created through IT is conditional on synergies between IT and other organisational resources (Melville et al., 2004; Nevo & Wade, 2010). The value created through a synergistic relationship between components cannot be created by a component in isolation (Melville et al., 2004). The alignment process presented in this study also facilitates IT resources such as IT knowledge and strategies to connect with business resources such as business knowledge and strategies and creates a greater level of business–IT alignment for the organisation.

Overall, the strategic alignment process is capable of achieving greater alignment by utilising internal resources in inimitable ways. In particular, knowledge is a distinctively unique resource of an organisation. Therefore, this process provides an understanding of how organisational resources, especially knowledge, can help improve business–IT alignment. Indeed, identifying and developing these resources and processes can lead to better strategic alignment.

6.3 Managerial practices in the strategic alignment process

This research found that the two managerial practices positively influence strategic alignment. It also revealed that communication between business and IT executives plays a contingent role in the alignment process and the effect of the two managerial

practices on strategic alignment varies between SMEs and large organisations. These findings are further discussed in the following sub-sections.

6.3.1 The role of communication in the strategic alignment process

One of the findings of this research was the positive impact of communication between business and IT executives on strategic alignment. This means that when communication between business and IT executives increases, alignment of business and IT strategies also increases. Communication is a process through which individuals share and create information in order to reach a mutual understanding (Johnson & Lederer, 2005). In the context of strategic alignment, communication involves sharing and exchanging information between business and IT executives relevant to the business, IT and the integration of IT with business. Ultimately this enhances the greater linkage of the strategic IT plan to the business goals and objectives. Communication facilitates integration of business and IT in many ways.

Firstly, communication reduces the information gaps between the two groups by facilitating information sharing. Communication helps business and IT executives to reduce the information gap between them and creates convergence in the understanding of common ideas. Ultimately, this mutual understanding allows them to work towards a common goal of alignment of the IT objectives, strategies and plan with the business objectives, strategies and plan.

Secondly, communication helps to increase the trust and interest between IT and business executives. Mutual trust and mutual interest between IT and business executives have been identified as important influencing factors for shared understanding (Nelson & Cooprider, 1996). When the executives have mutual trust, they are more likely to believe the other party. Similarly, mutual interest motivates executives to consider the other party's issues. Therefore, mutual trust and interest create additional motivation between business and IT executives to consider each other's opinion during the strategic alignment process.

Therefore, this result confirms the argument of communication helping with the convergence of business and IT strategies through sharing of knowledge between business and IT executives. This implies that if an organisation requires business–IT

alignment, they should encourage activities that produce frequent communication between business and IT executives. However, other than communication there may be several other practices that encourage knowledge sharing, and improve shared understanding and trust between business and IT groups. Therefore, organisations need to encourage knowledge sharing practices such as brainstorming sessions and steering committees within the organisation.

However, implementing communication and knowledge sharing activities incurs a cost to the business and there is a limit to such activity where the costs exceed the benefits. Due to the law of diminishing returns, increasing the number of activities causes the benefits of an activity to be smaller than the benefits of the previous activity (Layson, 2015). Therefore, at the initial stage, increasing communication and knowledge sharing activities provides more benefits than it costs to implement. However, continued increases of such activities decrease the marginal benefits (i.e. the benefits added to the total benefits from increased activity) and create a situation where the implementing costs exceed the marginal benefits. Therefore, organisations need to consider the cost and benefits of communication and knowledge sharing activities and are recommended to only implement such activities in a situation where the benefits are higher than the implementation costs.

The results also indicated communication had different levels of effects on strategic alignment in SMEs and large organisations. The results were significant for the large organisations while only partially supported for the SME sector.

One of the reasons may be organisation structure. Large organisations generally use decentralised structures that make coordination more difficult. Additionally, physical organisational structure may be spread over several geographic locations that may create even more difficulties in coordination. Therefore, well-established cross-functional communication methods should be mandatory for the large organisations. Moreover, large organisations are able to invest resources in communication facilities and thus, they may utilise various channels to communicate between business and IT groups. Therefore, the decentralised structure in large organisations makes communication mandatory and as this is facilitated by using various communication facilities, more cross-functional communication can be expected.

On the other hand, SMEs are more likely to have centralised structures with centrally coordinated functions (Armstrong & Sambamurthy, 1999; Entrialgo, 2002). All the business functions may be coordinated by the Director or the owner of the organisations. This central coordination may minimise the need for other explicit mechanisms to promote communication (Chan et al., 2006). Moreover, formal communication procedures may not be necessary for SMEs and thus limit the opportunities for communication between IT and business.

The second reason may be the level of formality of cross-functional communication activities. Large organisations are generally managed by an agent (the Board of Directors) and they are liable for all the activities in the organisation. There is a mandate to report the organisational activities to the stakeholders. Therefore, this makes it a requirement to implement best managerial practices within the organisation. Therefore, in most large organisations, formal communication activities such as progress meetings and steering committee meetings may be a part of an organisation's best management practices. Moreover, some of the meetings are mandated by regulations. Further, large organisations may tend to document all the outcomes of these communication activities as evidence as well as for future use. Therefore, more regular communication between business and IT executives can be expected in large organisations, leading to continued information sharing and mutual learning.

Such formal communication activities are less likely in SMEs. Generally, SMEs are managed by the owners and there are less mandatory requirements for implementing best management practices. Therefore, communication practices are biased by the owners' expectations. The owner(s) might encourage horizontal communication rather than cross-functional communication. Further, SMEs may use ad hoc and informal communication practices rather than having formal communication.

The directionality of the communication may be another reason for the different effects between large organisations and SMEs. Cross-functional and hierarchical communication directions can be seen in large organisations. In large organisations, both business and IT units are headed by different executives and both units have the capability to make their own decisions and do their own strategic planning. However, it is essential that they coordinate with other functional units as well as across the top

and bottom of the hierarchy. Therefore, the communication creates a cross-functional platform to disseminate their decisions to other relevant groups as well as to exchange ideas between groups during the decision-making process.

Conversely, in SMEs, there may be no need for cross-functional communication. Communication is more likely to occur between the functional division and the owner. In SMEs, functional executives may be less likely to have the capability to make their own decisions. Responsibility and decision-making power may be solely held by the owner. Therefore, communication with the owner is more significant than communication between business and IT groups. This may create a limited need for communication between business and IT groups. Therefore, communication between business and IT executives is less likely to create business–IT mutual understanding in SMEs.

Additionally, both the business and IT departments in large organisations employ specialised professionals in their particular domains. Therefore, this creates an additional necessity for cross-functional communication in order to get to know about other domains. Executives in SMEs may perform duties in several functions. Their scope, responsibilities and duties may not be limited to a single function. Further, they may have multidisciplinary knowledge rather having only specialised knowledge of one domain. This may again limit the explicit requirement for cross-functional communication.

Therefore, communication between business and IT executives may have different effects on strategic alignment in large organisations and SMEs. Relevant factors in large organisations – such as decentralisation, formality of the process and multidirectional communication flows – create the explicit necessity for formal cross-functional communication. Therefore, communication between business and IT executives has a significant effect in large organisations. However, centrally coordinated functions, the limited requirement for cross-functional communication and multitasking executives may limit the explicit need for communication and thus, indicate a less significant effect of communication on strategic alignment in the SME sector.

6.3.2 The role of planning connection in the strategic alignment process

The second management practice for achieving strategic alignment is planning connection. The findings of this research confirmed that organisations are more likely to achieve strategic alignment when they increase the degree of planning connection. The connection of business and IT planning has a greater influence on the integration of IT with business since it includes necessary characteristics for cross-functional knowledge integration activities such as a collective learning environment, active participation towards a common goal and guided leadership for strategic alignment.

Firstly, planning connection provides a collective learning environment to achieve a goal of collaborative activity. When the business and IT plans are developed and ratified simultaneously, both business and IT executives participate in the planning process. This participation creates a cross-functional interface, providing opportunities for collective learning. It enables sharing of information, experiences, and opinions through brainstorming (Zollo & Winter, 2002). This process provides an opportunity for consideration of others' opinions as well as reconciliation of conflicting objectives (Argote et al., 2003), ultimately, moving both executives to the same opinion in terms of strategising.

Secondly, leadership is inherent in the planning connection. One of the success factors for alignment is top management leadership (Luftman & Brier, 1999; Ohlsson et al., 2016). Strategic planning is a critical and formal activity in any organisation. Generally the strategic planning process is led by the top management and thus, the process provides the required leadership for alignment. Additionally, it provides the formal structure and the guidance to properly integrate IT with business. The planning process consists of several phases and specific tasks within each phase (Newkirk & Lederer, 2006a) and thus, is a guide to achieving all the planning objectives. One of the objectives of business–IT planning is the proper integration of IT with business. Therefore, the planning connection provides the leadership and the guidance for better integration of IT with business.

However, these benefits may be hindered when IT and business plans are developed in isolation. Deviation from the planning connection reduces the opportunity for

knowledge integration in a collective learning environment. Therefore, this limits the opportunity for proper integration of IT with business. However, organisations can mitigate the negative effect by strengthening the other formal and informal communication between business and IT executives.

In achieving strategic alignment, the planning connection is equally important for both SMEs and large organisations. The findings confirm that regardless of organisation size, organisations implementing an integrated planning approach improve their chances of achieving better business–IT alignment. Strategic planning is a common business practice which concerns the setting of objectives, the development and implementation of plans, and the allocation of resources (O'Regan & Ghobadian, 2004; Stonehouse & Pemberton, 2002). The only difference that can be expected between different organisations is the planning range. Large organisations may tend to adopt a wide range of objectives while SMEs focus on a single or a few objectives.

6.3.3 The relative importance of communication and planning connection

When the effects of communication and planning connection are compared with each other, the results indicate that the positive effect of the planning connection on strategic alignment is much greater than that of communication. This suggests that even though both communication and planning contribute to strategic alignment, the planning connection is more important in the strategic alignment process.

Planning is a more formal process and consists of a set of phases and specific tasks within each phase (Newkirk & Lederer, 2006a) and thus, more action is taken to align IT with business in planning than in communication which is more embedded in relationships (Yayla & Hu, 2009). Further, the planning process results in written documents, thus enforcing a stronger form of alignment. So the formality and the documentation strengthen alignment.

In contrast, communication between the executives is bound to individuals and highly embedded in their relationships. Cultural characteristics such as power distance may influence the outcome of communication (El-Mekawy & Rusu, 2011). Further, an outcome of the communication may dissipate when the executives leave the organisation or when the roles of executives change over time. This is not the case for

the planning connection. When both business and IT plans are developed, the plans became a part of the organisation and their benefits are not tied to individuals.

Further, an integrated strategic planning process provides a comprehensive setting for business–IT integration. Top management leadership, participation of both types of executives, a platform for cross-functional knowledge sharing and a collective learning environment facilitate better business–IT integration than communication does. Further, communication is an embedded part of the integrated planning process. Therefore, the planning process enforces a stronger form of alignment since it is a more focussed and result-oriented activity.

6.3.4 Interaction between communication and planning connection

Another important finding of this research is the negative interaction effect of communication and planning connection on strategic alignment. An integrated planning process creates cross-functional interfaces, establishing dialogue and lines of communication between the business and IT groups (Kearns & Sabherwal, 2007; Segars & Grover, 1999). Meanwhile, communication enables information sharing and mutual understanding (Johnson & Lederer, 2005), and thereby facilitates the integration of different views among IT and business groups (Bai & Lee, 2003). Therefore, this research expected a positive interaction effect between communication and planning connection. However, the results show a significant negative interaction effect.

A negative interaction effect indicates that the role of communication in the strategic alignment process reduces as the planning connection increases. An integrated planning process requires increased interaction between different executives and the interpretation of various views from organisational interest groups (Ruohonen, 1991). An integrated planning process by itself creates an interface for information sharing and mutual understanding (Johnson & Lederer, 2005), and thereby facilitates the integration of different views and cooperation among IT and business groups (Bai & Lee, 2003). Therefore, communication is embedded in integrated planning and thus, when the organisation has a high planning connection, the role of communication within the alignment process diminishes.

This finding suggests that when the planning connection is weak or less integrated, the role of communication becomes even more important. The lack of a planning connection reduces the opportunity for knowledge sharing in a collective learning environment. However, sharing knowledge cannot be eliminated from the strategic alignment process. It is essential for strategic decision making as well as for aligning IT strategies with business strategies. Therefore, communication makes a significant contribution in less integrated planning situations by facilitating knowledge sharing between business and IT executives. This result highlights the contingency role of communication in the alignment process. Communication is more important when the organisation lacks planning integration. If organisations increase the planning connection then the influence of communication on the strategic alignment process diminishes.

6.4 The role of antecedents in the strategic alignment process

The alignment literature discloses numerous antecedents that contribute to strategic alignment. The literature indicates two categories of antecedents relevant to strategic alignment: internal antecedents which are directly under the control of the organisation and external antecedents which are external to the organisation.

6.4.1 Internal antecedents of strategic alignment

Reich and Benbasat (2000) found that shared domain knowledge and successful IT history were potential antecedents that influenced the social dimension of strategic alignment. Other researchers have also identified shared domain knowledge, relationship management and prior IS success as key antecedents (Chan & Reich, 2007b; Chan et al., 2006; Hu & Huang, 2006; Yayla & Hu, 2009). In line with the literature, the research proposed three key internal antecedents to strategic alignment. The following subsections discuss the results for each of those antecedents.

6.4.1.1 Shared domain knowledge

Shared domain knowledge is one of the most widely studied antecedents of strategic alignment. It refers to business and IT executives' knowledge of each other's domain

(Reich & Benbasat, 2000). The literature argues that if the executives have shared domain knowledge they are more likely to develop a shared understanding and vision (Chan et al., 2006), which will improve communication and planning connection (Chan et al., 2006; Hu & Huang, 2006; Reich & Benbasat, 2000; Yayla & Hu, 2009). The findings of this research support these arguments and the results indicated a positive significant influence of shared domain knowledge on both communication and planning connection.

The first finding is the positive impact of shared domain knowledge on communication which implies that the knowledge of another domain facilitates better cross-functional communication. Shared domain knowledge is a critical factor for effective communication (Nelson & Cooprider, 1996). Firstly, it provides the required knowledge for effective communication. Knowledge of one's own domain as well as others' domains is essential for effective cross-functional communication. Knowledge of the other domain brings the familiarity and confidence to communicate with each other. Therefore, the business knowledge of IT executives and the IT knowledge of business executives provide both with the required knowledge for effective communication. Conversely, a lack of knowledge of each other's domains constrains communication (Feeny et al., 1992; Lederer & Mendelow, 1987). It increases information asymmetry, and results in the inaccurate interpretation of messages between business and IT executives, ultimately leading to intergroup conflicts (Nelson & Cooprider, 1996).

Secondly, shared domain knowledge increases motivation for cross-functional communication. Shared domain knowledge develops the executives' understanding of each other's jobs. This understanding also brings an appreciation of each other's accomplishments. If executives do appreciate each other's accomplishments, it encourages participation and active engagement in cross-functional communication. In contrast, lack of appreciation constrains participation in a communication activity. Participation is a key success factor in knowledge sharing activities such as communication (Kearns & Lederer, 2003). Therefore, the second reason for the positive effect of shared domain knowledge on communication is the motivation to

participate in communication which is created through the knowledge of another domain and the appreciation of accomplishments by other group.

Therefore, this result confirms the argument that shared domain knowledge improves communication between business and IT executives and thus, organisations need to establish activities that improve shared domain knowledge such as brainstorming sessions and promote knowledge sharing tools (e.g. blogs and newsletters). Further, executives need to appreciate each other's success. Overall, shared domain knowledge provides essential other domain knowledge and motivation for effective communication between business and IT executives.

The results also indicated that the facilitating role of shared domain knowledge for communication varies between SMEs and large organisations. The results indicated a significant effect in large organisations but not in the SMEs. One of the possible reasons for this is the directionality of communication with regard to decision making. Large organisations are more likely to consist of separate business and IT units with their own decision-making power. In this context, the decision-making process includes bargaining, lobbying, and agreement building before reaching final decisions. Therefore, knowledge of the other domain and extensive communication play a vital role in the strategic decision-making process and thus, more cross-functional communication between business and IT executives can be expected. Therefore, shared domain knowledge is more meaningful in such a context and facilitates communication.

In SMEs, communication mainly occurs between the owner and the business or IT unit. Often a single executive (the owner) makes decisions without consulting other executives. Therefore, less cross-functional communication can be expected between business and IT executives with regard to strategic decision making. Therefore, shared domain knowledge may not be a key influential factor for communication related to the alignment process.

Further, organisational structure may be another reason. The structure of an organisation influences the flow of information and the nature of human interaction (Miller, 1987). The structure of an organisation channels collaboration, specifies

modes of coordination, and allocates power and responsibility (Bower, 1970). A decentralised structure assigns power and responsibility to the respective departments and creates a formal process of coordination through the organisational hierarchy. Moreover, it creates a formal setting for collaborations such as integrated planning and steering committee meetings. Therefore, the decentralised structure of large organisations may require more communication between business and IT executives and thus, shared domain knowledge plays a more significant role. In contrast, the centralised structure and centrally coordinated functions in SMEs may limit the requirement for explicit mechanisms for cross-functional communication and knowledge sharing and thus, shared domain knowledge may be less likely to influence communication.

Another finding of this research is the positive influence of shared domain knowledge on the planning connection. The findings of this research confirm the previous literature which suggest that an increase in shared domain knowledge results in better planning integration (Hu & Huang, 2006; Reich & Benbasat, 2000; Yayla & Hu, 2009).

Firstly, IT knowledge of business executives creates an opportunity for IT executives to participate in business planning and for business executives to participate in IT planning (Kearns & Sabherwal, 2006-7). Business executives with greater awareness and appreciation of IT are more likely to understand the importance of IT and tend to use IT for operational and strategic activities (Boynton, Zmud, & Jacobs, 1994; Kearns & Lederer, 2003). Therefore, business executives who know about IT and its strategic potential are more likely to communicate with IT executives and involve them in business decisions. This creates an opportunity for IT executives to participate in business planning as well as for business executives to participate in IT planning (Kearns & Sabherwal, 2007). Similarly, the business knowledge of IT executives enables them to convince business executives that they understand business goals and processes and that they are generally trying to help them achieve those goals (Bassellier & Benbasat, 2004).

Secondly, an understanding of each other's subject domain is more likely to lead to the establishment of shared understanding (Feeny & Willcocks, 1998) and a tendency to share risks and responsibilities in common activities (Bassellier & Benbasat, 2007).

So this allows executives to work towards a common goal (Nelson & Cooprider, 1996). Therefore, shared domain knowledge is a critical success factor for the integration of business and IT plans (Teo & Ang, 1999).

When the effect of shared domain knowledge on planning connection was compared between SMEs and large organisations, the effect was significant in SMEs but not as significant in the large organisations. The literature argued that if the executives have shared domain knowledge, they are more likely to have a shared understanding and vision, and it enables them to achieve better strategy integration during the planning process. However, this argument did not hold in large organisations. One of the reasons may be power decentralisation.

Power decentralisation has been identified as an inhibitor to interactive decision making (Miller, 1987). Decentralisation of the decision-making power in large organisations may be one of the reasons for the insignificant effect. However, there may be other reasons. This research only considered cross-functional domain knowledge. This research has not tested the impact of IT knowledge of business executives and business knowledge of IT executives on planning separately. There may be a distinct contribution of these two domain knowledge areas on planning connection which has never been tested. Similarly, competency may be more important than knowledge with regard to decision making. Even though executives have shared domain knowledge, they may not be competent enough to apply that knowledge. Therefore, further research is required to fully understand the underlying reasons for this insignificant effect.

6.4.1.2 Relationship management

Relationship management refers to the extent to which business and IT executives have the behavioural tendency to actively cultivate and maintain close working relationships (Smith, 1998). Relationship management had a considerably stronger effect on communication than its effect on planning connection. Communication between the executives is highly linked to personal relationships and thus, a greater effect is obvious. However, planning is a more formal and structured process.

Therefore, close working relationships have much less influence on planning than on communication.

Characteristics such as trust and understanding each other are crucial for cross-functional communication. Having a good relationship between business and IT executives builds trust and understanding between the two groups which facilitates the free flow of cross-functional information sharing (Hatzakis et al., 2005; Nahapiet & Ghoshal, 1998). Further, good relationships motivate executives to make themselves available for other communication activities (Hatzakis et al., 2005). Relationships create obligations, expectations and identification (Hatzakis et al., 2005; Nahapiet & Ghoshal, 1998). Therefore, executives with good relationships with others may consider more seriously the information needs of the other group and may actively participate in communication. Overall, the existence of a relationship motivates the business and IT executives to engage in knowledge creation and increases their availability for knowledge exchange (Hatzakis et al., 2005; Nahapiet & Ghoshal, 1998). Therefore, organisations need to encourage executives to establish good relationships with other departments' executives.

The positive effect of relationship management on communication was demonstrated only for SMEs. One unexpected result was the insignificant effect in large organisations. The decentralised structure and the formality of procedures in large organisations may be one of the reasons for the insignificant effect. Decentralised governance and decision-making structures in large organisations force executives to follow the established communication protocols to communicate with each other. Moreover, both business and IT units are responsible for their decisions. This creates a tendency to collect required information in a more formal and responsible manner. Therefore, executives in each unit may tend to communicate officially with each other using a given procedure rather than communicate based on personal relationships. Therefore, relationship management is less likely to influence communication in large organisations.

Conversely in SMEs, there is centralised decision making by the owner and they are less likely to have a standard protocol for cross-function communication. Informal communication which is based on trust and personal relationships may play a

significant role in SMEs. Further, the organisational culture in SMEs may promote personal relationships. A limited number of executives and multifunctional duties encourages close working relations between executives. Therefore, personal relations tend to be more meaningful in SMEs.

The other finding is the positive impact of relationship management on the planning connection. Having good relations between business and IT executives is an important asset for an organisation (Ross et al., 1998). When business and IT executives have a good relationship, IT and business executives work together (Jones et al., 1995; Rockart et al., 1996; Watson, 1990) and share the risk of and responsibility for the strategic use of IT in the organisation (Ross et al., 1998). Therefore, both types of executives consider each other's objectives and goals as their own. Such an asset is a significant factor in obtaining competitive advantage through leveraging strategically aligned plans (Ross et al., 1998). Ultimately, both give more value to each other's input during the planning process, resulting in a higher level of planning connection.

On the other hand, relationship management is one of the most important tasks of IT management (Hu & Huang, 2006). A good relationship between business and IT can positively influence IT integration in organisations (Armstrong & Sambamurthy, 1999). When there is a good relationship between business and IT executives, it is easy to convince business executives of the importance of IT and its capability. The literature also identified that CIOs' formal and informal interactions with business executives facilitate IT integration in organisations (Hu & Huang, 2006). Therefore, organisations can utilise the benefits of relationship management to develop group capabilities and competencies to achieve organisational goals such as strategic alignment.

The effect of relationship management on the planning connection was fully supported in large organisations and partially supported in the SME sector. Large organisations use all their resources to achieve organisational goals, and thus, they tend to deploy programmes to develop group capabilities and competencies. Large organisations commonly utilise mechanisms such as task forces, interdepartmental committees, liaison personnel and steering committees. This enhances good relationships between business and IT executives towards achieving common goals. Therefore, the effect of

relationship management on planning connection is more visible in the large organisations than the SMES.

6.4.1.3 Prior IS success

Along with shared domain knowledge and relationship management, prior IS success is another identified antecedent (Chan et al., 2006; Hu & Huang, 2006; Reich & Benbasat, 2000; Yayla & Hu, 2009). It captures the perceptions of business executives with regard to the success of the IT unit in the organisation. The findings of this research showed that prior IS success has a positive effect on communication and the planning connection. This result implied that business executives consult more IT executives and request more solutions from the IT unit when business executives trust the IT unit and recognise IT as being successful. On the other hand IT success demonstrates the ability and the competency to help business executives meet their IT needs. Therefore, perceived trust and the success of IT among business executives and the demonstrated ability and the competency of IT executives facilitated better communication and planning integration.

The significant influence on communication suggests that a favourable perception of IS success among business executives encourages communication with IT executives. The prior success of IT creates trust and increases the credibility of the IT function in the organisation and consequently creates a favourable perception of IT among executives (Chan et al., 2006; Hu & Huang, 2006; Reich & Benbasat, 2000; Yayla & Hu, 2009). This encourages business executives to communicate and exchange information with the IT executives (Pearlman & Baker, 2005). In contrast, if the IT unit is unsuccessful, business executives do not invest time and effort in communication with IT executives. Business executives may be reluctant to consult with an unsuccessful group.

On the other hand, IS success improves the confidence and competency of IT executives to help meet others' IT needs in the organisation. Therefore, IT executives tend to communicate more confidently with business executives. In contrast, a lack of success reduces the IT executives' confidence and competency and thus, negatively affects IT executives' communication with business executives. Therefore, the IT unit

has to meet the expectations of business executives and create a good impression among business executives regarding the IT department's success.

Interestingly, the effect of prior IS success on communication was insignificant in large organisations. This result implies that the trust and credibility created through the success of IT is not strong enough to increase communication between business and IT executives in large organisations. However, it is strong enough to alter the planning process in the organisation.

One of the reasons for this insignificant result may be the embedded nature of IT in large organisations. Due to the sophisticated managerial and technical structure of large organisations, IT is a critical and primary resource for daily operations. All the activities are highly dependent on the IT facilities. Therefore, regardless of success, business executives have to rely on IT and they may communicate with the IT unit for their IT needs more frequently. In contrast, in SMEs, the IT function may not be as critical as in large organisations and thus, fewer mandatory requirements may exist for business executives to communicate with the IT unit so frequently. Therefore, prior IS success is important since it builds credibility of the IT function among business executives, and thus business executives are more likely to communicate with IT.

This study also found a positive effect of prior IS success on the planning connection. Efficient and reliable IT services delivery is a critical success factor for aligning IS plans with business plans (Luftman & Brier, 1999; Teo & Ang, 1999). When the IT unit is reliable, credible and delivers its commitments on time, this creates a positive impression and confidence among business executives (Massey et al., 2001) and thus, increases their commitment to the strategic use of IT (Teo & Ang, 1999). Moreover, the business executives' positive perception of the IT unit often determines the participation of business executives in IS planning and participation of IS executives in business planning (Pearlman & Baker, 2005).

Understandably, when the IT unit performs poorly, their lack of credibility can hinder IS planning efforts, and make it difficult to formulate strategies jointly (Lederer & Mendelow, 1989; Teo & Ang, 1999). Moreover, business executives may not invite IT executives to participate in business strategic planning and they may refuse to

participate in IS strategic planning. Therefore, prior IS success gives more value to the IT unit and it facilitates the formulation of IS strategies as well as the integration of business and IT planning processes. The effect of prior IS success on the planning connection was significant for both SMEs and large organisations. This implies that the increased confidence in and the greater credibility of the IT unit enable the IT unit to participate more effectively in the strategic planning process and communicate effectively with business executives.

6.4.2 Environmental uncertainty as an external antecedent

Executives have identified environmental uncertainty as one of the most difficult aspects of strategic planning (Lederer & Mendelow, 1989) as well as being an issue in the alignment of business and IT strategies (Sabherwal & Kirs, 1994). The literature review revealed that most of the previous attempts to understand the impact of environmental uncertainty were largely qualitative and produced mixed results. This research proposed environmental uncertainty as an external antecedent to strategic alignment and found that environmental uncertainty has a positive effect on communication and the planning connection.

One of the reasons for the contradictory arguments in the literature could be the different conceptualisation of environmental uncertainty. Executives experienced three types of uncertainty – perceived, effect and response uncertainty (Milliken, 1987) – and they may each have a different effect on strategic alignment. This research differentiated between the three types of environmental uncertainty and only examined the effects of perceived environmental uncertainty as a perceptual phenomenon. It referred to the perceived unpredictability of environmental factors that have an impact on an organisation's performance (Miller, 1993). Executives' perceptions of the environment have a stronger influence on organisational strategy than the actual environment (Freel, 2005; Gerloff, Muir, & Bodensteiner, 1991; Miller, 1993; Russell & Russell, 1992). If executives perceive an environment to be uncertain then they are likely to make strategic decisions to avoid the consequences of that uncertain environment (Miller, 1988). Therefore, executives' perceptions of environmental uncertainty are more important in determining strategic actions in an organisation (Bourgeois, 1980b; Freel, 2005; Gerloff et al., 1991).

Further, previous alignment studies have considered only the direct effect of environmental uncertainty (positive and negative) on strategic alignment. However, this research treated strategic alignment as an outcome of the alignment process. This research proposed that environmental uncertainty had an indirect effect on strategic alignment and thus proposed it as an antecedent. Organisations are open systems that have interactions between themselves and the external environment (Miller, 1992). Any changes in the external environmental factors – such as competition, market, and technology – affect internal operations (Berglund & Sandström, 2013). In particular, environmental uncertainty is a key influencing force for strategic decision making and the strategic use of IS (Bourgeois, 1980a; Chi et al., 2005; Freel, 2005; Kearns & Lederer, 2004). Therefore, expecting an effect of environmental uncertainty on communication and planning connection would be more meaningful than expecting a direct effect on strategic alignment.

Overall the results support the positive effect of environmental uncertainty on managerial practices. Due to the lack of information, increased environmental uncertainty creates challenges for the development of strategies (Johnston, Gilmore, & Carson, 2008). Moreover, executives may perceive environmental uncertainty differently, they must share information, opinion and perceptions (Gerloff et al., 1991) thus requiring more shared information and coordination among different business units (Freel, 2005). The greater the uncertainty, the greater the amount of information that has to be shared between decision makers during the execution of the task (Galbraith, 1977; Koberg, 1987) and thus more communication is required. The results showed a moderate effect of environmental uncertainty on communication between business and IT executives. This moderate effect only appeared in the large organisations.

The results also demonstrated the positive effects of environmental uncertainty on the planning connection. One of the reasons for this positive effect on planning connection is that organisations respond to environmental uncertainty by increasing planning (Lindsay & Rue, 1980; Matthews & Scott, 1995). Greater unpredictability is likely to force organisations to safeguard their market position through the introduction of innovative strategies. Moreover, executives perceive environmental uncertainty as a

threat as well as an opportunity (Aragon-Correa & Sharma, 2003; Bstieler, 2005; Sharma, 2000). As a consequence, executives require continuous adaption or introduction of different strategies depending on environmental conditions. Therefore, more extensive planning is a successful strategy in an uncertain environment, because it helps planners understand the impact of the environment and better respond to it (Newkirk & Lederer, 2006a, 2006b; Sabherwal & King, 1992). Strategic planning allows organisations to reduce the unfavourable effects of the environment and safeguard their markets. More integrated business and IT planning will help them to face the uncertainty.

Moreover, IT plays a critical role as a source of information. Organisational strategic decisions are derived from many years of data in relation to the internal and external environment (Parnell, Lester, Long, & Köseoglu, 2012). This is even more important in an uncertain environment. Some of the required information to make comprehensive strategic decisions may not be available in an uncertain environment (Fredrickson & Mitchell, 1984). Executives thus have to rely more on IT to derive information and predict the future. Therefore, this extensive use of IT in the decision-making process creates more value for IT units and provides opportunities for IT executives to participate in business strategic planning as well as for business executives to participate in IT planning. Further, it creates opportunities to collectively react to uncertainty through integrated business and IT planning.

The comparative analysis between SMEs and large organisations revealed the positive effect of environmental uncertainty on communication and planning connection appeared only in large organisations. The effect of environmental uncertainty was insignificant for the SMEs. The level of flexibility, different approaches to coping with environmental uncertainty and different perceptions of owners/managers may be the possible reasons for this result.

SMEs are more likely to be capable of adopting changes quickly due to the greater flexibility and simplicity of their internal organisation (Aragón-Sánchez & Sánchez-Marín, 2005). Larger organisations may not have such flexibility and thus, tend to use a proactive approach in adopting changes with proper planning. They thus rely more on IT as a source of generating information. Therefore, more communication between

business and IT executives and planning connection can be expected in the larger organisation. In contrast, due to greater flexibility, SMEs may apply a reactive approach and may be less likely to respond to the environment with long-term planning. Therefore, environmental uncertainty may not be such an influential factor for communication and planning connection between business and IT in SMEs.

Approaches to coping with environmental uncertainty were classified along a range from reactive to proactive (Aragon-Correa & Sharma, 2003). A reactive approach only responds to changes in the environment once those changes have taken place. At the other end of the continuum, the proactive approach involves anticipating future trends and designing or altering processes and strategies in advance to prevent negative environmental impacts (Aragon-Correa & Sharma, 2003; Wernerfelt & Karnani, 1987). Different organisations adopt a different position on this continuum. Miles et al. (1978) described four types of organisations: reactor, defender, analyser and prospector. A reactor responds passively to environmental change and has inefficient internal operations. Defenders are internally focused on operational efficiency and focus on narrow markets (Sabherwal & Chan, 2001; Zhang, Macpherson, & Jones, 2006). The defender does not tend to search for new opportunities (Sabherwal & Chan, 2001). Analysers gain competitive advantage based on efficient internal operations, but also seek emerging market opportunities with new ideas (Sabherwal & Chan, 2001; Zhang et al., 2006). They do not usually initiate new products but often follow the prospectors by introducing competitive products (Sabherwal & Chan, 2001). Prospectors are externally focused on market opportunities and are creators of change in the market (Zhang et al., 2006). Emphasising innovations, the prospectors invest heavily in research and development, and environmental scanning (Sabherwal & Chan, 2001).

Large organisations are more likely to react to the environmental uncertainty with proper environmental analysis using data from several years (Johnston et al., 2008; Morgan & Hunt, 2002). They more often have a dedicated research and development unit. Therefore, large organisations tend to manifest the prospector or the analyser organisation type which are externally focused on market opportunities and are creators of change in the market (Zhang et al., 2006). Both prospector and analyser constantly search for new information and knowledge (Scranton, 1999). Conversely,

SMEs are often regarded as organisations that frequently use old-fashioned managerial approaches and that occupy niche markets (Scranton, 1999). Therefore, SMEs are less likely to use intensive environmental analysis for strategic decision making (Shuman, Shaw, & Sussman, 1985). Moreover, due to the lack of resources and capabilities, SMEs are more likely to implement reactive defender strategies (Aragón-Correa, Hurtado-Torres, Sharma, & García-Morales, 2008). These organisational styles may be a reason for the significant result in the large organisations, and the insignificant result in SMEs. Since the reactions to environmental uncertainty may depend on organisational style, further research is required to fully understand how the effects of environmental uncertainty on managerial practices vary by organisational style.

Further, SMEs' reaction to environmental uncertainty relies on the perception of the owners/managers (Lester & Parnell, 2007). They may not be as proactive as decision makers in large organisations, resulting in less influence on managerial practices. On the other hand, large organisations are more often managed by a group of executives on behalf of the owners. Executives are appointed based on qualifications and experience and are responsible for organisational performance even in an uncertain environment. Executives in large organisations thus need to be more proactive and perform well even in an uncertain environment. Therefore, perceived uncertainty of executives is more influential in large organisations.

A recognised argument in the literature was that a lack of information and the unpredictability of the environmental factors adversely affects strategic planning (Fredrickson & Mitchell, 1984; Lederer & Mendelow, 1989) and thus negatively affects strategic alignment (Sabherwal & Kirs, 1994). However, the findings of this research contradict this argument and provide empirical evidence that environmental uncertainty positively influences managerial practices pertaining to strategic alignment. Chan et al. (2006) argued that given a lack of information, change, and an unstable environment, businesses tend to rely more on IT and thus, environmental uncertainty has a positive influence on strategic alignment. Further, the increase in environment volatility and unpredictability means that organisations must adopt a responsive approach to market changes. In this context, agility becomes essential for business survival. Agility has been identified as a solution for maintaining competitive

advantage in turbulent and uncertain environments (Roberts & Grover, 2012). Therefore, organisations are increasingly reliant on IT since it creates a foundation for organisational agility to respond to environmental changes (Donaldson, Blackburn, Blessner, & Olson, 2015; Ross, Weill, & Robertson, 2006). However, since the findings are counter-intuitive, further research with qualitative evidence is required to fully understand why environmental uncertainty has this positive influence on strategic alignment.

6.4.3 Effects of three sources of uncertainty on managerial practices

This research conceptualised environmental uncertainty using three first-order constructs: market, technological and regulatory uncertainty. Market uncertainty is one of the most challenging factors for strategic decision making (Bowen & Bowen, 2014; Bstieler, 2005). Similarly, organisations increasingly rely on IT for competitiveness (Chan et al., 2006) and IT has been considered a strategic tool to help gain competitive advantage (Choe, 2003). Moreover, changes to existing regulations and new regulations which expose organisations to regulatory uncertainty have an influence on strategic planning (Engau & Hoffmann, 2009; Hoffmann et al., 2009). Therefore, further analysis helps to identify the effect of each source of uncertainty on managerial practices.

The results of the full sample showed the positive effects of market uncertainty and technological uncertainty on planning connection. Regulatory uncertainty was not found to have any direct effect on planning connection. This again confirms the argument that organisations respond to uncertainty with increased planning (Matthews & Scott, 1995). Generally, organisations continuously adapt strategies in line with changes in the market and in technology (Chi et al., 2005). Therefore, uncertainty in the market and technology positively influences the planning connection. On the other hand, regulatory changes apply equally to all the organisations within the industry, and thus, organisations may adapt business activities according to new regulatory changes rather than trying to obtain advantages by manipulating the rules (Engau & Hoffmann, 2009; Le, Harvie, Blackburn, & Schaper, 2012). Therefore, regulatory uncertainty is less likely to influence strategic decision making. However, some literature argued that regulatory changes create new opportunities (Mechanic, 2012). Therefore, further

research is required to fully understand the effects of regulatory uncertainty on strategic decision making.

6.4.3.1 Effects of three sources of uncertainty in SMEs

None of the uncertainties had an effect on communication and planning connection in SMEs. This result again confirms the arguments raised earlier in this discussion. SMEs tend to occupy a narrow market niche (Scranton, 1999) and their reaction to environmental uncertainty relies on the perceptions of owners/managers (Lester & Parnell, 2007). Generally, SMEs are less likely to use a proactive approach to the environment. They more likely to use a defender approach (Aragón-Correa et al., 2008). Further, one of the ways of dealing with environmental uncertainty is through scenario planning (Morgan & Hunt, 2002) which is a technique that has been used mainly by larger organisations (Johnston et al., 2008). However, due to its complexity, high cost and intensive information process, scenario planning is unattractive to SMEs (Johnston et al., 2008). Therefore, environmental uncertainty may not be such an influential factor for communication and planning connection.

6.4.3.1 Effects of three sources of uncertainty in large organisations

In large organisations, only market uncertainty and technology uncertainty were found to have a positive direct effect on both communication and planning connection. As discussed earlier, large organisations are more likely to adopt a more proactive approach using the analysis of cumulative data from several years. Techniques such as scenario analysis are being used to deal with uncertainty (Johnston et al., 2008; Morgan & Hunt, 2002). Therefore, business and IT executives discuss the ideas and opinions about the market and technology more frequently (Koberg, 1987), improving communication between business and IT executives. Further, greater planning connection thus helps executives to understand the market and collectively identify the strategies to respond to uncertainty.

When the effects of market uncertainty and technological uncertainty were compared with each other, the positive effect of technological uncertainty on managerial practices was much greater than the effect of market uncertainty. This suggests that technological uncertainty is more influential than market uncertainty. Organisations

have shifted from gaining competitive advantages through market-based strategies to technology-driven strategies (Teece, 2007; Teece et al., 1997). Therefore, both business and IT executives work together to find innovative IT-based strategies to gain advantages.

6.5 Chapter summary

The results obtained through comprehensive statistical analysis helped successfully answer all the research questions and this chapter has compared these findings with the literature.

The strategic alignment process can be considered as a knowledge integration process used to reach a better alignment of IT strategies with business strategies. Within that process two managerial practices facilitate knowledge sharing between business and IT executives. Four antecedents provide the required knowledge and behavioural tendency for the alignment process. This was confirmed by the empirical results of this research.

The empirical results of this research found that the two managerial practices positively affect strategic alignment. Both communication between business and IT executives and business–IT planning connection help to develop the necessary mutual understanding and opportunities for executives to consider each other's requirements and reconcile conflicting objectives. This leads to a better convergence of business and IT strategies. Moreover, as the planning process is a formal process and the outcomes are documented, the planning connection has a stronger effect on strategic alignment than communication. However, communication plays an important contingent role in the alignment process. In particular, communication is more important if the organisations lack an integrated planning process.

This research also found that all the internal antecedents provide favourable conditions for alignment to occur. Each of the antecedents positively supports better communication and planning connection. However, the effects vary. With regard to environmental uncertainty, the results rejected the argument made in the literature of the negative effect on strategic alignment and confirmed a positive effect on alignment.

This research empirically proved the positive effect of environmental uncertainty on managerial practices. Environmental uncertainty, therefore, creates favourable conditions for alignment.

Another finding of this research is that the relative importance of antecedents varies between SMEs and large organisations. SMEs and large organisations fundamentally differ from each other. Therefore, different characteristics may influence the alignment process resulting in a different level of importance of antecedents among SMEs and large organisations. Overall, the results achieved the research objectives by successfully answering the research questions.

CHAPTER 07: CONCLUSION

This chapter provides a conclusion to the research. The chapter begins with an overview of the research process followed by a discussion of the key research contributions to IS literature and practice. To conclude, the limitations and future research possibilities are discussed.

7.1 Overview of the research

Strategic alignment is viewed as an important driver for optimising organisational performance (Chan et al., 2006; Yayla & Hu, 2012). Despite recognition of its importance, attaining alignment remains a challenge (Luftman & Derksen, 2014; Luftman et al., 2012; Preston, 2014), and only a few organisations consider themselves to be in business–IT alignment (Luftman et al., 1999; Rosa, 1998). Environmental uncertainty, in particular, has been found to be one of the key challenges (Chan et al., 2006; Sabherwal & Kirs, 1994; Yayla & Hu, 2012). As discussed in the literature review in chapter 2, previous empirical findings for the implications of environmental uncertainty on strategic alignment are limited and have mixed results. Most of those studies were largely exploratory and lacked statistical validation for the effects of environment uncertainty. Moreover, the majority of alignment studies have been conducted in the developed countries so there was a lack of empirical validation in a developing country context, thus limiting the generalisation of findings (Kapurubandara & Lawson, 2006). This research attempted to fill these gaps by providing empirical assessment of a comprehensive alignment model.

There were two objectives for this research. The first objective was to determine the effect of environmental uncertainty on managerial practices which pertain to strategic alignment. The second objective was to determine the effect of the internal antecedents on managerial practices in an uncertain environment. Both objectives were successfully accomplished by the extended literature review and empirical validation of the conceptual model. The two research questions that guided this research were:

RQ1: How does environmental uncertainty affect the managerial practices which pertain to strategic alignment?

RQ2: What is the effect of internal antecedents on the managerial practices in an uncertain environment?

The literature review in chapter 2 facilitated the identification of the theoretical concepts of strategic alignment. They were fundamental to the development of the conceptual model of the strategic alignment process introduced in chapter 3. Empirical validation of the conceptual model answered the two research questions. Partial Least Squares structural equation modelling techniques facilitated empirical validation and the results were presented in chapter 5. The analysis revealed that organisation size has a positive influence on strategic alignment and thus, the research addressed organisation size and identified whether the antecedents of strategic alignment manifest different effects in SMEs and large organisations.

In order to achieve the first research objective and answer the first research question, two research sub-questions were posed to guide the study.

RQ1a: How does environmental uncertainty affect communication in the context of strategic alignment?

RQ1b: How does environmental uncertainty affect planning connection in the context of strategic alignment?

The research was able to effectively answer the two sub-research questions. In regard to sub-question 1a, it was found that perceived environmental uncertainty positively influences communication between business and IT executives. However, a moderate effect appeared only in the large organisations, while the effect was not significant in the SMEs. Thus, perceived environmental uncertainty is not a strong influencing factor for increasing communication between business and IT executives.

In regard to sub-question 1b, the positive influence of perceived environmental uncertainty on business and IT planning connection was confirmed. Extensive strategic planning helps organisations to understand the impact of the environment and better respond to it and thus, perceived environmental uncertainty increases the business–IT planning connection in organisations.

In order to achieve the second research objective and answer the second research question, two research sub-questions were posed to guide the research.

RQ2a: How do internal antecedents affect communication in an uncertain environment?

RQ2b: How do internal antecedents affect planning connection in an uncertain environment?

Once more, the research was able to effectively answer the two sub-research questions. In regard to sub-question 2a, three hypothesised antecedents were found to have a positive influence on communication between business and IT executives. From the hypothesised antecedents, all three antecedents had a positive effect on business–IT planning connection and thus, sub-question 2b was successfully answered.

Answers to all the research questions were found through validating a conceptual model. Overall, through the review of the research objectives and associated research questions, it can be concluded that this research fulfilled its purpose and successfully evaluated the implications of environmental uncertainty on business–IT alignment through validating a conceptual model of the antecedents, i.e. managerial practices that influence business–IT alignment. The findings contribute to the literature on strategic alignment in several ways and also provide insights for practitioners.

7.2 Contribution to IS literature

One of the contributions of this research is the theoretical explanation of the strategic alignment process using two theories: the knowledge-based view of the firm and the resource-based theory. Theories provide comprehensive conceptual understanding of the research phenomena. Further, they give researchers theoretical 'lenses' through which to look at complicated problems. One of the limitations of previous alignment research was that it was largely lacking in theory and heavily reliant on strategic management literature (Chan & Reich, 2007b). With the use of two theories, this research provided both a knowledge-based perspective and a resource-based perspective on the strategic alignment process.

From the perspective of the knowledge-based view, the alignment process presented in this research was a knowledge integration process between business and IT executives. The process consisted of three basic elements of knowledge integration: the knowledge, the integration process and the knowledge integration (outcome) (Kearns & Sabherwal, 2007; Okhuysen & Eisenhardt, 2002). The four antecedents contributed to the knowledge integration process by providing the required knowledge. The two managerial practices facilitated the integration of business and IT knowledge to achieve an alignment of business and IT.

From the perspective of the resource-based theory, the alignment process presented in this research facilitates alignment by utilising internal resources. The resource-based theory suggests that organisations need to focus on unique internal corporate resources to obtain sustainable competitive advantages. The alignment process presented in this research focused on unique internal resources such as shared domain knowledge and knowledge gained through prior IS success. Further, the resource-based theory suggests creating value through synergies between IT and other organisational resources (Melville et al., 2004; Nevo & Wade, 2010) and implementing processes that are inimitable (Vitale et al., 1986). The alignment process presented in this research facilitates synergies between IT and business executives through a unique inimitable process of strategic alignment. Knowledge is considered a unique resource for an organisation (Kearns & Sabherwal, 2007; Kogut & Zander, 1992). Moreover, strategic alignment is an inimitable process for the organisation which combines business and IT resources in order to support business objectives (Reich & Benbasat, 1996).

Another contribution of this research is the introduction of environmental uncertainty as an external antecedent to strategic alignment. Previous studies produced mixed results in regard to the impact of environmental uncertainty on strategic alignment. Environmental uncertainty has been considered an inhibitor (Sabherwal & Kirs, 1994), as well as an enabler (Chan et al., 2006). Sabherwal and Kirs (1994) hypothesised environmental uncertainty as an inhibitor of alignment between an organisation's critical success factors and its IT capabilities. They postulated that the lack of necessary information in uncertain environments disturbs the harmony in

organisations, and thus inhibits the alignment. Later studies such as those of Teo and King (1997) and Chan et al. (2006) argued that due to the lack of information in an uncertain environment, executives rely more on information systems and thus, it positively influences strategic alignment. However, none of the approaches to environmental uncertainty, as an inhibitor or as an enabler, are empirically supported.

One of the key differences between the literature and this research is the consideration of environmental uncertainty as an antecedent, as opposed to having a direct effect on alignment. Organisations are open systems that interact with the external environment. Business executives view the impact of external factors such as competition and business environment as one of the most difficult aspects of the IS strategic planning process (Lederer & Mendelow, 1986). Therefore, this research proposed that environmental uncertainty affects the two managerial practices – communication and planning connection – pertaining to strategic alignment. This was more meaningful than assessing its direct effect on strategic alignment as suggested in previous studies.

Building on the strategic alignment and management research literature, this research developed a conceptual model to assess the impact of environmental uncertainty on managerial practices pertaining to strategic alignment. It empirically validated the positive effect of environmental uncertainty on managerial practices. Therefore, this research extends the alignment literature by integrating the existing literature and introducing environmental uncertainty as an external antecedent to strategic alignment.

Another important contribution to the literature is the conceptualisation of the environmental uncertainty construct. One possible explanation of mixed findings in the literature could be due to the issue of conceptualising the construct while disregarding the sources of the uncertainty. Environmental uncertainty is often caused by changes in either the market, technology or regulatory environment and thus literature suggests three sources: market uncertainty, technological uncertainty and regulatory uncertainty (Bstieler, 2005; Engau & Hoffmann, 2009). Attempting to capture the effect of environmental uncertainty by focusing on a single source may have prevented researchers from detecting the effect of its other sources. This research conceptualised environmental uncertainty in a broader sense and measured environmental uncertainty using three first-order constructs which measured market

uncertainty, technological uncertainty and regulatory uncertainty. The measurement and validation of environmental uncertainty by considering the three sources provides a foundation for researchers to explore the implications of environmental uncertainty in the context of information systems.

This research also extends theory by highlighting the interaction effect between communication and planning connection on strategic alignment. In integrated planning, business and IT executives are both present and develop business and IT plans simultaneously and interactively (Teo & King, 1996). Therefore, planning connection creates an interface for cross-functional communication. Moreover, communication facilitates the integration of different views in the planning process. Therefore, this research postulated an interaction effect between communication and planning connection on strategic alignment. This is the first research to establish this relationship. This research found statistical support for a significant negative interaction effect between communication and planning connection on strategic alignment. This highlighted how the role of communication between business and IT executives in the alignment process depends on the level of planning connection, i.e. if an organisation increases the planning connection then the effect of communication between business and IT executives on strategic alignment diminishes.

Another contribution of this research is the empirical validation of an alignment model based on recent literature and advances in statistical techniques. Although there has been significant research on strategic alignment emphasising its antecedents, most of the studies on the social dimension of strategic alignment were largely subjective and exploratory (Aggarwal, 2010; Yayla & Hu, 2009). The majority of the data used in these studies was gathered in the 1990s when IT had a considerably less strategic role in organisations. Further, most of the studies utilised less sophisticated statistical techniques such as t-tests and multiple regression. This research is a confirmatory study and data was collected from organisations which use IT as a strategic tool for business. Further, the structural equation modelling technique was used to test the proposed model and the model demonstrated good predictive power.

Extending the validity of the alignment process to the developing country context is another theoretical contribution. Differences between developed and developing

countries such as available infrastructure, and social and cultural issues may not support generalising the findings from developed countries to developing countries (Kapurubandara & Lawson, 2006; Kartiwi & MacGregor, 2007). There was a lack of empirical support for the arguments raised in alignment studies in a developing country context (Chan & Reich, 2007b; Yayla & Hu, 2009). Therefore, the investigation of the strategic alignment phenomenon in Sri Lanka extends the validity of the antecedents of strategic alignment and provides empirical evidence in the context of a developing country.

Finally, even though Chen et al. (2006) found that organisational size influences strategic alignment, the role of organisation size in the alignment process has not been sufficiently investigated in the alignment literature. In the literature, organisation size has been widely used as a control variable in the analysis. However, SMEs and large organisations are fundamentally different from each other and that influences their internal business processes and the way organisations achieve their objectives. Thus, a direct assessment of how organisation size influences the alignment process is another contribution of this research. This research addressed organisation size and measured the influence of antecedents on strategic alignment in SMEs and large organisations separately. The findings revealed that the relative influence of antecedents varies between SMEs and large organisations. Therefore, this research contributes to the alignment literature by producing comparative empirical evidence from SMEs and large organisations. Examining the alignment process in SMEs and large organisations separately is beneficial because it provides insights on how the alignment process works differently in each type of organisation.

7.3 Contribution to practice

The research presents a broader view of the alignment process and highlights the importance of two managerial practices and the role of antecedents in the alignment process. Therefore, this research provides useful advice for executives on how to achieve and sustain strategic alignment by manipulating the managerial practices and relevant antecedents. The findings of the research can be translated into a set of useful guidelines for executives.

Strategic alignment is a shared responsibility between business and IT executives. The action of one unit alone is not sufficient to achieve business–IT alignment. One of the ways to motivate both business and IT executives to facilitate strategic alignment is the planning connection. This means that both business and IT executives should participate, and business and IT plans should be developed and ratified simultaneously. An integrated planning process creates a cross-functional environment to attain strategic alignment by knowledge sharing. Therefore, organisations need to promote an integrated planning style for strategic planning. This research further found that planning connection contributes equally to strategic alignment in both SMEs and large organisations. Therefore, regardless of their size, any organisation can utilise the integrated planning process to achieve strategic alignment.

Communication between business and IT executives plays an important contingent role in the alignment process. This means that when the organisation increases the planning connection the positive impact of communication on strategic alignment declines. It does not mean that communication is less important and organisations should encourage the planning connection and discourage communication. Instead, organisations need to use both practices wisely. For instance, when the organisations lack or find it difficult to establish a planning connection, they can still attain alignment by providing the required knowledge integration through increasing communication between business and IT executives. Therefore, communication can play an important role in alignment by itself or as an embedded part of the planning connection. Organisations can adopt strategies to improve communication between business and IT executives. Possible strategies are inviting each other to formal and informal meetings, using liaisons, task forces, or steering committees where IT and business executives participate actively, or making the top IT executive a member of the top management team.

Communication has a lesser effect on strategic alignment in SMEs. However, this does not mean that communication is not important in SMEs. The main reason for such a result is the flow of communication. SMEs are more likely to have a strong horizontal communication flow due to centralised decision making. However, cross-functional communication in SMEs is still important, because it helps to share knowledge and

creates trust between different functional areas which is beneficial for the planning connection.

Another finding with implications for practice is that environmental uncertainty works as a facilitator for strategic alignment. As globalisation increases, executives are forced to respond to greater environmental uncertainty. Therefore, this research helps executives to understand the impact of environmental uncertainty and better respond to it in the context of strategic alignment. The managerial perception of environmental uncertainty is an influencing factor for internal actions. For instance, if executives perceive an environment to be uncertain then they tend to take actions to avoid the consequences. IT is one of the ways to produce information and facilitates decision making by bridging the information gap. Therefore, in such environments, executives take the importance of IT more seriously during the strategy-making process. Therefore, environmental uncertainty has positive implications for communication and planning connection. Although the environment is an external factor, uncertainty creates favourable conditions for alignment to occur.

Another contribution of this research is the identification of the effect of antecedents on managerial practices. The three internal antecedents are essential prerequisites that facilitate strategic alignment. Shared domain knowledge facilitates alignment by providing knowledge of another domain. Trust and credibility of IT are essential for the use of IT. Therefore, prior IS success provides the trust and credibility to consider IT a reliable resource for business. Finally, relationship management enhances the social aspects required for the cross-functional collaborative process, such as trust and mutual understanding. Further, the influence of antecedents on managerial practices varies by firm size. However, overall, the three antecedents play a significant role in the alignment process either through communication or planning connection or both. Therefore, organisations need to be aware of all three antecedents.

Therefore, business and IT executives should seek opportunities to increase their knowledge of each other's domains. Organisations can arrange training sessions for executives and encourage executives to participate in such sessions. This helps business executives to identify the capabilities and limitations of information

technology and helps IT executives to understand the business environment, problems and role of IT in the business.

Similarly, IT executives should be more proactive in terms of increasing the visibility of their successes and making sure that they meet the expectations of business executives. This would increase the perception of reliability and credibility of the IT unit among business executives. Business executives are more likely to consult IT executives if they perceive the IT unit as successful and reliable. Therefore, the IT unit has to meet the expectations of business executives and achieve success; otherwise, they may not only lose their trust and credibility among business executives but also erode their own confidence and competency.

Finally, relationship management helps to improve the social capital of an organisation such as trust in and recognition of each other. Organisations thus can utilise features of social capital for the improvement of the connection between business and IT. Having a good relationship between business and IT executives builds trust, recognition and understanding between the two groups which is vital for active participation and free flow of cross-function information sharing during the strategic planning process. Therefore, both business and IT executives need to make an effort to maintain a good relationship with each other and organisations need to facilitate such relationships. Organisations should utilise both formal methods such as joint learning activities and joint committees, and informal methods such as get-togethers and other social events to establish good relationships between groups.

7.4 Research limitations

One of the limitations of the research is the possible recursive relations between some of the constructs in the research model. For instance, communication between business and IT executives may increase their shared domain knowledge. However, the correlations between constructs cannot indicate the direction of the relationship. Therefore, the directions of the relationships should be derived from the theory and thus, the directions of relationships between constructs were hypothesised based on the alignment literature (Hu & Huang, 2006; Reich & Benbasat, 2000).

Common method variance is a potential threat to the findings of a study which uses self-reported surveys. This research utilised commonly-used statistical techniques to measure the potential method variance. Although the effect of the common method variance was found to be insignificant, it is important to note that these techniques do not correct for this bias but rather measure its effect size.

Another limitation of this research is the use of the cross-sectional survey. The data were only collected at one point in time. Therefore, the interpretation of the causality expressed is not as robust as in a longitudinal study. Future studies may extend this research by adopting longitudinal methods that lead to stronger conclusions.

There are some challenges such as measurement error, sampling error, internal validity error, and statistical conclusion error, mainly due to the quantitative nature of this research (Straub, 1989). These errors may reduce the accuracy of results (Hair et al., 2014). This research attempted to mitigate these errors through a rigorous process of model development, instrument validation, pilot test and data collection. Nevertheless, possible errors cannot be completely ruled out.

The importance of strategic alignment may vary by the stage of a firm's life cycle. For instance, strategic alignment may not be a significant problem for organisations in their early stages. Therefore, this may have influenced the results. This research attempted to mitigate this issue by assessing the level of strategic importance of IT to the organisation. Organisations were asked to rank the level of importance of strategic alignment and the research only considered those who ranked it as important. However, there may be a potential influence of level of strategic use of IT which is not measured in this research.

Another limitation of the research is the use of perceptual data to validate the research model. Perceptions of CEOs can be biased due to their attempts at self-promotion or due to the complexity of the organisation (Tallon, Kraemer, & Gurbaxani, 2000). Therefore, it is possible that these perceptual measures did not accurately reflect reality. However, the use of perceptual data has been widely accepted in alignment research (Chan et al., 1997; Chan et al., 2006). Moreover, this creates a further research opportunity for validating the model using objective measures of the constructs. For

instance, strategic alignment can be measured using profile deviation scores based on the distance between the actual level of alignment and an ideal alignment profile (Chan & Reich, 2007b; Sabherwal & Kirs, 1994).

Finally, the population sampled in this research is limited to organisations in Sri Lanka. This limits the generalisability to other contexts (Johnson & Onwuegbuzie, 2004). Therefore, future research could expand the sample population to other countries and test the research model and hypotheses to increase the generalisability of the results.

7.5 Future research opportunities

One opportunity for future research is the investigation of the alignment process by strategy type. Some of the antecedents may not have significant effects on alignment for certain business strategies. For instance, the effect of the antecedents may depend on the business strategy types such as defender, prospector and analyser (Chan et al., 2006). Similarly, reactions to environmental uncertainty may vary by the strategy type. Therefore, one of the areas for future research is the investigation of the effects of antecedents and environmental uncertainty with regard to the business strategy. Such an investigation will reveal how the effects of antecedents including environmental uncertainty vary by strategy type.

Secondly, investigation of the effects of environmental uncertainty by type is another future research area. Executives can experience three types of uncertainty: state, effect and response uncertainty (Milliken, 1987). This study only considered perceived environmental uncertainty in terms of the market, technology and regulatory environments. Therefore, another area for further research is the investigation of the effect of other types of environmental uncertainty. Each type may have a different effect on strategic alignment. For instance, effect and response uncertainty may have a different level of influence than perceived uncertainty. Such an investigation would reveal how the effects of uncertainty vary by type.

Another possible future research avenue is to expand the research model by including organisational performance. The alignment literature provides empirical support for the positive effect of strategic alignment on organisational performance. An

investigation of the effects of antecedents and managerial practices would help in understanding how the strategic alignment process affects organisational performance.

Use of the multiple informant approach for alignment research is another future research area. Even though some studies suggested using a multiple informant approach for organisation-level studies this research used a single informant approach due to the practical constraints of the multiple informants approach. However, the use of the single informant approach has been widely accepted in information systems research (Wagner, Rau, & Lindemann, 2010; Malhotra & Grover 1998) and it has been used as a reliable data collection approach in strategic alignment research (Gutierrez et al., 2009; Kearns & Sabherwal, 2007). The informants for this research were CEOs and thus, the findings represent only the CEOs' perspectives. The CIOs' perspectives with regard to the alignment might differ from the CEOs' perspectives. Therefore, future research could integrate both perspectives by utilising the multiple informant approach and testing the research model and hypotheses to increase the generalisability of the results. It would also reveal whether there are any differences in perspectives.

The findings of the research show that antecedents of strategic alignment have different effects in SMEs and large organisations. However, this research does not sufficiently explain the underlying reasons for the different effects. Therefore, another future research area is the investigation of how antecedents manifest different effects in SME and large organisations. In particular, centralisation and formality are considered important factors in strategic decision making (Ranganathan & Sethi, 2002; Rothfeder, 2005). SMEs are more likely to have a centralised decision-making structure and less formal processes. Therefore, such an investigation would reveal the underlying reason for the different effects.

Certain other contextual factors may influence the relationships investigated in this research. Other contextual factors such as organisation culture and organisation structure may influence the research outcomes. They were excluded from this research due to the limited scope and limited resources of the research. Thus, future researchers should consider including such contextual factors to better understand the strategic alignment process. Lack of consideration of contextual factors might be a reason for the different effects of antecedents in SMEs and large organisations.

Finally, the conceptual model of this research was validated using a sample consisting of a wide range of industries. Therefore, some useful details for further explaining the relationships may have been overlooked, such as industry-specific information. A single study on alignment cannot be exhaustive. The literature also highlights the need for future research on industry-specific and strategy-specific IS alignment (Chan et al., 2006). Such studies would explore specific research phenomena and make industry-specific and strategy-specific recommendations for practice.

APPENDICES

Appendix A: Selected studies that investigate the antecedents of strategic alignment

Author(s)	Definition of Strategic Alignment	Methodology	Sample	Antecedents
Pyburn (1983)	"The relationship between the overall organisation's missions, objectives, and strategies, and those for MIS" (p.3)	Descriptive analysis of survey data	8 organisations	Style of senior management decision making Volatility of the business and the applications development portfolio Complexity of the IT organisation and management tasks Status and physical location of the IS manager Business planning style
Chan and Huff (1993)	"the fit between business strategic orientation and IS strategic orientation" (p.126)	Multiple regression	170 North American companies	Awareness Integrate operational plan
Sabherwal and Kirs (1994)	"The proximity of the organisation's IT capability to the ideal capability for its critical success factors" (p. 304)	Multiple regression	244 US academic institutions	Environmental uncertainty Organisational integration IT management sophistication
Reich and Benbasat (1996)	"The degree to which the IT mission, objectives and plans support and are supported by the business mission, goals and needs" (p. 56)	Interviews Written documents	3 Canadian insurance firms (10 separate business units)	Choices of actor, timing, decision making, and communication used during IT and business planning process

Luftman et al. (1999)	"Appling IT in an appropriate and timely way, in harmony with business strategies, gals and needs" (p. 3)	Descriptive analysis of survey data	Over 500 US firms during 1992-1997	Senior executive support to IT IT involved in strategy development IT understands the business Business/IT partnership Well-prioritized IT projects IT demonstrates leadership
Teo and Ang (1999)	"alignment of IS plans with business plans" (p.173)	Descriptive analysis of survey data	Senior IS executives in 600 firms	Top management is committed to the strategic use of IT Information systems (IS) management is knowledgeable about business Top management has confidence in the IS department The IS department provides efficient and reliable services to user departments There is frequent communication between user and IS departments The IS staff are able to keep up with advances in IT Business and IS management work together in partnership in prioritizing applications development Business goals and objectives are made known to IS management The IS department is responsive to user needs

				Top management is knowledgeable about IT
				The IS department often comes up with creative ideas on how to use IT strategically
				The corporate business plan is made available to IS management
				There is a set of organisational goals and objectives for the IS department
				User departments view IS staff as competent
				The IS management actively participates in business planning
				Top management actively participates in IS planning
				The planning horizons for business and IS plans are similar
				Users actively participate in IS plannin
Reich and Benbasat (2000)	"The degree to which the IT mission, objectives and plans support and are supported by the business mission, goals and needs" (p. 82)	Interviews Written documents	3 Canadian insurance firms (10 separate business units)	Shared domain knowledge
				Successful IT history
				Communication between business and IT executives
				Connection between business and IT plans

196

Chan (2002)	"The fit between the priorities and activities of the IS function and the business unit" (p. 98)	Interviews Written documents	5 US firms 3 Canadian firms	Communication and understanding Linked IS and business plans/planning Business executives committed to IS
Hussin et al. (2002)	"How well the content of the business strategy match[es] the content of the IT strategy" (p. 110)	Cluster analysis	256 UK small manufacturing firms	IT sophistication CEO committed to IT External IT expertise
Chan et al. (2006)	"The deviation of an organisation's actual IS strategy from the IS strategy that is theoretically ideal for its business strategy" (p. 33)	Structural equation modelling	164 US firms 62 Canadian firms 244 US academic institutions	Shared domain knowledge Prior IT success Planning sophistication Organisation size Environment uncertainty
Hu and Huang (2006)	"The degree to which the IT mission, objectives and plans support and are supported by the business mission, goals and needs" (Reich & Benbasat, 2000)	Interviews Written documents Case study	1 US firm	Shared domain knowledge Successful IT history Relationship management Communication between IT and business Connection between IT and business plans
Kearns and Sabherwal (2007)	"The extent to which the strategic IT plan is aligned with the business strategy" (p. 133)	Structural equation modelling	269 US firms	IT managers' participation in business planning Business managers' participation in IT planning

| Yayla and Hu (2009) | "The fit between IS strategy and business strategy of organisations" (p. 2) | Partial Least Squares analysis | 169 Turkish firms | IT unit structure
Shared domain knowledge
Successful IT history
Relationship management
Communication
Connection |

Appendix B: Detailed conceptual model
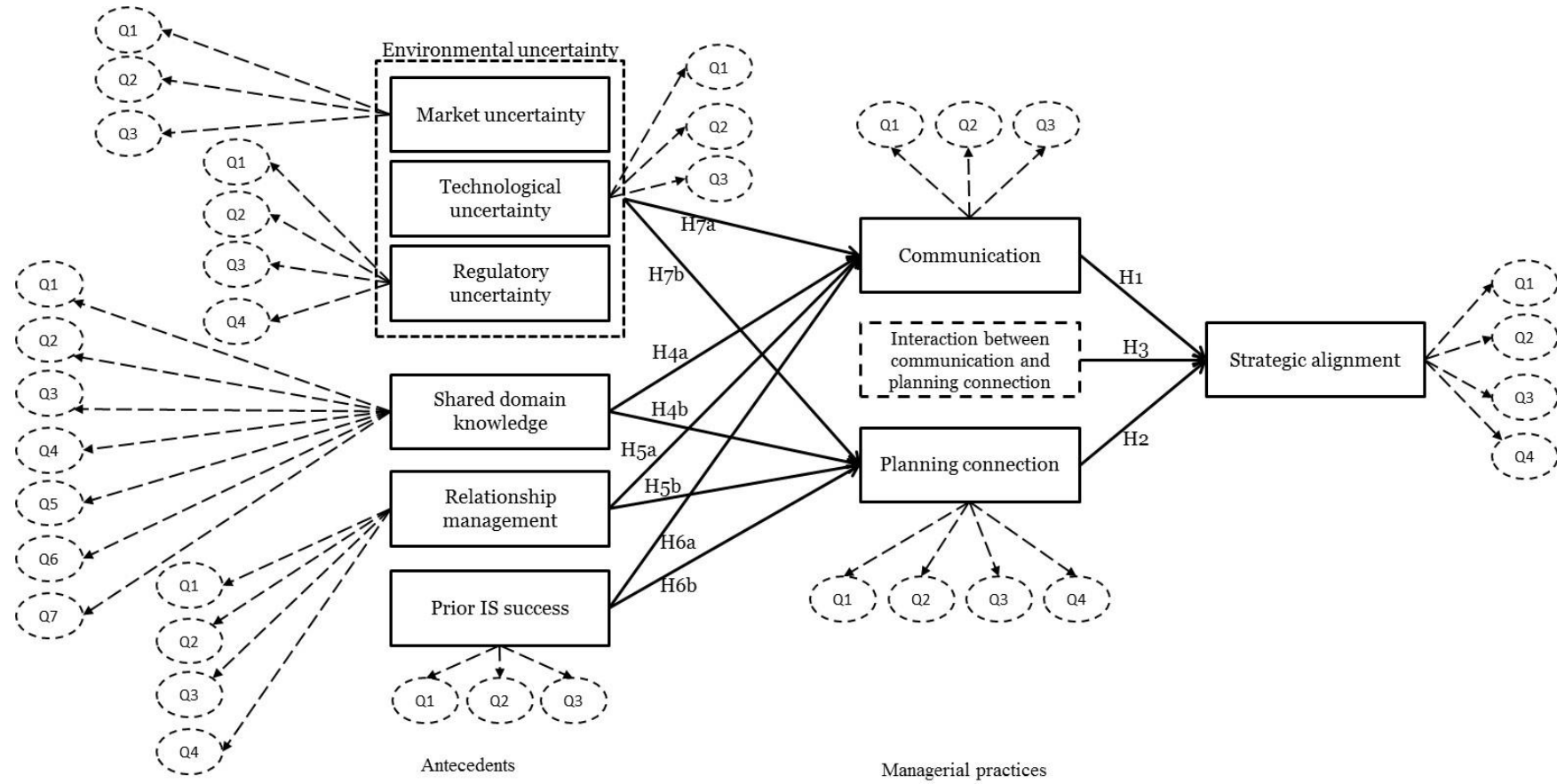
Appendix C: Definitions of the research constructs

Constructs	Definition
Strategic Alignment	"The extent to which the IT mission, objectives, and plans support and are supported by the business mission, objectives, and plans" (Reich and Benbasat, 2000, p. 82).
Communication	"A process through which individuals share and create information in order to reach a mutual understanding" (Johnson & Lederer, 2005, p. 229)
Planning connection	The degree of integration between business and IT planning process (Hu & Huang, 2006; Reich & Benbasat, 2000)
Shared domain knowledge	"The ability of IT and business executives, at a deep level, to understand and be able to participate in the other's unique key processes and to respect each other's unique contribution and challenges" (Reich & Benbasat, 2000, p. 89).
Relationship management	The extent to which parties (business and IT executives) have the orientation or behavioural tendency to actively cultivate and maintain close working relationships (Smith, 1998, p. 79).
Prior IS success	The perceptions of business executives with regard to the success of the IT unit in organisation (Reich & Benbasat, 2000).
Environmental uncertainty	The perceived unpredictability of environmental variables that have an impact on an organisation's performance (Miller, 1993)
Market uncertainty	The perceived unpredictability of rapid and significant changes in, and the instability and complexity of, market (Bstieler, 2005)
Technological uncertainty	The perceived unpredictability of rapid and significant changes in, and the instability and complexity of, technology (Bstieler, 2005)
Regulatory uncertainty	The perceived unpredictability of rapid and significant changes in, and the instability and complexity of, regulations and policies (Bstieler, 2005; Engau & Hoffmann, 2009)

Appendix D: Human Ethics Committee (HEC) approval

SIM HUMAN ETHICS COMMITTEE

Comments on Application for Human Ethics Approval

Date: 7 March 2014

Principal Researcher: Amitha Padukkage

Research Project: The impact of environmental uncertainty on business-IT alignment

Supervisor: Janet Toland

Reference No: 20715

	Accept
X	Accept with minor changes. (Stated below)
	Accepted with required changes. (Stated below)
	Do not accept in present form. (Changes required as below)

Required Changes (dealing with ethical issues only)

Application Form

1.   5(b) – Please indicate how long survey completion is likely to take.

Invitation Email

2.   Please include a statement indicating how long survey completion is likely to take.

Appendix E: Survey pack used for the survey

SCHOOL OF INFORMATION MANAGEMENT
TE KURA TIAKI, WHAKAWHITI KŌRERO
LEVEL 5, RUTHERFORD HOUSE, PIPITEA CAMPUS, 23 LAMBTON QUAY, WELLINGTON
PO Box 600, Wellington 6140, New Zealand
Phone + 64-4-463 5103 **Fax** +64-4-463 5446 **Email** sim@vuw.ac.nz **Website**
www.victoria.ac.nz/sim

<The Chief Executive Officer name>
<Company>
<No and Street>
<City>
<District>
<Postal Code>

<Date>

Dear <Sir / Madam>

Invitation to participate in a research study

Research study: Implications of environmental uncertainty as an antecedent to business IT alignment

I am a Lecturer in the Department of Information Technology at the Faculty of Management Studies and Commerce, University of Sri Jayewardenepura. I am also a PhD student in the School of Information Management at Victoria University of Wellington, New Zealand.

As part of the completion of my PhD, I am conducting a research study about how organisations integrate information technology (IT) with business. This has been found to be one of the most important requirements for converting IT investment into profit. Often business is conducted in a complex and rapidly changing business environment. This research study aims to identify how uncertainty in the business environment influences the alignment between business and IT.

The research promises to yield important results for the business community. Managers can utilize the findings of the research to improve integration of IT with business even when operating in an uncertain environment.

Over 800 Sri Lankan companies in a variety of industries have been invited to participate in the survey. In each company, the CEO is being asked to participate in the survey. Participation is voluntary, and you and your company will not be identified

in any report produced as a result of this research. All information collected will be kept confidential to the researcher and his supervisors. A summary of the results will be sent to the participants when the research is completed.

I would be very grateful if you would participate in this survey. Together with this letter, I have enclosed a questionnaire and a consent form which will require your signature as a participant. I have also enclosed a participant information sheet indicating the guidelines of the research, and a self-addressed envelope in which you can return the completed questionnaire to me. I hope you will take a few minutes to complete this questionnaire. I anticipate that the questionnaire will take you no more than 15 minutes to complete. Please return the completed questionnaire together with the consent form on or before <Date>.

If you have any questions or would like to receive further information about the project, please contact me at telephone +94 112 881 500 (ext.1212) or email - amitha.padukkage@vuw.ac.nz. Alternatively, you can contact my supervisor Dr. Janet Toland, School of Information Management, Victoria University of Wellington at janet.toland@vuw.ac.nz or telephone +64 4 463 6861.

Your participation is highly appreciated.

Yours sincerely

Amitha Padukkage

Participant Information Sheet

Research Project Title: Implications of environmental uncertainty as an antecedent to business IT alignment

Researcher: Amitha Padukkage, School of Information Management, Victoria University of Wellington, New Zealand

This study forms part of the requirements for the completion of my PhD, this study is designed to investigate how Information Technology (IT) and business strategies are aligned in organisations. It aims to identify the impact of environmental uncertainty on the business IT alignment process and abilities of factors that enable the business IT alignment process to ameliorate the impact of environmental uncertainty.

The research findings will provide better guidance on how to manipulate alignment factors more appropriately in order to improve the integration of IT with business strategies. Victoria University requires, and has granted, approval from the School's Human Ethics Committee for this study to be conducted.

I am inviting CEOs of companies in a variety of industries to participate in this research and complete the survey. Participation is voluntary, and you and your company will not be identified in any written report produced as a result of this research, including possible publication in academic conferences and journals. A summary of the results of this research will be sent to the participants when the project is completed.

All material collected will be kept confidential, and will be viewed only by myself and my supervisors Dr. Janet Toland and Dr. Val Hooper. The thesis will be submitted for marking to the School of Information Management, and subsequently deposited in the University Library. All data collected from participants will be destroyed within five years after the completion of the project. Participants are free to withdraw their consent or any information that they have provided by emailing amitha.padukkage@vuw.ac.nz by 31/08/2014.

If you have any questions or would like to receive further information about the project, please contact me via email (amitha.padukkage@vuw.ac.nz) or telephone +94 112 881 500 (ext.1212), or you may contact my supervisor Dr. Janet Toland via email (janet.toland@vuw.ac.nz) or telephone +64 4 463 6861.

Amitha Padukkage

Participant Consent Form

Research Project Title: **Implications of environmental uncertainty as an antecedent to business IT alignment**

Researcher: Amitha Padukkage, School of Information Management, Victoria University of Wellington, New Zealand

I have been given and have understood an explanation of this research project. I have had an opportunity to ask questions and have them answered to my satisfaction.

I understand that any information I provide will be kept confidential and accessible only to the researcher and his supervisors.

I understand that the published results will not use my name or my organisation name, and that no opinions will be attributed to me or my organisation in any way that will identify me or my organisation.

I understand that, the data I provide will not be used for any other purpose or released to others.

I understand that, all the data will be destroyed within five years after the completion of the project.

I understand that I may withdraw myself (or any information I have provided) from this project, without having to give reasons, by emailing amitha.padukkage@vuw.ac.nz by 31/08/2014.

I indicate my willingness to voluntarily take part in the study.

Signed:

Name of participant:

Date:

Implications of environmental uncertainty as an antecedent to business IT alignment

Questionnaire

School of Information Management

Victoria University of Wellington

New Zealand

Amitha Padukkage

INSTRUCTIONS

It would be appreciated if you would answer each of the following questions in the booklet. The questionnaire consists of three sections – A, B, and C – and comprises 44 questions in total. All you are required to do is to tick (√) the appropriate answer box to each question. There is no right or wrong answer. Please answer the questions with regards to the organisation or branch of the organisation for which you are responsible. Please ensure that you answer all questions.

Your responses will be treated with the strictest confidentiality. You and your company will not be identified in any report produced as a result of this research. Any data provided will only be used for statistical calculations. All information collected from you will be destroyed within five years after the completion of the project.

If you have any questions, do not hesitate to contact me at telephone +94 112 881 500 (ext.1212) or email: amitha.padukkage@vuw.ac.nz. Alternatively, you can contact my supervisor Dr. Janet Toland, School of Information Management, Victoria University of Wellington at janet.toland@vuw.ac.nz or telephone +64 4 463 6861.

I hope you find the questionnaire itself interesting and thought-provoking. A report of the findings will be sent to you as soon as the project is completed.

Thank you for your willingness to participate in this study.

Amitha Padukkage

Please return the completed questionnaire together with the consent form in the envelope provided.

SECTION A

The following statements will help me understand your company's strategic alignment process and level of strategic alignment. Please tick (√) the appropriate answer box that best reflects what the organisation has been practising so far with respect to the following scale:

| 1=Strongly Disagree | 2=Disagree | 3=Neutral | 4=Agree | 5= Strongly Agree |

Please indicate how much you agree with the following statements regarding how IT strategies and business strategies are aligned in your organisation:	1	2	3	4	5
1) Major IT investments are prioritized by their expected impact on business performance					
2) IT-related opportunities are identified to support the strategic direction of the organisation					
3) The goals/objectives of IT are adapted to changing goals/objectives of the organisation					
4) The IT plan contains detailed action plans/strategies that support the organisation's business objectives and strategies					

To what extent do you agree with the following statements describing communication between business and IT executives?	1	2	3	4	5
5) Business and IT executives have frequent, formal communications (e.g., meetings, business memos)					
6) Business and IT executives have frequent, direct communications (e.g., face to face, telephone, email)					
7) Business and IT executives utilize various channels to communicate with each other (e.g., liaisons, task forces, steering meetings)					

To what extent do you agree with the following statements describing connection between business and IT planning?	1	2	3	4	5
8) Business and IT plans are developed together					
9) Business and IT plans are integrated					
10) Business and IT executives both participate in the planning process					
11) Business and IT executives consider each other's inputs during the strategic planning process					

To what extent do you agree with the following statements about shared domain knowledge?	1	2	3	4	5
12) IT executives have a good understanding of the organisation's business environment (problems, tasks, roles)					
13) Business executives have a good understanding of the organisation's IT environment (problems, tasks, roles)					
14) IT executives have a good understanding of key business initiatives and plans					
15) Business executives have a good understanding of information technology developments					
16) IT executives appreciate the accomplishments of the business executives					
17) Business executives appreciate the accomplishments of the IT executives					
18) Business and IT executives appreciate each other's accomplishments					

To what extent do you agree with the following statements about the success of information technology department/unit?	1	2	3	4	5
19) IT executives are kept informed about key business initiatives and plans					
20) Improved effectiveness of management decision-making is due to information systems					
21) Introduction of new products and services is based on advances in information technology					

To what extent do you agree with the following statements describing how business and IT executives maintain relationship with each other?	1	2	3	4	5
22) Business and IT executives make an effort to maintain better relationships with each other					
23) Business and IT executives invest time in managing relationships with each other					
24) Business and IT executives use liaisons to foster good relationships					
25) Business and IT executives invite each other to their meetings to maintain a close relationship between business and IT executives					

SECTION B

The following statements will help me understand the business environment in which your company operates. In the primary industry where you work, evaluate the aspects of your environment with respect to the following scale:

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

To what extent do you agree with the following statements describing the **market environment** your organisation is in?	1	2	3	4	5
26) Our market environment is very dynamic and rapidly changing					
27) Our market environment is very unpredictable and hard to anticipate					
28) Our market environment is very complex					

To what extent do you agree with the following statements describing the **technology environment** your organisation is in?	1	2	3	4	5
29) Our technology environment is very dynamic and rapidly changing					
30) Our technology environment is very unpredictable and hard to anticipate					
31) Our technology environment is very complex					

To what extent do you agree with the following statements describing the **regulatory environment** your organisation is in?	1	2	3	4	5
32) Our regulatory environment is very dynamic					
33) Our regulatory environment is rapidly changing (regulations/policies)					
34) Our regulatory environment is very unpredictable and hard to anticipate					
35) Our regulatory environment (regulations/policies) is very complex					

SECTION C

Please complete the following questions on your background information.

36) What industry does your organisation belong to?

	Agriculture, Livestock and Forestry		Manufacturing
	Banking, Insurance and Real Estate		Mining and Quarrying
	Construction		Ownership of Dwellings
	Fishing		Private Services
	Electricity, Gas and Water		Transport and Communication
	Government Services		Wholesale and Retail Trade
	Hotels and Restaurants		Other ………………………

37) What is the ownership status of your organisation?

Private	Government	Semi-government	Multinational

38) How strategically important is information technology (IT) to your organisation's operations?

Not important at all	Not important	Neutral	Important	Very Important

39) What percentage of your organisation's total capital expenditure is spent on IT per annum?

Between 0-10%	Between 11-20%	Between 21-30%	Between 31-40%	Over 40%

40) How many employees are there in your organisation?

Between 0-50	Between 51-300	Between 301-1000	Over 1000

41) Is the Head of IT a member of the top management team?

Yes	No

42) Number of years you have been in the CEO position   …………………...

43) Number of years you have been in this organisation   …………………….

44) How many years you have been participated in strategic planning in this organisation?

Please check that you have answered all the questions, then return the completed questionnaire together with the consent form in the envelope provided to the address below.

Amitha Padukkage

No. 119, Pathiragoda Road

Maharagama

Colombo

Thank you for participating in this research

Amitha Padukkage

Reminder letter

<The Chief Executive Officer name>
<Company>
<No and Street>
<City>, <District>

<Date>

Dear <Sir / Madam>

Invitation to participate in a PhD research study

A few weeks ago, I sent you a letter kindly requesting you to take part in my PhD study survey. Having not yet received your completed questionnaire, I am writing to you to ascertain whether you have received the questionnaire and if so, whether you have any queries regarding the questions or any other aspect of the research.

I realize that work pressure and busy schedules might well have caused the delay in response. I would be extremely grateful if you could spare 10 minutes of your valuable time to complete this questionnaire.

This research study is about integration of IT with business in complex and dynamic business environment. This has been found to be one of the most important requirements for converting IT investment into profit.

This research is very meaningful, not only to the participating companies and myself but also to the whole Sri Lankan business community. The business community can utilize the findings to improve the integration of IT with business and thereby gain higher return on IT investment.

You and your company will not be identified in any report produced as a result of this research. All information collected will be kept confidential to me and my supervisors. A summary of the results will be sent to you when the research is completed. I would greatly appreciate it if you could return the completed questionnaire to me at your earliest convenience.

Thank you, in advance, for your participation and time. I look forward to receiving your completed questionnaire.

Yours sincerely,

Amitha Padukkage

Senior Lecturer
Department of Information Technology
Faculty of Management Studies and Commerce
University of Sri Jayewardenepura, Sri Lanka

PhD student
School of Information Management
Victoria University of Wellington, New Zealand

Appendix F: Calculation of f^2 and q^2 for all organisations

Table F.1: F-test (f^2 effect size) statistics – All organisations

Exogenous Constructs Excluded		Endogenous construct		
	Original R^2	SA 0.457	COM 0.403	CON 0.407
COM	R^2	0.346		
	f^2	0.204		
CON	R^2	0.278		
	f^2	0.330		
Interaction (COM-CON)	R^2	0.398		
	f^2	0.109		
SDK	R^2		0.365	0.382
	f^2		0.064	0.042
RM	R^2		0.368	0.392
	f^2		0.059	0.025
PISS	R^2		0.380	0.352
	f^2		0.039	0.093
EU	R^2		0.399	0.396
	f^2		0.007	0.019

Table F.2: Predictive relevance statistics – All organisations

Exogenous Constructs Excluded		Exogenous construct		
	Model Q^2	SA 0.272	COM 0.261	CON 0.282
COM	Q^2	0.210		
	q^2	0.085		
CON	Q^2	0.166		
	q^2	0.146		
Interaction (COM-CON)	Q^2	0.239		
	q^2	0.045		
SDK	Q^2		0.236	0.266
	q^2		0.034	0.022
RM	Q^2		0.242	0.275
	q^2		0.026	0.010
PISS	Q^2		0.246	0.244
	q^2		0.020	0.053
EU	Q^2		0.260	0.275
	q^2		0.001	0.010

Appendix G: Calculation of f^2 and q^2 for the SMEs

Table G.1: F-test (f^2 effect size) statistics - SME

Exogenous Constructs Excluded		Endogenous construct		
		SA	COM	CON
	Original R^2	0.484	0.464	0.398
COM	R^2	0.36		
	f^2	0.240		
CON	R^2	0.286		
	f^2	0.384		
Interaction (COM-CON)	R^2	0.409		
	f^2	0.145		
SDK	R^2		0.449	0.353
	f^2		0.028	0.075
RM	R^2		0.395	0.379
	f^2		0.129	0.032
PISS	R^2		0.428	0.369
	f^2		0.067	0.048
EU	R^2		0.463	0.398
	f^2		0.002	0.000

Table G.2: Predictive relevance statistics - SME

Exogenous Constructs Excluded		Endogenous construct		
		SA	COM	CON
	Model Q^2	0.291	0.274	0.269
COM	Q^2	0.234		
	q^2	0.080		
CON	Q^2	0.172		
	q^2	0.170		
Interaction (COM-CON)	Q^2	0.257		
	q^2	0.050		
SDK	Q^2		0.267	0.245
	q^2		0.010	0.030
RM	Q^2		0.233	0.262
	q^2		0.060	0.010
PISS	Q^2		0.261	0.250
	q^2		0.020	0.030
EU	Q^2		0.276	0.273
	q^2		0.000	-0.010

Appendix H: Calculation of f^2 and q^2 for the large organisations

Table H.1: F-test (f^2 effect size) statistics – large organisations

Exogenous Constructs Excluded	Original	Endogenous construct		
		SA	COM	CON
	R^2	0.43	0.371	0.442
COM	R^2	0.333		
	f^2	0.170		
CON	R^2	0.266		
	f^2	0.288		
Interaction (COM-CON)	R^2	0.385		
	f^2	0.079		
SDK	R^2		0.311	0.436
	f^2		0.095	0.011
RM	R^2		0.356	0.42
	f^2		0.024	0.039
PISS	R^2		0.362	0.362
	f^2		0.014	0.143
EU	R^2		0.353	0.405
	f^2		0.029	0.066

Table H.2: Predictive relevance statistics – large organisations

Exogenous Constructs Excluded		Endogenous construct		
		SA	COM	CON
	Model Q^2	0.227	0.237	0.281
COM	Q^2	0.182		
	q^2	0.060		
CON	Q^2	0.137		
	q^2	0.120		
Interaction (COM-CON)	Q^2	0.208		
	q^2	0.020		
SDK	Q^2		0.196	0.277
	q^2		0.050	0.010
RM	Q^2		0.230	0.269
	q^2		0.010	0.020
PISS	Q^2		0.234	0.236
	q^2		0.000	0.060
EU	Q^2		0.226	0.259
	q^2		0.010	0.030

Appendix I: Results of the structural model evaluation with three sources of uncertainty

Table I.1: Result summary of the structural model evaluation only with market uncertainty

Hypothesis		All organisations			SMEs			Large organisations		
		Path coefficient	Std. error	p-values	Path coefficient	Std. error	p-values	Path coefficient	Std. error	p-values
H1:	COM → SA	0.273	0.082	0.001	0.267	0.148	0.072	0.272	0.089	0.002
H2:	CON → SA	0.432	0.082	0.000	0.443	0.140	0.002	0.424	0.102	0.000
H3:	COM ↔ CON	-0.229	0.055	0.000	-0.268	0.109	0.015	-0.208	0.063	0.001
H4a	SDK → COM	0.267	0.079	0.001	0.180	0.118	0.130	0.358	0.100	0.000
H4b	SDK → CON	0.209	0.078	0.007	0.282	0.112	0.012	0.126	0.103	0.219
H5a:	RM → COM	0.256	0.074	0.001	0.350	0.113	0.002	0.165	0.101	0.102
H5b:	RM → CON	0.183	0.076	0.016	0.196	0.127	0.123	0.202	0.088	0.021
H6a:	PISS → COM	0.202	0.062	0.001	0.221	0.099	0.025	0.140	0.089	0.116
H6b:	PISS → CON	0.325	0.072	0.000	0.213	0.112	0.057	0.397	0.097	0.000
	MU → COM	0.075	0.060		0.080	0.135		0.141	0.084	0.094
	MU → CON	0.082	0.061	0.097	0.100	0.176		0.147	0.081	0.072

Table I.2: Result summary of the structural model evaluation only with technological uncertainty

Hypothesis		All organisations			SMEs			Large organisations		
		Path coefficient	Std. error	p-values	Path coefficient	Std. error	p-values	Path coefficient	Std. error	p-values
H1:	COM → SA	0.273	0.087	0.002	0.267	0.151	0.078	0.272	0.089	0.002
H2:	CON → SA	0.432	0.086	0.000	0.443	0.138	0.001	0.424	0.103	0.000
H3:	COM ↔ CON	-0.229	0.051	0.000	-0.268	0.111	0.016	-0.208	0.079	0.009
H4a	SDK → COM	0.268	0.081	0.001	0.179	0.118		0.349	0.102	0.001
H4b	SDK → CON	0.213	0.083	0.011	0.296	0.113	0.009	0.114	0.105	
H5a:	RM → COM	0.250	0.080	0.002	0.367	0.119	0.002	0.147	0.095	
H5b:	RM → CON	0.164	0.078	0.036	0.185	0.131		0.181	0.083	0.030
H6a:	PISS → COM	0.203	0.072	0.005	0.247	0.107	0.021	0.137	0.090	
H6b:	PISS → CON	0.313	0.077	0.000	0.218	0.121	0.073	0.383	0.092	0.000
	TU → COM	0.069	0.064		-0.012	0.110		0.157	0.087	0.072
	TU → CON	0.135	0.067	0.044	0.091	0.100		0.205	0.089	0.022

Table I.3: Result summary of the structural model evaluation only with regulatory uncertainty

Hypothesis		All organisations			SMEs			Large organisations		
		Path coefficient	Std. error	p-values	Path coefficient	Std. error	p-values	Path coefficient	Std. error	p-values
H1:	COM → SA	0.273	0.083	0.001	0.267	0.151	0.077	0.272	0.084	0.001
H2:	CON → SA	0.432	0.083	0.000	0.443	0.141	0.002	0.424	0.099	0.000
H3:	COM ↔ CON	-0.229	0.051	0.000	-0.268	0.111	0.016	-0.208	0.089	0.020
H4a	SDK → COM	0.272	0.075	0.000	0.164	0.126		0.359	0.101	0.000
H4b	SDK → CON	0.217	0.078	0.006	0.282	0.116	0.016	0.127	0.109	
H5a:	RM → COM	0.257	0.077	0.001	0.384	0.105	0.000	0.167	0.112	
H5b:	RM → CON	0.181	0.072	0.013	0.214	0.116	0.064	0.205	0.092	0.026
H6a:	PISS → COM	0.209	0.071	0.004	0.261	0.114	0.023	0.140	0.097	
H6b:	PISS → CON	0.326	0.083	0.000	0.243	0.126	0.055	0.382	0.109	0.001
	RU → COM	0.029	0.063		-0.050	0.107		0.092	0.085	
	RU → CON	0.051	0.072		-0.004	0.126		0.135	0.088	

Appendix J: Descriptive statistics of questionnaire items

Construct	Item	Item wording	N	Min	Max	Mean	Std. Dev.
Strategic alignment	SA1	Major IT investments are prioritized by their expected impact on business performance	211	1	5	4.22	.891
	SA2	IT-related opportunities are identified to support the strategic direction of the organisation	211	1	5	4.03	.875
	SA3	The goals/objectives of IT are adapted to changing goals/objectives of the organisation	212	1	5	3.77	.927
	SA4	The IT plan contains detailed action plans/strategies that support the organisation's business objectives and strategies	212	1	5	3.86	.968
Communication	COM1	Business and IT executives have frequent, formal communications (e.g., meetings, business memos)	212	1	5	3.67	.920
	COM2	Business and IT executives have frequent, direct communications (e.g., face to face, telephone, email)	212	1	5	3.93	.797
	COM3	Business and IT executives utilize various channels to communicate with each other (e.g., liaisons, task forces, steering meetings)	212	1	5	3.67	.935
Connection	CON1	Business and IT plans are developed together	212	1	5	3.35	1.027
	CON2	Business and IT plans are integrated	212	1	5	3.66	.953

	CON3	Business and IT executives both participate in the planning process	212	1	5	3.55	.979
	CON4	Business and IT executives consider each other's inputs during the strategic planning process	212	1	5	3.53	.975
Shared domain knowledge	SDK1	IT executives have a good understanding of the organisation's business environment (problems, tasks, roles)	212	1	5	3.65	1.003
	SDK2	Business executives have a good understanding of the organisation's IT environment (problems, tasks, roles)	211	1	5	3.32	.936
	SDK3	IT executives have a good understanding of key business initiatives and plans	212	1	5	3.62	.898
	SDK4	Business executives have a good understanding of information technology developments	212	1	5	3.32	.902
	SDK5	IT executives appreciate the accomplishments of the business executives	212	1	5	3.52	.846
	SDK6	Business executives appreciate the accomplishments of the IT executives	212	1	5	3.43	.876
	SDK7	Business and IT executives appreciate each other's accomplishments	211	1	5	3.48	.841
Prior IS success	PISS1	IT executives are kept informed about key business initiatives and plans	212	1	5	3.64	.931
	PISS2	Improved effectiveness of management decision-making is due to information systems	211	0	5	3.73	.999
	PISS3	Introduction of new products and services is based on advances in information technology	211	1	5	3.40	1.011

			N			Mean	Std. Dev.
Relationship management	RM1	Business and IT executives make an effort to maintain better relationships with each other	212	1	5	3.70	.822
	RM2	Business and IT executives invest time in managing relationships with each other	212	1	5	3.39	.821
	RM3	Business and IT executives use liaisons to foster good relationships	211	1	5	3.51	.824
	RM4	Business and IT executives invite each other to their meetings to maintain a close relationship between business and IT executives	212	1	5	3.43	.903
Market Uncertainty	MU1	Our market environment is very dynamic and rapidly changing	211	1	5	3.91	1.054
	MU2	Our market environment is very unpredictable and hard to anticipate	211	1	5	3.40	1.071
	MU3	Our market environment is very complex	211	1	5	3.53	1.020
Technological Uncertainty	TU1	Our technology environment is very dynamic and rapidly changing	212	1	5	3.69	1.038
	TU2	Our technology environment is very unpredictable and hard to anticipate	212	1	5	2.94	.998
	TU3	Our technology environment is very complex	212	1	5	3.14	1.002
Regulatory Uncertainty	RU1	Our regulatory environment is very dynamic	212	1	5	3.29	.977
	RU2	Our regulatory environment is rapidly changing (regulations/policies)	212	1	5	3.21	.977
	RU3	Our regulatory environment is very unpredictable and hard to anticipate	212	1	5	3.00	.931
	RU4	Our regulatory environment (regulations/policies) is very complex	212	1	5	3.06	1.003

REFERENCES

Abdul-Cader, K. M., & Johar, G. M. (2015). A Study of Knowledge Seeking through Electronic Knowledge Repositories among Sri Lankan IT Professionals. *International Journal of Emerging Trends & Technology in Computer Science, 5*(6), 12.

Abraham, G. A. (2006). Successful organizational leadership: Effective execution through strategic management. *CEO Refresher.* Retrieved from http://www.refresher.com/Archives/agaaexecution.html

Achrol, R. S., Reve, T., & Stern, L. W. (1983). The environment of marketing channel dyads: a framework for comparative analysis. *The Journal of Marketing, 47*(4), 55-67.

Aggarwal, H. (2010). Critical success factors in IT alignment in public sector petroleum industry of India. *International Journal of Innovation, Management and Technology, 1*(1), 56-63.

Aguilar, F. J. (1967). *Scanning the business environment*. New York: Macmillan.

Ahmad, S. (2015). Changing technological scenario in organisations. *Middle East Journal of Management, 2*(2), 143-156.

Aldrich, H. E., & Pfeffer, J. (1976). Environments of organizations. *Annual Review of Sociology, 2*(1), 79-105.

Aragón-Correa, J. A., Hurtado-Torres, N., Sharma, S., & García-Morales, V. J. (2008). Environmental strategy and performance in small firms: A resource-based perspective. *Journal of Environmental Management, 86*(1), 88-103.

Aragon-Correa, J. A., & Sharma, S. (2003). A contingent resource-based view of proactive corporate environmental strategy. *Academy of management review, 28*(1), 71-88.

Aragón- Sánchez, A., & Sánchez- Marín, G. (2005). Strategic orientation, management characteristics, and performance: A study of Spanish SMEs. *Journal of Small Business Management, 43*(3), 287-308.

Argote, L., McEvily, B., & Reagans, R. (2003). Managing knowledge in organizations: An integrative framework and review of emerging themes. *Management Science, 49*(4), 571-582.

Ariyachandra, T. R., & Frolick, M. N. (2008). Critical success factors in business performance management—Striving for success. *Information Systems Management, 25*(2), 113-120.

Armstrong, C. P., & Sambamurthy, V. (1999). Information technology assimilation in firms: The influence of senior leadership and IT infrastructures. *Information Systems Research, 10*(4), 304-327.

Armstrong, J. S., & Overton, T. S. (1977). Estimating nonresponse bias in mail surveys. *Journal of Marketing Research, 14*(3), 396-402.

Avison, D., Jones, J., Powell, P., & Wilson, D. (2004). Using and validating the strategic alignment model. *Journal of Strategic Information Systems, 13*(3), 223-246.

Azeez, A. (2015). Corporate governance and firm performance: evidence from Sri Lanka. *Journal of Finance, 3*(1), 180-189.

Badri, M. A., Davis, D., & Davis, D. (2000). Operations strategy, environmental uncertainty and performance: a path analytic model of industries in developing countries. *The International Journal of Management Science, 28*(2), 155-173.

Baets, W. J. (1992). Aligning information systems with business strategy. *Journal of Strategic Information Systems, 1*(4), 205-214.

Bai, R., & Lee, G. (2003). Organizational factors influencing the quality of the IS/IT strategic planning process. *Industrial Management & Data Systems, 103*(8), 622-632.

Baker, E. (2004). Leading alignment. *CIO Insight, 1*(45), 19-20.

Baker, J., & Jones, D. (2008). *A theoretical framework for sustained strategic alignment and an agenda for research.* Paper presented at the JAIS Theory Development Workshop.

Baker, J., Jones, D. R., Qing, C., & Jaeki, S. (2011). Conceptualizing the dynamic strategic alignment competency. *Journal of the Association for Information Systems, 12*(4), 299-322.

Barclay, D., Higgins, C., & Thompson, R. (1995). The partial least squares (PLS) approach to causal modeling: Personal computer adoption and use as an illustration. *Technology studies, 2*(2), 285-309.

Barney, J. B., & Clark, D. N. (2007). *Resource-based theory: Creating and sustaining competitive advantage*. Oxford: Oxford University Press.

Barney, J. B., Ketchen, D. J., & Wright, M. (2011). The future of resource-based theory revitalization or decline? *Journal of management, 37*(5), 1299-1315.

Barua, A., Kriebel, C. H., & Mukhopadhyay, T. (1995). Information technologies and business value: An analytic and empirical investigation. *Information Systems Research, 6*(1), 3-23.

Bassellier, G., & Benbasat, I. (2004). Business competence of information technology professionals: conceptual development and influence on IT-business partnerships. *MIS Quarterly, 28*(4), 673-694.

Bassellier, G., & Benbasat, I. (2007). *Assessing the contributions of business and IT knowledge to the development of IT/business partnerships*. Paper presented at the 45th Annual Computer Personnel Research Conference, St Louis, MO, USA.

Bazerman, M. H., & Moore, D. A. (2008). *Judgment in managerial decision making* (7 ed.). New York: Wiley.

Becerra, M., & Gupta, A. K. (2003). Perceived trustworthiness within the organization: The moderating impact of communication frequency on trustor and trustee effects. *Organization Science, 14*(1), 32-44.

Becker, J.-M., Klein, K., & Wetzels, M. (2012). Hierarchical latent variable models in PLS-SEM: guidelines for using reflective-formative type models. *Long Range Planning, 45*(5), 359-394.

Benbya, H., & McKelvey, B. (2006). Using coevolutionary and complexity theories to improve IS alignment: a multi-level approach. *Journal of Information technology, 21*(4), 284-298.

Benson, R. J., Parker, M. M., & Zoryan, M. D. (1985). *Enterprise-wide information management: an introduction to the concepts*. Los Angeles: IBM Los Angeles Scientific Center.

Bergeron, F., Raymond, L., & Rivard, S. (2004). Ideal patterns of strategic alignment and business performance. *Information & Management, 41*(8), 1003-1020.

Berglund, H., & Sandström, C. (2013). Business model innovation from an open systems perspective: structural challenges and managerial solutions. *International Journal of Product Development, 18*(3-4), 274-285.

Bharadwaj, A. S. (2000). A resource-based perspective on information technology capability and firm performance: an empirical investigation. *MIS Quarterly, 24*(1), 169-196.

Bicocchi. (2013). Should a CIO be proactive and suguest IT systems or applications to meet a business need or should a CIO wait for the business to come to him? *CIO Network.* Retrieved from https://www.linkedin.com/groups/51825/51825-18599232

Boudreau, M. C., Gefen, D., & Straub, D. W. (2001). Validation in information systems research: A state-of-the-art assessment. *MIS Quarterly, 25*(1), 1-16.

Bourgeois, L. J. (1980a). Performance and consensus. *Strategic Management Journal, 1*(3), 227-248.

Bourgeois, L. J. (1980b). Strategy and environment: A conceptual integration. *Academy of Management Review, 5*(1), 25-39.

Bowen, G., & Bowen, D. (2014). Strategy Formulation and Uncertainty in Environments. *Journal of Business and Economics, 5*(12), 2315-2326.

Bower, G. H. (1970). Imagery as a relational organizer in associative learning. *Journal of Verbal Learning and Verbal Behavior, 9*(5), 529-533.

Boynton, A. C., Zmud, R. W., & Jacobs, G. C. (1994). The influence of IT management practice on IT use in large organizations. *MIS Quarterly, 18*(3), 299-318.

Brown, C. V., & Magill, S. L. (1994). Alignment of the IS functions with the enterprise: towards a model of antecedents. *MIS Quarterly, 18*(4), 371-403.

Brown, R. (1991). Value-added associations: the IS/CEO relationship. *Systems/3X and AS World, 19*(2), 28-35.

Bryman, A. (2012). *Social research methods*. Oxford: Oxford university press.

Bstieler, L. (2005). The Moderating Effect of Environmental Uncertainty on New Product Development and Time Efficiency. *Journal of Product Innovation Management, 22*(3), 267-284.

Byrd, T. A., Lewis, B. R., & Bryan, R. W. (2006). The leveraging influence of strategic alignment on IT investment: An empirical examination. *Information & management, 43*(3), 308-321.

Calantone, R., Garcia, R., & Droge, C. (2003). The effects of environmental turbulence on new product development strategy planning. *Journal of Product Innovation Management, 20*(2), 90-103.

Campbell, B. (2005). *Alignment: Resolving ambiguity within bounded choices.* Paper presented at the PACIS 2005, Bangkok, Thailand.

Campbell, B., Kay, R., & Avison, D. (2005). Strategic alignment: a practitioner's perspective. *Journal of Enterprise Information Management, 18*(6), 653-664.

Cao, Q., Baker, J., & Hoffman, J. J. (2012). The role of the competitive environment in studies of strategic alignment a meta-analysis. *International Journal of Production Research, 50*(2), 567-580.

Carter, N. M. (1984). Computerization as a predominate technology: its influence on the structure of newspaper organizations. *Academy of Management Journal, 27*(2), 247-270.

Chan, Y. E. (2002). Why haven't we mastered alignment? The importance of the informal organization structure. *MIS Quarterly Executive, 1*(2), 97-112.

Chan, Y. E., & Huff, S. L. (1993). Strategic information systems alignment. *Business Quarterly, 58*(1), 51-55.

Chan, Y. E., Huff, S. L., Barclay, D. W., & Copeland, D. G. (1997). Business strategic orientation, information systems strategic orientation, and strategic alignment. *Information Systems Research, 8*(2), 125-150.

Chan, Y. E., & Reich, B. H. (2007a). IT Alignment: An annotated bibliography. *Journal of Information Technology, 22*(4), 316-396.

Chan, Y. E., & Reich, B. H. (2007b). IT alignment: what have we learned? *Journal of Information Technology, 22*(4), 297-315.

Chan, Y. E., Sabherwal, R., & Thatcher, J. B. (2006). Antecedents and outcomes of strategic IS alignment: an empirical investigation. *IEEE Transactions on Engineering Management, 53*(1), 27-47.

Chandrasekaran, V., Recht, B., Parrilo, P. A., & Willsky, A. S. (2012). The convex geometry of linear inverse problems. *Foundations of Computational mathematics, 12*(6), 805-849.

Chang, D. R., & Park, S. B. (2013). The effects of brand strategy and technological uncertainty on pioneering advantage in the multigenerational product market. *Journal of Product Innovation Management, 30*(1), 82-95.

Chen, D. Q., Mocker, M., Preston, D. S., & Teubner, A. (2010). Information systems strategy: reconceptualization, measurement, and implications. *MIS Quarterly, 34*(2), 233-259.

Chen, L. (2010). Business–IT alignment maturity of companies in China. *Information and Management, 47*(1), 9-16.

Cheng, W.-H., Kadir, K. A., & Bohari, A. M. (2014). The strategic planning of SMEs in Malaysia: a view of external environmental scanning. *International Journal of Business and Society, 15*(3), 437.

Chenhall, R. H. (2006). Theorizing contingencies in management control systems research. *Handbooks of management accounting research* (Vol. 1, pp. 163-205). Netherlands: Elsevier Ltd.

Chi, L., Jones, K. G., Lederer, A. L., Li, P., Newkirk, H. E., & Sethi, V. (2005). Environmental assessment in strategic information systems planning. *International Journal of Information Management, 25*(3), 253-269.

Chi, T. (2009). Measurement of business environment characteristics in the US technical textile industry: an empirical study. *The Journal of the Textile Institute, 100*(6), 545-555.

Chin, W. W. (1998a). Issues and opinions on structural equation modeling. *MIS Quarterly, 22*(1), vii-xvi.

Chin, W. W. (1998b). The partial least squares approach to structural equation modeling. *Modern methods for business research* (pp. 295–336). NJ: Lawrence Erlbaum Associates.

Chin, W. W. (2010). How to write up and report PLS analyses. *Handbook of partial least squares* (pp. 655-690). Heidelberg: Springer.

Chin, W. W., Marcolin, B. L., & Newsted, P. R. (2003). A partial least squares latent variable modeling approach for measuring interaction effects: Results from a

Monte Carlo simulation study and an electronic-mail emotion/adoption study. *Information Systems Research, 14*(2), 189-217.

Chin, W. W., & Newsted, P. R. (1999). Structural equation modeling analysis with small samples using partial least squares. *Statistical Strategies for Small Sample Research* (pp. 307-341). London: Sage Publication Inc.

Choe, J. (2003). The effect of environmental uncertainty and strategic applications of IS on a firm's performance. *Information & Management, 40*(4), 257-268.

Christensen, C. M. (1997). *The Innovator\'s Dilemma: The Revolutionary Book that Will Change the Way You Do Business*. New York: Collins Business Essentials.

Churchill, G. A. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research, 16*(1), 64-73.

Ciavolino, E., & Nitti, M. (2013). Using the Hybrid Two-Step estimation approach for the identification of second-order latent variable models. *Journal of Applied Statistics, 40*(3), 508-526.

Ciborra, C. U. (1997). De profundis? Deconstructing the concept of strategic alignment. *Scandinavian Journal of Information Systems, 9*(1), 67-82.

Cohen, J. (1988). Statistical Power Analysis for the Behavioral Sciences. Hillsdale, New Jersey: Erlbaum.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly, 35*(1), 128-152.

Collins, D. (2003). Pretesting survey instruments: an overview of cognitive methods. *Quality of Life Research, 12*(3), 229-238.

Coltman, T., Tallon, P., Sharma, R., & Queiroz, M. (2015). Strategic IT alignment: twenty-five years on. *Journal of Information Technology, 30*(2), 91-100.

Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches* (2 ed.). California: Sage Publications Inc.

Crolty, M. (1998). *The foundations of Social Research*. London: Sage Publications Inc.

Croteau, A. M., & Bergeron, F. (2001). An information technology trilogy: business strategy, technological deployment and organizational performance. *The journal of strategic information systems, 10*(2), 77-99.

Cui, T., Ye, H. J., Teo, H. H., & Li, J. (2015). Information technology and open innovation: A strategic alignment perspective. *Information & Management, 52*(3), 348-358.

Cumps, B., Martens, D., De Backer, M., Haesen, R., Viaene, S., Dedene, G., . . . Snoeck, M. (2009). Inferring comprehensible business/ICT alignment rules. *Information & Management, 46*(2), 116-124.

Damanpour, F. (1996). Organizational complexity and innovation: developing and testing multiple contingency models. *Management science, 42*(5), 693-716.

Das, S. R., Zahra, S. A., & Warkentin, M. E. (1991). Integrating the Content and Process of Strategic MIS Planning with Competitive Strategy. *Decision Sciences, 22*(5), 953-984.

Dawes, J. G. (2008). Do data characteristics change according to the number of scale points used? An experiment using 5 point, 7 point and 10 point scales. *International journal of market research, 51*(1).

De Los Reyes, A., Thomas, S. A., Goodman, K. L., & Kundey, S. M. (2013). Principles underlying the use of multiple informants' reports. *Annual Review of Clinical Psychology, 9*(1), 123.

Delmas, M., & Tokat, Y. (2005). Deregulation, governance structures, and efficiency: the US electric utility sector. *Strategic Management Journal, 26*(5), 441-460.

Denzin, A., & Lincoln, Y. S. (2011). *Qualitative Research*. London: Sage Publications Inc.

Dess, G. G., & Beard, D. W. (1984). Dimensions of organizational task environments. *Administrative Science Quarterly, 29*(1), 52-73.

Donaldson, W. M., Blackburn, T. D., Blessner, P., & Olson, B. A. (2015). An Examination of the Role of Enterprise Architecture Frameworks in Enterprise Transformation. *Journal of Enterprise Transformation, 5*(3), 218-240.

Drnevich, P. L., & Croson, D. C. (2013). Information Technology and Business-Level Strategy: Toward an Integrated Theoretical Perspective. *MIS Quarterly, 37*(2), 483-509.

Dulipovici, A., & Robey, D. (2013). Strategic alignment and misalignment of knowledge management systems: a social representation perspective. *Journal of Management Information Systems, 29*(4), 103-126.

Earl, M. J., & Feeny, D. F. (1994). Is your CIO adding value? *Sloan Management Review, 35*(3), 11-20.

Edmondson, A. C., & McManus, S. E. (2007). Methodological fit in management field research. *Academy of management review, 32*(4), 1246-1264.

Edmondson, A. C., Roberto, M. A., & Watkins, M. D. (2003). A dynamic model of top management team effectiveness: Managing unstructured task streams. *The Leadership Quarterly, 14*(3), 297-325.

Edwards, J. R. (2001). Multidimensional constructs in organizational behavior research: An integrative analytical framework. *Organizational Research Methods, 4*(2), 144-192.

El-Masri, M., Orozco, J., Tarhini, A., & Tarhini, T. (2015). *The Impact of IS-Business Alignment Practices on Organizational Choice of IS-Business Alignment Strategies.* Paper presented at the The 19th Pacific Asia Conference on Information Systems (PACI S 2015), Singapore.

El-Mekawy, M., & Rusu, L. (2011). *Organizational culture impact on business-IT alignment: A case study of a multinational organization.* Paper presented at the 44th Hawaii International Conference on System Sciences, Hawaii, USA.

Engau, C., & Hoffmann, V. H. (2009). Effects of regulatory uncertainty on corporate strategy—an analysis of firms' responses to uncertainty about post-Kyoto policy. *Environmental Science & Policy, 12*(7), 766-777.

Enns, H., Murray, E., & Huff, S. (1997). *Shared understanding between IS and business executives: impacts on IS effectiveness and business performance.* Paper presented at the IS Administrative Science Association, Newfoundland, Canada.

Entrialgo, M. (2002). The impact of the alignment of strategy and managerial characteristics on Spanish SMEs. *Journal of Small Business Management, 40*(3), 260-270.

Falk, R. F., & Miller, N. B. (1992). *A primer for soft modeling.* OH: University of Akron Press.

Feeny, D. F., Edwards, B. R., & Simpson, K. M. (1992). Understanding the CEO/CIO relationship. *MIS Quarterly 16*(4), 435-448.

Feeny, D. F., & Willcocks, L. P. (1998). Core IS capabilities for exploiting information technology. *MIT Sloan Management Review, 39*(3), 9-21.

Field, A. (2009). *Discovering statistics using SPSS* (4 ed.). New Delhi: Sage publications.

Fisher, R. J., Maltz, E., & Jaworski, B. J. (1997). Enhancing communication between marketing and engineering: the moderating role of relative functional identification. *The Journal of Marketing, 61*(3), 54-70.

Fornell, C., & Cha, J. (1994). Partial least squares *Advanced methods of marketing research* (Vol. 52-78, pp. 52-78). Cambridge: Basil Blackwell.

Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of marketing research, 18*(3), 382-388.

Fredrickson, J. W., & Mitchell, T. R. (1984). Strategic decision processes: comprehensiveness and performance in an industry with an unstable environment. *Academy of Management Journal, 27*(2), 399-423.

Freel, M. S. (2005). Perceived environmental uncertainty and innovation in small firms. *Small Business Economics, 25*(1), 49-64.

Galbraith, J. R. (1977). Organization design: An information processing view. *Organizational Effectiveness Center and School, 21*(1), 21-26.

Galliers, R. D., & Leidner, D. E. (2014). *Strategic information management: challenges and strategies in managing information systems*. New York: Routledge.

Gefen, D., & Straub, D. (2005). A practical guide to factorial validity using PLS-Graph: Tutorial and annotated example. *Communications of the Association for Information systems, 16*(1), 91-109.

Gefen, D., Straub, D. W., & Boudreau, M.-C. (2000). Structural equation modeling and regression: Guidelines for research practice. *Communications of the Association for Information Systems, 4*(1), 1-65.

Gefen, D., Straub, D. W., & Rigdon, E. E. (2011). An update and extension to SEM guidelines for admnistrative and social science research. *Management Information Systems Quarterly, 35*(2), iii-xiv.

Geisser, S. (1974). A predictive approach to the random effect model. *Biometrika, 61*(1), 101-107.

Gelderman, C. J., Semeijn, J., & Mertschuweit, P. P. (2016). The impact of social capital and technological uncertainty on strategic performance: The supplier perspective. *Journal of Purchasing and Supply Management, 22*(3), 225–234.

Gerloff, E. A., Muir, N. K., & Bodensteiner, W. D. (1991). Three components of perceived environmental uncertainty: An exploratory analysis of the effects of aggregation. *Journal of Management, 17*(4), 749-768.

Gerow, J. E., Thatcher, J. B., & Grover, V. (2015). Six types of IT-business strategic alignment: an investigation of the constructs and their measurement. *European Journal of Information Systems, 24*(5), 465-491.

Gordon, L. A., & Miller, D. (1976). A contingency framework for the design of accounting information systems. *Accounting, Organizations and Society, 1*(1), 59-69.

Grant, R. M. (1991). The resource-based theory of competitive advantage: implications for strategy formulation. *California management review, 33*(3), 114-135.

Grant, R. M. (1996a). Prospering in dynamically-competitive environments: Organizational capability as knowledge integration. *Organization science, 7*(4), 375-387.

Grant, R. M. (1996b). Toward a knowledge- based theory of the firm. *Strategic Management Journal, 17*(S2), 109-122.

Gregor, S. (2006). The nature of theory in information systems. *MIS quarterly, 30*(3), 611-642.

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. *Handbook of qualitative research (pp. 105-117), Thousand Oaks, CA: Sage*.

Gutierrez, Orozco, Papazafeiropoulou, & Serrano. (2008). *Developing a taxonomy for the understanding of business and IT alignment paradigms and tools.* Paper presented at the 16th European Conference on Information Systems, Galway, Ireland.

Gutierrez, Orozco, & Serrano. (2009). Factors affecting IT and business alignment: a comparative study in SMEs and large organisations. *Journal of Enterprise Information Management, 22*(1), 197-211.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (Vol. 17). NJ: Pearson Prentice Hall.

Hair, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2014). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. California: SAGE Publications Inc.

Hair, J. F., Ringle, C., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *The Journal of Marketing Theory and Practice, 19*(2), 139-152.

Haldma, T., & Lääts, K. (2002). Contingencies influencing the management accounting practices of Estonian manufacturing companies. *Management Accounting Research, 13*(4), 379-400.

Harel, E. C., & McLean, E. R. (1985). The effects of using a nonprocedural computer language on programmer productivity. *MIS Quarterly, 9*(2), 109-120.

Hashemi, S., Monfaredi, K., & Masdari, M. (2013). Using cloud computing for e-government: challenges and benefits. *International Journal of Computer, Information, Systems and Control Engineering, 7*(9), 596-603.

Hatzakis, T., Lycett, M., Macredie, R. D., & Martin, V. A. (2005). Towards the development of a social capital approach to evaluating change management interventions. *European Journal of Information Systems, 14*(1), 60-74.

Helm, S., Eggert, A., & Garnefeld, I. (2010). Modeling the impact of corporate reputation on customer satisfaction and loyalty using partial least squares *Handbook of partial least squares* (pp. 515-534): Springer.

Henderson, J. C., & Venkatraman, H. (1993). Strategic alignment: leveraging information technology for transforming organizations. *IBM Systems Journal 32*(1), 4-16.

Henseler, J. (2012). PLS-MGA: A non-parametric approach to partial least squares-based multi-group analysis. *Challenges at the interface of data analysis, computer science, and optimization* (pp. 495-501). Brtlin, Heidelberg: Springer.

Henseler, J., & Chin, W. W. (2010). A comparison of approaches for the analysis of interaction effects between latent variables using partial least squares path modeling. *Structural Equation Modeling, 17*(1), 82-109.

Henseler, J., Dijkstra, T. K., Sarstedt, M., Ringle, C. M., Diamantopoulos, A., Straub, D. W., . . . Calantone, R. J. (2014). Common beliefs and reality about PLS comments on Rönkkö and Evermann (2013). *Organizational Research Methods, 17*(2), 1-28.

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of Partial Least Squares Path Modeling in International Marketing. *Advances in International Marketing, 20*(1), 277-320.

Hin, C. W., Kadir, K. A., & Bohari, A. M. (2013). The strategic planning of SMEs in Malaysia: types of strategies in the aftermath of economic downturn. *Asian Journal of Business and Management Sciences, 2*(8), 51-59.

Hoffmann, V. H., Trautmann, T., & Hamprecht, J. (2009). Regulatory uncertainty: A reason to postpone investments? Not necessarily. *Journal of Management Studies, 46*(7), 1227-1253.

Holland, R. G., Smith, A., Hasselback, J. R., & Payne, B. (2010). Survey responses: Mail versus email solicitations. *Journal of Business & Economics Research, 8*(4), 95-98.

Horovitz, J. (1984). New Perspectives on Strategic Management. *Journal of Business Strategy, 4*(3), 19-33.

Hu, Q., & Huang, C. D. (2006). Using the balanced scorecard to achieve sustained IT-business alignment: a Case Study. *Communications of the Association for Information Systems, 17*(1), 181-204.

Hulland, J. (1999). Use of partial least squares (PLS) in strategic management research: a review of four recent studies. *Strategic Management Journal, 20*(2), 195-204.

Hussin, H., King, M., & Cragg, P. (2002). IT alignment in small firms. *European Journal of Information Systems, 11*(2), 108-127.

Hutchison, J., Tollefson, N., & Wigington, H. (1987). Response bias in college freshmen's responses to mail surveys. *Research in Higher Education, 26*(1), 99-106.

Iakovleva, T., Kolvereid, L., & Stephan, U. (2011). Entrepreneurial intentions in developing and developed countries. *Education and Training, 53*(5), 353-370.

Igbaria, M., Zinatelli, N., Cragg, P., & Cavaye, A. L. (1997). Personal computing acceptance factors in small firms: a structural equation model. *MIS quarterly, 31*(3), 279-305.

Iivari, J., Hirschheim, R., & Klein, H. K. (1998). A paradigmatic analysis contrasting information systems development approaches and methodologies. *Information Systems Research, 9*(2), 164-193.

Ismail, K., Zainuddin, S., & Sapiei, N. S. (2015). The Use of Contingency Theory in Management and Accounting Research. *Journal of Accounting Perspectives, 3*(1), 22-37.

Jarvis, C. B., MacKenzie, S. B., & Podsakoff, P. M. (2003). A critical review of construct indicators and measurement model misspecification in marketing and consumer research. *Journal of Consumer Research, 30*(2), 199-218.

Jayasekara, S. D. (2016). Exchange rate, exchange rate volatility and foreign direct investment in Sri Lanka. *Sri Lanka Journal of Advanced Social Studies, 3*(2), 75-96.

Johnson, A. M., & Lederer, A. L. (2005). The effect of communication frequency and channel richness on the convergence between chief executive and chief information officers. *Journal of Management Information Systems, 22*(2), 227-252.

Johnson, A. M., & Lederer, A. L. (2006). The impact of communication between CEOs and CIOs on their shared views of the current and future role of IT. *Information Systems Management, 24*(1), 85-90.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher, 33*(7), 14-26.

Johnston, M., Gilmore, A., & Carson, D. (2008). Dealing with environmental uncertainty: The value of scenario planning for small to medium-sized enterprises (SMEs). *European Journal of Marketing, 42*(11/12), 1170-1178.

Jonassen, D. H. (1991). Objectivism versus constructivism: Do we need a new philosophical paradigm? *Educational Technology Research and Development, 39*(3), 5-14.

Jones, M. C., Taylor, G. S., & Spencer, B. A. (1995). The CEO/CIO relationship revisited: An empirical assessment of satisfaction with IS. *Information & Management, 29*(3), 123-130.

Kaplan, B., & Duchon, D. (1988). Combining qualitative and quantitative methods in information systems research: a case study. *MIS Quarterly, 2*(4), 571-586.

Kapurubandara, M., & Lawson, R. (2006). *Barriers to Adopting ICT and e-commerce with SMEs in developing countries: an Exploratory study in Sri Lanka*. Paper presented at the CollECTeR, Adelaide, Australia.

Kartiwi, M., & MacGregor, R. C. (2007). Electronic commerce adoption barriers in small to medium-sized enterprises (SMEs) in developed and developing countries: A cross-country comparison. *Journal of Electronic Commerce in Organizations, 5*(3), 35-51.

Katz, D., & Kahn, R. L. (1978). *The social psychology of organizations*. New York: Wiley.

Kaufmann, L., & Astou Saw, A. (2014). Using a multiple-informant approach in SCM research. *International Journal of Physical Distribution & Logistics Management, 44*(6), 511-527.

Kearns, G. S., & Lederer, A. L. (2000). The effect of strategic alignment on the use of IS-based resources for competitive advantage. *The Journal of Strategic Information Systems, 9*(4), 265-293.

Kearns, G. S., & Lederer, A. L. (2003). A Resource Based View of Strategic IT Alignment: How Knowledge Sharing Creates Competitive Advantage. *Decision Sciences, 34*(1), 1-29.

Kearns, G. S., & Lederer, A. L. (2004). The impact of industry contextual factors on IT focus and the use of IT for competitive advantage. *Information & Management, 41*(7), 899-919.

Kearns, G. S., & Sabherwal, R. (2006-7). Strategic Alignment Between Business and Information Technology: A Knowledge-Based View of Behaviors, Outcome, and Consequences. *Journal of Management Information Systems, 23*(3), 129-162.

Kearns, G. S., & Sabherwal, R. (2007). Strategic Alignment Between Business and Information Technology: A Knowledge-Based View of Behaviors, Outcome,

and Consequences. *Journal of Management Information Systems, 23*(3), 129-162.

Keats, B. W., & Hitt, M. A. (1988). A causal model of linkages among environmental dimensions, macro organizational characteristics, and performance. *Academy of Management Journal, 31*(3), 570-598.

Keil, M., Tan, B. C., Wei, K.-K., Saarinen, T., Tuunainen, V., & Wassenaar, A. (2000). A cross-cultural study on escalation of commitment behavior in software projects. *MIS Quarterly, 24*(2), 299-325.

Koberg, C. S. (1987). Resource scarcity, environmental uncertainty, and adaptive organizational behavior. *Academy of Management Journal, 30*(4), 798-807.

Kogut, B., & Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization Science, 3*(3), 383-397.

Kotrlik, J. W. K. J. W., & Higgins, C. C. H. C. C. (2001). Organizational research: Determining appropriate sample size in survey research appropriate sample size in survey research. *Information technology, Learning, and Performance Journal, 19*(1), 43-50.

Kozlenkova, I. V., Samaha, S. A., & Palmatier, R. W. (2014). Resource-based theory in marketing. *Journal of the Academy of Marketing Science, 42*(1), 1-21.

Kumar, N., Stern, L. W., & Anderson, J. C. (1993). Conducting interorganizational research using key informants. *Academy of Management Journal, 36*(6), 1633-1651.

Lai, V. S. (2001). Issues of international information systems management: a perspective of affiliates. *Information & Management, 38*(4), 253-264.

Lawless, M. W., & Finch, L. K. (1989). Choice and determinism: A test of Hrebiniak and Joyce's framework on strategy- environment fit. *Strategic Management Journal, 10*(4), 351-365.

Lawrence, P. R., & Lorsch, J. W. (1986). *Organization and environment: managing differentiation and integration*. Boston: Harvard Business School.

Le, V., Harvie, C., Blackburn, R. A., & Schaper, M. T. (2012). *Regulatory reform and the growth of private entrepreneurship in Vietnam*. London: Gower publications.

Lederer, A. L., & Mendelow, A. L. (1986). Issues in information systems planning. *Journal of Information & Management, 10*(5), 245-254.

Lederer, A. L., & Mendelow, A. L. (1987). Information resource planning: Overcoming difficulties in identifying top management's objectives. *MIS Quarterly 11*(3), 389-400.

Lederer, A. L., & Mendelow, A. L. (1989). Coordination of Information Systems Plans with Business Plans. *Journal of Management Information Systems, 6*(2), 5-19.

Lederer, A. L., & Sethi, V. (1998). Seven guidelines for strategic information systems planning. *Information Strategy-Boca Raton, 15*(1), 23-28.

Ledermann, T., & Macho, S. (2015). Assessing mediation in simple and complex models. *International Journal of Mathematics, Game Theory, and Algebra, 24*(2/3), 131.

Lester, D., & Parnell, J. (2007). *Organizational Theory: A Strategic Approach*. OH: Thomson Mason

Leung, S.-O. (2011). A comparison of psychometric properties and normality in 4-, 5-, 6-, and 11-point Likert scales. *Journal of Social Service Research, 37*(4), 412-421.

Liao, J., & Gartner, W. B. (2006). The effects of pre-venture plan timing and perceived environmental uncertainty on the persistence of emerging firms. *Small Business Economics, 27*(1), 23-40.

Likert, R. (1932). A technique for the measurement of attitudes. *Archives of psychology*.

Lindsay, W. M., & Rue, L. W. (1980). Impact of the Business Environment on the Long-Range Planning Process: A Contingency View. *The Academy of Management Journal, 23*(3), 385-404.

Little, R. J. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association, 83*(404), 1198-1202.

Little, T. D., Bovaird, J. A., & Widaman, K. F. (2006). On the merits of orthogonalizing powered and product terms: Implications for modeling interactions among latent variables. *Structural Equation Modeling, 13*(4), 497-519.

Lohmöller, J.-B. (1989). *Latent variable path modeling with partial least squares*. Heidelberg: Physica-Verlag.

Lowry, P. B., & Gaskin, J. (2014). Partial least squares (PLS) structural equation modeling (SEM) for building and testing behavioral causal theory: When to choose it and how to use it. *Professional Communication, IEEE Transactions on, 57*(2), 123-146.

Luftman, J. (2003). Assessing IT/business alignment. *Information Systems Management, 20*(4), 9-15.

Luftman, J., & Ben-Zvi, T. (2010). Key issues for IT executives 2010. *MIS Quarterly Executive, 9*(4), 81-99.

Luftman, J., & Brier, T. (1999). Achieving and sustaining business-IT alignment. *California Management Review, 42*(1), 109-122.

Luftman, J., & Derksen, B. (2014). European key IT and management issues & trends for 2014. *CIONET Europe and Business & IT Trend Institute.* Retrieved from https://www.ngi-ngn.nl/Afdelingen/Informatie-Management/Evenementen/How-to-leverage-IT-for-the-benefit-of-the-Business/Bijlagen/ITTrends2014print.pdf

Luftman, J., & McLean, E. R. (2004). Key issues for IT executives. *MIS Quarterly Executive, 3*(2), 89-104.

Luftman, J., Papp, R., & Brier, T. (1999). Enablers and inhibitors of business IT alignment. *Communications of AIS, 1*(11), 1-33.

Luftman, J., Papp, R., & T. Brier. (1999). Enablers and inhibitors of business- IT alignment. *Communications of the AIS, 1*(11), 1-32.

Luftman, J., Zadeh, H. S., Derksen, B., Santana, M., Rigoni, E. H., & Huang, Z. D. (2012). Key information technology and management issues 2011–2012: an international study. *Journal of Information Technology, 27*(2), 198-212.

MacDonald, H. (1991). The strategic alignment process *The Corporation of the 1990s: Information Technology and Organisational Transformation*. Oxford: Oxford Press.

MacKechnie, C. (2015). Information Technology & Its Role in the Modern Organization. *Small Business.* Retrieved from

http://smallbusiness.chron.com/information-technology-its-role-modernorganization-1800.html

MacKenzie, S. B., Podsakoff, P. M., & Podsakoff, N. P. (2011). Construct measurement and validation procedures in MIS and behavioral research: Integrating new and existing techniques. *MIS quarterly, 35*(2), 293-334.

Malhotra, M. K., & Grover, V. (1998). An assessment of survey research in POM: from constructs to theory. *Journal of Operations Management, 16*(4), 407-425.

Malhotra, N. K., Kim, S. S., & Patil, A. (2006). Common method variance in IS research: A comparison of alternative approaches and a reanalysis of past research. *Management Science, 52*(12), 1865-1883.

Mann, R. I., & Watson, H. J. (1984). A contingency model for user involvement in DSS development. *MIS Quarterly, 8*(1), 27-38.

March, J. G., & Simon, H. A. (1958). *Organizations*. New York: Wiley.

Martin, N., Gregor, S., & Hart, D. (2005). The social dimension of business and IS/IT alignment: Case studies of six public-sector organisations. *Australian Accounting Review, 15*(3), 28-38.

Martins, L. L., & Kambil, A. (1999). Looking back and looking ahead: Effects of prior success on managers' interpretations of new information technologies. *Academy of Management Journal, 42*(6), 652-661.

Massey, A. P., Montoya-Weiss, M. M., & Brown, S. A. (2001). Reaping the benefits of innovative IT: The long and winding road. *IEEE Transactions on Engineering Management, 48*(3), 348-357.

Matthews, C. H., & Scott, S. G. (1995). Uncertainty and planning in small and entrepreneurial firms: an empirical assessment. *Journal of Small Business Management, 33*(4), 34-52.

McGrath, J. E., & Brinberg, D. (1983). External validity and the research process: A comment on the Calder/Lynch dialogue. *Journal of Consumer Research, 10*(1), 115-124.

McKendrick, J. (2011). Finance executives, not CIOs, have final word on IT: Gartner survey. Retrieved from http://www.zdnet.com/blog/serviceoriented/finance-executives-not-cios-have-final-word-on-it-gartner-survey/7338

Mechanic, D. (2012). Seizing opportunities under the Affordable Care Act for transforming the mental and behavioral health system. *Health Affairs, 31*(2), 376-382.

Melville, N., Kraemer, K., & Gurbaxani, V. (2004). Review: Information technology and organizational performance: An integrative model of IT business value. *MIS Quarterly, 28*(2), 283-322.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. California: Sage Publications Inc.

Miles, R. E., Snow, C. C., Meyer, A. D., & Coleman, H. J. (1978). Organizational strategy, structure, and process. *Academy of Management Review, 3*(3), 546-562.

Miller, D. (1987). Strategy making and structure: Analysis and implications for performance. *Academy of Management Journal, 30*(1), 7-32.

Miller, D. (1988). Relating Porter's business strategies to environment and structure: Analysis and performance implications. *Academy of Management Journal, 31*(2), 280-308.

Miller, D. (1992). Environmental fit versus internal fit. *Organization Science, 3*(2), 159-178.

Miller, D. (1993). Industry and country effects on managers' perceptions of environmental uncertainties. *Journal of International Business Studies, 24*(4), 693-714.

Miller, D., & Friesen, P. H. (1983). Strategy-making and environment: The third link. *Strategic Management Journal, 4*(3), 221-235.

Milliken, F. J. (1987). Three types of perceived uncertainty about the environment: State, effect, and response uncertainty. *Academy of Management Review, 12*(1), 133-143.

Mingers, J. (2003). The paucity of multimethod research: a review of the information systems literature. *Information Systems Journal, 13*(3), 233-249.

Moore, G. C., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research, 2*(3), 192-222.

Moore, S. (2012). How to align your IT services strategy with the business. *CIO Magazine.* Retrieved from http://www.cio.com/article/2395985/it-strategy/how-to-align-your-it-services-strategy-with-the-business.html

Morgan, R. E., & Hunt, S. D. (2002). Determining marketing strategy: A cybernetic systems approach to scenario planning. *European Journal of Marketing, 36*(4), 450-478.

Myers, M. D., & Newman, M. (2007). The qualitative interview in IS research: Examining the craft. *Information and Organization, 17*(1), 2-26.

Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review, 23*(2), 242-266.

Nath, R. (1989). Aligning MIS with the business goals. *Information & Management, 16*(2), 71-79.

Nelson, K. M., & Cooprider, J. G. (1996). The contribution of shared knowledge to IS group performance. *Management Information Systems Quarterly, 20*(4), 409-432.

Nevo, S., & Wade, M. R. (2010). The formation and value of IT-enabled resources: antecedents and consequences of synergistic relationships. *MIS Quarterly, 34*(1), 163-183.

Newkirk, H. E., & Lederer, A. L. (2006a). The effectiveness of strategic information systems planning under environmental uncertainty. *Information & Management, 43*(4), 481-501.

Newkirk, H. E., & Lederer, A. L. (2006b). Incremental and comprehensive strategic information systems planning in an uncertain environment. *Engineering Management, IEEE Transactions 53*(3), 380-394.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric Theory* (3rd ed ed.). New York: McGraw-Hill.

O'Regan, N., & Ghobadian, A. (2004). The importance of capabilities for strategic direction and performance. *Management Decision, 42*(2), 292-313.

Oh, W., & Pinsonneault, A. (2007). On the assessment of the strategic value of information technologies: conceptual and analytical approaches. *MIS Quarterly, 31*(2), 239-265.

Ohlsson, J., Han, S., & Hultin, M. (2016). *How to Achieve Sustainable Business IT Alignment--Designing a Circular Organizational Structure at SAAB.* Paper presented at the 49th Hawaii International Conference on System Sciences, Hawaii

Okhuysen, G. A., & Eisenhardt, K. M. (2002). Integrating knowledge in groups: How formal interventions enable flexibility. *Organization Science, 13*(4), 370-386.

Orlikowski, W. J., & Baroudi, J. J. (1991). Studying information technology in organizations: Research approaches and assumptions. *Information Systems Research, 2*(1), 1-28.

Palmer, J. W., & Markus, M. L. (2000). The performance impacts of quick response and strategic alignment in specialty retailing. *Information Systems Research, 11*(3), 241-259.

Papp, R. (1999). Business-IT alignment: productivity paradox payoff? *Industrial Management & Data Systems, 99*(8), 367-373.

Parnell, J. A., Lester, D. L., Long, Z., & Köseoglu, M. A. (2012). How environmental uncertainty affects the link between business strategy and performance in SMEs: Evidence from China, Turkey, and the USA. *Management Decision, 50*(4), 546-568.

Pearlman, E., & Baker, E. (2005, 2005). Measure of alignment predicts success. *CIO Insight.* Retrieved from http://www.cioinsight.com/c/a/Expert-Voices/Measure-of-Alignment-Predicts-Success

Peiris, P. M., Kulkarni, D., & de Silva Mawatha, C. R. (2015). An Empirical Study of Customer Adoption of E-Commerce: A Customer Trust Model to Support the Adoption of E-Commerce Among Small-and Medium-Sized Enterprises in Sri Lanka. *International Journal of Business and Information, 10*(4), 491-518.

Pelletier, C., & Raymond, L. (2014). *The IT Strategic Alignment Process: A Dynamic Capabilities Conceptualization.* Paper presented at the Twentieth Americas Conference on Information Systems, Savannah, Georgia.

Peng, D. X., Heim, G. R., & Mallick, D. N. (2014). Collaborative product development: The effect of project complexity on the use of information technology tools and new product development practices. *Production and Operations Management, 23*(8), 1421-1438.

Peteraf, M. A., & Barney, J. B. (2003). Unraveling the resource- based tangle. *Managerial and decision economics, 24*(4), 309-323.

Pfeffer, J., & Salancik, G. R. (1978). *The external control of organizations: A resource dependence approach*. New York: Harper and Row Publishers.

Pinsonneault, A., & Kraemer, K. L. (1993). Survey research methodology in management information systems: an assessment. *Journal of Management Information Systems, 10*(2), 75-105.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879-903.

Porra, J., Hirschheim, R., & Parks, M. S. (2005). The history of texaco's corporate information technology function: a general systems theoretical interpretation. *MIS Quarterly, 29*(4), 721-746.

Porter, M. E. (1991). Towards a dynamic theory of strategy. *Strategic Management Journal, 12*(S2), 95-117.

Porter, M. E. (2001). Strategy and the Internet. *Harvard Business Review, 79*(3), 63-78.

Powell, T. C. (1992). Strategic planning as competitive advantage. *Strategic Management Journal, 13*(7), 551-568.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior research methods, instruments, & computers, 36*(4), 717-731.

Premkumar, G., & King, W. R. (1994). Organizational characteristics and information systems planning: an empirical study. *Information Systems Research, 5*(2), 75-109.

Preston, D. S., & Karahanna, E. (2009). Antecedents of IS Strategic Alignment: A Nomological Network. *Information Systems Research, 20*(2), 159–179.

Preston, R. (2014). CIO worries: Security, talent and (sadly)'alignment'. *InformationWeek.* Retrieved from http://www.informationweek.com/strategic-cio/digital-business/cio-worries-security-talent-and-(sadly)-alignment/a/d-id/1315575

Punch, K. F. (2013). *Introduction to social research: Quantitative and qualitative approaches*. California: Sage Publications Inc.

Pyburn, P. J. (1983). Linking the MIS Plan with Corporate Strategy: An exploratory study. *MIS Quarterly, 7*(2), 1-14.

Raghunathan, B., & Raghunathan, T. (1991). MIS steering committees: their effect on information systems planning. *Journal of Information Systems, 3*(2), 104-116.

Ranganathan, C., & Sethi, V. (2002). Rationality in Strategic Information Technology Decisions: The Impact of Shared Domain Knowledge and IT Unit Structure. *Decision Sciences, 33*(1), 59-86.

Ravishankar, M., Pan, S. L., & Leidner, D. E. (2011). Examining the strategic alignment and implementation success of a KMS: A subculture-based multilevel analysis. *Information Systems Research, 22*(1), 39-59.

Ray, G., Muhanna, W. A., & Barney, J. B. (2005). Information technology and the performance of the customer service process: A resource-based analysis. *MIS Quarterly, 29*(4), 625-652.

Raymond, L., Pare, G., & Bergeron, F. (1995). Matching information technology and organizational structure: an empirical study with implications for performance. *European Journal of Information System, 4*(1), 3-16.

Reich, B. H., & Benbasat, I. (1996). Measuring the linkage between business and information technology objectives. *MIS Quarterly, 20*(1), 55-81.

Reich, B. H., & Benbasat, I. (2000). Factors that influence the social dimension of alignment between business and information technology objectives. *MIS Quarterly Executive, 24*(1), 81-113.

Reinartz, W., Krafft, M., & Hoyer, W. D. (2004). The customer relationship management process: Its measurement and impact on performance. *Journal of Marketing Research, 41*(3), 293-305.

Revilla, M. A., Saris, W. E., & Krosnick, J. A. (2013). Choosing the number of categories in agree–disagree scales. *Sociological Methods & Research, 43*(1), 73-93.

Reynolds, P., & Yetton, P. (2015). Aligning business and IT strategies in multi-business organizations. *Journal of Information Technology, 30*(2), 101-118.

Rigdon, E. E. (2012). Rethinking partial least squares path modeling: In praise of simple methods. *Long Range Planning, 45*(5), 341-358.

Rigdon, E. E., Ringle, C. M., & Sarstedt, M. (2010). Structural modeling of heterogeneous data with partial least squares. *Review of marketing research, 7*(7), 255-296.

Ringle, C. M., Sarstedt, M., & Straub, D. W. (2012). Editor's comments: a critical look at the use of PLS-SEM. *MIS Quarterly, 36*(1), iii-xiv.

Roberts, N., & Grover, V. (2012). Leveraging information technology infrastructure to facilitate a firm's customer agility and competitive activity: An empirical investigation. *Journal of Management Information Systems, 28*(4), 231-270.

Rockart, J. F. (1978). Chief executives define their own data needs. *Harvard Business Review, 57*(2), 81-93.

Rockart, J. F., Earl, M. J., & Ross, J. W. (1996). Eight imperatives for the new IT organization. *MIT Sloan Management Review, 38*(1), 43-55.

Rondinelli, D., Rosen, B., & Drori, I. (2001). The struggle for strategic alignment in multinational corporations: Managing readjustment during global expansion. *European Management Journal, 19*(4), 404-416.

Rönkkö, M., McIntosh, C. N., Antonakis, J., & Edwards, J. R. (2016). Partial least squares path modeling: Time for some serious second thoughts. *Journal of Operations Management*.

Rosa, F. (2015). How aligning with the organization's strategy ensures outsourcing success. *CIO Network*. Retrieved from http://www.cio.com/article/2912898/outsourcing/game-changer-no1-for-a-successful-outsourcing-relationship-alignment-with-the-organizations-strateg.html

Rosa, J. (1998). CIOs challenged by disparate goals. *Computer Reseller News, Dec. 7,* 43-46.

Ross, J. W., Beath, C. M., & Goodhue, D. L. (1998). Develop long-term competitiveness through IT assets. *IEEE Engineering Management Review, 26*(2), 37-47.

Ross, J. W., Weill, P., & Robertson, D. (2006). *Enterprise architecture as strategy: Creating a foundation for business execution*. Harvard: Harvard Business Press.

Rothfeder, J. (2005). Pulling Kaiser's IT Out of Intensive Care. *CIO Insight, October, 15*, 2005.

Ruohonen, M. (1991). Stakeholders of strategic information systems planning: theoretical concepts and empirical examples. *The Journal of Strategic Information Systems, 1*(1), 15-28.

Russell, R. D., & Russell, C. J. (1992). An examination of the effects of organizational norms, organizational structure, and environmental uncertainty on entrepreneurial strategy. *Journal of Management, 18*(4), 639-656.

Sabherwal, R., & Chan, Y. E. (2001). Alignment between business and IS strategies: a study of prospectors, analyzers and defenders. *Information Systems Research, 12*(1), 11-33.

Sabherwal, R., & King, W. R. (1992). Decision Processes for Developing Strategic Applications of Information Systems: A Contingency Approach. *Decision Sciences, 23*(4), 917-943.

Sabherwal, R., & Kirs, P. (1994). The alignment between organizational critical success factors and information technology capabilities in academic institutions. *Decision Sciences, 25*(2), 301-330.

Sardana, D., Terziovski, M., & Gupta, N. (2016). The impact of strategic alignment and responsiveness to market on manufacturing firm's performance. *International Journal of Production Economics, 177*(1), 131-138.

Sarstedt, M., Hair, J. F., Ringle, C. M., Thiele, K. O., & Gudergan, S. P. (2016). Estimation issues with PLS and CBSEM: Where the bias lies! *Journal of Business Research, 69*(10), 3998-4010.

Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research Methods for Business Students* (5th ed.). Essex: Pearson Education Limited.

Sax, L. J., Gilmartin, S. K., & Bryant, A. N. (2003). Assessing response rates and nonresponse bias in web and paper surveys. *Research in Higher Education, 44*(4), 409-432.

Schirmer, N., Ringle, C. M., Gudergan, S. P., & Feistel, M. S. (2016). The link between customer satisfaction and loyalty: the moderating role of customer characteristics. *Journal of Strategic Marketing, 24*(7), 1-20.

Schlägel, C., & Sarstedt, M. (2016). Assessing the measurement invariance of the four-dimensional cultural intelligence scale across countries: A composite model approach. *European Management Journal, 34*(6), 633-649.

Schlosser, F., Beimborn, D., Weitzel, T., & Wagner, H.-T. (2015). Achieving social alignment between business and IT–an empirical evaluation of the efficacy of IT governance mechanisms. *Journal of Information Technology, 30*(2), 119-135.

Schreiber, J. B., Nora, A., Stage, F. K., Barlow, E. A., & King, J. (2006). Reporting structural equation modeling and confirmatory factor analysis results: A review. *The Journal of educational research, 99*(6), 323-338.

Schwab, K. (2014). Global competitiveness report. *World Economic Forum.* Retrieved from http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2014-15.pdf

Scranton, P. (1999). Moving outside manufacturing: research perspectives on small business in twentieth-century America *Small Firms, Large Concerns.* Oxford: Oxford University Press.

Segars, A. H., & Grover, V. (1999). Profiles of strategic information systems planning. *Information Systems Research, 10*(3), 199-232.

Sekaran, U. (2006). *Research methods for business: A skill building approach*. New York: Wiley.

Sha, X., Cheng, Y., Pan, S. L., & Teoh, S. Y. (2011). *The implementation success of healthcare information systems: A business-IT alignment perspective.* Paper presented at the 19th European Conference on Information Systems, Helsinki, Finland.

Shah, H. (2012). As CIO, what is the #1 challenge that keeps you worried all the time. *CIO Network, LinkedIn.* Retrieved from http://www.linkedin.com/groups/As-CIO-what-is-1-51825.S.154128732?trk=group_search_item_list-0-b-ttl&goback=.gmp_51825.gna_51825

Sharfman, M. P., & Dean, J. W. (1991). Conceptualizing and measuring the organizational environment: A multidimensional approach. *Journal of Management, 17*(4), 681-700.

Sharma, S. (2000). Managerial interpretations and organizational context as predictors of corporate choice of environmental strategy. *Academy of Management Journal, 43*(4), 681-697.

Shuman, J. C., Shaw, J. J., & Sussman, G. (1985). Strategic planning in smaller rapid growth companies. *Long Range Planning, 18*(6), 48-53.

Silvius, A. J. G., Waal, B. D., & Smit, J. (2009). *Business and IT Alignment: Answers and Remaining Questions.* Paper presented at the Pacific Asia Conference on Information Systems, Hyderabed, India.

Singh, H., & Das, A. (2007). Country-level determinants of e-government maturity. *Communications of the Association for Information Systems, 20*(1), 632-648.

Sivalogathasan, V., & Wu, X. (2015). Impact of Organization Motivation on Intellectual Capital and Innovation Capability of the Textile and Apparel Industry in Sri Lanka. *International Journal of Innovation Science, 7*(2), 153-168.

Sledgianowski, D., Luftman, J. N., & Reilly, R. R. (2006). Development and validation of an instrument to measure maturity of IT business strategic alignment mechanisms. *Information Resources Management Journal, 19*(3), 18-23.

Smaczny, T. (2001). Is an alignment between business and information technology the appropriate paradigm to manage IT in today's organisations? *Management Decision, 39*(10), 797-802.

Smith, B. (1998). Buyer-Seller Relationships: Bonds, Relationship Management, and Sex-Type. *Canadian Journal of Administrative Sciences, 15*(1), 76-92.

Smith, K. G., Smith, K. A., Olian, J. D., Sims Jr, H. P., O'Bannon, D. P., & Scully, J. A. (1994). Top management team demography and process: The role of social integration and communication. *Administrative Science Quarterly, 24*(2), 412-438.

Snow, C. C., & Hambrick, D. C. (1980). Measuring organizational strategies: Some theoretical and methodological problems. *Academy of Management Review, 5*(4), 527-538.

Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological methodology, 13*(1982), 290-312.

Spender, J. C. (1996). Making knowledge the basis of a dynamic theory of the firm. *Strategic Management Journal, 17*(S2), 45-62.

Sri Lanka Tourism Development Authority. (2016). Sri Lanka Tourism Development Authority. Retrieved from http://www.sltda.lk/why_invest_in_sri_lanka

Srinivasan, A. (1985). Alternative measures of system effectiveness: associations and implications. *MIS Quarterly, 9*(3), 243-253.

Stone, M. (1974). Cross-validatory choice and assessment of statistical predictions. *Journal of the Royal Statistical Society, 36*(2), 111-147.

Stonehouse, G., & Pemberton, J. (2002). Strategic planning in SMEs-some empirical findings. *Management Decision, 40*(9), 853-861.

Straub, D. (1989). Validating instruments in MIS research. *MIS Quarterly, 13*(2), 147-169.

Straub, D., Boudreau, M., & Gefen, D. (2004). Validation guidelines for IS positivist research. *The Communications of the Association for Information Systems, 13*(1), 381-428.

Tallon, P. P. (2003). The alignment paradox. *CIO insight.* Retrieved from http://www.cioinsight.com/c/a/Past-News/Paul-Tallon-The-Alignment-Paradox

Tallon, P. P. (2007). Does IT pay to focus? An analysis of IT business value under single and multi-focused business strategies. *The Journal of Strategic Information Systems, 16*(3), 278-300.

Tallon, P. P. (2008). A Process-Oriented Perspective on the Alignment of Information Technology and Business Strategy. *Journal of Management Information Systems, 24*(3), 227-268.

Tallon, P. P., Kraemer, K. L., & Gurbaxani, V. (2000). Executives' perceptions of the business value of information technology: a process-oriented approach. *Journal of Management Information Systems, 16*(4), 145-173.

Tallon, P. P., & Pinsonneault, A. (2011). Competing perspectives on the link between strategic information technology alignment and organizational agility: insights from a mediation model. *MIS Quarterly, 35*(2), 463-486.

Tan, F. B., & Gallupe, R. D. (2006). Aligning business and information systems thinking: a cognitive approach. *IEEE Transactions on Engineering Management, 53*(2), 223-237.

Tarhini, A., Al-Dmour, R. H., & Obeidat, B. Y. (2015). Strategic IT-business alignment as managers' explorative and exploitative strategies. *European Scientific Journal, 11*(7), 437-457.

Teece, D. J. (2007). Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal, 28*(13), 1319-1350.

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal, 18*(7), 509-533.

Teo, T. S., & Ang, J. S. K. (1999). Critical success factors in the alignment of IS plans with business plans *International Journal of Information Management, 19*(1), 173-185.

Teo, T. S., & King, W. R. (1996). Assessing the impact of integrating business planning and IS planning. *Information & Management, 30*(6), 309-321.

Teo, T. S., & King, W. R. (1997). Integration between business planning and information systems planning: an evolutionary-contingency perspective. *Journal of Management Information Systems, 14*(1), 185-214.

The Central Bank of Sri Lanka. (2014). Annual Report 2014. Retrieved from http://www.cbsl.gov.lk/pics_n_docs/10_pub/_docs/efr/annual_report/AR2014 /English/6_Chapter_02.pdf

The World Bank. (2009). Micro, small, and medium enterprise. Retrieved from http://www.ifc.org/wps/wcm/connect/9ae1dd80495860d6a482b519583b6d16 /MSME-CI-AnalysisNote.pdf?MOD=AJPERES

The World Bank. (2014). The economy rankings index. Retrieved from http://www.doingbusiness.org/rankings

Thompson, J. D. (1967). *Organizations in action: Social science bases of administrative theory*. New Jersey: Transaction publishers.

Tushman, M. L., & Nadler, D. A. (1978). Information Processing as an Integrating Concept in Organizational Design. *Academy of management review, 3*(3), 613-624.

Van de Wetering, R. (2016). *Modeling Alignment as a Higher Order Nomological Framework.* Paper presented at the International Conference on Business Information Systems, Leipzig, Germany.

Van Teijlingen, E., & Hundley, V. (2001). The importance of pilot studies. *Social Research Update, 35*(1), 1-4.

Vessey, I., & Ward, K. (2013). The dynamics of sustainable IS alignment: The case for IS adaptivity. *Journal of the Association for Information Systems, 14*(6), 283-311.

Vinzi, V. E., Trinchera, L., & Amato, S. (2010). PLS path modeling: from foundations to recent developments and open issues for model assessment and improvement *Handbook of partial least squares* (pp. 47-83). Berlin: Springer.

Vitale, M. R., Ives, B., & Beath, C. M. (1986). *Linking Information Technology and Corporate Strategy: an Organizational View.* Paper presented at the International Conference on Information Systems, San Diego, USA.

Wagner, S. M., Rau, C., & Lindemann, E. (2010). Multiple informant methodology: a critical review and recommendations. *Sociological Methods & Research, 38*(4), 582-618.

Walker, R. M., Berry, F. S., & Avellaneda, C. N. (2015). Limits on innovativeness in local government: examining capacity, complexity, and dynamism in organizational task environments. *Public Administration, 93*(3), 663-683.

Wang, E. T. G., & Tai, J. C. F. (2003). Factors affecting information systems planning effectiveness: Organizational contexts and planning systems dimensions. *Information Management, 40*(1), 287-303.

Ward, P. T., Duray, R., Keong, L. G., & Sum, C. C. (1995). Business environment, operations strategy, and performance: an empirical study of Singapore manufacturers. *Journal of Operations Management, 13*(2), 99-115.

Waterhouse, J. H., & Tiessen, P. (1978). A contingency framework for management accounting systems research. *Accounting, Organizations and Society, 3*(1), 65-76.

Watson, R. T. (1990). Influences on the IS manager's perceptions of key issues: information scanning and the relationship with the CEO. *MIS Quarterly, 14*(2), 217-231.

Weill, P., & Olson, M. H. (1989). An assessment of the contingency theory of management information systems. *Journal of Management Information Systems, 6*(1), 59-86.

Wernerfelt, B. (1984). A resource- based view of the firm. *Strategic Management Journal, 5*(2), 171-180.

Wernerfelt, B., & Karnani, A. (1987). Competitive strategy under uncertainty. *Strategic Management Journal, 8*(2), 187-194.

Werts, C. E., Linn, R. L., & Jöreskog, K. G. (1974). Intraclass reliability estimates: Testing structural assumptions. *Educational and Psychological Measurement, 34*(1), 25-33.

Wetzels, M., Odekerken-Schröder, G., & Van Oppen, C. (2009). Using PLS path modeling for assessing hierarchical construct models: Guidelines and empirical illustration. *MIS Quarterly, 33*(1), 177-195.

Wong, K. K.-K. (2013). Partial Least Squares Structural Equation Modeling (PLS-SEM) Techniques Using SmartPLS. *Marketing Bulletin, 24*(1), 1-32.

Wu, D., Rosen, D. W., Wang, L., & Schaefer, D. (2015). Cloud-based design and manufacturing: A new paradigm in digital manufacturing and design innovation. *Computer-Aided Design, 59*, 1-14.

Wu, S. P.-J., Straub, D. W., & Liang, T.-P. (2015). How information technology governance mechanisms and strategic alignment influence organizational performance: Insights from a matched survey of business and IT managers. *MIS Quarterly, 39*(2), 497-518.

Xu, H., & Koronios, A. (2005). Understanding Information Quality in E-Business. *The Journal of Computer Information Systems, 45*(2), 73-82.

Yayla, A. A., & Hu, Q. (2009). *Antecedents and Drivers of IT-Business Strategic Alignment Empirical Validation of a Theoretical Model.* Paper presented at the European Conference on Information Systems, Verona, Italy.

Yayla, A. A., & Hu, Q. (2012). The impact of IT-business strategic alignment on firm performance in a developing country setting: exploring moderating roles of environmental uncertainty and strategic orientation. *European Journal of Information Systems, 21*(1), 373-387.

Zelenkov, Y. (2015). *Business and IT Alignment in Turbulent Business Environment.* Paper presented at the International Conference on Business Information Systems, Switzerland.

Zhang, M., Macpherson, A., & Jones, O. (2006). Conceptualizing the learning process in SMEs Improving innovation through external orientation. *International Small Business Journal, 24*(3), 299-323.

Zollo, M., & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization Science, 13*(3), 339-351.