A DISSERTATION ON

THE IMPACT OF SHARED DOMAIN KNOWLEDGE (SDK) ON STRATEGIC INFORMATION SYSTEMS PLANNING (SISP) AND EFFECTIVENESS

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1 ABSTRACT

In today's competitive business environment, organisations are increasingly dependent on Information Technology (IT) to support and enhance their business processes. In some organisations, IT does not merely support the business – it is the business – as IT forms the basis for the entire business model. IT has become a strategic asset and a key business enabler in organisations yet failures in IT investment are still attributed to the technology rather than its links with business operations, customer value, and management decision making. This could be attributed to a lack of alignment or harmony between IT and business imperatives within organisations. Strategic Information Systems Planning (SISP) is the planning process of coordinating the relationship between IT and the business and alignment is viewed as the result of this process. Shared Domain Knowledge (SDK) is a factor that has been identified as being very important in influencing alignment, IT decision processes, IT-line partnerships, IT performance, and IT use. To examine the impact of SDK on SISP and effectiveness (measured by alignment between IT and business), this study posits that SDK positively influences SISP effectiveness. Data, which was gathered from consultants in a large, global IT organisation, through the use of a structured questionnaire, was analysed and the finding was that there was support for SDK positively influencing SISP effectiveness. Additional findings of this study were that the SISP process dimensions of rationality and IT manager's participation in business planning positively influenced intellectual alignment and social alignment respectively and SDK positively influenced all of the SISP process dimensions (rationality, adaptation, BP/ISP integration, and IT manager's participation in business planning) examined in this study. SDK was also found to positively impact social alignment, intellectual alignment, and consequently SISP effectiveness.

2 INTRODUCTION

In today's competitive business environment, organisations are increasingly dependent on IT to support and enhance the business processes required to meet their organisational needs and in some organisations, IT does not merely support the business – it is the business – as IT services form the basis for the entire business model. IT has become a strategic asset and a key business enabler in organisations and has moved from traditionally being considered a cost centre to a revenue generator. Despite the continual growth in significance and importance of IT to most organisations, intense competitive and economic pressures on business are often reflected through corporate mandates to maintain, or even to decrease, their current IT budgets, yet at the same time, there is an increase in expectations of IT for quality, innovation, and value contributions. Successful IT investments continues to be a difficult but important task for senior business and information systems managers (Kearns and Sabherwal, 2007) and failures in IT investment are still attributed to the technology rather than its links with business operations, customer value, and management decision making. Haglind and Cheong (2001 reports that this shows that there still exists as a lack of alignment or harmony between IT and other organisational and business imperatives. Tallon (2007-8) adds that even after a decade of research and discussion, strategic alignment between business and IT remains an enduring challenge for firms worldwide. Because business success increasingly depends on IT enabled processes, products, and services, it has become imperative for business and IT to work together to form a common vision on how IT can support and contribute to the business goals and strategies (Haglind and Cheong, 2001).

In order to elevate the strategic impact of IT within the corporate sphere, IT must clearly focus on directly supporting the business objectives of the organisation and emphasising the business value IT provides. This requires IT to be able to show how their services make specific, tangible, and critical contributions to achieving business outcomes. Organisations that understand how to generate real business advantage from integrating technology, business process design and business relationships will outperform those that do not. Keeping in mind that business processes that depend on IT are only as reliable and sustainable as the underlying IT infrastructure, it is imperative to note the considerable risks and strategic advantage of IT dependency. The risks include IT failures having an increasingly significant impact on business processes, IT not being aligned with the changing needs of the business, and the cost of the supporting IT infrastructure exceeding the benefits achieved from the business process. To manage these risks, and in order to

better align business requirements with IT capabilities, and to deliver IT capabilities at an appropriate cost, IT leaders and organisations need to evaluate all IT activities from a business perspective.

Research has been conducted on the management processes for planning, controlling, organising, and coordinating IT resources in an organisation. A very important internal contextual factor that has been suggested by a number of prescriptive articles, case studies, and empirical studies on IT management processes as being very important in influencing IT decision processes, IT-line partnerships, IT performance, and IT use is Shared Domain Knowledge (SDK) (Tan and Gallupe, 2006; Reich and Benbasat, 2000; Ranganathan and Sethi, 2002; and Chan, et al., 2006). SDK 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 key processes and to respect each other's unique contribution and challenges" (Reich and Benbasat, 2000).

The objective of this study is to examine the impact of SDK on Strategic Information Systems Planning (SISP) and effectiveness. "Strategic Information Systems (SIS) are computerised information systems that align the use of Information Systems (IS) and Information Technology (IT) strategically with corporate strategies in organisations" (Pun, et al., 2007). Brown (2004) reported that SISP has been a key issue for information systems managers for a long time and that the interest in SISP stems from organisations recognising IT as a strategic resource, capable of providing strategic advantage and overall business performance improvement. SISP focuses on the planning process of coordinating the relationship between the business domain and the IT domain (Haglind and Cheong, 2001) and has been identified as essential in integrating information technology into an organisation to increase a firm's strategic competitive advantage (Grover and Segars, 2005).

Segars and Grover (1999) have described SISP effectiveness along the following four dimensions: a*lignment, analysis, cooperation,* and *improvement in capability.* Research on SDK has revealed that SDK impacts alignment (Reich and Benbasat, 2000). In the study by Reich and Benbasat (2000), alignment was operationalised in two ways: short term alignment (the degree of understanding of current objectives between IT and business executives) and long term alignment (congruence of IT vision between IT and business executives). Ness (2005) reports that alignment has been, and remains, one of the top concerns for both business and IT management and the interaction and linkages between business and IT strategies remain one of the top objectives among CIOs. Alignment has been used by Segars and Grover (1998) and Brown and Motjolopane (2005) as measures

for the effectiveness of SISP. Therefore SDK could impact the effectiveness of SISP. This study explores the impact of SDK on SISP and effectiveness by measuring the impact of SDK on SISP process dimensions (comprehensiveness, formalisation, participation, consistency, BP/ISP integration, and IT manager's participation in business planning) and SISP effectiveness (social dimension of alignment and intellectual dimension of alignment).

The first step of the study was to perform a literature survey in order to define the research domain and the research constructs. A research model was built from the examination of the literature survey and the respective hypotheses were built to test the impact of SDK on the SISP process dimensions and SISP effectiveness. A questionnaire was used to gather data from 59 consultants who were involved or observed SISP in the last 10 years. The data was analysed through statistical techniques and presented in the data analysis and results chapter of this dissertation. The study was concluded with a discussion on the study's findings, its limitations and suggestions for future research.

3 LITERATURE SURVEY

This literature survey starts with the examination of the literature on Shared Domain Knowledge (SDK), which is a very important research construct in this study as the aim of this study is to examine the impact of SDK on Strategic Information Systems Planning (SISP) and effectiveness. In order to be able to make any deductions on the impact of SDK on SISP effectiveness, there first needs to be an understanding of the relationship between SDK and SISP, the SISP process, and its dimensions, as well as the dimensions of SISP effectiveness. The SDK literature survey is followed by the literature survey on SISP, the SISP process, the SISP dimensions and the impact of SDK and alignment thereon, as well as SISP effectiveness and its dimensions.

3.1 Shared Domain Knowledge (SDK)

SDK is defined as the ability of Information Systems (IS) and business executives to deeply understand each other's key processes and be able to participate in those key processes at a deep level (Chan, et al., 2006). IS and business executives should also respect each other's unique contributions that they make to the organisation as well as their respective challenges that they face (Chan, et al., 2006). Another construct that is quite similar to SDK and is used in many studies (Reich and Benbasat, 2000; Kearns and Lederer, 2003; Pai, 2005; Vitale, et al., 1986; Henderson, 1990; Boynton, et al., 1994) is the shared knowledge or knowledge sharing. Shared knowledge is described as "an understanding and appreciation among IT and line managers for the technologies and processes that affect their mutual performance" (Reich and Benbasat, 2000) and Pai (2005) described knowledge sharing as "a set of behaviours that involve the exchange of information or assistance to others". Kearns and Lederer (2003) examined how knowledge sharing (represented by the transfer of knowledge between the CIO and the CEO – which illustrates the knowledge sharing between the IT domain and other business domains) in the alignment process contributed to the creation of superior organisational strategies that yield competitive advantage. The knowledge sharing construct was used in these studies (Reich and Benbasat, 2000; Kearns and Lederer, 2003; Pai, 2005; Vitale, et al., 1986; Henderson, 1990; Boynton, et al., 1994) to discuss the development of IT-knowledgeable line managers, its importance for IT-line partnerships, its importance for IT use, its impact on IT performance, its influence on innovation, its impact on communication improvement, its impact on the alignment of IS and business strategy, and its contribution to the alignment-performance relationship.

SDK and its importance have also been examined in the SISP literature within the last seven years. Studies by Reich and Benbasat (2000), Kearns and Lederer (2003), Pai (2005), and Chan, et al., (2006) use the construct of shared knowledge or knowledge sharing to examine its impact on alignment and Ranganathan and Sethi (2002) examine the influence of the SDK construct on the SISP process dimension of rationality. Tan and Gallupe's (2006) research is based on the notion that shared domain knowledge increases alignment and examines alignment at its most micro-level, the cognitive level. The study proved that the higher the level of cognitive commonality between IT and business executives, the higher the level of IT-Business alignment (Tan and Gallupe, 2006). In the study by Reich and Benbasat (2000), the impact of SDK on attaining short-term alignment (operationalised by the degree of mutual understanding of current objectives between business and IT executives) and long-term alignment (operationalised by the congruence of IT vision between business and IT executives) was examined. Ranganathan and Sethi (2002) examined the impact of SDK on the rationality (represented by the levels of information gathering and analysis) in strategic IT decisions, and Kearns and Lederer (2003) examined how knowledge sharing in the alignment process contributes to gaining a competitive advantage. Pai (2005) indicated that knowledge sharing behaviour (represented by trust among stakeholders, CIO's knowledge sharing behaviour, and top management support for SISP) influences the effectiveness of IS/IT strategic planning (defined by the quality of the SISP process and the alignment of IS and business strategy). Findings from Chan, et al., (2006) indicated that alignment depends on shared knowledge and prior IS success.

A summary of these studies (with the emphasis on SDK and knowledge sharing examination) is provided in Table 1.

Study	**Year**	**Nature of Empirical Research**	**Findings**
Reich and Benbasat	2000	57 Semi-structured interviews were held with 45 informants. The written business and IT strategic plans, minutes from IT steering committee meetings, and other strategy documents were collected from 10 business units and were examined.	SDK, IT implementation success, communication between business and IT executives, and connections between business and IT planning influenced short term alignment (operationalised by the degree of mutual understanding of current

			objectives between business and IT executives) and only SDK influenced long term alignment (operationalised by the congruence of IT vision between business and IT executives). Strategic business plans influenced both short and long-term alignment.
Ranganathan and Sethi	2002	A survey was used to gather data from 223 senior IT executives	There was a positive impact of SDK on rationality (represented by the levels of information gathering and analysis) in strategic IT decisions. A highly centralised IT unit structure was found to negatively influence SDK and formalisation of IT structure positively influenced shared domain knowledge.
Pai	2005	Data was collected by a questionnaire survey sent to the IS/IT executives of 805 large companies in Taiwan.	Knowledge sharing behaviour (represented by trust among stakeholders, CIO's knowledge sharing behaviour, and top management support for SISP) influences the effectiveness of SISP (defined by the quality of the SISP process and the alignment of business and IS strategy).
Chan, et al.	2006	Data from multiple surveys.	Alignment depends on

			shared knowledge and prior IS success.

Table 1: Summary of SDK studies

3.2 Strategic Information Systems Planning (SISP)

"Strategic Information Systems (SIS) are computerised information systems that align the use of Information Systems (IS) and Information Technology (IT) strategically with corporate strategies in organisations" (Pun, et al., 2007). Information systems planning (ISP) has been defined as "the process of identifying prioritised information systems (IS) that are efficient, effective and/or strategic in nature together with the necessary resources (human, technical and financial), management of change considerations, control procedures and organisational structure needed to implement these" (Brown, 2004). This study focuses on strategic ISP (SISP), which is the strategic to tactical level of ISP, and differs from lower levels of planning in terms of scope, perspective, level of abstraction, and time frame. Segars and Grover (1998) describes the scope of SISP as being broad, the perspective of SISP is that of the highest levels of management within the organisation, it has a medium to long time frame, and in terms of the level of abstraction, it is more conceptual than physical. Bai and Lee (2003) reveal that according to surveys on information systems management issues, SISP remains one of the top ten issues facing corporate general managers and IS executives and that improper SISP may fail to realise the anticipated benefits. Surmsuk and Thanawastien (2007) describe a new information systems planning methodology, called ISISP (integrated strategic information systems planning), which combines the top-down and bottom-up methodologies of SISP. The ISISP methodology contributes to the development of an application portfolio that is more suitable for creating an IT-enabled enterprise as it takes care of both existing and future strategic applications.

To gain a clearer definitional context for describing potential process characteristics of SISP, extensive analysis and reconciliation of research in both strategic management and IS were undertaken by Segars and Grover (1999). Together, these streams seem to suggest that six broad process dimensions are useful in characterising the activity of strategic planning. These dimensions are *comprehensiveness, formalisation, focus, flow, participation,* and *consistency*. Brown's (2004) summary of the SISP characteristics includes: *frequency, participation, ownership, alignment, implementation, competitive focus, BSP-IP integration, and alacrity.* Table 2 summarises the aforementioned SISP process characteristics.

Characteristic	Definition
Comprehensiveness	The extent to which an organisation attempts to be exhaustive or inclusive in making and integrating decisions
Flow	The locus of authority or devolution of responsibilities for strategic planning (top-down, bottom-up, interactive)
Focus	The balance between creativity and control orientations inherent within the strategic planning system
Formalisation	The existence of structures, techniques, written procedures and policies that guide the planning process.
Consistency/Frequency	The frequency of planning activities or cycles, and, relatedly, the frequency of evaluation/revision of strategic choices (occasional vs. continuous)
Participation	The breadth of involvement in strategic planning (narrow vs. wide)
Ownership	The locus of ownership for the planning process (business/IS group/mixed)
Alignment	The degree to which alignment between corporate and IS strategies is explicitly sought
Implementation	Focus during the planning process on the implications for implementation
Competitive focus	The range of benefits sought (primarily efficiency vs. wider benefits, including competitive advantage)
BP/ISP integration	The level of integration between business planning and SISP (business-led, IT-led, reciprocal or full integration) (Teo and King, 1997)
Alacrity	The speed of the SISP process (Lederer & Sethi, 1998)

Table 2: SISP Process — Characteristics (Segars and Grover, 1998; Doherty, et al., 1999; Brown, 2004)

Grover and Segars (2005) revealed that the six broad dimensions of the SISP process exhibit elements of both rationality (high comprehensiveness, high formalisation, top–down flow, control focus) and adaptability (wide participation, high consistency). Grover and Segars (2005) added that adaptability may be designed into a system through wide participation profiles and through higher levels of planning consistency. Research by Ranganathan and Sethi (2002) provides evidence that rationality, represented by the levels of information gathering and analysis, is strongly related to SDK. Segars and Grover (1998) strongly suggested that high performing systems of planning contain aspects of adaptability, represented by participation and consistency. Therefore, participation and consistency will

be included in this study's research model. Reich and Benbasat (2000) also investigated the level of connection between IT and business planning processes and its level of influence on alignment. This characteristic termed BP/ISP integration will also be included in this study's research model. Factors that were identified in the research undertaken by Kearns and Sabherwal (2006 -7) – business managers' participation in strategic IT planning and IT managers' participation in business planning – were found to affect business-IT strategic alignment. These factors will therefore be included in this study's research model. The paragraphs that follow will discuss the aforementioned SISP process dimensions that are included in this study's research model and how they are impacted by SDK and alignment.

3.3 SISP Process Dimensions

3.3.1 Rationality

The study by Segars and Grover (1998) strongly suggested that high performing systems of planning contain aspects of rationality of which the following are indicative: higher levels of comprehensiveness, formalisation, focus on control and top-down planning flow.
Ranganathan and Sethi (2002) defines rationality as "the desire to make the best possible decision as characterised by the extent of information acquired and analysed, despite the disorderliness and deviations that might be encountered in the decision process". When examining MIS research, it was found that the entire stream of SISP research is grounded in the context of rationality (Ranganathan and Sethi, 2002). Ranganathan and Sethi (2002) states that senior IT executives make many crucial decisions with the expectation that their decision outcomes will be sufficiently successful to achieve their objectives. Many of them try to be logical and systematic and use rational approaches in their decision-making process. Yet, many times, discrepancies creep in their processes as well as outcomes (Ranganathan and Sethi 2002).

Ranganathan and Sethi (2002) provide a theoretical basis for linking rationality and SDK. Strategic decisions, which are characterised by their complexity, uncertainty, importance to organisations, and a high level of information asymmetries, require not only large amounts of information and a high level of information processing capacity but also a variety of information. To attain this amount, level and variety of information inputs, knowledge, and expertise, a heterogeneous, cross-functional participation is required. Successful strategic decisions are dependent on the strategic knowledge of IT top and functional managers, the functional managers' IT knowledge, and the business knowledge of IT managers, which is integrated into SDK. SDK therefore significantly influences the rationality in strategic IT decisions (Ranganathan and Sethi, 2002). Ranganathan and Sethi (2002) provide evidence

that rationality, represented by the levels of information gathering and analysis, is strongly related to SDK.

Formalisation is another distinct process characteristic of strategic planning that was found to positively influence strategic alignment (Basir and Yusof, 2006). The author used both the study by Ranganathan and Sethi (2002) and Basir and Yusof (2006) as the basis to include comprehensiveness and formalisation in this study. Comprehensiveness and formalisation are described in further detail in the following sections.

3.3.1.1 Comprehensiveness

Within the literature of strategic management, a rather well grounded feature of the strategic planning process is the emphasis placed on being *comprehensive* in making and integrating decisions (Segars and Grover 1998). Segars and Grover (1998) illustrated that this construct has a multitude of behaviours. These behaviour include the following: (1) the thorough canvassing of a wide range of alternatives; (2) surveying a full range of objectives; (3) carefully weighing the costs and risks of various consequences; (4) intensively searching for information to evaluate alternative actions; (5) objectively evaluating information, or expert judgment regarding alternative actions; (6) re-examining the positive and negative consequences of all known alternatives; and (7) making detailed plans—including consideration of contingencies—for implementing a chosen action. Utilising this and other multifaceted characterisations of the construct, Segars, et al., (1998) formally defines comprehensiveness as "*the extent to which an organisation attempts to be exhaustive or inclusive in making and integrating strategic decisions.*" Basir and Yusof (2006) assessed the impact of rationality on strategic alignment and found that there was a positive influence of comprehensiveness (the extent of the solution search) on strategic alignment.

3.3.1.2 Formalisation

On review of IS literature (Sabherwal and King, 1995; Lederer and Sethi, 1996; Premkumar and King, 1994) and strategic management literature (Segars and Grover, 1998) *formalisation* was found to be another process characteristic that is well researched and defined with minimal variation. Segars and Grover (1999) state that formalisation refers to the existence of structures, techniques, written procedures, and policies that guide the planning process. Haglind and Cheong (2001) report that a typical SISP setting is a situation where top management executes a major, intensive study in order to produce a strategic IS plan which is implemented by deciding and initiating a number of projects concerned with changing or extending the organisations software systems as defined and prescribed in the plan. Organisations usually follow one of several, similar well-defined and documented SISP

methodologies to guide it or it could customise its own (Haglind and Cheong, 2001). A highly formalised planning system (characterised by written policies, formalised techniques, and/or known procedures for structuring, conducting and initiating the strategic planning process respectively) is a more rationalised process for constructing strategic plans that ideally produce efficiency gains for receiving and processing of information, which ultimately provides organisations with the capacity to consider many strategic issues (Segars and Grover 1999). Basir and Yusof (2006) assessed the impact of rationality on strategic alignment and found that there was a positive influence of formalisation (rules and procedures guiding SISP) on strategic alignment.

3.3.2 Adaptation

The study by Segars and Grover (1998) strongly suggested that high performing systems of planning contain aspects of adaptability. Adaptability is built into the planning system through increased levels of participation and consistency, which is discussed in more detail in the next section.

3.3.2.1 Participation

Participation, which was first developed in strategic management literature and is now well researched in recent SISP studies (Lederer and Sethi, 1996; Sabherwal and King, 1995) represents the breadth of involvement in strategic planning (Segars and Grover 1999). The breadth of involvement in the strategic planning process across organisations may vary in the number of planners involved, representation from various functional areas, and amount of lateral communication. Typically, organisations that have planning structures with narrow participation profiles follow a "top-down" planning flow with little involvement or interaction among various functional or operational managers and organisations with broader participation profiles follow a "bottom-up" planning flow which involves many planning participants from a variety of functional and operational areas (Segars and Grover 1999). A "top-down" planning flow may be deemed necessary when there is a lack of business or "strategic" knowledge among lower level managers or when the participation of many managers may slow examination of alternatives and, subsequently, decision speed (Lederer and Sethi 1996). A "bottom-up" planning flow may be necessary to offset the "bounded rationality" of top managers inundated by the complexity and dynamic nature of the competitive environment (Sabherwal and King 1995). Bai and Lee (2003) state that as information systems become more complex, numerous cooperative factors may influence the quality of the SISP process. To ensure that the SISP is of a high quality, it must involve multiple stakeholders, cut across departments, and feature increased cooperation among managers and managerial groups (Bai and Lee, 2003). Ranganathan and Sethi (2002)

states that effective IT-business alignment is attained when the CIO and the senior IT executives have a good knowledge of the business domains, functional managers are involved in IT management processes and business managers are IT-knowledgeable. The study by Bai and Lee (2003) revealed that the CEO/CIO relationship had a positive influence on SISP quality. Kearns and Sabherwal (2007) examined three types of participation: business managers' participation in IT planning, IT managers' participation in business planning, and top managers' participation in IT resource allocation, and found that the role of IT planning and alignment might be weakened when investments reflect top managements' selection. IT-based organisational performance was found to be more strongly influenced by top managers' participation in resource allocation than was quality of IT plans or the absence of IT project problems (Kearns and Sabherwal, 2007). Basir and Yusof (2006) assessed the impact of adaptation on strategic alignment and found that there was a positive influence of participation (number and variety of participants) on strategic alignment.

3.3.2.2 Consistency

Consistency is concerned with the frequency of planning activities or cycles and, relatedly, the frequency of evaluation of the vision of strategic choices (Lederer & Sethi, 1996; Sabherwal and King, 1995). The study by Segars and Grover (1999) revealed that stronger planning effectiveness is related to high consistency. Basir and Yusof (2006) assessed the impact of consistency on strategic alignment and found that there was a positive influence of consistency (frequency of planning cycles) on strategic alignment.

3.3.3 BP/ISP Integration (Business Planning/IS Planning integration)

BP/ISP Integration has been operationalised by Teo and King (1997) as a four-stage typology, varying from no integration to full integration. It is demonstrated in Teo and King (1997) that the greater the degree of integration, the fewer the planning problems, and the greater the IS contribution to organisational performance. Similarly, Reich and Benbasat (2000) define connections between business planning and IT planning, according to a similar typology of integration, and demonstrate this as an influence on social alignment. Pai (2005) provides empirical evidence that knowledge sharing positively impacts the quality of the SISP process and the alignment of the business and IS strategy. Basir and Yusof (2006) also used the four-stage BP/ISP Integration typology (Administrative – IS planning and business planning are related processes, Sequential – IS planning follows and supports business planning, Reciprocal – IS planning and business planning are mutually reinforcing, Full – IS planning and business planning are fully integrated) to assess its impact on strategic alignment and found that there was a positive influence of BP/ISP Integration on strategic alignment.

3.3.4 IT Manager's Participation in Business Planning

Reich and Benbasat (1996) stipulated that "information technology management can be conceptualised as coordinating the relationship between the business domain and the IT domain". Kearns and Lederer (2001) provided evidence that participation by the CIO in business planning improves alignment of IT strategies with business strategies and promotes the identification of explicit information systems and technologies in business strategies. Kearns and Lederer (2003) proved that participation in business planning by the CIO was strongly associated with business and IT plan alignment (intellectual alignment). Hu and Huang's (2005) case study found that the relationship between IT and other business departments achieved a high degree of strategic alignment between business and IT. The CIO in this case study considered relationship management as one of the most important jobs of IT management and installed liaisons with each of the business areas to encourage regular communication to understand, on an ongoing basis, how to work with the rest of the company (Hu and Huang, 2005). Kearns and Sabherwal (2006-7) added that interpersonal sharing of information creates benefits by amplifying the new knowledge and provides benefits such as an improved ability to reflect business objectives in IT plans. Kearns and Sabherwal (2006-7) conducted research on how planning behaviours (specifically, IT managers' participation in business planning and business managers' participation in IT planning) affect business–IT strategic alignment taking knowledge considerations into play and proved that IT managers' participation in business planning is positively associated with business–IT strategic alignment.

3.4 SISP Effectiveness

SISP goals may differ across various organisations, in terms of the number and specific goals for SISP; however, Segars and Grover (1999) identified two approaches for measuring strategic IS planning success, which are "goal-centred judgment" and "improvement judgement", and report on the following six important goals for planning: (1) enhancing managerial development, (2) predicting future trends, (3) short-term performance, (4) long-term performance, (5) gathering relevant information, and (6) avoiding problem areas. "Goal-centred" judgement seeks to assess the degree of attainment in relation to targets and Segars and Grover (1999) terms this evaluative dimension "IS planning Effectiveness" and the focus of "improvement judgement" is on assessing how the planning system has evolved or improved *over time* in supporting organisational planning needs. Tallon (2007-8) looked at alignment at a process level and found a positive link between alignment and perceived IT business value in each of the primary processes in the value chain. The study revealed the need for managers to look more closely at how IT can support individual processes rather

than how IT can support an entire strategy (Tallon, 2007-8). Segars and Grover (1999) suggests that when evaluating SISP, planning evaluators should determine longitudinal patterns in (1) the relative efficiency in use of financial and personnel resources devoted to SISP; (2) the actual use of strategic plans; (3) the contribution of SISP to organisational performance; and (4) changes in IS strategy resulting from changes in business strategy.

Segars and Grover (1999) adds that most aspects of effectiveness with respect to IS and IS management are complex therefore multiple, interrelated success dimensions, are more likely to accurately capture changes in performance. Based on an extensive review and analysis of literature as well as expert opinion, the following fou r dimensions of SISP effectiveness are described by Segars and Grover (1999): *alignment, analysis, cooperation,* and *improvement in capability.* The first three constructs represent "goals" for SISP while the last construct represents "improvement" in SISP over time.

The study by Reich and Benbasat (2000) specifically researched the impact of SDK on the social dimension of alignment and Kearns and Lederer (2003) examined knowledge sharing in the alignment process and its contribution to the intellectual alignment-performance relationship. Therefore, social and intellectual alignment will be used to measure SISP effectiveness in this study's research model and will be discussed in detail in the following section.

3.4.1 Alignment

Reich and Benbasat (2000) report that one of the top organisational concerns for IS and business executives that has been around for the last decade, is the alignment of information technology plans with organisational objectives. Academics and researchers have also paid this topic lots of attention and many investigations into the means of attaining alignment and its impact on organisational outcomes have been executed (Reich and Benbasat, 2000). Strategic alignment can be defined as the art and science of formulating, integrating, and implementing decisions between the business and IT, which enables an organisation to improve organisational effectiveness, maximise return on investment, allows companies to better manage their overall business needs, technology and competition, and provides balance within an organisation (Ness, 2005). Strategic alignment and SISP are often considered as "two sides of the same coin", on the one side, SISP deals with the planning process of coordinating the business and IT relationship and on the other side, alignment represents the result of the process (Haglind and Cheong, 2001).

In the research literature, there seem to be two approaches to the subject of alignment. The first concentrates on examining the strategies, structure, and planning methodologies in organisations and the second investigates the role players in organisations, examining their values, communications with each other, and ultimately their understanding of each others' domains (Reich and Benbasat, 2000). These two dimensions are referred to the intellectual dimension and the social dimension of alignment. Research into the intellectual dimension is more likely to concentrate on the content of plans and on planning methodologies. Research into the social dimension was more likely to focus on the people involved in the creation of alignment. Both these types of alignment will be discussed in detail in the following section.

3.4.1.1 Social Dimension of Alignment

The social dimension of alignment is 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 and Benbasat, 2000). This dimension can be described as the "culture gap" between IT and business people. Another theoretical perspective supporting the concept of the social dimension of alignment is the social construction of reality (Reich and Benbasat, 2000). This view would suggest that, in addition to studying artifacts (such as plans and structures) to predict the presence or absence of alignment, one should investigate the contents of the players' minds: their beliefs, attitudes, and understanding of these artifacts. Results from the study by Cohen and Toleman (2006) revealed that a strong IS–business relationship, defined in terms of the following three relational attributes which form part of the social alignment construct introduced by Reich and Benbasat (2000) – commitment, mutual understanding and shared vision, is a significant determinant of IS performance. The study by Reich and Benbasat (2000) provided support for SDK positively influencing the social dimension of alignment.

3.4.1.2 Intellectual Dimension of Alignment

"The intellectual dimension of alignment refers to the alignment of IT plans (or strategies) with business plans (or strategies), and is defined as the state in which a set of high quality interrelated business plans and IT plans exist" (Brown and Motjolopane, 2005). This type of alignment requires IS and business executives to take joint responsibility for delivering benefits from the investments made in IT and the ideal situation would be for both the business plan and the IS plan to be linked by the mapping of IS strategies to one or more business strategies in order to optimise the business performance and the return to the organisation (Kearns and Lederer, 2000). Alignment is represented as two sets of outcomes: the alignment of the IT plan with the business plan which means that the IT plan will actually reflect what is in the business plan (e.g. business goals and business

strategies), and the alignment of the business plan with the IT plan which means that the business plan will actually reflect what is in the IT plan (e.g. expected performance from IS applications) (Kearns and Lederer, 2003). Kearns and Lederer (2003) proved that knowledge sharing in the alignment process positively contributed to the alignment-performance relationship.

3.5 Literature Survey Summary

This literature survey first examined the literature on SDK and thereafter SISP. In order to ascertain the impact of SDK on SISP and effectiveness, the SISP process dimensions and the SISP effectiveness dimensions had to be examined. The SISP process dimension that was included was rationality, which comprised of comprehensiveness and formalisation, and adaptation, which comprised participation and consistency. The SISP effectiveness dimensions that were included were social alignment and intellectual alignment. Figure 1 diagrammatically illustrates the research constructs in this study.

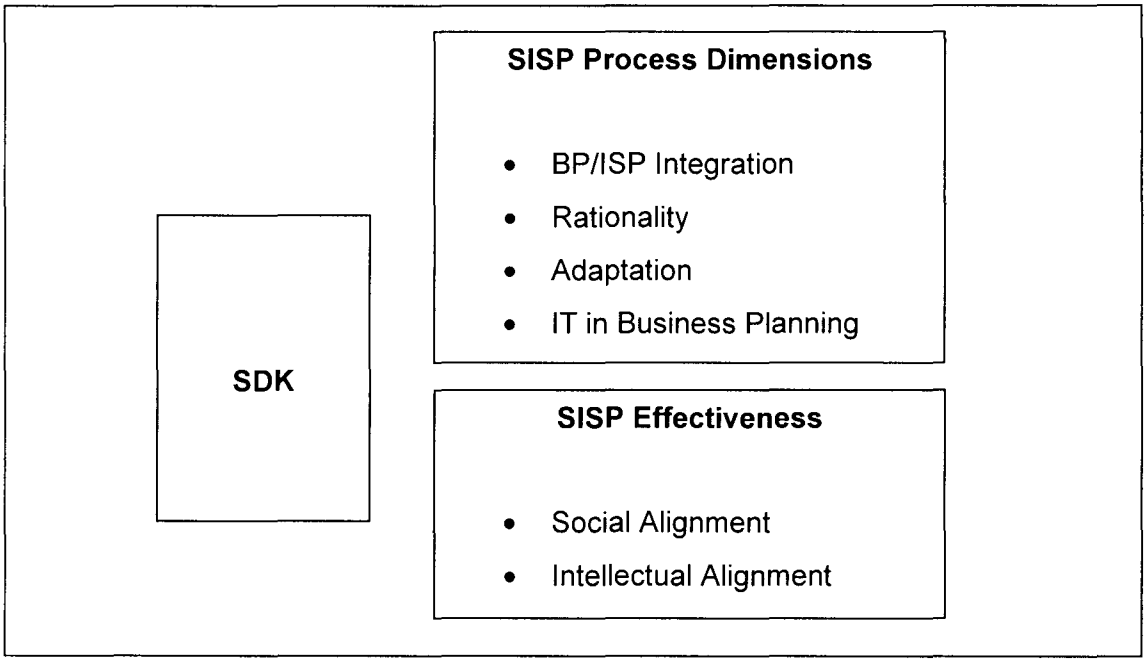

Figure 1: Research Constructs

4 RESEARCH FRAMEWORK

4.1 Research Model and Hypotheses

The objective of this research is to examine the impact of SDK on SISP and effectiveness. In order to ascertain this, a research model (Figure 2) has been constructed based on the literature review in the previous section. The research model has been developed through the findings of various studies (Ranganathan and Sethi, 2002; Pai, 2005; Kearns and Lederer, 2003; Kearns and Sabherwal, 2006-7; Chan, et al., 2006; Reich and Benbasat, 2000; Cohen and Toleman, 2006; Segars and Grover, 1998, 1999; Brown and Motjolopane, 2005). Each study focused on specific elements of the research model in Figure 2 but the author has not found any research being executed on the research model in its entirety. The research model that will be used in this study contains three main parts, namely SDK, SISP Process Dimensions, and SISP Effectiveness and the hypotheses that have been developed from this research model are detailed in the following section.

4.1.1 Impact of SISP Process Dimensions on SISP Effectiveness

In the study by Brown and Motjolopane (2005), SISP Process Dimension BP/ISP was found to positively influence strategic alignment. Since there are two types of alignment in this study, BP/ISP's influence will be tested on both social and intellectual alignment and ultimately SISP effectiveness, as per the hypotheses below:

H1: BP/ISP integration positively influences social alignment
H2: BP/ISP integration positively influences intellectual alignment
H3: BP/ISP integration positively influences the effectiveness of SISP

Segars and Grover (1998) revealed that SISP Process Dimensions are positively associated with SISP Effectiveness. The study showed that planning systems that exhibit aspects of rationality and adaptation are positively associated with planning effectiveness. Since SISP effectiveness is made up of social and intellectual alignment in this study, the study done by Segars and Grover (1998) contributes to the development of hypotheses that will test the influence of rationality and adaptation on social alignment as follows.

H4: Rationality positively influences social alignment
H5: Adaptation positively influences social alignment

In the study by Brown and Motjolopane (2005), SISP Process Dimensions rationality and adaptation was found to positively influence strategic alignment. Therefore the hypotheses

that will examine the influence of rationality and adaptation on intellectual alignment are as follows:

H6: Rationality positively influences intellectual alignment
H7: Adaptation positively influences intellectual alignment

Thereafter, the influence of rationality and adaptation on SISP effectiveness will be tested by the following hypotheses:

H8: Rationality positively influences the effectiveness of SISP
H9: Adaptation positively influences the effectiveness of SISP

The empirical results in Kearns and Sabherwal (2006-7) study supported that business–IT alignment is affected by IT managers' participation in business planning and business managers' participation in strategic IT planning. Pai's (2005) study looked at the relationship between the quality of the SISP process and alignment of IS and business strategies and the empirical results indicate that the casual relationship exist between the quality of the SISP process and alignment of IS and business strategies which implied that the alignment between IS strategy and business strategy improves with the quality of the SISP process. All of the aforementioned studies contribute to this study's following hypotheses:

H10: IT manager's participation in business planning positively influences social alignment
H11: IT manager's participation in business planning positively influences intellectual alignment
H12: IT manager's participation in business planning positively influences the effectiveness of SISP

4.1.2 Impact of SDK on SISP Process Dimensions

In an examination of 223 strategic IT decisions, Ranganathan and Sethi (2002) found that the degree of rationality, represented by the levels of information gathering and analysis, is strongly related to the SDK in the organisation. This study provides direct empirical support for the positive influence of SDK on rational IT decision-making processes. Therefore a further hypothesis for this study is:

H13: SDK positively influences rationality

In the study by Segars and Grover (1998), it is stated that two of the dimensions that SISP can be operationalised along is "participation (number and variety of planners) and consistency (frequency of planning cycles)". The study (Segars and Grover, 1998) found that planning effectiveness was positively associated with high participation and high consistency (collectively defined as adaptation). Since this study posits that SDK positively influences SISP effectiveness and examines the impact of SDK on the SISP process to understand the impact of SDK on SISP effectiveness, the impact of SDK on adaptation needs to be tested. The author has found that there is a lack of research on the impact of SDK on adaptation, which therefore contributes to the following hypothesis in this study:

H14: SDK positively influences adaptation

Results of the study by Pai (2005) demonstrated that knowledge sharing behaviour significantly affects the alignment of IS and business strategy. Therefore the following hypotheses have been developed in this study:

H15: SDK positively influences BP/ISP integration
H16: SDK positively influences IT manager's participation in business planning

4.1.3 Impact of SDK on SISP Effectiveness

The objective of this study is to examine the impact of SDK on SISP and effectiveness. In the study by Reich and Benbasat (2000), SDK was found to influence social dimension of alignment. The study by Kearns and Lederer (2003) proved that knowledge sharing in the alignment process positively contributed to the intellectual alignment-performance relationship. Based on the above studies, there is evidence that SDK impacts social and intellectual dimensions of alignment (the measures of SISP effectiveness in this study) and based on the studies in the aforementioned sections, there is a considerable amount of evidence on the impact that SDK has on the SISP Process Dimensions and the impact that the SISP Process Dimensions have on SISP Effectiveness. All of this evidence contributes to the following hypotheses of this study which will ultimately assist in realising the objective of this study:

H17: SDK positively influences social alignment
H18: SDK positively influences intellectual alignment
H19: SDK positively influences the effectiveness of SISP

Figure 2 is an illustration of all the relationships that are being tested in this study and the hypotheses that are associated to them.

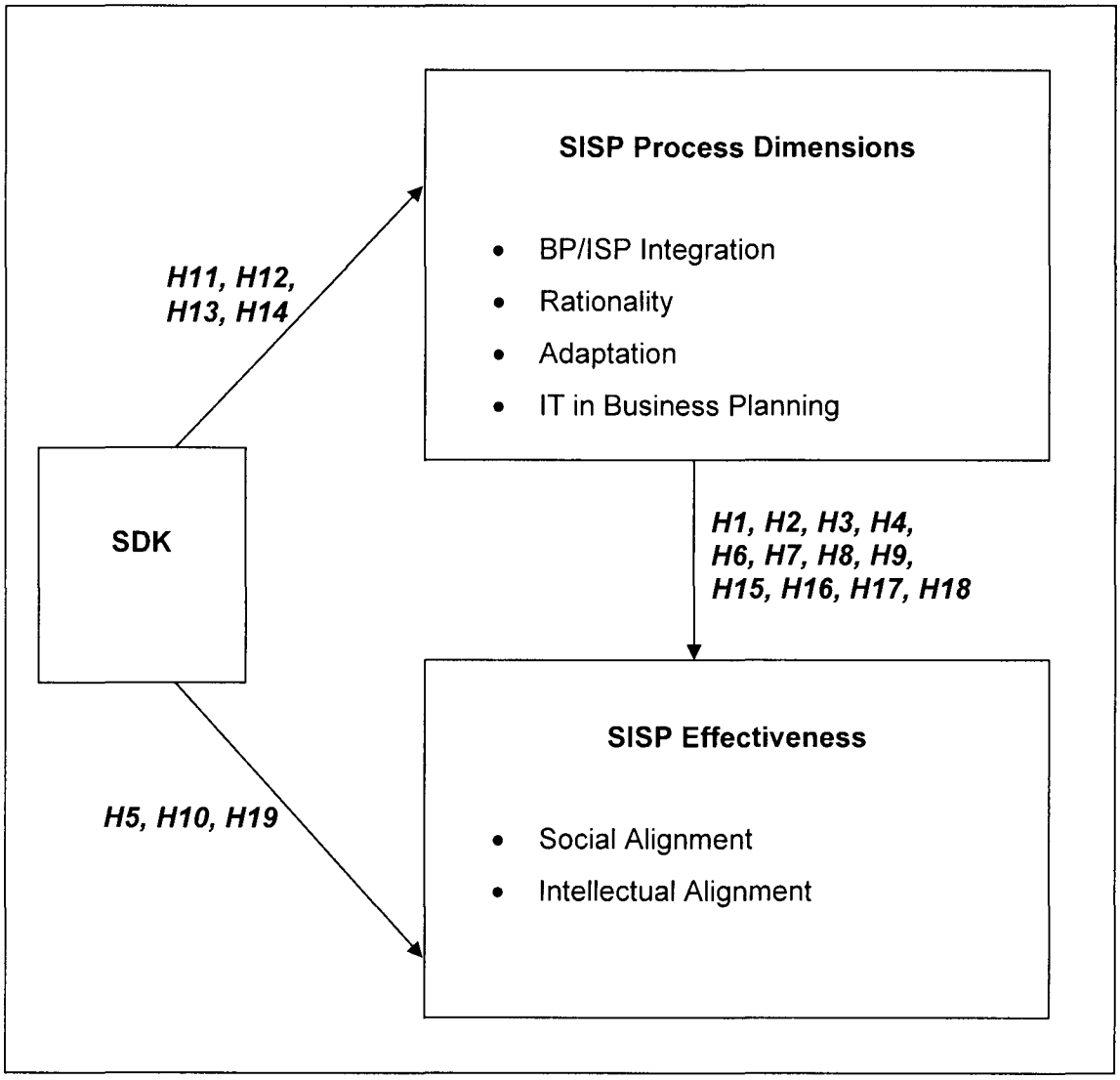

Figure 2: Research Model

5 RESEARCH METHODOLOGY

The research methodology used in this study is a positivist approach as this research deals with observable phenomena and positive facts that exist within this area. In keeping with the positivist approach, the objectives of this study is to describe this area of research (which has been done in the previous sections), test what has been described and thereafter analyse and explain the findings of this study. The hypothetical deductive method has been employed in this study and the hypotheses that have been developed in the previous section will be tested to evaluate if they are supported. This is a quantitative study as it draws on measurable evidence which will be obtained through this study's questionnaire. Measures for the research constructs that will be used in this study's questionnaire are developed in the following section and statistical analysis will be conducted on the responses in order to test the hypotheses. Further details on the research instrument, the data collection process, and the data analysis procedure are provided in the following sections.

5.1 Development of the Measures of Research Constructs

This research study has been based on the findings of various studies (Ranganathan and Sethi, 2002; Pai, 2005; Kearns and Lederer, 2003; Kearns and Sabherwal, 2006-7; Chan, et al., 2006; Reich and Benbasat, 2000; Cohen and Toleman, 2006; Segars and Grover, 1998, 1999; Brown and Motjolopane, 2005) and as such involves many items of interest. These items are essentially complex in nature and measuring them accurately using a single scale is not feasible as single measures typically have considerable uniqueness. This would ultimately result in a low correlation with the attribute being measured (Segars and Grover, 1998). When using single measures it is also necessary to keep in mind that single measures tend to frame concepts narrowly which could result in considerable measurement error. The study by Segars and Grover (1998) used a widely accepted framework by Churchill (1979, 1982) to base its measures of research constructs on. The framework was used for developing measures of complex research items. Segars and Grover (1998) iterated that the general nature of the framework has made it applicable to a variety of studies in both strategic management and IS even though it was initially presented in the context of developing marketing constructs.

On examination of this framework, it was concluded that this framework would be suitable for use in this study as the multi-item measures would overcome the difficulties of single items that tend to frame concepts narrowly, resulting in considerable measurement error. The framework also puts forward that in order to reduce the measurement error, the

specificity of individual items could be averaged out thereby allowing more robust conceptualisations of complex items to be developed.

In order to develop the multi-item measures for this study, the author executed an intense review of the literature and the resultant domain of this study was specified as SDK, SISP Process Dimensions, and SISP Effectiveness. Thereafter the author went through a process of delineating what would be included, and what would be excluded in the definition of research constructs. The aforementioned areas of SDK, SISP Process Dimensions, and SISP Effectiveness provided the theoretical underpinning for the initial conceptual definition and thereafter the research items were generated for each construct of interest. The author tried to identify and use or adapt existing measurement scales as far as possible for this study as Segars and Grover (1998) noted that the use of new scales makes it difficult to compare and accumulate findings, thereby inhibiting synthesis of what is known.

After the initial list of research items was generated, each measure within the list went through a process of sanitisation in order to ensure that the meaning that was associated by this study with each item was the same meaning that the targeted respondent associated to it. An exercise involving getting expert opinions and a pilot test was then conducted in order to remove any ambiguous questions, questions that had multiple interpretations, leading questions, and unnecessary terminology as any of the aforementioned questions or terminology could seriously inhibit the validity of this study's findings. Further, Segars and Grover (1998) iterated that this step ensures the "completeness" of construct operationalisation.

The final list of research constructs, detailed hereafter, was generated through analysis of existing measurement scales, relevant literature, and expert opinion (academic and practitioners).

5.1.1 Measures of the Research Constructs

The following section details all the measures for each research construct. These measures were used in this study's questionnaire and were the basis for the multi-item measures in this study.

5.1.1.1 SDK

Table 3 illustrates the research questions that were used for measuring the SDK research construct. The measurement scales were adapted from an existing measurement scale in studies by Ranganathan and Sethi (2002) and Kearns and Sabherwal (2006-7). A seven-

point Likert scale ranging from 1 for "not at all" to 7 for "to great extent" was employed in the questionnaire.

Constructs and Survey Questions	**Supporting Literature**	**Measures**
Shared Domain Knowledge		
Business executives recognised the potential of IS as a competitive weapon.	Ranganathan and Sethi, 2002	measured on a 1-7 scale; 1 = *not at all;* *7* = to *great extent*
Business executives recognised IS as a tool to increase productivity.	Ranganathan and Sethi, 2002	measured on a 1-7 scale; 1 = *not at all;* *7* = to *great extent*
Business executives were highly knowledgeable about the firm's information technology assets and opportunities.	Kearns and Sabherwal, 2006-7	measured on a 1-7 scale; 1 = *not at all;* *7* = *greatly*
Business executives agreed that information technology could have important intangible benefits that should be funded.	Kearns and Sabherwal, 2006-7	measured on a 1-7 scale; 1 = *not at all;* *7* = *greatly*
IS executives were highly knowledgeable about business operations of the firm.	Ranganathan and Sethi, 2002	measured on a 1-7 scale; 1 = *not at all;* *7* = *greatly*
IS executives were highly knowledgeable about business strategies of the firm.	Ranganathan and Sethi, 2002	measured on a 1-7 scale; 1 = *not at all;* *7* = *greatly*

Table 3: Measures of Research Constructs for SDK

5.1.1.2 Rationality – Comprehensiveness and Formalisation

The higher order item, Rationality, comprises planning comprehensiveness and planning formalisation (as identified in the literature survey). Table 4 illustrates the research questions used for measuring the comprehensiveness process dimension of SISP research construct. The measurement scales were adapted from an existing measurement scale in a study by Segars and Grover (1999). A seven-point Likert scale ranging from 1 for "strongly disagree" to 7 for "strongly agree" was employed in the questionnaire. Table 4 also illustrates the research questions that were used for measuring the formalisation process dimension of

SISP research construct. The measurement scales were adapted from an existing measurement scale in a study by Segars and Grover (1999). A seven-point Likert scale ranging from 1 for "strongly disagree" to 7 f or "strongly agree" was employed in the questionnaire.

Higher Order Item	Constructs and Survey Questions	Supporting Literature	Measures
Rationality	Planning Comprehensiveness		
	The company attempted to be exhaustive in gathering information relevant for SISP	Segars and Grover, 1999	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
	Before a decision was made, each possible course of action was thoroughly evaluated	Segars and Grover, 1999	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
	The company attempted to determine optimal courses of action from identified alternatives	Segars and Grover, 1999	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
	There was little trial-and-error in the SISP process	Segars and Grover, 1999	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
	Decisions were delayed until they were sure that all alternatives were evaluated	Segars and Grover, 1999	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
	Planning Formalisation		
	Policies and procedures greatly influenced the process of SISP within the firm.	Segars and Grover, 1999	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
	Formalised planning techniques in the SISP process were utilised.	Segars and Grover, 1999	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
	The process for strategic planning was very structured.	Segars and Grover, 1999	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*

	Written guidelines to structure strategic IS planning existed in the organisation.	Segars and Grover, 1999	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
	The process and outputs of strategic IS planning were formally documented.	Segars and Grover, 1999	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*

Table 4: Measures of Research Constructs for Adaptation - Comprehensiveness and Formalisation

5.1.1.3 Adaptation - Participation and Consistency

The higher order item, Adaptation, comprises participation and consistency (as identified in the literature survey). Table 5 illustrates the research questions used for measuring the participation and consistency process dimensions of SISP research construct. The measurement scales were adapted from an existing measurement scale in a study by Segars and Grover (1999). A seven-point Likert scale ranging from 1 for "strongly disagree" to 7 for "strongly agree" was employed in the questionnaire.

Higher Order Item	Constructs and Survey Questions	Supporting Literature	Measures
Adaptation	Planning Participation		
	Business executives were actively involved in strategic IS planning.	Segars and Grover, 1999	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
	A variety of functional area managers participated in the process of IS planning.	Segars and Grover, 1999	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
	The process for strategic IS planning included numerous participants.	Segars and Grover, 1999	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
	Strategic IS planning was a relatively isolated organisational activity.	Segars and Grover, 1999	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
	The level of participation in SISP by diverse interests of the organisation was high.	Segars and Grover, 1999	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
	Planning Consistency		

	Conformance to strategic plans were constantly evaluated and reviewed.	Segars and Grover, 1999	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
	Strategic plans were frequently adjusted to better adapt them to changing conditions.	Segars and Grover, 1999	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
	Strategic IS Planning was a continuous process.	Segars and Grover, 1999	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
	Formal planning for information systems was undertaken as the need arose.	Segars and Grover, 1999	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
	Face-to-face meetings to discuss strategic planning issues were frequently scheduled.	Segars and Grover, 1999	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*

Table 5: Measures of Research Constructs for Participation & Consistency

5.1.1.4 BP/ISP

Table 6 illustrates the research questions that were used for measuring BP/ISP process dimension of SISP research construct. The measurement scales were adapted from an existing measurement scale in studies by Teo and King (1997) and Reich and Benbasat 2000. Respondents were asked to select which description most closely fit their BP/ISP integration.

BP/ISP Integration Descriptions	**Supporting Literature**	**Select 1**
Administrative Integration: In this type of integration, there is a weak relationship between Business Planning (BP) and Information Systems Planning (ISP). Generally there is *little* significant effort to use information technology (e.g. Computers, telecommunications) to support business plans.	Teo and King, 1997	

Sequential Integration: In this type of integration, a sequential relationship exists between Business Planning (BP) and Information Systems Planning (ISP). BP *provides direction* for ISP. ISP primarily focuses on providing support for business plans.	Teo and King, 1997	
Reciprocal Integration: In this type of integration, there is a reciprocal and *interdependent* relationship between Business Planning (BP) and Information Systems Planning (ISP). ISP plays *both* a role in supporting and influencing business plans.	Teo and King, 1997	
Full Integration: In this type of integration, there is little distinction between the Business Planning (BP) process and the Information Systems Planning (ISP) process. Business and information systems strategies are developed *concurrently* in the *same integrated* planning process.	Teo and King, 1997	
Proactive: IS objectives preceded the formulation of business objectives and were used as input to their development. IS was considered significant in changing the basis of competition.	Reich and Benbasat, 2000	

Table 6: Measures of Research Constructs for BP/ISP

5.1.1.5 IT Manager's Participation in Business Planning

Table 7 illustrates the research questions that were used for measuring the IT manager's participation in business planning process dimensions of SISP research construct. The measurement scales were adapted from an existing measurement scale in a study by

Kearns and Sabherwal (2006-7). A seven-point Likert scale ranging from 1 for "strongly disagree" to 7 for "strongly agree" was employed in the questionnaire.

Constructs and Survey Questions	**Supporting Literature**	**Measures**
IT Manager's Participation in Business Planning		
IS executives regularly attended business meetings.	Kearns and Sabherwal, 2006-7	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
IS executives participated in setting business goals and strategies.	Kearns and Sabherwal, 2006-7	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
IS executives were involved early in the meetings for major projects.	Kearns and Sabherwal, 2006-7	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*

Table 7: Measures of Research Constructs for IT Manager's Participation in Business Planning

5.1.1.6 Social Dimension of Alignment

Table 8 illustrates the research questions that were used for measuring the social dimension of alignment research construct. The measurement scales were adapted from an existing measurement scale in a study by Cohen and Toleman (2006). The respondent was asked to select the extent to which you agree with each of the following statements relating to the relationship between IS and the business.

Constructs and Survey Questions	**Supporting Literature**	**Measures**
Social Dimension of Alignment		
Please select the extent to which you agree with each of the following statements relating to the relationship between IS and the business		
Shared vision		
Business and IS executives shared a common vision for the long term role of IS within the organisation	Cohen and Toleman, 2006	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*

Business and IS executives agreed on priorities for the organisational use of IS	Cohen and Toleman, 2006	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
Business and IS executives agreed on the key IS management issues affecting the organisation	Cohen and Toleman, 2006	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
IS understands the Business		
IS executives had a good level of understanding of strategic business plans	Cohen and Toleman, 2006	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
IS executives had a good level of understanding of the work environment of the business	Cohen and Toleman, 2006	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
Commitment		
Business executives regarded the achievement of IS/IS objectives as important to organisational success	Cohen and Toleman, 2006	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
Business executives went out of their way to maintain a strong working relationship with IS managers	Cohen and Toleman, 2006	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
Business executives frequently demonstrated enthusiasm for the IS function's efforts	Cohen and Toleman, 2006	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
Business understands IS		
Business executives had a good level of understanding of the work environment of the IS function	Cohen and Toleman, 2006	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
Business executives had a good level of understanding of strategic IS plans	Cohen and Toleman, 2006	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*

Table 8: Measures of Research Constructs for Social Dimension of Alignment

5.1.1.7 Intellectual Dimension of Alignment

Table 9 illustrates the research questions that were used for measuring the intellectual dimension of alignment research construct. The measurement scales were adapted from an existing measurement scale in a study by Kearns and Lederer (2003). A seven-point Likert

scale ranging from 1 for "strongly disagree" to 7 for "strongly agree" was employed in the questionnaire.

Constructs and Survey Questions	**Supporting Literature**	**Measures**
IS and Business Plan Alignment		
The IS plan reflected the business plan mission	Kearns and Lederer, 2003	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
The IS plan reflected the business plan goals	Kearns and Lederer, 2003	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
The IS plan supported the business strategies	Kearns and Lederer, 2003	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
The IS plan recognised external business environment factors	Kearns and Lederer, 2003	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
The IS plan reflected the business plan resource constraints	Kearns and Lederer, 2003	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
Business Plan and IS Plan Alignment		
The business plan referred to the IS plan	Kearns and Lederer, 2003	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
The business plan referred to specific IS applications	Kearns and Lederer, 2003	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*

The business plan referred to specific information technologies	Kearns and Lederer, 2003	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
The business plan utilised the strategic capability of IS	Kearns and Lederer, 2003	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*
The business plan contained reasonable expectations of IS	Kearns and Lederer, 2003	measured on a 1-7 scale; 1 = *strongly disagree; 7 = strongly agree*

Table 9: Measures of Research Constructs for Intellectual Dimension of Alignment

5.2 Research Instrument

An explanatory study was conducted to test whether SDK affects SISP effectiveness. Conducting an explanatory study is appropriate since phenomena in this area are familiar and well researched. A structured questionnaire was used to collect the data (Annexure 1). A structured questionnaire is an efficient data-collection mechanism because exactly what is required and how to measure the items of interest is known.

Questionnaires were hosted on a website in order to target a larger population, cover a wide geographical area, save time and costs in terms of printing a large amount of questionnaires and using envelopes with stamps, and reduce manpower required to conduct the survey. Tan and Teo (2000) summarised how an internet based survey differed from a traditional mail survey and iterated that mail surveys are usually more costly in terms of manpower and costs and that internet surveys are suitable when the target population consists of people with internet access and also when a short time frame for responses is required (Tan and Teo, 2000). In terms of quality of data, Tan and Teo (2000) revealed that it was adequate in an internet based survey if the respondent that was targeted is part of the general Internet user population. However, Tan and Teo (2000) did stipulate that there could be potential for systematic bias if the responses were only from people with specific characteristics. In terms of generalisability of the results from the survey, Tan and Teo (2000) highlighted that in an internet based survey, it would be difficult to determine the generalisability of the results as there could be a systematic bias in terms of who actually responded to the questionnaire. Therefore, the responses were thoroughly examined to ensure that there was no chance that the respondents could have been children or people who were not familiar with SDK or

SISP. Completeness and consistency of the responses were examined and ensured to the best of the author's ability.

Access to the questionnaire was granted via an email that was sent to the participants work email addresses. The email had a link to the website where the questionnaire resided and all the responses to the questionnaire were kept confidential. The website did not allow the same participant to respond to the questionnaire more than once but it allowed the participant to pause answering the questionnaire and resume at any time that was suitable. On completion of the survey, the participants did not have access to any responses.

5.3 Data Collection

5.3.1 Sampling

The target population for this study consisted of consultants from a large, global IT organisation that were based at companies that were conducting SISP in the last 10 years. These consultants would have had a view or participated in the SISP at the specific company in which they were based. Random sampling was used so that each population member has an equal chance of being selected, and so that the particular combination of organisations selected into the sample was neither more nor less likely to have been chosen than any other combination. 300 consultants from the large, global IT organisation were asked to respond to the questionnaire, since an acceptable response rate of 20% would result in 60 individuals in the sample.

5.3.2 Pilot Testing

The questionnaire was first pre-tested by three academics who have experience in this area of research. The questionnaire was sent directly to their work email addresses and they completed the questionnaire and replied with their feedback. Good feedback and suggestions for improvements were provided by the academics and the questionnaire was amended accordingly. A pilot test was thereafter conducted on the questionnaire in order to assess its clarity and its comprehension. A total of five consultants, three of which were from the large, global IT organisation which was targeted for this study, and two were consultants from other organisations. The questionnaire was sent directly to their work email addresses and they completed the questionnaire and replied with their feedback. Based on the feedback, some questions where re-worded and some questions were removed as the respondents felt that they were repetitive. Generally, the questionnaire was well received and understood with positive feedback e.g. the instructions were clear, and the length of the

questionnaire was adequate. The changes that were suggested in the feedback were made accordingly and the final questionnaire was posted on the website.

5.3.3 Data Collection Procedure

The online questionnaire was hosted on a general survey website and all consultants in the target population were sent an email to the work addresses which included the link to the questionnaire on the website. Confidentiality of the responses was assured and respondents were asked to provide their contact details in the survey if they wished to receive a copy of the findings of this study. Email reminders were sent every two weeks for one month to ensure that the maximum number of consultants answered the questionnaire. The responses to the questionnaire were saved to the website's database and downloads of the responses were available at all times.

5.3.4 Response Rate

Three hundred consultants from one large, global IT organisation were targeted for this survey and on closure of the online survey, a total number of 175 consultants had responded to the survey. On analysis of the responses, it was found that 59 questionnaires were answered completely. Based on the fact that this was an acceptable response rate for this size of survey, the incomplete questionnaires were discarded.

5.4 Data Analysis Procedure

The first part of the data analysis process was to conduct basic descriptive statistics on the questionnaire responses. Frequency tables based on the demographic data in the responses were developed in order to provide a description of the demographic profile of the responses on this study. A frequency table and histogram, based on the BP/ISP Integration responses, were developed in order to gain an understanding of the types of BP/ISP Integration was employed within the responses. The next part of the data analysis was the execution of a factor analysis exercise to reduce the number of items and to identify if there were any structures in the relationships between items. The Cronbach Alpha coefficient for the final set of research items was thereafter tested to ensure their reliability. This was followed by the analysis of the means, standard deviations, and correlations within the final set of items. Finally the hypotheses developed in this study were tested using multiple linear regression which was deemed suitable by the author as multiple linear regression was used to test hypotheses in the study by Pai (2005) and Tan and Teo (2000).

6 DATA ANALYSIS AND RESULTS

6.1 Demographic Profile

The demographic profile of the respondents is illustrated in the tables below. Table 10 details the level of experience of the respondents, the number of years of IS experience that respondents have, and the number of years of SISP experience that the respondents have. Table 11 provides details on the years in which the SISP was conducted and Table 12 shows the industries in which the SISP was executed. Table 13 provides details in the annual revenue of the companies which conducted SISP.

In Table 10, the responses reveal that a large number of respondents in this sample have senior level experience, more than 10 years of IS experience and up to 15 years of SISP experience as 72% have a senior level of experience and 74% have greater than 10 years of IS experience. On examination of the number of years of SISP experience, it is observed that approximately 90% of the respondents have up to 15 years of SISP experience with about 9% of the respondents having greater than 15 years of SISP experience.

Item		**Frequency**	**Percent**
Level of Experience			
	Junior	5	8.62
	Middle	10	17.24
	Senior	42	72.41
Number of years of IS Experience			
	< 5	7	12.07
	5 – 10	7	12.07
	10 – 15	17	29.31
	15 – 20	15	25.86
	> 20	11	18.97
Number of years of SISP Experience			
	< 5	20	34.48
	5 – 10	25	43.10
	10 – 15	7	12.07
	15 – 20	4	6.89
	> 20	1	1.72

Table 10: Level of Experience of Respondents

A large number of the SISP has taken place since 2000 with about 45% of the SISP was done in the last 5 years (however none was reported as being done this year – 2008) and 38% of the SISP was done between 2000 and 2003 (Table 11). 7% of the SISP took place in 1998 and 1999. About 83% of the SISP in this survey has been executed in the last 7 years.

Year SISP was conducted		
Item	**Frequency**	**Percent**
1998	3	5.17
1999	1	1.72
2000	4	6.89
2001	5	8.62
2002	7	12.06
2003	6	10.34
2004	4	6.89
2005	3	5.17
2006	3	5.17
2007	16	27.58
2008	0	0

Table 11: Year SISP was conducted

57 respondents provided details on the industry in which the SISP took place and Manufacturing and Finance have the most responses which is about 13% and 31% respectively (Table 12). The transport, engineering, service, government, retail, communications and IT industries had less than 10% responses each and together they accounted for about 35% of the responses.

Industry		
Item	**Frequency**	**Percent**
Manufacturing	19	32.75
Communications	5	8.62
Finance	18	31.03
Retail	1	1.72
IT	3	5.17
Government	4	6.89
Transport	3	5.17
Engineering	1	1.72
Service	3	5.17

Table 12: Industry in which SISP was conducted

In terms of revenue, 48% of the companies that carried out SISP had annual revenue greater than $100 million and 17% had annual revenue between $50 million and $100 million (Table 13). 29% of the companies that carried out SISP had annual revenue less than $50 million. From the survey responses, it can be concluded that 78% of the companies that carried out SISP had annual revenue greater than $10 million.

Annual Revenue ($ millions)		
Item	**Frequency**	**Percent**
< 5	5	8.62
6 – 10	5	8.62
11 – 50	7	12.069
50 – 100	10	17.24
101 – 500	6	10.34
> 500	22	37.93

Table 13: Annual Revenue of Companies

6.2 BP/ISP Integration

Table 14 illustrates that just over 48% of the companies' BP/ISP Integration in this survey are Sequential Integrations which means that a sequential relationship exists between BP and ISP and that BP *provides direction* for ISP. ISP primarily focuses on providing support for business plans. About 19% of the companies' BP/ISP Integration in this survey are Administrative Integrations which shows that there is a weak relationship between BP and ISP. About 16% of the companies' BP/ISP Integration is Reciprocal Integration where there is a reciprocal and *interdependent* relationship between BP and ISP and ISP plays *both* a role in supporting and influencing business plans and about 12% are Full Integration where there is little distinction between the BP process and the ISP process. Only 5% the companies' BP/ISP Integration in this survey are Proactive where IS objectives precede the formulation of business objectives and are used as input to their development. In these companies, IS is considered significant in changing the basis of competition.

BP/ISP Integration		
Item	**Frequency**	**Percent**
Administrative	11	18.96
Sequential	28	48.27
Reciprocal	9	15.51
Full Integration	7	12.06
Proactive	3	5.17

Table 14: BP/ISP Frequency Table

Figure 3 illustrates the distribution of the BP/ISP responses to this survey and though the responses appear not to be normally distributed, we are more concerned with the fact that BP/ISP Integration is being carried out in companies rather than its distribution. If we examine the median of these responses, it is 28.5 which falls in the Sequential BP/ISP Integration group therefore it is not critical that there are a few responses that fall in the Reciprocal, Full Integration and Proactive Integration groups.

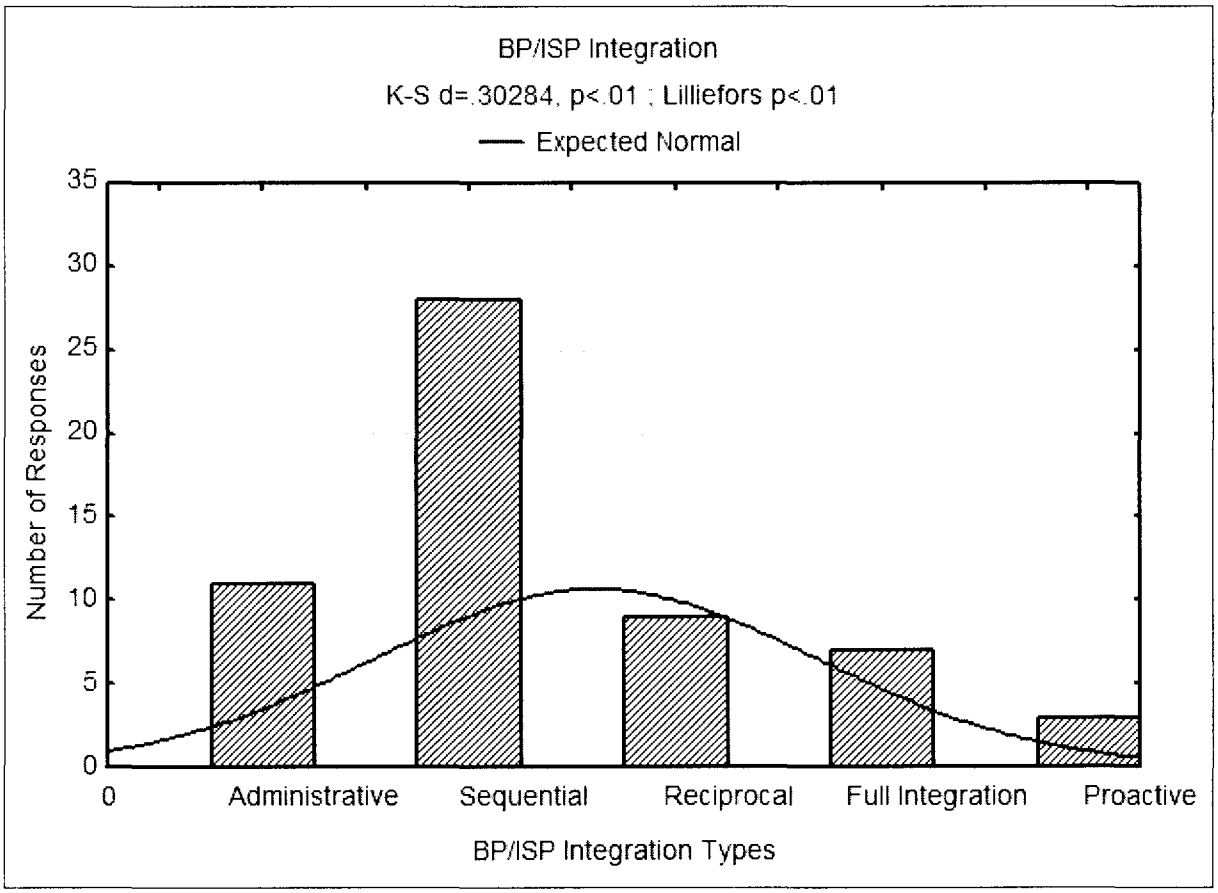

Figure 3: BP/ISP Histogram

6.3 Items Factor Analysis and Reliability

Table 15 illustrates the items used in the study. A seven-point Likert scale ranging from 1 for "strongly disagree" to 7 for "strongly agree" was employed for all the items tested in this section.

Higher Order Items	Items	
	BP/ISP Integration	
	BP/ISP_Int	Level of Business/IS Planning integration in the organisation
	Shared Domain Knowledge	
	SDK1	Business executives recognised the potential of IS as a competitive weapon.
	SDK2	Business executives recognised IS as a tool to increase productivity.
	SDK3	Business executives were highly knowledgeable about the firm's information technology assets and opportunities.
	SDK4	Business executives agreed that information technology could have important intangible benefits that should be funded.
	SDK5	IS executives were highly knowledgeable about business operations of the firm.
	SDK6	IS executives were highly knowledgeable about business strategies of the firm.
	Planning Comprehensiveness	
Rationality	SISP_RAT1	The company attempted to be exhaustive in gathering information relevant for SISP
	SISP_ RAT 2	Before a decision was made, each possible course of action was thoroughly evaluated
	SISP_ RAT 3	The company attempted to determine optimal courses of action from identified alternatives
	SISP_ RAT 4	There was little trial-and-error in the SISP process
	SISP_ RAT 5	Decisions were delayed until they were sure that all alternatives were evaluated
	Planning Formalisation	
	SISP_ RAT6	Policies and procedures greatly influenced the

		process of SISP within the organisation.
	SISP_RAT7	Formalised planning techniques in the SISP process were utilised.
	SISP_RAT8	The process for strategic planning was very structured.
	SISP_RAT9	Written guidelines to structure strategic IS planning existed in the organisation.
	SISP_RAT10	The process and outputs of strategic IS planning were formally documented.
	Planning Participation	
Adaptation	SISP_AD1	Business executives were actively involved in SISP.
	SISP_AD2	A variety of functional area managers participated in the process of SISP.
	SISP_AD3	The process for SISP included numerous participants.
	SISP_AD4	SISP was a relatively isolated organisational activity.
	SISP_AD5	The level of participation in SISP by diverse interests of the organisation was high.
	Planning Consistency	
	SISP_AD6	Conformance to strategic plans were constantly evaluated and reviewed.
	SISP_AD7	Strategic plans were frequently adjusted to better adapt them to changing conditions.
	SISP_AD8	SISP was a continuous process.
	SISP_AD9	Formal SISP for information systems was undertaken as the need arose.
	SISP_AD10	Face-to-face meetings to discuss SISP issues were frequently scheduled.
	IT Manager's Participation in Business Planning	
	SISP_ISBP1	IS executives regularly attended business meetings.

	SISP_ISBP2	IS executives participated in setting business goals and strategies.
	SISP_ISBP3	IS executives were involved early in the meetings for major projects.
	Social Dimension of Alignment	
	Shared vision	
	SOC_AL1	Business and IS executives shared a common vision for the long term role of IS within the organisation
	SOC_AL2	Business and IS executives agreed on priorities for the organisational use of IS
	SOC_AL3	Business and IS executives agreed on the key IS management issues affecting the organisation
	IS understands the Business	
	SOC_AL4	IS executives had a good level of understanding of strategic business plans
	SOC_AL5	IS executives had a good level of understanding of the work environment of the business
	Commitment	
	SOC_AL6	Business executives regarded the achievement of IS objectives as important to organisational success
	SOC_AL7	Business executives went out of their way to maintain a strong working relationship with IS executives
	SOC_AL8	Business executives frequently demonstrated enthusiasm for the IS function's efforts
	Business understands IS	
	SOC_AL9	Business executives had a good level of understanding of the work environment of the IS function
	SOC_AL10	Business executives had a good level of understanding of strategic IS plans

	Intellectual Dimension of Alignment	
	IS Plan and Business Plan Alignment	
	INT_AL1	The IS plan reflected the business plan mission
	INT_AL2	The IS plan reflected the business plan goals
	INT_AL3	The IS plan supported the business strategies
	INT_AL4	The IS plan recognised external business environment factors
	INT_AL5	The IS plan reflected the business plan resource constraints
	Business Plan and IS Plan Alignment	
	INT_AL6	The business plan referred to the IS plan
	INT_AL7	The business plan referred to specific IS applications
	INT_AL8	The business plan referred to specific information technologies
	INT_AL9	The business plan utilised the strategic capability of IS
	INT_AL10	The business plan contained reasonable expectations of IS

Table 15: Items for Factor Analysis

6.3.1 Factor Analysis

Factor analysis has been performed on the items in order to detect structure in the relationships between items and to classify the items. Factor analysis was also used to reduce the number of items. Rounds of factor analysis were performed on the items in order to determine the minimum loading necessary to include an item in its respective construct. Items that were included were judged on suggestions from Tan and Teo (2000) which were that items that load greater than 0.3 should be considered significant; items should be considered more important if they load greater than 0; and items were very significant if they load 0.5 or greater. Accordingly, it was decided that in this study, all items that load at 0.4 or more will be retained for further analysis. In the factor analysis exercise, Pairwise MD Deletion was selected, a maximum number of 7 factors were initially selected and Varimax Normalised factor rotation was selected.

Factor analysis was first executed on the SDK items and the SISP process items. Factor analysis was thereafter executed on the Social and Intellectual alignment items. The results from the aforementioned factor analyses were then combined into one table and factor analysis was executed on those items in order to attain the final set of items which were used for correlation and hypotheses testing.

Table 16 illustrates the results of the first round of factor analysis that was performed on the SDK and SISP process items detailed in Table 15. On examination of the results, it was noted that SDK loads on 2 factors and therefore has 2 distinct dimensions. From the questionnaire it is noted that SDK1, SDK2, SDK3, SDK4 focuses on the business executive's knowledge of IS and SDK5, and SDK6 focuses on the IS executive's knowledge of the business. Since the very basis of SDK is the ability of IT and business executives, at a deep level, to understand and be able to participate in the others' key processes and to respect each other's unique contribution and challenges, the SDK items were not eliminated in the next round of factor analysis. To include both dimensions of SDK, the next round of factor analysis was therefore executed using 5 factors. The results of the following rounds of the factor analysis are detailed in Annexure 2. Ultimately, the Adaptations items represented by SISP_AD1 to SISP_AD10 loads on Factor 1, the Rationality items represented by SISP_RAT1 to SISP_RAT10 loads on Factor 2, SDK1 to SDK4 loads on Factor 3, the IT manager's participation in business planning items represented by SISP_ISBP1 to SISP_ISBP3 loads on Factor 4, and SDK5 to SDK6 loads on Factor 5.

Factor Loadings: SDK and SISP Process Items				
Extraction: Principal components (Marked loadings are >.400000)				
	Factor - 1	**Factor - 2**	**Factor – 3**	**Factor – 4**
SDK1	**0.688**	0.070	0.284	0.309
SDK2	**0.683**	-0.063	0.117	0.348
SDK3	**0.737**	0.303	0.072	0.382
SDK4	**0.885**	0.030	0.040	-0.028
SDK5	0.194	0.060	0.221	**0.689**
SDK6	0.108	0.116	0.311	**0.603**
SISP_RAT1	0.356	0.729	0.021	0.033
SISP_RAT2	0.135	0.775	0.302	0.171
SISP_RAT3	0.131	0.655	0.504	0.173
SISP_RAT4	0.132	0.618	-0.149	0.286
SISP_RAT5	-0.016	0.814	0.001	0.146
SISP_RAT6	-0.076	0.807	0.082	0.067
SISP_RAT7	-0.001	0.579	0.604	0.188

SISP_RAT8	-0.001	0.731	0.451	0.137
SISP_RAT9	0.303	0.330	0.705	-0.106
SISP_RAT10	0.091	0.668	0.501	0.233
SISP_AD1	0.265	0.196	0.370	0.691
SISP_AD2	0.287	0.008	0.662	0.503
SISP_AD3	-0.011	-0.024	0.668	0.384
SISP_AD4	0.173	0.199	-0.218	-0.415
SISP_AD5	0.413	0.148	0.219	0.520
SISP_AD6	0.230	0.473	0.429	0.359
SISP_AD7	0.032	0.459	0.379	0.519
SISP_AD8	0.197	0.360	0.495	0.517
SISP_AD9	0.027	0.445	0.395	0.565
SISP_AD10	0.380	0.197	0.509	0.371
SISP_ISBP1	0.311	0.300	0.045	0.757
SISP_ISBP2	0.209	0.382	0.031	0.775
SISP_ISBP3	0.235	0.278	-0.075	0.772
Expl.Var	3.388	6.014	4.051	5.701
Prp.Totl	0.117	0.207	0.140	0.197

Table 16: Factor Analysis Round 1 Results: SDK and SISP Process Items

Table 17 illustrates the results of the first round of factor analysis that was performed on the Social and Intellectual Alignment items detailed in Table 15. On examination of the results, it was noted that Intellectual Alignment loads on 2 factors and therefore has 2 distinct dimensions. From the questionnaire it is noted that INT_AL1, INT_AL2, INT_AL3, INT_AL4, and INT_AL5 focuses on the IS Plan and Business Plan Alignment and INT_AL6, INT_AL7, INT_AL8, INT_AL9, and INT_AL10 focuses on the Business Plan and IS Plan Alignment. Since the very basis of Intellectual Alignment is IS and Business Strategy Alignment, the Intellectual Alignment items were not eliminated in the next round of factor analysis. To include both dimensions of Intellectual Alignment, the next round of factor analysis was therefore executed using 3 factors. The results of the following rounds of the factor analysis are detailed in Annexure 2. Ultimately, SOC_AL1 to SOC_AL5 and SOC_AL10 loads on Factor 1, INT_AL1 to INT_AL5 loads on Factor 2 and INT_AL6, INT_AL8, INT_AL9 to INT_AL10 loads on Factor 3. Intellectual Alignment items load on 2 factors and on examination of the questionnaire, INT_AL1 to INT_AL5 focuses on the IS plan in relation to the business and INT_AL6, INT_AL8, INT_AL9 to INT_AL10 focuses on the Business Plan in relation to IS. Since a key factor of intellectual alignment is the close linkage of the IS strategy and business strategy, these items were not eliminated and were used in the next round of factor analysis which will involved SDK, SISP process, Social and Intellectual Alignment items.

Factor Loadings: Social and Intellectual Alignment Items		
Extraction: Principal components (Marked loadings are >.400000)		
	Factor – 1	**Factor - 2**
SOC_AL1	0.774	0.332
SOC_AL2	0.678	0.327
SOC_AL3	0.609	0.382
SOC_AL4	0.634	0.452
SOC_AL5	0.459	0.401
SOC_AL6	0.692	0.049
SOC_AL7	0.768	0.116
SOC_AL8	0.824	0.226
SOC_AL9	0.906	0.078
SOC_AL10	0.874	0.174
INT_AL1	0.342	**0.854**
INT_AL2	0.394	**0.821**
INT_AL3	0.450	**0.717**
INT_AL4	0.021	**0.807**
INT_AL5	0.104	**0.898**
INT_AL6	**0.633**	0.446
INT_AL7	**0.213**	0.719
INT_AL8	**0.557**	0.419
INT_AL9	**0.686**	0.388
INT_AL10	**0.648**	0.487
Expl.Var	**7.505**	5.486
Prp.Totl	**0.375**	0.274

Table 17: Factor Analysis Round 1 Results: Social and Intellectual Alignment Items

Table 18 illustrates the results of the first round of factor analysis that was performed on the SDK, SISP Process, and Social and Intellectual Alignment items and Table 19 illustrates the results of the final round of factor analysis that was performed on the SDK, SISP Process, and Social and Intellectual Alignment items. All rounds of factor analysis of these items between the first and last round can be found in Annexure 2. On examination of the results in Table 18, INT_AL8 was found to load on the incorrect factor and was therefore eliminated.

Factor Loadings: SDK, SISP Process and Social and Intellectual Alignment Items							
Extraction: Principal components (Marked loadings are >.400000)							
	Factor - 1	**Factor - 2**	**Factor - 3**	**Factor - 4**	**Factor - 5**	**Factor - 6**	**Factor – 7**
SDK1	0.083	0.091	0.428	0.706	0.172	0.007	-0.101
SDK2	0.159	-0.106	0.253	0.633	0.274	0.094	-0.063
SDK3	0.243	0.222	0.119	0.716	0.301	0.130	0.136
SDK4	0.014	-0.042	0.013	0.793	0.005	-0.033	0.316
SDK5	0.200	0.051	0.205	0.192	0.415	0.646	0.166

SDK6	0.346	0.125	0.214	0.081	0.276	0.704	0.151
SISP_RAT1	0.200	0.692	-0.131	0.432	0.041	-0.041	0.097
SISP_RAT2	0.153	0.788	0.220	0.188	0.157	-0.050	0.108
SISP_RAT3	0.237	0.740	0.267	0.168	0.011	0.276	0.072
SISP_RAT4	0.058	0.481	0.078	0.105	0.386	-0.246	0.135
SISP_RAT5	0.198	0.720	-0.006	-0.043	0.262	-0.114	0.163
SISP_RAT6	0.204	0.785	-0.002	-0.075	0.133	-0.099	-0.026
SISP_RAT7	0.103	0.667	0.412	0.023	0.059	0.263	0.124
SISP_RAT8	-0.016	0.799	0.216	-0.010	0.144	0.289	0.157
SISP_RAT9	-0.152	0.497	0.326	0.315	-0.215	0.449	0.126
SISP_RAT10	0.037	0.755	0.320	0.146	0.157	0.290	0.006
SISP_AD1	0.152	0.188	0.593	0.248	0.468	0.212	0.073
SISP_AD2	0.026	0.100	0.667	0.304	0.173	0.440	0.187
SISP_AD3	0.134	0.091	0.803	0.008	0.066	0.094	-0.029
SISP_AD5	0.228	0.096	0.439	0.428	0.374	0.054	-0.021
SISP_AD6	0.210	0.465	0.423	0.254	0.199	0.090	0.276
SISP_AD7	0.272	0.462	0.557	0.049	0.289	0.014	0.045
SISP_AD8	0.212	0.393	0.604	0.252	0.265	0.012	0.204
SISP_AD9	0.103	0.469	0.603	0.051	0.320	0.054	0.056
SISP_AD10	0.183	0.191	0.563	0.324	0.078	0.106	0.502
SISP_ISBP1	0.090	0.216	0.273	0.316	0.768	0.099	0.141
SISP_ISBP2	0.087	0.304	0.248	0.193	0.799	0.141	0.100
SISP_ISBP3	0.220	0.142	0.183	0.159	0.795	0.173	0.087
SOC_AL1	0.183	0.378	0.164	0.385	0.452	0.132	0.512
SOC_AL2	0.222	0.258	0.038	0.146	0.399	0.193	0.744
SOC_AL3	0.262	0.369	0.184	0.009	0.419	0.205	0.628
SOC_AL4	0.369	0.086	0.219	0.140	0.630	0.241	0.252
SOC_AL5	0.331	-0.163	0.296	0.063	0.412	0.448	0.315
SOC_AL10	0.129	0.200	0.060	0.351	0.698	0.066	0.328
INT_AL1	0.804	0.197	0.099	0.245	0.198	0.130	0.256
INT_AL2	0.767	0.236	0.167	0.301	0.200	0.114	0.252
INT_AL3	0.703	0.128	0.197	0.215	0.330	0.164	0.198
INT_AL4	0.771	0.211	0.085	0.028	0.083	0.191	-0.206
INT_AL5	0.866	0.158	0.183	0.121	0.074	-0.031	0.137
INT_AL6	0.284	0.259	-0.018	0.623	0.250	0.371	0.173
INT_AL8	0.297	0.427	-0.063	0.326	0.406	0.391	-0.187
INT_AL9	0.211	0.327	0.121	0.571	0.419	0.304	-0.037
INT_AL10	0.347	0.359	0.069	0.549	0.403	0.134	0.052
Expl.Var	4.676	7.151	4.598	4.861	5.716	2.730	2.546
Prp.Totl	0.109	0.166	0.107	0.113	0.133	0.063	0.059

Table 18: Factor Analysis Round 1 Results: SDK, SISP Process and Social and Intellectual Alignment Items

In subsequent rounds of factor analysis, SISP_AD6 loaded higher on Factor 3 and was eliminated, SISP_AD5 loaded incorrectly and was eliminated, SISP_AD7 loaded higher on Factor 2 and was therefore eliminated, SISP_AD9 loaded higher on Factor 2 and was therefore eliminated, and SOC_AL5 loaded incorrectly and was therefore eliminated. SOC_AL1 to SOC_AL3 and SOC_AL4 and SOC_AL10 loads on 2 factors. On examination of the questionnaire, SOC_AL1 to SOC_AL3 focuses on the shared vision of business and IS executives and SOC_AL4 and SOC_AL10 focuses on the business and IS executives understanding of strategic business and IS plans. Since the very definition of social alignment focuses on 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, all these items were retained. The results of the final round of factor analysis on these items are illustrated in Table 19. SDK loads on Factor 1 and Factor 6, Rationality loads on Factor 2, Adaptation loads on Factor 4, IT manager's participation in business planning (ISBP) loads on Factor 5, SOC_AL loads on Factor 7 and Factor 5 and INT_AL loads on Factor 3 and Factor 1.

Factor Loadings: : SDK, SISP Process and Social and Intellectual Alignment Items							
Extraction: Principal components (Marked loadings are >.400000)							
	Factor - 1	**Factor - 2**	**Factor - 3**	**Factor - 4**	**Factor - 5**	**Factor - 6**	**Factor – 7**
SDK1	**0.713**	0.087	0.113	0.389	0.228	0.017	-0.105
SDK2	**0.629**	-0.100	0.181	0.262	0.327	0.054	-0.094
SDK3	**0.711**	0.225	0.244	0.073	0.298	0.199	0.140
SDK4	**0.802**	-0.047	0.019	0.055	0.024	-0.054	0.307
SDK5	0.181	0.029	0.182	0.151	0.361	**0.752**	0.173
SDK6	0.065	0.100	0.336	0.206	0.232	**0.766**	0.155
SISP_RAT1	0.450	**0.692**	0.187	-0.207	0.012	0.087	0.103
SISP_RAT2	0.194	**0.781**	0.162	0.184	0.159	-0.055	0.179
SISP_RAT3	0.143	**0.723**	0.262	0.350	0.036	0.211	0.104
SISP_RAT4	0.144	**0.532**	0.064	-0.040	0.426	-0.163	0.031
SISP_RAT5	-0.045	**0.738**	0.190	-0.075	0.239	-0.092	0.210
SISP_RAT6	-0.069	**0.790**	0.214	-0.054	0.140	-0.058	-0.017
SISP_RAT7	0.006	**0.671**	0.129	0.440	0.124	0.234	0.068
SISP_RAT8	-0.023	**0.784**	-0.005	0.248	0.151	0.267	0.179
SISP_RAT9	0.270	**0.489**	-0.136	0.480	-0.187	0.327	0.148
SISP_RAT10	0.130	**0.751**	0.059	0.369	0.190	0.250	0.009
SISP_AD1	0.225	0.187	0.183	**0.560**	0.517	0.193	0.088
SISP_AD2	0.282	0.105	0.057	**0.720**	0.238	0.362	0.146
SISP_AD3	-0.014	0.099	0.187	**0.827**	0.163	-0.036	-0.029

SISP_AD8	0.251	0.372	0.237	**0.495**	0.304	0.074	0.244
SISP_AD10	0.339	0.190	0.208	**0.532**	0.118	0.069	0.492
SISP_ISBP1	0.287	0.199	0.105	0.215	**0.789**	0.140	0.180
SISP_ISBP2	0.168	0.282	0.104	0.193	**0.819**	0.196	0.136
SISP_ISBP3	0.147	0.140	0.236	0.152	**0.815**	0.166	0.083
SOC_AL1	0.358	0.348	0.197	0.179	0.465	0.134	**0.549**
SOC_AL2	0.116	0.224	0.220	0.063	0.387	0.201	**0.775**
SOC_AL3	-0.002	0.335	0.260	0.132	0.408	0.266	**0.649**
SOC_AL4	0.126	0.100	0.377	0.207	**0.656**	0.192	0.213
SOC_AL10	0.322	0.174	0.131	0.015	**0.694**	0.115	0.376
INT_AL1	0.227	0.169	**0.805**	0.057	0.193	0.186	0.284
INT_AL2	0.285	0.223	**0.768**	0.103	0.206	0.190	0.262
INT_AL3	0.190	0.121	**0.706**	0.142	0.334	0.195	0.214
INT_AL4	0.008	0.201	**0.782**	0.111	0.096	0.154	-0.185
INT_AL5	0.134	0.159	**0.881**	0.139	0.097	-0.043	0.128
INT_AL6	**0.582**	0.235	0.265	-0.022	0.217	0.467	0.203
INT_AL9	**0.554**	0.323	0.203	0.082	0.413	0.402	-0.036
INT_AL10	**0.541**	0.355	0.341	-0.010	0.390	0.256	0.063
Expl.Var	4.295	6.149	4.419	3.446	5.263	2.610	2.536
Prp.Totl	0.116	0.166	0.119	0.093	0.142	0.071	0.069

Table 19: Factor Analysis Final Round of Results: SDK, SISP Process and Social and Intellectual Alignment Items

The final set of items that are used for further testing in this study is illustrated in Table 20.

Higher Order Items	**Items**	
	BP/ISP Integration	
	BP/ISP_Int	Level of Business/IS Planning integration in the organisation
	Shared Domain Knowledge	
	SDK1	Business executives recognised the potential of IS as a competitive weapon.
	SDK2	Business executives recognised IS as a tool to increase productivity.
	SDK3	Business executives were highly knowledgeable about the firm's information technology assets and opportunities.

	SDK4	Business executives agreed that information technology could have important intangible benefits that should be funded.
	SDK5	IS executives were highly knowledgeable about business operations of the firm.
	SDK6	The IS executives were highly knowledgeable about business strategies of the firm.
	Planning Comprehensiveness and Planning Formalisation	
Rationality	***Planning Comprehensiveness***	
	SISP_RAT1	The company attempted to be exhaustive in gathering information relevant for SISP
	SISP_ RAT 2	Before a decision was made, each possible course of action was thoroughly evaluated
	SISP_ RAT 3	The company attempted to determine optimal courses of action from identified alternatives
	SISP_ RAT 4	There was little trial-and-error in the SISP process
	SISP_ RAT 5	Decisions were delayed until they were sure that all alternatives were evaluated
	Planning Formalisation	
	SISP_ RAT6	Policies and procedures greatly influenced the process of SISP within the organisation.
	SISP_RAT7	Formalised planning techniques in the SISP process were utilised.
	SISP_RAT8	The process for strategic planning was very structured.
	SISP_RAT9	Written guidelines to structure strategic IS planning existed in the organisation.
	SISP_RAT10	The process and outputs of strategic IS planning were formally documented.
	Planning Participation & Consistency	
	Planning Participation	

Adaptation	SISP_AD1	Business executives were actively involved in SISP.
	SISP_AD2	A variety of functional area managers participated in the process of SISP.
	SISP_AD3	The process for SISP included numerous participants.
	Planning Consistency	
	SISP_AD8	SISP was a continuous process.
	SISP_AD10	Face-to-face meetings to discuss SISP issues were frequently scheduled.
	IT Manager's Participation in Business Planning	
	SISP_ISBP1	IS executives regularly attended business meetings.
	SISP_ISBP2	IS executives participated in setting business goals and strategies.
	SISP_ISBP3	IS executives were involved early in the meetings for major projects.
	Social Dimension of Alignment	
	Shared vision	
	SOC_AL1	Business and IS executives shared a common vision for the long term role of IS within the organisation
	SOC_AL2	Business and IS executives agreed on priorities for the organisational use of IS
	SOC_AL3	Business and IS executives agreed on the key IS management issues affecting the organisation
	IS understands the Business	
	SOC_AL4	IS executives had a good level of understanding of strategic business plans
	Business understands IS	
	SOC_AL10	Business executives had a good level of understanding of strategic IS plans

	Intellectual Dimension of Alignment	
	IS and Business Plan Alignment	
	INT_AL1	The IS plan reflected the business plan mission
	INT_AL2	The IS plan reflected the business plan goals
	INT_AL3	The IS plan supported the business strategies
	INT_AL4	The IS plan recognised external business environment factors
	INT_AL5	The IS plan reflected the business plan resource constraints
	Business Plan and IS Plan Alignment	
	INT_AL6	The business plan referred to the IS plan
	INT_AL9	The business plan utilised the strategic capability of IS
	INT_AL10	The business plan contained reasonable expectations of IS

Table 20: Final set of items after factor analysis

In order to address the sub dimensions within SDK, Social Alignment and Intellectual Alignment, and to simplify the way they are named going forward, new item names have been given to them. The names are displayed in Table 21.

Sub-Items		
Shared Domain Knowledge		
SDK1 to SDK4	Business knowledge of IS	BKIS
SDK5 to SDK6	IS knowledge of business	ISKB
Social Alignment		
SOC_AL1 to SOC_AL3	Business and IS executives shared vision	SVIS
SOC_AL4 and SOC_AL10	Business and IS executives understanding of strategic plans	USP
Intellectual Alignment		
INT_AL1 to INT_AL5	IS plan and Business Plan Alignment	ISPBP
INT_AL6 and INT_AL9 and INT_AL10	Business plan and IS Plan Alignment	BPISP

Table 21: Sub-items from factor analysis

6.3.2 Cronbach Reliability

When items that are developed from summated scales are used as predictor components in objective models, as is the case in this study, reliability becomes extremely important to ensure the validity of the research constructs and its respective items. In order to declare that the items from the test instrument are reliable, the items need to provide stable and reliable responses over a repeated administration of the test. It is of the utmost importance to know whether the assembly of interrelated items designed to measure underlying constructs in the summated scales would elicit the same responses if the same questions are recast and re-administered to the same respondents.

Items derived from test instruments are declared to be reliable only when Cronbach's alpha is an index of reliability associated with the variation accounted for by the true score of the "underlying construct." Alpha coefficient ranges in value from 0 to 1 and may be used to describe the reliability of factors extracted from scales (i.e., rating scale: 1 = strongly agree, 7 = strongly disagree). The higher the score, the more reliable the generated scale is. Tan and Teo (2000) have indicated 0.7 to be an acceptable reliability coefficient.

To ensure the reliability of the final set of items that were produced from the factor analysis exercise, their Cronbach's alpha coefficient was tested. Table 22 shows the Cronbach's alpha for the research constructs in this research study. Cronbach's alpha was also calculated on the dimensions within SDK, SOC_AL and INT_AL which evolved from the factor analysis and since the Cronbach's alpha ranges from 0.92815 to 0.76163, the research constructs are deemed to have adequate reliability.

Factor	**Cronbach's Alpha**	**Sub-Factor**	**Cronbach's Alpha**
SDK	.81694		
		BKIS	.84043
		ISKB	.9082
Rationality	.90803		
Adaptation	.8755		
IT Manager's Participation in	.93643		

Business Planning			
Social Alignment	.9098		
		SVIS	.9200
		USP	.7616
Intellectual Alignment	.9224		
		ISPBP	.9282
		BPISP	.9227

Table 22: Cronbach after Factor Analysis

6.3.3 Items Means and Standard Deviations

Table 23 shows that the mean for SDK is close to 5 which reveals that most respondents "Agreed to Some Extent" that IT and business executives had the ability to understand and be able to participate in the others' key processes and to respect each other's unique contribution and challenges. The remaining responses seem to be either "Neutral" or "Agree" (with the standard deviation being 1.09) therefore the sample represents a high level of SDK. The mean for Rationality is about 4 which means that most respondents were "Neutral" with respect to the extent to which their organisations' attempt to be exhaustive or inclusive in making and integrating strategic decisions. From the standard deviation of 1.13, the remaining responses seem to "Disagree to Some Extent" or "Agree to Some Extent". Adaptation, Social and Intellectual Alignment have means that are close to 5. This reveals that most respondents "Agreed to Some Extent" that there was a high frequency of planning activities as well as the evaluation of the vision of strategic choices. They also "Agreed to Some Extent" that there was a state within the respective companies where business and IT executives understood and were committed to the business and IT mission, objectives, and plans, and they "Agreed to Some Extent" that there was a close linkage of the IS strategy and business strategy. The standard deviations for Adaptation, Social, and Intellectual Alignment are around 1 so the responses vary from "Neutral" to "Agree".

Means and Standard Deviations – All Items				
Item	**Mean Calculation**	**Valid N**	**Mean**	**Std.Dev.**
BP/ISP Integration	Mean (BP/ISP)	58	2.36	1.09
SDK	Mean (Average SDK1-4, Average SDK 5-6)	58	4.94	0.97
Rationality	Mean (RAT1-10)	58	4.43	1.13
Adaptation	Mean (PART1,2,3,8,10)	58	4.88	1.19
IT Manager's Participation in Business Planning	Mean (ISBP1-3)	58	4.35	1.53
Social Alignment	Mean (Average SHRD VIS1-3, Average SOC_AL_IS_BUS1, SOC_AL_BUS_IS2)	58	4.52	1.23
Intellectual Alignment	Mean (Average INT AL1-5, Average INT AL6,9,10)	57	4.49	1.23
SISP Effectiveness	Mean (SOC AL Mean, INT AL Mean)	58	4.45	1.14

Table 23: Means and Standard Deviations – All Items

Further means and standard deviations were calculated for the sub-items that were evident from the factor analysis. The results of this exercise are illustrated in Table 24. Business knowledge of IS and IS knowledge of business have means that are close to 5 which is consistent with the SDK mean in Table 23. The social alignment mean in Table 23 is close to the business and IS executives shared vision mean and the business and IS executives understanding of strategic plans mean in Table 24. It must be noted that there seems to be a higher number of responses who believe that business and IS executives have a shared vision as compared to their understanding of the business and IS strategic plans. The mean for the IS Plan sub item for intellectual alignment is much higher than that of the business plan which reveals that more responses reported that the IS plan reflected the business mission and goals and supported the business strategies. Fewer responses reported that the Business plan referred to the IS plan, utilised the strategic capability of IS and contained reasonable expectations of IS.

Means and Standard Deviations – Sub Items				
Sub Item	**Mean Calculation**	**Valid N**	**Mean**	**Std.Dev.**
Business knowledge of IS	Mean (SDK1-4)	58	4.88	0.99
IS knowledge of business	Mean (SDK 5-6)	57	4.99	1.30
Business and IS executives shared vision	Mean (Average SHRD VIS1-3)	58	4.59	1.32
Business and IS executives understanding of strategic plans	Mean (SOC_AL_IS_BUS1, SOC_AL_BUS_IS2)	58	4.45	1.29
IS Plan and Business Plan Alignment	Mean (INT AL1-5)	57	4.94	1.18
Business Plan and IS Plan Alignment	Mean (INT AL6,9,10)	57	4.33	1.37

Table 24: Means and Standard Deviations – Sub Items

6.3.4 Correlations

Correlation tables have been produced to show whether and how strongly pairs of items in this study are related. Table 25 illustrates the correlations for all the items and Table 26 illustrates the correlations for the sub items that have been identified in the factor analysis exercise. Correlations with p values less than 0.05 were considered significant.

In Table 25, there is no significant relationship between the research constructs of this study (SDK, Rationality, Adaptation, IT Manager's Participation in Business Planning, Social Alignment, and Intellectual Alignment) and the level of Experience of the respondents, the level of IS Experience of the respondents, the Year the SISP was conducted, the Industry in which the organisations reside and the Revenue of the organisations. A possible explanation for this lack of correlation could be due to the small number of responses. The level of SISP Experience of the respondents did relate to BP/ISP Integration, SDK, Adaptation, Intellectual Alignment, and SISP Effectiveness. This seems to indicate that the greater the level of SISP Experience of the respondent, the greater the level of the following within the respective organisations: Business/IS Planning integration, understanding between business and IS respective domains, adherence to the participation and consistency of SISP and the business and IS content in the respective IS and Business Plans. This could be because people with greater SISP Experience either get that level of experience in the companies they are in or will gravitate to companies who take SISP seriously. There is a correlation between IS Experience and SISP Experience which is understandable as the greater the IS

Experience, the greater the likelihood is that those individuals will understand SISP and the importance of IS to the business and vice versa. There is also a correlation between Revenue and SISP Experience. There are two possible explanations for this relationship. Firstly, SISP is a major undertaking within organisations and requires time, money and resources. Therefore, SISP initiatives would be more prominent in organisations with high revenue which could afford highly skilled and experienced SISP resources. The second explanation could be because this study targeted highly experienced and highly paid enterprise strategy consultants from a large, global IT organisation. The companies in this study would have to have high revenues in order to afford having these consultants onsite.

In Table 26, there is no significant relationship between the sub items in this study (IS Knowledge of Business, Business Knowledge of IS, Shared Vision, Understanding of Strategic Plans, IS and Business Plan Alignment, and Business and IS Plan Alignment) and the level of Experience of the respondents, the level of IS Experience of the respondents, the Year the SISP was conducted, and the Industry in which the organisations resided. Again, as mentioned above, this could be due to the fact that there were only 59 responses to this survey. The level of SISP Experience of the respondents did relate to the IS Knowledge of the Business which makes sense as their SISP experience would make these respondents more aware of the business operations and business strategies of the business. The level of SISP Experience of the respondents also related to the IS plan reflecting the business mission and goals and supporting the business strategies, and the Business plan referring to the IS plan and utilising the strategic capability of IS and containing reasonable expectations of IS. Since the respondents were enterprise strategy consultants from a large, global organisation, it is understandable that their strong background in IS will influence the organisations they are in and contribute to the business seeing and deriving value from IS.

Correlations: All Items
Marked correlations are significant at p < .05000

	Experience	IS Experience	SISP Experience	Year SISP conducted	Industry	Revenue	BP/ISP Integration	SDK	Rationality	Adaptation	IT Manager's Participation in Business Planning	Social Alignment	Intellectual Alignment	SISP Effectiveness
Experience	1.00	***0.60***	***0.41***	-0.13	-0.20	0.17	0.23	0.10	0.12	0.11	-0.04	0.04	0.20	0.12
IS Experience	***0.60***	1.00	***0.55***	0.01	-0.26	***0.36***	0.12	0.09	-0.07	0.12	-0.05	-0.04	0.05	0.01
SISP Experience	***0.41***	***0.55***	1.00	**-0.08**	-0.13	***0.33***	***0.28***	***0.32***	0.07	***0.29***	0.20	0.24	***0.35***	***0.31***
Year SISP conducted	-0.13	0.01	***-0.08***	1.00	**-0.15**	**0.20**	-0.04	-0.16	0.04	-0.11	-0.20	-0.21	-0.19	-0.20
Industry	-0.20	-0.26	-0.13	***-0.15***	1.00	0.01	0.00	0.07	-0.13	-0.14	-0.08	-0.11	0.09	-0.05
Revenue	0.17	***0.36***	***0.33***	**0.20**	0.01	1.00	0.00	0.07	-0.13	***0.01***	-0.20	***-0.17***	***-0.09***	***-0.14***
BP/ISP Integration	0.23	0.12	***0.28***	-0.04	0.00	0.00	1.00	***0.52***	***0.29***	***0.49***	***0.38***	***0.36***	***0.49***	***0.47***
SDK	0.10	0.09	***0.32***	-0.16	0.07	*0.07*	***0.52***	1.00	***0.41***	***0.67***	***0.65***	***0.68***	***0.71***	***0.73***
Rationality	0.12	-0.07	0.07	0.04	-0.13	-0.13	***0.29***	***0.41***	1.00	***0.58***	***0.48***	***0.54***	***0.56***	***0.60***
Adaptation	0.11	0.12	***0.29***	-0.11	-0.14	0.01	***0.49***	***0.67***	***0.58***	1.00	***0.61***	***0.65***	***0.61***	***0.69***
IT Manager's Participation in Business Planning	-0.04	-0.05	***0.20***	-0.20	-0.08	-0.20	***0.38***	***0.65***	***0.48***	***0.61***	1.00	***0.83***	***0.64***	***0.80***
Social Alignment	0.04	-0.04	0.24	-0.21	-0.11	-0.17	***0.36***	***0.68***	***0.54***	***0.65***	***0.83***	1.00	***0.71***	***0.93***
Intellectual Alignment	0.20	0.05	***0.35***	-0.19	0.09	-0.09	***0.49***	***0.71***	***0.56***	***0.61***	***0.64***	***0.71***	1.00	***0.93***
SISP Effectiveness	0.12	0.01	***0.31***	-0.20	-0.05	-0.14	***0.47***	***0.73***	***0.60***	***0.69***	***0.80***	***0.93***	***0.93***	1.00

Table 25: Correlation Matrix – All Items

Correlations: Sub Items - Marked correlations are significant at p < .05000																	
	Experience	IS Experience	SISP Experience	Year SISP conducted	Industry	Revenue	BP/ISP Integration	Business Knowledge of IS	IS Knowledge of Business	Rationality	Adaptation	IT Manager's Participation in Business Planning	Shared Vision	Understanding of Strategic Plans	IS Plan	Business Plan	SISP Effectiveness
Experience	1.00	***0.60***	***0.41***	-0.13	-0.20	0.17	0.23	0.01	0.14	0.12	0.11	-0.04	0.09	-0.02	0.10	0.21	0.12
IS Experience	***0.60***	1.00	***0.55***	0.01	-0.26	0.36	0.12	0.04	0.09	-0.07	0.12	-0.05	0.01	-0.09	0.04	0.05	0.01
SISP Experience	***0.41***	***0.55***	1.00	***-0.08***	-0.13	***0.33***	***0.28***	0.22	***0.31***	0.07	***0.29***	0.20	0.23	0.23	***0.33***	***0.33***	***0.31***
Year SISP conducted	-0.13	0.01	***-0.08***	1.00	***-0.15***	***0.20***	-0.04	-0.23	-0.07	0.04	-0.11	-0.20	-0.16	-0.24	-0.19	-0.17	-0.20
Industry	-0.20	0.26	-0.13	***0.15***	1.00	0.01	0.00	0.19	-0.07	-0.13	-0.14	-0.08	-0.16	-0.04	0.18	0.05	-0.05
Revenue	0.17	0.36	***0.33***	***0.20***	0.01	1.00	***0.25***	0.10	0.02	-0.13	0.01	-0.20	-0.14	-0.17	-0.10	-0.08	-0.14
BP/ISP Integration	0.23	0.12	***0.28***	-0.04	0.00	***0.25***	1.00	***0.46***	***0.42***	***0.29***	***0.49***	***0.38***	***0.30***	***0.39***	***0.30***	***0.50***	***0.47***
Business Knowledge of IS	0.01	0.04	0.22	-0.23	0.19	0.10	***0.46***	1.00	***0.41***	***0.37***	***0.56***	***0.53***	***0.46***	***0.55***	***0.44***	***0.63***	***0.62***
IS Knowledge of Business	0.14	0.09	***0.31***	-0.07	-0.07	0.02	***0.42***	***0.41***	1.00	***0.32***	***0.57***	***0.56***	***0.56***	***0.56***	***0.47***	***0.54***	***0.62***
Rationality	0.12	-0.07	0.07	0.04	-0.13	-0.13	***0.29***	***0.37***	***0.32***	1.00	***0.58***	***0.48***	***0.58***	***0.44***	***0.45***	***0.54***	***0.60***
Adaptation	0.11	0.12	***0.29***	-0.11	-0.14	0.01	***0.49***	***0.56***	***0.57***	***0.58***	1.00	***0.61***	***0.63***	***0.60***	***0.53***	***0.57***	***0.69***
IT Manager's Participation in Business Planning	-0.04	-0.05	0.20	-0.20	-0.08	-0.20	***0.38***	***0.53***	***0.56***	***0.48***	***0.61***	1.00	***0.70***	***0.86***	***0.49***	***0.63***	***0.80***
Shared Vision	0.09	0.01	0.23	-0.16	-0.16	-0.14	***0.30***	***0.46***	***0.56***	***0.58***	***0.63***	***0.70***	1.00	***0.77***	***0.58***	***0.60***	***0.86***
Understanding of Strategic Plans	-0.02	-0.09	0.23	-0.24	-0.04	-0.17	***0.39***	***0.55***	***0.56***	***0.44***	***0.60***	***0.86***	***0.77***	1.00	***0.58***	***0.64***	***0.88***

IS and Business Plan Alignment	0.10	0.04	***0.33***	-0.19	0.18	-0.10	***0.30***	***0.44***	***0.47***	***0.45***	***0.53***	***0.49***	***0.58***	***0.58***	1.00	***0.59***	***0.73***
Business Plan and IS Plan Alignment	0.21	0.05	***0.33***	-0.17	0.05	-0.08	***0.50***	***0.63***	***0.54***	***0.54***	***0.57***	***0.63***	***0.60***	***0.64***	***0.59***	1.00	***0.89***
SISP Effectiveness	0.12	0.01	***0.31***	-0.20	-0.05	-0.14	***0.47***	***0.62***	***0.62***	***0.60***	***0.69***	***0.80***	***0.86***	***0.88***	***0.73***	***0.89***	1.00

Table 26: Correlation Matrix – Sub Items

6.3.5 Multiple Linear Regression

Multiple linear regression was used to test the 19 hypotheses formulated in this study. The dependent items against which the independent items were regressed are social alignment, intellectual alignment, the SISP process dimensions (Rationality, Adaptation, BP/ISP Integration, IT Manager's Participation in Business Planning, and SDK), and SISP effectiveness. The results of the multiple linear regression are illustrated in Table 27 together with the associated hypotheses. P values that were less than or equal to 0.05 were considered significant. In this study, hypotheses H6, H10, H12, H13, H14, H15, H16, H17, H18 and H19 are supported.

Dependent Item		**Hypotheses**	**Independent Item**	**Beta**	**p-level**
Social Alignment		H1	BP/ISP Integration	-0.076	0.453
		H4	Rationality	0.183	0.088
		H5	Adaptation	0.091	0.452
		H10	IT Manager's Participation in Business Planning	0.451	***0.000***
		H17	SDK	0.273	***0.059***
Intellectual Alignment		H2	BP/ISP Integration	0.146	0.213
		H6	Rationality	0.328	***0.009***
		H7	Adaptation	-0.048	0.730
		H11	IT Manager's Participation in Business Planning	0.178	0.070
		H18	SDK	0.508	***0.003***
SISP Process Dimension	Rationality	***H13***	SDK	0.487	***0.001***
	Adaptation	***H14***	SDK	0.821	***0.000***
	BP/ISP Integration	***H15***	SDK	0.584	***0.000***

	IT Manager's Participation in Business Planning	***H16***	SDK	1.021	***0.000***
SISP Effectiveness		H8	Rationality	0.158	0.069
		H9	Adaptation	0.049	0.617
		H3	BP/ISP Integration	0.098	0.231
		H12	IT Manager's Participation in Business Planning	0.393	***0.000***
		H19	SDK	0.288	***0.015***

Table 27: Results of Multiple Linear Regression – All Items

6.3.6 Further Regression Analyses

Further regression analyses were executed using the sub items. The following were tested in Table 28 using sub items of SDK (Business knowledge of IS and IS knowledge of business) along with Rationality, Adaptation and IT Manager's Participation in Business Planning as the independent item and sub items of Social Alignment (business and IS executives shared vision and business and IS executives understanding of strategic plans) as the dependent item. Numbers 4, 6, and 12 are supported.

1. Business knowledge of IS positively influences Business and IS executives shared vision
2. IS knowledge of business positively influences Business and IS executives shared vision
3. BP/ISP integration positively influences Business and IS executives shared vision
4. Rationality positively influences Business and IS executives shared vision
5. Adaptation positively influences Business and IS executives shared vision
6. IT Manager's Participation in business planning positively influences Business and IS executives shared vision
7. Business knowledge of IS positively influences Business and IS executives understanding of strategic plans
8. IS knowledge of business positively influences Business and IS executives understanding of strategic plans

9. BP/ISP integration positively influences Business and IS executives understanding of strategic plans
10. Rationality positively influences Business and IS executives understanding of strategic plans
11. Adaptation positively influences Business and IS executives understanding of strategic plans
12. IT manager's participation in business planning positively influences Business and IS executives understanding of strategic plans

Dependent Item	**Number**	**Independent Item**	**Beta**	**p-level**
Business and IS executives shared vision	1	Business knowledge of IS	0.067	0.659
	2	IS knowledge of business	0.206	0.085
	3	BP/ISP integration	-0.116	0.376
	4	Rationality	0.309	***0.019***
	5	Adaptation	0.129	0.404
	6	IT Manager's Participation in business planning	0.343	***0.002***
Business and IS executives understanding of strategic plans	7	Business knowledge of IS	0.145	0.217
	8	IS knowledge of business	0.089	0.331
	9	BP/ISP integration	0.016	0.872
	10	Rationality	0.006	0.948
	11	Adaptation	0.028	0.814
	12	IT Manager's Participation in business planning	0.610	***0.000***

Table 28: Results of Multiple Linear Regression – Social Alignment Sub Items

Table 29 tests the following using sub items of SDK (Business knowledge of IS and IS knowledge of business) along with Rationality, Adaptation and IT Manager's Participation in Business Planning as the independent item and sub items of Intellectual Alignment (IS Plan and Business Plan Alignment, and Business Plan and IS Plan Alignment) as the dependent item. Numbers 19 and 22 are supported.

13. Business knowledge of IS positively influences the IS Plan and Business Plan Alignment
14. IS knowledge of business positively influences the IS Plan and Business Plan Alignment
15. BP/ISP integration positively influences the IS Plan and Business Plan Alignment
16. Rationality positively influences the IS Plan and Business Plan Alignment
17. Adaptation positively influences the IS Plan and Business Plan Alignment
18. IT manager's participation in business planning positively influences the IS Plan and Business Plan Alignment
19. Business knowledge of IS positively influences the Business Plan and IS Plan Alignment
20. IS knowledge of business positively influences the Business Plan and IS Plan Alignment
21. BP/ISP integration positively influences the Business Plan and IS Plan Alignment
22. Rationality positively influences the Business Plan and IS Plan Alignment
23. Adaptation positively influences the Business Plan and IS Plan Alignment
24. IT manager's participation in business planning positively influences the Business Plan and IS Plan Alignment

Factor	**Number**	**Item**	**Beta**	**p-level**
IS Plan and Business Plan Alignment	13	Business knowledge of IS	0.181	0.295
	14	IS knowledge of business	0.193	0.155
	15	BP/ISP integration	-0.0282	0.849
	16	Rationality	0.199	0.179
	17	Adaptation	0.133	0.453
	18	IT Manager's Participation in business planning	0.099	0.424
Business Plan and IS Plan Alignment	***19***	Business knowledge of IS	0.421	***0.011***

	20	IS knowledge of business	0.186	0.137
	21	BP/ISP integration	0.211	0.128
	22	Rationality	0.319	***0.021***
	23	Adaptation	-0.091	0.578
	24	IT Manager's Participation in business planning	0.203	0.0783

Table 29: Results of Multiple Linear Regression – Intellectual Alignment Sub Items

Table 30 tests the sub items of SDK (Business knowledge of IS and IS knowledge of business) as the independent item on BP/ISP integration as the dependent item. Both 25 and 26 are supported.

25. Business knowledge of IS positively influences BP/ISP integration
26. IS knowledge of business positively influences BP/ISP integration

Factor	**Number**	**Item**	**Beta**	**p-level**
BP/ISP integration	***25***	Business knowledge of IS	0.376	***0.001***
	26	IS knowledge of business	0.230	***0.035***

Table 30: Results of Multiple Linear Regression – SDK sub items on BP/ISP integration

Table 31 tests the sub items of SDK (Business knowledge of IS and IS knowledge of business) as the independent item on Rationality as the dependent item. Only 27 is supported.

27. Business knowledge of IS positively influences rationality
28. IS knowledge of business positively influences rationality

Factor	Number	Item	Beta	p-level
Rationality	***27***	Business knowledge of IS	0.324	***0.042***
	28	IS knowledge of business	0.175	0.147

Table 31: Results of Multiple Linear Regression – SDK sub items on Rationality

Table 32 tests the sub items of SDK (Business knowledge of IS and IS knowledge of business) as the independent item on Adaptation as the dependent item. Both 29 and 30 are supported.

29. Business knowledge of IS positively influences adaptation
30. IS knowledge of business positively influences adaptation

Factor	Number	Item	Beta	p-level
Adaptation	***29***	Business knowledge of IS	0.451	***0.001***
	30	IS knowledge of business	0.381	***0.001***

Table 32: Results of Multiple Linear Regression – SDK sub items on Adaptation

Table 33 tests the sub items of SDK (Business knowledge of IS and IS knowledge of business) as the independent item on IT manager's participation in business planning as the dependent item. Both 31 and 32 are supported.

31. Business knowledge of IS positively influences IT manager's participation in business planning
32. IS knowledge of business positively influences IT manager's participation in business planning

Factor	Number	Item	Beta	p-level
IT Manager's Participation in business planning	***31***	Business knowledge of IS	0.547	***0.003***
	32	IS knowledge of business	0.482	***0.001***

Table 33: Results of Multiple Linear Regression – SDK sub items on IT Manager's Participation in Business Planning

7 DISCUSSION AND IMPLICATIONS

7.1 Impact of SISP Process Dimensions on SISP Effectiveness

In this study, the Social Alignment and the Intellectual Alignment between Business and IT were used as a measurement of SISP Effectiveness. The impact of the following SISP Process dimensions of Rationality, Adaptation, BP/ISP Integration, and IT Manager's Participation in Business Planning on Social and Intellectual Alignment was tested and it was found that there was support for IT Manager's Participation in Business Planning positively influencing Social Alignment (H10) ($p < 0.05$). The positive influence can easily be explained since IT Manager's Participation in Business Planning involves IS executives regularly attending business meetings, participating in setting business goals and objectives, and being involved early in the meetings for major projects. All of these actions ultimately contribute to the following underpinning factors of Social Alignment: the shared vision of business and IS executives on the role of IS in the organisation, and the mutual understanding of each other's domains. This finding is in keeping with the results of Kearns and Sabherwal (2006-7) study of 274 senior information officers which found that business managers' participation in strategic IT planning and IT managers' participation in business planning affected business–IT strategic alignment. Rationality was a bit high (the p value was a bit higher than 0.05) but could be considered as positively influencing Social Alignment (H4) as a high degree of SISP Planning Comprehensiveness and SISP Planning Formalisation would ensure that there was a shared vision and a mutual understanding between business and IS executives.

Further analyses into the impact of the sub items (derived from the factor analysis exercise), emphasised the support of Rationality on Social Alignment. Social Alignment was found to be made of two sub items - business and IS executives shared vision and business and IS executives understanding of each other's strategic plans. This study revealed that there was support for Rationality positively influencing the business and IS executives shared vision (4) and there was support for IT Manager's Participation in Business Planning positively influencing both the business and IS executives shared vision (6) and business and IS executives understanding of each other's strategic plans (12). Therefore, Planning Comprehensiveness and Planning Formalisation, as well as IS executives attendance at business meetings, their contribution to setting business goals and strategies and their early involvement in major projects are all the main contributing factors to ensuring Social Alignment. Planning Comprehensiveness and Planning Formalisation had a greater influence on the business and IS executives shared vision and a mutual understanding than on enabling business and IS executives to understand of each other's strategic plans.

There was however no support for the positive influence of BP/ISP Integration (H1) and Adaptation (H5) on Social Alignment. The lack of support for BP/ISP Integration could be due to the fact that in this study about 67% of the BP/ISP Integrations were Sequential and Administrative Integrations. This means that ISP primarily focuses on providing support for business plans and that there is a weak relationship between BP and ISP.

In terms of the influence that the aforementioned SISP Process dimensions had on Intellectual Alignment, it was found that there was only support for Rationality positively influencing Intellectual Alignment (H6). A high level of Planning Comprehensiveness and Planning Formalisation would ensure that the IS plan reflects the business mission and goals, and supports the business strategies and that the Business plan reflects the IS plan, utilises the strategic capability of IS and contains reasonable expectations of IS. Although IT Manager's Participation in Business Planning (H11) is a bit high (the p value was a bit higher than 0.05), it could also be considered as having a positive influence on Intellectual Alignment. BP/ISP Integration (H2) and Adaptation (H7) lacked support for a positive influence on Intellectual Alignment. With the alignment of the Business and IS strategy being key for Intellectual Alignment, it is understandable why the influence of BP/ISP Integration on Intellectual Alignment is not supported in this study as the BP/ISP Integration responses illustrated a weak relationship between BP and ISP with ISP primarily focused on providing support for Business Plans.

Further analyses into the impact of the two Intellectual Alignment sub items (derived from the factor analysis exercise) – IS Plan and Business Plan Alignment (ISPBP), and Business Plan and IS Plan Alignment (BPISP) – revealed that Rationality positively influences BPISP (22). This implies that the support for Rationality positively influencing Intellectual Alignment (H6) can mainly be attributed to a high level of Planning Comprehensiveness and Planning Formalisation ensuring that the Business plan reflects the IS plan, utilises the strategic capability of IS and contains reasonable expectations of IS. There is no support for IT Manager's Participation in Business Planning positively influencing ISPBP (18) nor BPISP (24) which could explain why IT Manager's Participation in Business Planning (H11) was a bit high (the p value was a bit higher than 0.05). This finding is contradictory to Kearns and Lederer's (2003) study which proved that IT's participation in business planning was positively associated with ISPBP and BPISP. A possible explanation for the difference in Kearns and Lederer's (2003) study's findings and this study's findings could be attributed to the fact Kearns and Lederer (2003) measured the CIO's participation in business planning specifically and this study measured IS executives participation in business planning which may not have necessarily included the CIO in all cases.

There appears to be a lack of support for the influence of adaptation on social and intellectual alignment. A possible explanation for this is that alignment is only one of the 4 measurements of SISP effectiveness described by Segars and Grover (1999) and the other 3 measures (analysis, cooperation, and improvement in capability) could be relatively more important when measuring the impact of participation and consistency on social and intellectual alignment.

On the overall SISP Effectiveness, it was found that only IT Manager's Participation in Business Planning (H12) had adequate support for its positive influence on SISP Effectiveness. Rationality (H8) could be considered as providing adequate support for positively influencing SISP Effectiveness as the p value in the results of the multiple linear regression is just a bit higher than 0.05 (which could be attributed to the p value of the impact of rationality on social alignment also being a bit higher than 0.05). There was inadequate support for Adaptation (H9) and BP/ISP Integration (H3) positively influencing SISP Effectiveness which follows from the fact that neither had support for influencing Social nor Intellectual Alignment.

It is interesting to note from the further analysis done on the sub items from the factor analysis that there is support for IT Manager's Participation in Business Planning positively influencing SISP effectiveness (H12), Social Alignment (H10), and the underpinning factors of Social Alignment – business and IS executives shared vision (6) and business and IS executives understanding of each other's strategic plans (12) but there is a lack of support for IT Manager's Participation in Business Planning positively influencing Intellectual Alignment (H11), and the underpinning factors of Intellectual Alignment – ISPBP (18) and BPISP (24). This implies that IS executives attendance at business meetings, their contribution to setting business goals and strategies and their early involvement in major projects has a greater contribution to business and IS executives shared vision and understanding of each other's strategic plans than it has on the IS plan reflecting the business mission and goals, and supporting the business strategies and the Business plan reflecting the IS plan, utilising the strategic capability of IS and containing reasonable expectations of IS.

7.2 Impact of SDK on SISP Process Dimensions

In this study, there was support for SDK positively influencing BP/ISP Integration (H15), Rationality (H13), Adaptation (H14), and IT Manager's Participation in Business Planning (H16). This finding is aligned to Ranganathan and Sethi's (2002) study which proved the

positive impact of SDK on Rationality, and Pai's (2005) study which proved knowledge sharing (represented by trust among stakeholders, CIO's knowledge sharing behaviour, and top management support for SISP) positively impacted the quality of the SISP process. On further examination of the two sub items of SDK – Business Knowledge of IS and IS Knowledge of Business – it was found that there was support for both sub items positively influencing BP/ISP Integration (25 and 26). It was also revealed that Business Knowledge of IS positively supports Rationality (27). This implies that Planning Comprehensiveness and Planning Formalisation is highly dependent on the ability of business executives recognising IS as a competitive weapon, as a tool to increase productivity, agreeing that information technology could have important intangible benefits that should be funded, and being highly knowledgeable about the firm's information technology assets and opportunities. There is also support for both sub items of SDK positively supporting Adaptation (29 and 30) and IT Manager's Participation in Business Planning (31 and 32). This implies that Business Knowledge of IS and IS Knowledge of Business influences Planning Participation and Planning Consistency and also whether IS executives attend business meetings, participate in setting business goals and strategies, and whether they get involved early in major projects.

7.3 Impact of SDK on SISP Effectiveness

With the overall SISP Effectiveness being measured by Social Alignment and Intellectual Alignment, SDK was tested against both and it was found that there was support for both SDK positively influencing Social Alignment (17) and Intellectual Alignment (H18). There was also support for SDK positively influencing SISP Effectiveness (H19), which was the main objective of this study.

Further analyses into the impact of the two sub items of SDK – Business Knowledge of IS and IS Knowledge of Business – on the two Intellectual Alignment sub items – IS Plan and Business Plan Alignment (ISPBP), and Business Plan and IS Plan Alignment (BPISP) – revealed a lack of support for the SDK sub items positively influencing ISPBP (13, 14) and support for the Business Knowledge of IS (19) positively influencing BPISP only. This implies that the ability of business executives recognising IS as a competitive weapon, as a tool to increase productivity, agreeing that information technology could have important intangible benefits that should be funded, and being highly knowledgeable about the firm's information technology assets and opportunities highly influences the Business plan reflecting the IS plan, utilising the strategic capability of IS and containing reasonable expectations of IS. The impact of the two sub items of SDK on the two Social Alignment sub items – business and IS executives shared vision and business and IS executives understanding of each other's

strategic plans – revealed a lack of support for the SDK sub items positively influencing both the business and IS executives shared vision (1, 2) and business and IS executives understanding of each other's strategic plans (7, 8). This implies that in this study, neither Business Knowledge of IS nor IS Knowledge of Business positively influenced the common vision for the long term role of IS within the organisation, agreement on priorities for the organisational use of IS, agreement on the key IS management issues affecting the organisation, IS executives level of understanding of strategic business plans, and business executives understanding of strategic IS plans. Ultimately, in this study, there is support for SDK positively influencing SISP Effectiveness (and social and intellectual alignment) and on further examination of the sub items, it seems that intellectual alignment (specifically Business Knowledge of IS impact on Business Plan and IS Plan alignment) is the main contributor to SISP Effectiveness.

8 LIMITATIONS AND FUTURE RESEARCH

The tar get population of this study consisted of consultants from one large, global IT organisation, who were based at various customers around the world and who participated or observed the SISP in the company where they were based. Even though the responses were based on various types of organisation from various industries, getting the responses from consultants only could be a limitation in this study. The bias could come about from these consultants possibly having a deeper knowledge of IS which could have resulted in them responding to the questionnaire from an IS perspective A suggestion for further research could be to test the research model that was developed in this study by including various roles from business and IT in the target population. A further limitation is the small number of completed questionnaires on which the conclusions of this study were based. Even though there were 175 responses, only 59 of the 175 were completed. Fu ture research could try to get a higher response rate in order to test if all the hypotheses in this study still hold true with more response data. On completion of the factor analysis exercise, it was noticed that only the distinct factors of Social Alignment were retained and 5 of the 10 Social Alignment items were eliminated due to cross loading. Even though the remaining Social Alignment items still captured the essence of the Social Alignment definition, it is thought that a larger number of completed responses could have avoided the 5 Social Alignment items f rom being eliminated. This could be a limitation in this study and a suggestion for future research would be to get a larger number of responses to ascertain if it would allow all Social Alignment items to be retained. Another finding from the factor analysis was that all the Commitment items of Social Alignment were eliminated. In hindsight, the author realised that the Commitment items only captured the business perspective and not the IS perspective and this could be a limitation in this study. A suggestion for further research is to include items that capture the IS perspective of Commitment in the research model. Through this study, a number of sub dimensions of the research constructs were indentified, e.g. SDK comprised of Business Knowledge of IS and IS Knowledge of Business. Further research on the identified sub dimensions of SDK, Social Alignment and Intellectual Alignment is suggested.

9 CONCLUSION

The objective of this study was to investigate the impact of SDK on SISP and effectiveness. Since the research on SDK revealed that SDK impacts IT-Business alignment (Reich and Benbasat, 2000) and IT-Business alignment was a SISP effectiveness measure (Segars and Grover, 1998 and Brown and Motjolopane, 2005), it followed that SDK would impact the effectiveness of SISP.

To test this theory, a survey of the literature on SDK and SISP was performed and the results of the literature survey contributed to the development of the research model, the research constructs, and the hypotheses that were tested in this study. The research model included the examination of how SDK impacted the SISP process dimensions (rationality, adaptation, BP/ISP integration, and IT manager's participation in business planning), how the SISP process dimensions (rationality, adaptation, BP/ISP integration, and IT manager's participation in business planning) impacted SISP effectiveness (measured by social and intellectual alignment), and lastly how SDK impacted SISP effectiveness (measured by social and intellectual alignment).

Multi-item measurement scales were developed to test the hypotheses in this study and these were based on existing measurement scales. A structured questionnaire was developed to gather data and this questionnaire was hosted on a website allowing respondents to answer the questionnaire electronically. Consultants in a large, global IT organisation were targeted for this study and out of the 175 questionnaires that were answered, 59 were completed and used for analysis and interpretation. Statistical techniques were used to analyse the data and multi linear regression was used to test the hypotheses.

The findings of this study were that there was support for hypotheses H6, H10, H12, H13, H14, H15, H16, H17, H18, and H19. Rationality was found to positively influence intellectual alignment and IT manager's participation in business planning was found to positively influence social alignment. SDK was found to positively impact rationality, adaptation, BP/ISP integration and IT manager's participation in business planning as well as social alignment, intellectual alignment, and SISP effectiveness. Hence the objective of this study was achieved.

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11 Appendix

11.1 Annexure 1: SISP Cover Letter and Questionnaire

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To Whom It May Concern:

This study forms part of research by the UCT Department of Information Systems (IS) into the characteristics of Strategic Information Systems Planning (SISP). SISP focuses on attaining alignment between IS strategy and corporate strategy, and on identifying initiatives for gaining competitive advantage through the use of IS.
The purpose of this particular study is to ascertain if SISP characteristics are impacted by Shared Domain Knowledge (SDK), which is the amalgamation of IS and Business knowledge.

The study will consist of a questionnaire that deals with factors that are well known in the research field with regards to SISP.
We would greatly appreciate your time and effort in completing this questionnaire. Your participation is entirely voluntary. Neither you nor the organisation you refer to will be named. The data collected will be used purely for academic purposes, which includes publication of findings in suitable outlets. At the end of the survey, please indicate if you would like a summary of the findings.

Yours sincerely,

Simla Hiralall

Irwin Brown (Supervisor)

SISP Questionnaire

1. Please indicate your level of experience:
    - o Junior
    - o Middle
    - o Senior

2. Please indicate your number of years of IS experience:
    - o < 5
    - o 5 – 10
    - o 10 – 15
    - o 15 -20
    - o 20

3. Please indicate your number of years of experience with SISP:
    - o < 5
    - o 5 – 10
    - o 10 – 15
    - o 15 -20
    - o 20

Please answer all of the following questions with respect to your most recent experience with SISP.

4. Please indicate the year when the SISP exercise was conducted:
    - o 1998
    - o 1999
    - o 2000
    - o 2001
    - o 2002
    - o 2003
    - o 2004
    - o 2005
    - o 2006

- o 2007
- o 2008

5. Please select the industry that this customer resided in:
   - o Manufacturing
   - o Communications
   - o Finance
   - o Retail
   - o Other (Please provide details)

     .....

6. Please select the annual revenue ($ millions) of this customer: annual revenue ($ millions)
   - o < 5
   - o 6 to 10
   - o to 50
   - o 51 to 100
   - o 101 to 500
   - o 500

7. From the choices below, please indicate with a check mark (✓) the description that most closely resembled the level of Business/IS Planning integration in the organisation:
   - o Administrative: There was a weak relationship between Business Planning (BP) and Information Systems Planning (ISP). Generally, there was little significant effort to use information systems to support business plans.
   - o Sequential: A sequential relationship existed between Business Planning (BP) and Information Systems Planning (ISP). BP *provided directions* for ISP. The relationship is depicted above by a unidirectional arrow flowing from BP to ISP. ISP primarily focused on providing support for business plans.
   - o Reciprocal: There was a reciprocal and *interdependent* relationship between Business Planning (BP) and Information Systems Planning (ISP). ISP played *both* a role in supporting and influencing business plans.
   - o Full Integration: There was little distinction between the Business Planning (BP) process and the Information Systems Planning (ISP) process. Business and Information Systems strategies were developed *concurrently* in the same *integrated planning* process.

- Proactive: Information Systems objectives preceded the formulation of business objectives and were used as input to their development. IS was considered significant in changing the basis of competition.

8. For each of the following statements, please select the response you feel most appropriately reflects the ***extent to which you agree***:

	Strongly Disagree	**Disagree**	**Somewhat Disagree**	**Neutral**	**Somewhat Agree**	**Agree**	**Strongly Agree**
Business executives recognised the potential of IS as a competitive weapon.	1	2	3	4	5	6	7
Business executives recognised IS as a tool to increase productivity.	1	2	3	4	5	6	7
Business executives were highly knowledgeable about the organisation's information technology assets and opportunities.	1	2	3	4	5	6	7
Business executives agreed that information technology could have important intangible benefits that should be funded.	1	2	3	4	5	6	7
IS executives were highly knowledgeable about business operations of the organisation.	1	2	3	4	5	6	7
IS executives were highly knowledgeable about business strategies of the organisation.	1	2	3	4	5	6	7

9. For each of the following statements, please select the response you feel most appropriately reflects the ***extent to which you agree***:

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
The company attempted to be exhaustive in gathering information relevant for SISP.	1	2	3	4	5	6	7
Before a decision was made, each possible course of action was thoroughly evaluated.	1	2	3	4	5	6	7
The company attempted to determine optimal courses of action from identified alternatives.	1	2	3	4	5	6	7
There was little trial-and-error in the SISP process.	1	2	3	4	5	6	7
Decisions were delayed until they were sure that all alternatives were evaluated.	1	2	3	4	5	6	7
Policies and procedures greatly influenced the process of SISP within the organisation.	1	2	3	4	5	6	7
Formalised planning techniques in the SISP process were utilised.	1	2	3	4	5	6	7
The process for SISP was very structured.	1	2	3	4	5	6	7
Written guidelines to structure SISP existed in the organisation.	1	2	3	4	5	6	7
The process and outputs of SISP were formally documented.	1	2	3	4	5	6	7

10. For each of the following statements, please select the response you feel most appropriately reflects the ***extent to which you agree***:

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
Business executives were actively involved in SISP.	1	2	3	4	5	6	7
A variety of functional area managers participated in the process of SISP.	1	2	3	4	5	6	7

The process for SISP included numerous participants.	1	2	3	4	5	6	7
SISP was a relatively isolated organisational activity.	1	2	3	4	5	6	7
The level of participation in SISP by diverse interests of the organisation was high.	1	2	3	4	5	6	7
Conformance to strategic IS plans were constantly evaluated and reviewed.	1	2	3	4	5	6	7
Strategic IS plans were frequently adjusted to better adapt them to changing conditions.	1	2	3	4	5	6	7
SISP was a continuous process.	1	2	3	4	5	6	7
Formal SISP for information systems was undertaken as the need arose.	1	2	3	4	5	6	7
Face-to-face meetings to discuss SISP issues were frequently scheduled.	1	2	3	4	5	6	7

11. For each of the following statements, please select the response you feel most appropriately reflects the ***extent to which you agree***:

	Strongly Disagree	**Disagree**	**Somewhat Disagree**	**Neutral**	**Somewhat Agree**	**Agree**	**Strongly Agree**
Business and IS executives shared a common vision for the long term role of IS within the organisation	1	2	3	4	5	6	7
Business and IS executives agreed on priorities for the organisational use of IS	1	2	3	4	5	6	7
Business and IS executives agreed on the key IS management issues affecting the organisation.	1	2	3	4	5	6	7

12. For each of the following statements, please select the response you feel most appropriately reflects the ***extent to which you agree***:

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
IS executives regularly attended business meetings.	1	2	3	4	5	6	7
IS executives participated in setting business goals and strategies.	1	2	3	4	5	6	7
IS executives were involved early in the meetings for major projects.	1	2	3	4	5	6	7
IS executives had a good level of understanding of strategic business plans	1	2	3	4	5	6	7
IS executives had a good level of understanding of the work environment of the business	1	2	3	4	5	6	7

13. For each of the following statements, please select the response you feel most appropriately reflects the ***extent to which you agree***:

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
Business executives regarded the achievement of IS objectives as important to organisational success	1	2	3	4	5	6	7
Business executives went out of their way to maintain a strong working relationship with IS executives	1	2	3	4	5	6	7
Business executives frequently demonstrated enthusiasm for the IS function's efforts	1	2	3	4	5	6	7
Business executives had a good level of understanding of the work environment of the IS function	1	2	3	4	5	6	7

Business executives had a good level of understanding of strategic IS plans	1	2	3	4	5	6	7

14. For each of the following statements, please select the response you feel most appropriately reflects the ***extent to which you agree***:

	Strongly Disagree	**Disagree**	**Somewhat Disagree**	**Neutral**	**Somewhat Agree**	**Agree**	**Strongly Agree**
The IS plan reflected the business plan mission.	1	2	3	4	5	6	7
The IS plan reflected the business plan goals	1	2	3	4	5	6	7
The IS plan supported the business strategies	1	2	3	4	5	6	7
The IS plan recognised external business environment factors	1	2	3	4	5	6	7
The IS plan reflected the business plan resource constraints	1	2	3	4	5	6	7

15. For each of the following statements, please select the response you feel most appropriately reflects the ***extent to which you agree***:

	Strongly Disagree	**Disagree**	**Somewhat Disagree**	**Neutral**	**Somewhat Agree**	**Agree**	**Strongly Agree**
The business plan referred to the IS plan	1	2	3	4	5	6	7
The business plan referred to specific IS applications	1	2	3	4	5	6	7
The business plan referred to specific information technologies	1	2	3	4	5	6	7
The business plan utilised the strategic capability of IS	1	2	3	4	5	6	7
The business plan contained reasonable expectations of IS	1	2	3	4	5	6	7

Thank You

Thank you for participating and completing this survey. As mentioned before, all the information you have provided will be totally confidential. You will not be identified from the information you provided, and no information will be passed on to any third parties. If you would like a summary of the findings, please provide your details below:

Name:

.....

Email Address:

.....

11.2 Annexure 2: Factor Analysis

Factor analysis has been performed on the items in order to detect structure in the relationships between items and to classify the items. Factor analysis was also used to reduce the number of items. Rounds of factor analysis were performed on the items in order to determine the minimum loading necessary to include an item in its respective construct. Items that were included were judged on suggestions from Tan and Teo (2000) which were that items that load greater than 0.3 should be considered significant; items should be considered more important if they load greater than 0; and items were very significant if they load 0.5 or greater. Accordingly, it was decided that in this study, all items that load at 0.4 or more will be retained for further analysis. In the factor analysis exercise, Pairwise MD Deletion was selected, a maximum number of 7 factors were initially selected and Varimax Normalised factor rotation was selected.

Factor analysis was first executed on the SDK items and the SISP process items. Factor analysis was thereafter executed on the Social and Intellectual alignment items. The results from the aforementioned factor analyses were then combined into one table and factor analysis was executed on those items in order to attain the final set of items which were used for correlation and hypotheses testing.

Factor Analysis: SDK and SISP Process Items

4 Factors were selected for factor analysis based on SDK and the SISP Process research constructs: SDK, Rationality, Adaptation, and IT Manager's Participation in Business Planning. SDK loaded on 2 factors (SDK1-4 on Factor 3, SDK 5-6 on Factor 1) as can be observed in Table 34 and therefore 5 factors were selected for the next round of factor analysis. The results are illustrated in Table 35.

Factor Loadings: SDK and SISP Process Items				
Extraction: Principal components (Marked loadings are >.400000)				
	Factor - 1	**Factor - 2**	**Factor - 3**	**Factor - 4**
SDK1	**0.688**	0.070	0.284	0.309
SDK2	**0.683**	-0.063	0.117	0.348
SDK3	**0.737**	0.303	0.072	0.382
SDK4	**0.885**	0.030	0.040	-0.028
SDK5	0.194	0.060	0.221	**0.689**
SDK6	0.108	0.116	0.311	**0.603**
SISP_RAT1	0.356	0.729	0.021	0.033
SISP_RAT2	0.135	0.775	0.302	0.171
SISP_RAT3	0.131	0.655	0.504	0.173
SISP_RAT4	0.132	0.618	-0.149	0.286
SISP_RAT5	-0.016	0.814	0.001	0.146
SISP_RAT6	-0.076	0.807	0.082	0.067
SISP_RAT7	-0.001	0.579	0.604	0.188
SISP_RAT8	-0.001	0.731	0.451	0.137
SISP_RAT9	0.303	0.330	0.705	-0.105
SISP_RAT10	0.091	0.668	0.501	0.233
SISP_AD1	0.265	0.196	0.370	0.691
SISP_AD2	0.287	0.008	0.662	0.503
SISP_AD3	-0.011	-0.024	0.668	0.384
SISP_AD4	0.173	0.199	-0.218	-0.415
SISP_AD5	0.413	0.148	0.219	0.520
SISP_AD6	0.230	0.473	0.429	0.359
SISP_AD7	0.031	0.459	0.379	0.519
SISP_AD8	0.197	0.360	0.495	0.517
SISP_AD9	0.027	0.445	0.395	0.565
SISP_AD10	0.380	0.197	0.509	0.371
SISP_ISBP1	0.311	0.300	0.045	0.757
SISP_ISBP2	0.209	0.382	0.031	0.775
SISP_ISBP3	0.235	0.278	-0.074	0.772
Expl.Var	3.388	6.014	4.051	5.701
Prp.Totl	0.117	0.207	0.140	0.197

Table 34: Factor Analysis Round 1: SDK and SISP Process Items

In Table 35, SDK1, SDK2, SDK3 and SDK4 loads on Factor 1 and SDK5 and SDK6 loads on Factor 5. Rationality represented by SISP_RAT1 to SISP_RAT10 loads on Factor 2 and IT manager's participation in business planning represented by SISP_ISBP loads on Factor 4. SISP_AD4 has no loadings and was therefore eliminated from the list of items. The results are illustrated in Table 36.

Factor Loadings: SDK and SISP Process Items					
Extraction: Principal components (Marked loadings are >.400000)					
	Factor - 1	**Factor – 2**	**Factor - 3**	**Factor - 4**	**Factor - 5**
SDK1	**0.706**	0.100	0.386	0.145	0.056
SDK2	**0.701**	-0.055	0.204	0.165	0.208
SDK3	**0.749**	0.277	0.093	0.308	0.236
SDK4	**0.885**	0.049	-0.052	-0.025	-0.018
SDK5	0.243	0.134	0.174	0.208	**0.832**
SDK6	0.161	0.233	0.172	0.097	**0.839**
SISP_RAT1	0.348	**0.695**	-0.138	0.225	0.002
SISP_RAT2	0.138	**0.773**	0.277	0.261	-0.089
SISP_RAT3	0.158	**0.779**	0.271	0.003	0.227
SISP_RAT4	0.116	**0.471**	0.007	0.535	-0.068
SISP_RAT5	-0.030	**0.719**	0.030	0.411	-0.126
SISP_RAT6	-0.081	**0.779**	-0.052	0.239	0.017
SISP_RAT7	0.032	**0.730**	0.399	-0.052	0.220
SISP_RAT8	0.022	**0.841**	0.195	0.019	0.221
SISP_RAT9	0.340	**0.577**	0.316	-0.415	0.162
SISP_RAT10	0.119	**0.778**	0.311	0.059	0.236
SISP_AD1	0.299	0.211	0.596	**0.376**	0.327
SISP_AD2	0.341	0.175	0.676	**-0.026**	0.411
SISP_AD3	0.029	0.103	0.844	**-0.008**	0.061
SISP_AD4	0.142	0.146	-0.339	-0.071	-0.363
SISP_AD5	0.428	0.109	0.496	**0.384**	0.070
SISP_AD6	0.252	0.517	0.480	**0.217**	0.087
SISP_AD7	0.055	0.468	0.534	**0.352**	0.164
SISP_AD8	0.228	0.407	0.650	**0.273**	0.147
SISP_AD9	0.056	0.466	0.534	**0.349**	0.247
SISP_AD10	0.414	0.300	0.525	**0.063**	0.208
SISP_ISBP1	0.327	0.197	0.361	**0.635**	0.306
SISP_ISBP2	0.227	0.284	0.289	**0.641**	0.406
SISP_ISBP3	0.251	0.162	0.194	**0.646**	0.442
Expl.Var	3.659	6.598	4.466	**2.902**	2.788
Prp.Totl	0.126	0.228	0.154	**0.100**	0.096

Table 35: Factor Analysis Round 2: SDK and SISP Process Items

In Table 36, the Adaptations items represented by SISP_AD1 to SISP_AD10 loads on Factor 1, the Rationality items represented by SISP_RAT1 to SISP_RAT10 loads on Factor 2, SDK1 to SDK4 loads on Factor 3, the IT manager's participation in business planning items represented by SISP_ISBP1 to SISP_ISBP3 loads on Factor 4, and SDK5 to SDK6 loads on Factor 5.

Factor Loadings: SDK and SISP Process Items					
Extraction: Principal components (Marked loadings are >.400000)					
	Factor - 1	**Factor - 2**	**Factor - 3**	**Factor - 4**	**Factor - 5**
SDK1	0.401	0.088	**0.705**	0.154	0.047
SDK2	0.207	-0.060	**0.706**	0.190	0.186
SDK3	0.121	0.284	**0.752**	0.305	0.238
SDK4	-0.009	0.042	**0.873**	-0.037	0.034
SDK5	0.195	0.078	0.216	0.286	**0.811**
SDK6	0.209	0.161	0.125	0.172	**0.842**
SISP_RAT1	-0.108	**0.741**	0.391	0.151	0.011
SISP_RAT2	0.316	**0.784**	0.143	0.202	-0.065
SISP_RAT3	0.333	**0.739**	0.143	-0.021	0.282
SISP_RAT4	0.020	**0.515**	0.116	0.488	-0.066
SISP_RAT5	0.065	**0.750**	-0.033	0.344	-0.098
SISP_RAT6	-0.031	**0.817**	-0.047	0.168	0.023
SISP_RAT7	0.460	**0.673**	0.004	-0.063	0.278
SISP_RAT8	0.276	**0.788**	-0.021	-0.006	0.309
SISP_RAT9	0.405	**0.488**	0.293	-0.419	0.274
SISP_RAT10	0.375	**0.733**	0.090	0.040	0.297
SISP_AD1	**0.618**	0.164	0.253	0.425	0.318
SISP_AD2	**0.708**	0.092	0.299	0.038	0.420
SISP_AD3	**0.839**	0.049	0.012	0.033	0.032
SISP_AD5	**0.514**	0.087	0.390	0.410	0.065
SISP_AD6	**0.516**	0.492	0.235	0.209	0.098
SISP_AD7	**0.565**	0.435	0.019	0.362	0.168
SISP_AD8	**0.662**	0.383	0.221	0.284	0.121
SISP_AD9	**0.558**	0.436	0.033	0.365	0.232
SISP_AD10	**0.560**	0.252	0.392	0.086	0.217
SISP_ISBP1	0.360	0.199	0.304	**0.663**	0.272

SISP_ISBP2	0.295	0.282	0.199	**0.669**	0.380
SISP_ISBP3	0.195	0.162	0.221	**0.683**	0.414
Expl.Var	4.876	6.201	3.438	2.996	2.724
Prp.Totl	0.174	0.221	0.123	0.107	0.097

Table 36: Factor Analysis Round 3: SDK and SISP Process Items

Factor Analysis: Social Alignment and Intellectual Alignment

In Table 37, 2 Factors were selected for factor analysis based on the Social and Intellectual Alignment research constructs: Intellectual Alignment loaded on 2 factors (INT_AL1-5 on Factor 2, INT_AL6-10 on Factor 1) therefore 3 factors were selected for the next round of factor analysis. The results are illustrated in Table 38.

Factor Loadings: Social and Intellectual Alignment		
Extraction: Principal components (Marked loadings are >.400000)		
	Factor – 1	**Factor - 2**
SOC_AL1	0.774	0.332
SOC_AL2	0.678	0.327
SOC_AL3	0.609	0.382
SOC_AL4	0.634	0.452
SOC_AL5	0.459	0.401
SOC_AL6	0.692	0.049
SOC_AL7	0.768	0.116
SOC_AL8	0.824	0.226
SOC_AL9	0.906	0.078
SOC_AL10	0.874	0.174
INT_AL1	0.342	**0.854**
INT_AL2	0.394	**0.821**
INT_AL3	0.450	**0.717**
INT_AL4	0.021	**0.807**
INT_AL5	0.104	**0.898**
INT_AL6	**0.633**	0.446
INT_AL7	**0.213**	0.719
INT_AL8	**0.557**	0.419
INT_AL9	**0.686**	0.388
INT_AL10	**0.648**	0.487

Expl.Var	**7.505**	5.486
Prp.Totl	**0.375**	0.274

Table 37: Factor Analysis Round 1: Social and Intellectual Alignment

In Table 38, SOC_AL loaded on 2 factors (SOC_AL1-5 on Factor 3, SOC_AL6-10 on Factor 1) therefore 4 factors were selected for the next round of factor analysis. Results are illustrated in Table 39.

Factor Loadings: Social and Intellectual Alignment			
Extraction: Principal components (Marked loadings are >.400000)			
	Factor - 1	**Factor - 2**	**Factor - 3**
SOC_AL1	0.444	0.220	**0.730**
SOC_AL2	0.220	0.196	**0.857**
SOC_AL3	0.133	0.252	**0.864**
SOC_AL4	0.389	0.362	**0.595**
SOC_AL5	0.243	0.328	**0.491**
SOC_AL6	**0.747**	0.018	0.177
SOC_AL7	**0.763**	0.068	0.289
SOC_AL8	**0.692**	0.149	0.483
SOC_AL9	**0.690**	-0.017	0.593
SOC_AL10	**0.596**	0.068	0.675
INT_AL1	0.214	0.799	0.415
INT_AL2	0.249	0.760	0.449
INT_AL3	0.264	0.646	0.502
INT_AL4	0.064	0.803	0.084
INT_AL5	0.046	0.869	0.253
INT_AL6	0.670	0.410	0.243
INT_AL7	0.438	0.739	-0.092
INT_AL8	0.650	0.399	0.142
INT_AL9	0.765	0.357	0.199
INT_AL10	0.704	0.453	0.231
Expl.Var	5.250	4.661	4.643
Prp.Totl	0.263	0.233	0.232

Table 38: Factor Analysis Round 2: Social and Intellectual Alignment

In the rounds of factor analysis that followed, INT_AL7 loaded higher on Factor 2 and was therefore removed. SOC_AL9 loaded higher on Factor 1 and was therefore removed. It was then observed that SOC_AL8 loaded higher on Factor 1 and was removed. SOC_AL7 was then seen to load higher on Factor 1 and was therefore removed. SOC_AL6 loaded higher on Factor 4 and was therefore removed. Finally it was observed that SOC_AL1-3, 4, 5, 10 loaded on Factor 1, INT_AL1-5 loaded on Factor 2 and INT_AL6, 8, 9, 10 loaded on Factor 3. Table 39 illustrates these details.

Factor Loadings: Social and Intellectual Alignment			
Extraction: Principal components (Marked loadings are >.400000)			
	Factor - 1	**Factor - 2**	**Factor - 3**
SOC_AL1	**0.742**	0.166	0.457
SOC_AL2	**0.863**	0.136	0.267
SOC_AL3	**0.850**	0.226	0.175
SOC_AL4	**0.684**	0.372	0.253
SOC_AL5	**0.610**	0.339	0.098
SOC_AL10	**0.688**	0.074	0.499
INT_AL1	0.377	**0.779**	0.314
INT_AL2	0.406	**0.753**	0.347
INT_AL3	0.473	**0.689**	0.278
INT_AL4	0.010	**0.832**	0.178
INT_AL5	0.210	**0.863**	0.174
INT_AL6	0.311	0.217	**0.803**
INT_AL8	0.184	0.297	**0.699**
INT_AL9	0.248	0.196	**0.881**
INT_AL10	0.284	0.303	**0.808**
Expl.Var	4.178	3.708	**3.553**
Prp.Totl	0.279	0.247	0.237

Table 39: Factor Analysis Round 8: Social and Intellectual Alignment

Factor Analysis: SDK, SISP, Social and Intellectual Alignment

Table 40 illustrates the results of the first round of factor analysis that was performed on the SDK, SISP Process, and Social and Intellectual Alignment items. On examination of the results in Table 40, INT_AL8 was found to load on the incorrect factor and was therefore eliminated.

Factor Loadings: SDK, SISP, Social and Intellectual Alignment							
Extraction: Principal components (Marked loadings are >.400000)							
	Factor - 1	**Factor - 2**	**Factor – 3**	**Factor - 4**	**Factor - 5**	**Factor - 6**	**Factor – 7**
SDK1	0.083	0.091	0.428	0.706	0.172	0.007	-0.101

SDK2	0.159	-0.106	0.253	0.633	0.274	0.094	-0.063
SDK3	0.243	0.222	0.119	0.716	0.301	0.130	0.136
SDK4	0.014	-0.042	0.013	0.793	0.005	-0.033	0.316
SDK5	0.200	0.051	0.205	0.192	0.415	0.646	0.166
SDK6	0.346	0.125	0.214	0.081	0.276	0.704	0.151
SISP_RAT1	0.200	0.692	-0.131	0.432	0.041	-0.041	0.097
SISP_RAT2	0.153	0.788	0.220	0.188	0.157	-0.050	0.108
SISP_RAT3	0.237	0.740	0.267	0.168	0.011	0.276	0.072
SISP_RAT4	0.058	0.481	0.078	0.105	0.386	-0.246	0.135
SISP_RAT5	0.198	0.720	-0.006	-0.043	0.262	-0.114	0.163
SISP_RAT6	0.204	0.785	-0.002	-0.075	0.133	-0.099	-0.026
SISP_RAT7	0.103	0.667	0.412	0.023	0.059	0.263	0.124
SISP_RAT8	-0.016	0.799	0.216	-0.010	0.144	0.289	0.157
SISP_RAT9	-0.152	0.497	0.326	0.315	-0.215	0.449	0.126
SISP_RAT10	0.037	0.755	0.320	0.146	0.157	0.290	0.006
SISP_AD1	0.152	0.188	0.593	0.248	0.468	0.212	0.073
SISP_AD2	0.026	0.100	0.667	0.304	0.173	0.440	0.187
SISP_AD3	0.134	0.091	0.803	0.008	0.066	0.094	-0.029
SISP_AD5	0.228	0.096	0.439	0.428	0.374	0.054	-0.021
SISP_AD6	0.210	0.465	0.423	0.254	0.199	0.090	0.276
SISP_AD7	0.272	0.462	0.557	0.049	0.289	0.014	0.045
SISP_AD8	0.212	0.393	0.604	0.252	0.265	0.012	0.204
SISP_AD9	0.103	0.469	0.603	0.051	0.320	0.054	0.056
SISP_AD10	0.183	0.191	0.563	0.324	0.078	0.106	0.502
SISP_ISBP1	0.090	0.216	0.273	0.316	0.768	0.099	0.141
SISP_ISBP2	0.087	0.304	0.248	0.193	0.799	0.141	0.100
SISP_ISBP3	0.220	0.142	0.183	0.159	0.795	0.173	0.087
SOC_AL1	0.183	0.378	0.164	0.385	0.452	0.132	0.512
SOC_AL2	0.222	0.258	0.038	0.146	0.399	0.193	0.744
SOC_AL3	0.262	0.369	0.184	0.009	0.419	0.205	0.628
SOC_AL4	0.369	0.086	0.219	0.140	0.630	0.241	0.252
SOC_AL5	0.331	-0.163	0.296	0.063	0.412	0.448	0.315
SOC_AL10	0.129	0.200	0.060	0.351	0.698	0.066	0.328
INT_AL1	0.804	0.197	0.099	0.245	0.198	0.130	0.256
INT_AL2	0.767	0.236	0.167	0.301	0.200	0.114	0.252
INT_AL3	0.703	0.128	0.197	0.215	0.330	0.164	0.198
INT_AL4	0.771	0.211	0.085	0.028	0.083	0.191	-0.206
INT_AL5	0.866	0.158	0.183	0.121	0.074	-0.031	0.137
INT_AL6	0.284	0.259	-0.018	0.623	0.250	0.371	0.173
INT_AL8	0.297	0.427	-0.063	0.326	0.406	0.391	-0.187
INT_AL9	0.211	0.327	0.121	0.571	0.419	0.304	-0.037

INT_AL10	0.347	0.359	0.069	0.549	0.403	0.134	0.052
Expl.Var	4.676	7.151	4.598	4.861	5.716	2.730	2.546
Prp.Totl	0.109	0.166	0.107	0.113	0.133	0.063	0.059

Table 40: Factor Analysis Round 1 Results: SDK, SISP Process and Social and Intellectual Alignment items

In subsequent rounds of factor analysis SISP_AD6 loaded higher on Factor 3 and was therefore removed. SISP_AD5 loaded incorrectly and was therefore removed. SISP_AD7 loaded higher on Factor 2 and was therefore removed. SISP_AD9 loaded higher on Factor 2 and was removed. Table 41 illustrates the results from all these rounds of factor analysis.

Factor Loadings: SDK, SISP, Social and Intellectual Alignment							
Extraction: Principal components (Marked loadings are >.400000)							
	Factor - 1	**Factor - 2**	**Factor – 3**	**Factor - 4**	**Factor - 5**	**Factor - 6**	**Factor - 7**
SDK1	0.386	0.095	0.111	0.718	0.219	0.012	-0.100
SDK2	0.273	-0.103	0.182	0.628	0.320	0.067	-0.086
SDK3	0.065	0.224	0.241	0.713	0.287	0.208	0.140
SDK4	0.059	-0.055	0.023	0.794	0.023	-0.056	0.318
SDK5	0.131	0.064	0.159	0.198	0.321	0.787	0.152
SDK6	0.180	0.142	0.311	0.085	0.190	0.796	0.131
SISP_RAT1	-0.232	0.679	0.190	0.449	0.016	0.061	0.100
SISP_RAT2	0.164	0.776	0.168	0.192	0.169	-0.064	0.180
SISP_RAT3	0.317	0.749	0.256	0.161	0.027	0.179	0.089
SISP_RAT4	-0.044	0.499	0.074	0.120	0.440	-0.116	0.048
SISP_RAT5	-0.089	0.714	0.199	-0.062	0.254	-0.067	0.219
SISP_RAT6	-0.074	0.782	0.220	-0.064	0.153	-0.089	-0.021
SISP_RAT7	0.414	0.696	0.125	0.021	0.117	0.213	0.057
SISP_RAT8	0.216	0.805	-0.009	-0.007	0.145	0.239	0.164
SISP_RAT9	0.453	0.521	-0.143	0.283	-0.201	0.291	0.136
SISP_RAT10	0.338	0.773	0.054	0.145	0.181	0.226	-0.004
SISP_AD1	0.549	0.212	0.173	0.236	0.498	0.228	0.084
SISP_AD2	0.706	0.139	0.044	0.286	0.211	0.405	0.143
SISP_AD3	0.824	0.126	0.183	-0.010	0.155	-0.006	-0.025
SISP_AD8	0.477	0.398	0.231	0.267	0.294	0.075	0.237
SISP_AD10	0.525	0.201	0.205	0.327	0.108	0.122	0.501
SISP_ISBP1	0.208	0.213	0.099	0.307	0.778	0.154	0.171
SISP_ISBP2	0.180	0.305	0.095	0.196	0.804	0.196	0.120
SISP_ISBP3	0.153	0.142	0.232	0.154	0.806	0.211	0.081
SOC_AL1	0.161	0.366	0.191	0.373	0.455	0.141	0.540

SOC_AL2	0.047	0.243	0.211	0.128	0.375	0.226	0.763
SOC_AL3	0.110	0.358	0.250	0.011	0.392	0.295	0.635
SOC_AL4	0.213	0.092	0.375	0.113	0.648	0.275	0.222
SOC_AL5	0.302	-0.144	0.323	0.031	0.395	0.501	0.272
SOC_AL10	0.010	0.180	0.128	0.338	0.687	0.123	0.369
INT_AL1	0.046	0.185	0.797	0.243	0.180	0.195	0.273
INT_AL2	0.091	0.238	0.761	0.297	0.193	0.201	0.253
INT_AL3	0.140	0.128	0.701	0.195	0.323	0.229	0.212
INT_AL4	0.104	0.214	0.778	0.023	0.088	0.148	-0.193
INT_AL5	0.141	0.152	0.883	0.126	0.097	-0.001	0.135
INT_AL6	-0.044	0.255	0.253	0.602	0.193	0.453	0.185
INT_AL9	0.064	0.336	0.194	0.569	0.394	0.397	-0.049
INT_AL10	-0.026	0.359	0.335	0.551	0.377	0.257	0.054
Expl.Var	3.343	6.400	4.431	4.430	5.184	3.033	2.530
Prp.Totl	0.088	0.168	0.117	0.117	0.136	0.080	0.067

Table 41: Factor Analysis Round 6 Results: SDK, SISP Process and Social and Intellectual Alignment items

In Table 41, SOC_AL5 loaded incorrectly and was therefore removed. This resulted in the final set of items from the factor analysis exercise which is illustrated in Table 42. SDK is loading on Factors 1 and 6. Rationality is loading on Factor 2. Adaptation is loading on Factor 4. ISBP is loading on Factor 5. Social Alignment is loading on Factors 7 and 5 and Intellectual Alignment is loading on Factors 3 and 1.

Factor Loadings: SDK, SISP, Social and Intellectual Alignment							
Extraction: Principal components (Marked loadings are >.400000)							
	Factor - 1	**Factor - 2**	**Factor – 3**	**Factor - 4**	**Factor - 5**	**Factor - 6**	**Factor - 7**
SDK1	**0.713**	0.087	0.113	0.389	0.228	0.017	-0.105
SDK2	**0.629**	-0.100	0.181	0.262	0.327	0.054	-0.094
SDK3	**0.711**	0.225	0.244	0.073	0.298	0.199	0.140
SDK4	**0.802**	-0.046	0.019	0.055	0.024	-0.054	0.307
SDK5	0.181	0.029	0.182	0.151	0.361	**0.752**	0.173
SDK6	0.065	0.100	0.336	0.206	0.232	**0.766**	0.155
SISP_RAT1	0.450	**0.692**	0.187	-0.207	0.012	0.087	0.103
SISP_RAT2	0.194	**0.781**	0.162	0.184	0.159	-0.055	0.179
SISP_RAT3	0.143	**0.723**	0.262	0.350	0.036	0.211	0.104
SISP_RAT4	0.144	**0.532**	0.064	-0.040	0.426	-0.163	0.031
SISP_RAT5	-0.045	**0.738**	0.190	-0.075	0.239	-0.092	0.210
SISP_RAT6	-0.069	**0.790**	0.214	-0.054	0.140	-0.058	-0.017
SISP_RAT7	0.006	**0.671**	0.129	0.440	0.124	0.234	0.068
SISP_RAT8	-0.023	**0.784**	-0.004	0.248	0.151	0.267	0.179

SISP_RAT9	0.270	**0.489**	-0.136	0.480	-0.187	0.327	0.148
SISP_RAT10	0.130	**0.751**	0.059	0.369	0.190	0.250	0.009
SISP_AD1	0.225	0.187	0.183	**0.560**	0.517	0.193	0.088
SISP_AD2	0.282	0.105	0.057	**0.720**	0.238	0.362	0.146
SISP_AD3	-0.014	0.099	0.187	**0.827**	0.163	-0.036	-0.029
SISP_AD8	0.251	0.372	0.237	**0.495**	0.304	0.074	0.244
SISP_AD10	0.339	0.190	0.208	**0.532**	0.118	0.069	0.492
SISP_ISBP1	0.287	0.199	0.105	0.215	**0.789**	0.140	0.180
SISP_ISBP2	0.168	0.282	0.104	0.193	**0.819**	0.196	0.136
SISP_ISBP3	0.147	0.140	0.236	0.152	**0.815**	0.166	0.083
SOC_AL1	0.358	0.348	0.197	0.179	0.465	0.134	**0.549**
SOC_AL2	0.116	0.224	0.220	0.063	0.387	0.201	**0.775**
SOC_AL3	-0.002	0.335	0.260	0.132	0.408	0.266	**0.649**
SOC_AL4	0.126	0.100	0.377	0.207	**0.656**	0.192	0.213
SOC_AL10	0.322	0.174	0.131	0.015	**0.694**	0.115	0.376
INT_AL1	0.227	0.169	**0.805**	0.057	0.193	0.186	0.284
INT_AL2	0.285	0.223	**0.768**	0.103	0.206	0.190	0.262
INT_AL3	0.190	0.121	**0.706**	0.142	0.334	0.195	0.214
INT_AL4	0.008	0.201	**0.782**	0.111	0.096	0.154	-0.184
INT_AL5	0.134	0.159	**0.881**	0.139	0.097	-0.043	0.128
INT_AL6	**0.582**	0.235	0.265	-0.022	0.217	0.467	0.203
INT_AL9	**0.554**	0.323	0.203	0.082	0.413	0.402	-0.036
INT_AL10	**0.541**	0.355	0.341	-0.010	0.390	0.256	0.063
Expl.Var	4.295	6.149	4.419	3.446	5.263	2.610	2.536
Prp.Totl	0.116	0.166	0.119	0.093	0.142	0.071	0.069

Table 42: Factor Analysis Round 7 Results: SDK, SISP Process and Social and Intellectual Alignment items