RESEARCH INSTRUMENT FOR THE MEASUREMENT OF FACILITATORS FOR ENHANCING SISP SUCCESS AND DYNAMIC CAPABILITIES

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Abstract

Strategic Information Systems Planning (SISP) has been recognized as one of the most essential tasks for better management and supporting strategic use of IS/IT in the current dynamic and increasingly digitalized environments. However, undertaking SISP is difficult, because organisations need to take multiple planning perspectives, including managerial, environmental and organisational perspectives all at the same time. To achieve and sustain organisational performance and competitive advantage, various facilitators affecting successful undertaking of SISP process, and the relationship regarding the facilitators and SISP success, need to be well identified and understood. The relevant SISP facilitators are selected to enhance SISP success and to improve dynamic capabilities. This paper proposes a model to show the relationship between six critical facilitators and SISP success. This research intends to undertake the survey of top 1,000 Korean large organisations to examine the relationships and test the proposed research hypothesis. A pilot study was carried out to confirm the adequacy and reliability of the research instrument, which final items are presented in this paper.

Keywords: Facilitators, Strategic Information Systems Planning, SISP success, Dynamic capabilities.
1 INTRODUCTION

In today’s rapidly changing and highly dynamic business environment, Information System (IS) and Information Technology (IT) driven business practices are regarded as critical factors for organisations’ growth, survival and for gaining a competitive advantages (Kanter 2003; O’Brien & Marakas 2009). Since the IS/IT is increasingly incorporated into all aspects of business operations, the need for strategic information systems planning (SISP) is of vital importance in attaining success with IS/IT. Although organisations have recognized the importance of SISP in the past decade, they have developed IS/IT strategies that have been left to ‘gather dust’ or have been implemented in “a half-hearted manner” (Ward & Peppard 2002). SISP theories and methods still lack the capabilities (Choi & Bae 2007) to systematically support sophisticated strategic planning in today’s digital environment such as e-business. Incorporating IS/IT into the organisation may involve considerable risks and critical returns potentially may reduce. Thus, considering possible facilitators for successful SISP will more likely help to realize business goals and strategies; enhance organisational performance and secure competitive advantage (Piccoli & Ives 2005; Reich & Benbasat 2000; Zwass 2009).

Prior literature sources have discussed one or a few critical facilitators individually (Chi et al. 2005; Newkirk et al. 2008; Rondeau et al. 2010; Stemberger et al. 2011), but there has been limited research that addressed various facilitators for a more extensive understanding of SISP. Prior studies also lack investigation about relationship between various facilitators and dynamic capabilities as the outcome of SISP success. Therefore, examining the importance of various facilitators; analysing the relationship between the facilitators and SISP success, and dynamic capabilities are the primary motivation of this study. This examination depends critically on reliable and valid research instrument. The main objective is to empirically find what are the essential facilitators and their relationships to undertake successful SISP in organisations. In this paper, the extensive literature review is summarized to provide ground for extracting the essential facilitators for superior SISP. Then, a conceptual model is suggested followed by detailed presentation of the research instrument. Conclusion and future research is also provided.

2 LITERATURE REVIEW: STRATEGIC INFORMATION SYSTEMS PLANNING IN THE CURRENT ORGANISATIONAL ENVIRONMENTS

Today, organisations could no longer afford to depend on the static strategic management constructs of the past (Grant et al. 2010; Verity 2012). The organisational changes are influenced and shaped by several dominant drivers, including globalization, virtualization, innovation and collaboration. The drivers also make organisations being more flexible, opportunistic and dynamic (Lutchman 2012; Rainey 2010). The term ‘dynamic’ could be defined as the capacity to renew resource positions to achieve harmonization with changing environmental conditions (Pettus 2001). In order to deal with the complex and dynamic environment, organisational framework need to be well harmonized with business-IS/IT planning, execution and organisational structure (Kemp et al. 2013).

Long ago, SISP was defined as “the process of identifying a portfolio of computer-based applications that will assist an organisation in executing its business plans and consequently realizing its business goals” (Lederer & Sethi 1988). Since then the definitions of SISP has evolved incorporating the developments in IS/IT systems and the rapid changes taking place in the business environment. Recently, SISP was defined as the process of strategic thinking that identifies the most desirable IS on which the firm can implement and enforce its long-term IT activities and policies (Bechor et al. 2010).

The main goals of SISP typically include business-IT strategic alignment and competitive advantage (Teo 2009), but the objectives of SISP are currently expanding beyond the strategic alignment of IS/IT with business needs. Its purposes contain improving systems’ architecture, infrastructure capability and
reliability from IS/IT investments; and managing information resources effectively and securing user satisfaction (Cassidy 2006; Lientz 2010; Philip 2009).

Although there have been various approaches for SISP, there is no universal way of carrying out SISP as well as there is no distinct consensus of the dimensions of SISP planning process (Cassidy 2006; McNurlin et al. 2009; Ward & Peppard 2002). SISP needs to include a broad set of characteristics and elements vital for undertaking it. Organisations also need to have a long-term strategic perspective for their organisational processes and structures based on enhanced communication and coordination, and improved decision-making because strategy should not be isolated but be consistent with the current environments (Grant et al. 2010; Rainey 2010). It means SISP to deal with dynamic environments needs to consider and take multiple planning views at addressing interactions of different cultures, political, structural and technological features and issues for improved organisational performance and competitive advantage based on the achievement of maximum capabilities (Bechor et al. 2010; King 2009; Peppard & Ward 2004).

2.1 Facilitators for improving successful SISP undertaking

According to the literature, there are essential facilitators of SISP process that need to be considered to underpin its effective undertaking, and the SISP success is a function of many variables (Gottschalk 1999; Rainey 2010). It is critical for organisations to understand the facilitators in order to recognise SISP challenges and related issues (Wallace 2013). From the literature, six facilitators that positively affect successful SISP are identified and proposed for research in this study

2.1.1 Top management participation and support (TMPS)

It has long been noted top management participation and support is a critical driver for organisations to achieve successful SISP process (Basu et al 2002; Philip 2007; Stemberger et al. 2011). Without it, the process can result in problems in the analysis, design and development of the selected IS/IT system and the business-IT gap might be presented continuously in the organisation (Salmela et al. 2000). Top management needs to be a good communicator or consultant who is congruent with the organisation’s objectives and principles based on the extensive mind-sets and interactions between members in the organisation (Grant et al. 2010; Kemp et al. 2013; Wallace 2013).

2.1.2 Active communication and knowledge-sharing between business and IT sectors (ACKS)

SISP requires discussion, clarification, negotiation and the realization of a mutual understanding and can help knowledge creation in both business and IT sectors (McNurlin et al. 2009; Piccoli 2008). The success of strategic management typically relies on extensive communication and knowledge-sharing, leading by various users’ participation to build awareness and understanding, and encourage desired behaviours. It is one of the most important views to attain a successful strategic business-IT planning for strategic management (Heath & Heath 2008; Wagner & Newell 2006). There has been a gap between business requirements and the ability of IT personnel to understand the requirements (Kovacic 2004). Active communication and knowledge-sharing between business and IT sectors within the organisation is thus essential for undertaking successful SISP process and realizing IS/IT implementation to deal with today’s dynamic environment effectively (Lutchman 2012; Wallace 2013; Yeh et al. 2011).

2.1.3 Consideration of internal and external environments (CIEE)

The internal and external business-IT environments greatly affect both the direction and pace of SISP for strategic use of IS/IT, because business activities of an organisation can be assessed and prioritized by the internal and external environmental changes and opportunities (Bechor et al. 2010; Chi et al. 2005). Organisational framework for strategic management also needs to be built to react swiftly and effectively to changing business drivers with flexibility and resilience by appropriate understanding
internal and external threats including corporate risks, asset risks and customer risks (Lutchman 2012). However, many organisations still have a difficulty in considering and maintaining various internal and external factors at the same time (Newell & David 2006). Therefore, organisations need to recognise the significance of internal and external environments in which undertaking SISP process is operating.

2.1.4 Appropriate resource allocation for undertaking SISP exercise (ARA)

Decision-making mainly encompasses business-IT investments, objectives and strategies by aligning business-IT plans (Wallace 2013). Resource allocation for SISP and IS/IT is anticipated to maintain and support the organisation’s objectives and activities for IT. In order to accomplish the success of strategic management based on IS/IT, it is also essential to arrange the appropriate resource allocation or investment to fix effectively key change issues and operationalize the change idea. In the past 10 years or more, attention has focused on investigating the success factors of SISP, but SISP success has been hindered in budget limitation or resource allocation issues. It indicates that if organisations lack the necessary resources it could make the progress of strategic tasks delayed or slow (Kim & Mauborgne 2003; Lientz 2010). Thus, effective SISP process with appropriate resource allocation, including HR and financial investment such as learning or training for the process could result in sustained competitive advantage and organizational performance in today’s dynamic environments.

2.1.5 Performing organisational learning (POL)

The SISP process and IS/IT implementation is typically accompanied by substantial investment in formal organisational learning/training programs. In particular, most organisations are concerned with learning on complex systems to enhance effective decision-making (Sterman 2000). Organisational learning enables an organisation to perform new tasks, do existing tasks faster and increase its quality of work by providing essential knowledge for efficient execution of tasks within the newly deployed IS/IT. Then, organisation could judge the merits and risks of proposed projects and create concrete procedures for measuring the effectiveness of the plan (Sharma & Yetton 2007). Also, organisational learning can contribute to organisational performance by improving the effects of IS/IT capabilities and competences. IS capabilities and competences are particularly a result of organisational learning (Grant et al. 2010; Lin & Hsu 2010; Peppard & Ward 2004). Thus, organisational learning is vital to undertake successful SISP in the current increasingly dynamic contexts, because SISP is viewed as a learning process rather than a problem solving process (Grover and Segars 2005; Wang and Tai 2003)

2.1.6 Active partnership with members of an organisation and external vendors (APMEV)

Currently, many organisations outsource or work together with business-IT specialists from outside vendors to undertake IT-related projects because of the lack of internal capabilities (Grant et al. 2010; Rainey 2010). SISP process is also the work closely related to a collaborative discussion, negotiation and understanding of various parties such as top management group, business-IT managers and external stakeholders (McNurlin et al. 2009; Piccoli 2008). With the recent IT outsourcing phenomena, some authors have made calls for more rigorous empirical study on influence of SISP practice by mainly external knowledge from the vendor (Chi et al. 2005) and other organizations (Lin 2006) and as to what extent that influence the SISP success. Thus, the partnership and relationship between members of the organisation and the external consultants or vendors might play a key part in the success of SISP process and IS/IT implementation (Piccoli 2008; Wallace 2013; Ward & Peppard 2002).

2.2 SISP success

Organisations are more likely to achieve their objectives and strategies, and to sustain organisational performance and competitive advantage with SISP success based on the improvement of planning effectiveness (Grover & Segars 2005; Otim et al. 2009; Tallon 2009; Wang & Tai 2003). IS planning
effectiveness (ISPE) is the assessment of ‘how well the IS planning system has met its goals’ (King 1988, p. 107). Some scholars argued the effectiveness or success of SISP is based on both judgmental and objective criteria such as alignment, analysis, cooperation and improvement in capabilities (Grover & Segars 2005). Several SISP studies stressed IS planning effectiveness is an important requirement for SISP success (Kunnathur & Shi 2001; Lee & Pai 2003). Besides, in today’s dynamic environmental conditions, the planning characteristics need to be well aligned and moved together to realise planning success. It is because SISP success is not only about an organisation’s objective to align its business-IT strategies, but also about its ability to learn and adapt to changing circumstances (Otim et al. 2009; Papke-Shields et al. 2002). The main goal of SISP process is typically business-IT strategic alignment to sustain long-term performance and competitive advantage, and realize business success (Lientz 2010). Therefore, in order to achieve SISP success, organisations need to address a wide set of factors positively affecting SISP undertaking and align the chosen factors for promoting planning effectiveness with IS/IT in accordance with their business-IT objectives and strategies.

### 2.3 Improving dynamic capabilities (Dycap) as the outcome of SISP success

SISP enables organisations to facilitate business value and competitive position through a measurable improvement of key business processes. SISP also enables them to sustain organisational performance by the improvement of IS/IT systems and resources (Lientz 2010; Wallace 2013). SISP success makes organisations possible to deliver more rapid benefits of IT to the business by the process change.

Dynamic capabilities refer to ‘the ability of the firm to reconfigure its internal and external capabilities in response to a dynamic environment’ (Teece et al. 1997). These capabilities involve organisational skills, resources, and functional capabilities to match the requirements of a changing environment and they can identify the bases on which the future of the IS function must be built. Dynamic capabilities enable an organisation to reconfigure and recombine existing knowledge to be more responsive (Eisenhardt and Martin 2000). Wang and Shi (2007) also proposed the three key sources of dynamic capabilities for e-business, such as market sensing, organisational learning and coordination. Thus, having a clear understanding of dynamic capabilities is critical for successful SISP process, and the dynamic capabilities should be achieved as the outcome of SISP successful implementation.

### 3 RESEARCH MODEL AND METHODOLOGY

Based on the above arguments, this research proposes a research model to show the relationship among the facilitators, SISP success and the outcome of its success as shown in Figure 1. The following six hypotheses are also proposed to test the relationship.

- **H1**: The higher consideration of the facilitators positively affects improving business-IT strategic alignment.
- **H2**: The higher consideration of the facilitators positively affects improving IS planning effectiveness.
- **H3**: Business-IT strategic alignment positively affects improving IS planning effectiveness for SISP success.
- **H4**: Business-IT strategic alignment positively affects improving dynamic capabilities.
- **H5**: IS planning effectiveness positively affects improving dynamic capabilities.
- **H6**: Facilitators vital to undertake SISP positively affect improving dynamic capabilities.

This research leads to a positivist quantitative study with pre-designed survey and statistical analysis to answer research question; test the hypotheses and validate the conceptual framework. Both, business and IT-related managers from top 1,000 large organisations of South Korea will be selected for the survey. As only large organisations are considered, this is a limitation of the study as different result may be obtained for small and medium size organisations.

The structural equation modelling (SEM) is regarded as a family of statistical techniques allowing researchers to test multivariate models by the analysis of covariance structures (Anderson and Gerbing
1988) and it will be utilised to analyse the survey data. Based on the SEM, the relationships among facilitators, SISP success and its outcome will be analysed as well as the ranks of significance about facilitators realising SISP success and dynamic capabilities.

Prior to the main survey, a pilot study was undertaken to examine a reliability of constructs and items about the questionnaire generated from the proposed research model. Before administering the pilot study, traditional validity checks such as face validity and peer review were performed by two academics that have an experience (over 10 years) in questionnaire design relating to strategic planning in the university. The main items for operationalizing the constructs were derived from the literature as shown in Table 1. 5-Likert scale is utilized for each statement, starting from 1 describing ‘no important at all’ until 5 to indicate ‘very important.’ The questionnaire was translated from English into Korean.

<table>
<thead>
<tr>
<th>Items of the constructs and Question</th>
<th>Sources</th>
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<tr>
<td><strong>TMPS 1</strong>: TM was knowledgeable about strategic potential of IS/IT, the organisation’s IS/IT assets and opportunities, and competitor’s use of IS/IT</td>
<td>Basu et al. 2002; Philip 2009; and Stemberger et al. 2011</td>
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<tr>
<td><strong>TMPS 2</strong>: TM perceived and understood SISP as an important activity/source or long-term investment for implementing IS/IT systems of the organisation</td>
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<td><strong>TMPS 3</strong>: TM was actively involved/participated in decision-making or project meetings for undertaking SISP process</td>
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<tr>
<td><strong>TMPS 4</strong>: TM communicated and shared his/her knowledge with CIO and CFO formally or informally while undertaking SISP process</td>
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<td><strong>TMPS 5</strong>: TM monitored/post-audited on the results of SISP process</td>
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<td><strong>ACKS 1</strong>: A variety of people from business and IT sectors participated in SISP process with high interest</td>
<td>Pai 2006; Parolia et al. 2007; and Yeh et al. 2011</td>
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<tr>
<td><strong>ACKS 2</strong>: Business and IT sectors properly understood their working environment while undertaking SISP</td>
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<tr>
<td><strong>ACKS 3</strong>: People of business sector participating in SISP process possessed proper IS/IT knowledge and those in IT sector had suitable business knowledge</td>
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<td><strong>ACKS 4</strong>: Business and IT sectors maintained open lines of oral/written communication with each other based on a close relationship while undertaking SISP process</td>
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<tr>
<td>ACKS 5: Business and IT sectors shared their knowledge, know-how, work experience and expertise such as emerging technologies, technological advancement in industry, and changes in business condition, customer needs, and strategies and tactics of competitors with each other</td>
<td></td>
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<tr>
<td>ACKS 6: Business and IT sectors helped and identified common goals/objectives, problems and opportunities with each other regarding SISP process</td>
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<tr>
<td>ACKS 7: Project members of SISP properly communicated and shared their information and knowledge with external vendors</td>
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| CIEE 1: The organisation considered and reviewed its internal business environments, including current business goals, strategies, resources, processes as well as its inherent culture while undertaking SISP process |
| CIEE 2: The organisation considered and reviewed its external business environments, including the economic, industrial and competitive climate in which the organisation operates, such as economic, social, political, legal, and ecological factors while undertaking SISP process |
| CIEE 3: The organisation considered and reviewed its internal IS/IT environments, including the current IS/IT perspective in the business, its maturity, business coverage and contribution, skills, resources and technological infrastructure while undertaking SISP process |
| CIEE 4: The organisation considered and reviewed its external IS/IT environments, including technology trends and opportunities, and the use of IS/IT by others, especially customers, competitors and suppliers while undertaking SISP process |

| POL 1: Project members were learned about the scope and goals of the SISP process, the organisation’s mission and purpose, key issues and its internal and external environments |
| POL 2: Project members were trained in the SISP methodology that the organisation intends to introduce |
| POL 3: End-users received extensive on-the-job learning/training on why the organisation undertake the SISP process; why it is important; what it is different from the previous one; and what the benefits are etc. |
| POL 4: The organisation provided the learning/training opportunities or supports regarding SISP process and IS/IT systems to end-users internally and externally on a regular basis |
| POL 5: The organisation provided incentives (i.e., awards or promotion etc.) for end-users to encourage the organisational learning |

| ARA 1: Human resources from business and IT sectors, and external vendors (i.e., consultants and system developers) with suitable understanding on the organisation’s business-IT goals and strategies were appropriately allocated and invested while undertaking SISP process |
| ARA 2: Financial funds for undertaking SISP, performing organisational learning, and IS/IT systems’ implementation and maintenance were properly allocated and invested |
| ARA 3: Top management clearly and well supported the resource investments necessary for the SISP process with active participation and strategic awareness of IS/IT |
| ARA 4: Communication, consensus and partnership between people of business and IT sectors regarding the resource allocation were suitably arranged and performed undertaken while undertaking SISP process |

| APMEV 1: The external vendors had a good relationship with various parties (i.e., CEO, project team and end-users) while undertaking SISP process |
| APMEV 2: The external vendors showed active commitment and participation while undertaking SISP process |
| APMEV 3: The external vendors properly understood the organisation’s culture, objectives and structures to undertake SISP process of the organisation |
| APMEV 4: The external vendors had a predisposition to communicate and share their expertise, information, knowledge and resources with members of the organisation based on integrity (performed with honesty) and trust while undertaking SISP process |
| APMEV 5: The external vendors had relevant and suitable project experience, management skills and technique for undertaking the task |
| APMEV 6: The external vendors have maintained long-term partnership with the organisation during/after the project |

| BITSA 1: Communication and knowledge-sharing between business and IT sectors regarding SISP process (i.e., exchange of ideas or information on the organisation’s long-term strategies and plans, business-IT environments and so on) |
| BITSA 2: Connection and integration between business planning and IS/IT planning (i.e., aligning IS/IT capabilities, goals, issues, missions, resources, HR skills and strategies with business ones) |
| BITSA 3: Adapting IS objectives to organisational change; and adapting technology to strategic change |
| BITSA 4: Identification of IT-related opportunities to support strategic direction of the organisation |
| BITSA 5: Assessment and management of the strategic importance of the organisation’s overall technologies, including enterprise architecture (EA), H/Ws, S/Ws and databases to use |

| ISPE 1: Better assessment of technology trends and better system investment decision |

| Chi et al. 2005; King 2009; and Newkirk et al. 2008 |
| Benamati and Lederer 2001; and Rondeau et al. 2010 |
| Pai 2006; and Wang and Tai 2003 |
| Ravichandran and Lertwongsatien 2005; and Thong et al. 1996 |
| Chan et al., 2006; Lee and Pai 2003; and Segars and Grover 1998 |
| Bechor et al. 1998 |
A reliability of the questionnaire was assessed using SPSS software. Cronbach’s Alpha is a commonly utilised test of internal consistency of the measuring instrument. The alpha is between 0.8 and 0.9 is considered as a high level of reliability (Hair et al. 2010) and 0.6 was a cut off accepted by researchers. The alpha of most constructs was more than 0.8, so that the internal reliability of the questionnaire can be acceptable and reliable for undertaking the main survey and further statistical analysis. Validity of the measuring instrument will be assessed when a full size survey is conducted as it depends of the sample size (Hair et al. 2010) which should be at least 100.

5 CONCLUSION WITH THE FUTURE RESEARCH

To undertake organisational-level of SISP successfully, it is necessary to consider critical facilitators that positively affect SISP process. In this paper, a conceptual framework and hypothesis are proposed to investigate the relationships among six SISP facilitators, SISP success and dynamic capabilities as the outcome of SISP success. A pilot study was undertaken by 10 managers of 8 large organisations in South Korea to examine the quality of the research instrument. The reliability of items of the constructs is tested by using Cronbach’s Alpha. Of course, the sample size was very small but it was useful to recognise the level of their reliabilities prior to the main survey. The alpha figure of all constructs was more than acceptable so that all items of the constructs will be used in the main survey. The main survey will be undertaken the exactly same way as the pilot study. The study will need to obtain at least 250 responses to assess fit between data and proposed model.
References


