SISP PRACTICES, APPROACHES, CONTEXTS AND PERFORMANCE OF GOVERNMENT AGENCIES IN MALAYSIA

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ABSTRACT

Strategic information system planning (SISP) is essential to both the operations as well as the performance of organizations. Viewed as a practice and process, SISP has gained approval and recognition from both public and private organizations. Notwithstanding, the attraction and attention on SISP, a review of previous studies suggests that SISP as an area of research has not received much research emphasis as deserved. Despite various research issues been highlighted in the area, limited studies have attempted to address these issues. As a result, not much is still known about SISP. This study represents an attempt to investigate the relationships between SISP practices, approaches, contexts and performance of government agencies. The data for the study were collected from 54 government agencies by using structured questionnaire. Results of the analyzed data indicate that SISP practices are positively related to performance. In addition, the results also show that SISP approaches and contexts moderate the relationships between SISP practices and performance of the government agencies that participated in the study.

Keywords: Strategic information system planning (SISP), Strategic information system planning approaches (SISP approaches), Strategic information system planning contexts (SISP contexts), information system (IS), information technology (IT), performance, government agencies.

INTRODUCTION

Various advances in information, computers and telecommunications (ICT) technologies have influenced the way organizations run their operations and managed their business activities. The new technologies in ICT have driven organizations to change their processes, structures, reshape their relationships with business partners and competitors. More significantly, organizations that adopted the new technologies were able to transform themselves into more profitable, productive, competitive and sustainable organizations.

Of the many advances in ICT, strategic information systems planning (SISP) has been identified as one of the most useful information technology driven process that has been able to help organizations improve their efficiency and effectiveness. More specifically, SISP has enable organizations to lower their operating costs by increasing the speed in which information is stored, retrieved, processed, communicated and used in organizations.

Given its usefulness and effectiveness, SISP has been viewed and adopted as good management practice among both public and private organizations. Since its introduction, organizations in both the public and private sectors have been using SISP to not only help them improve their performance, but also to assist them in dealing with uncertainty, increasing complexity and intensifying competition in the global business environment.
The importance of SISP to organizations has attracted much attention and interest in the literature. The literature indicates that over the years, the number of research on SISP has also studies on SISP, a review of prior studies suggests several shortcomings. Among these include; too much focus on qualitative research methods, emphasis on describing issues

relating to the adoption of SISP such as its development, process, process planning, methodologies, implementation and adoption success (Khani, Md Nor, Samani & Hakimpoor, 2012; Gufroni, 2011; Khani, Md Noor & Bahrami, 2011; Issa-Salwe, Sharif & Ahmed, 2011; Al-Aboud, 2011; Pollack, 2010; Md Basir & Norzaidi, 2009; Abu Bakar, Suhaimi & Hussain, 2009; Pita, Cheong & Corbitt, 2008; Teubneur, 2007; and Ishak & Alias, 2005).

Despite the usefulness of SISP to both organizations in the public and private sectors, the literature review reveals that research on the adoption of SISP in the government agencies remained limited and neglected. The review of past studies indicates that very few studies have attempted to investigate the adoption of SISP in these agencies. As such, there is little information about SISP among government agencies, especially in the Malaysian context. This paper reports a study that attempted to examine the relationships between SISP practices, contexts, approaches and performance of government agencies in Malaysia. In addition, by adopting the contingency approach, the study strives to determine whether SISP approaches and contexts moderate the relationships between SISP practices and performance of the government agencies.

LITERATURE REVIEW

The literature indicates various terms have been used by different authors to describe SISP. Terms such as strategic planning for information system (SPIS) information system planning (ISP) information system strategy (ISS), information system strategic planning (ISSP) have been used interchangeably to mean SISP (King, 1988; Premkumar, King, 1994b; Raghunathan & Raghunathan, 1994; Earl 1993; Gottschalk & Lederer, 1997; Henderson & Sifonis, 1988; Lederer & Salmela, 1996; Lederer & Sethi, 1988, 1991, 1992, 1996; O'Connor, 1993; Premkumar and King, 1994a; Earl, 1989; Ward et al. 1990; Galliers, 1993; and Fitzgerald, 1993). Although the terms SPIS, ISSP, ISS, and ISP may appear to be different, a close examination of these terms suggests they all refer to SISP (Ribbers, 1996).

In addition to being described in various ways, numerous official definitions of SISP have also been presented in the literature. In general, however, the review of the definitions suggests most of the experts tend to view SISP as a management practice and process. As management practice and process, SISP involves the use of information systems as well as technology to help organizations identify and select suitable computer-based applications for the purpose of developing, implementing their strategic plan and for improving organizational performance (Issa-Salwa, Sharif and Ahmed, 2011; Gufroni, 2011; and Khani, Md Nor, Samani, and Hakimpoor, 2012).

According to Hackos (1997), indicated that organizations need to develop SISP that can help to address the future requirements of information technology (IT) and information systems (IS) in accordance with the organization's objectives in a formal or less formal way. Other studies have suggested that the development of SISP in organizations is important for the following reasons; managing the overall effective usage of all IT and IS investments, alignment between business needs and IS strategies, competitive advantage for business opportunities in the use of strategic, appropriate resources and competencies for the successful deployment of the IS (Hartono, Lederer, Sethi & Zhuang, 2003; and Ward & Peppard, 2002)

Past studies have also shown that the adoption of SISP in organizations require that they emphasized on their capabilities, particularly information systems capabilities (IS capabilities). More specifically, by applying the resource-based framework, the study by Khani, Md Nor and Bahrami (2011) stressed that IS capabilities such as financial, human resources, technical, and business dimensions (which includes alignment, analysis,

cooperation, improvement in capabilities, and contributions) of information systems can influence the SISP success in organizations.

Besides the focus on IS capabilities, prior research has also proposed other important factors and requirements for SISP success in organizations. For instance, the study by Issa-Salwa, Sharif and Ahmed (2011) identified several specific factors and requirements that are associated to SISP success. These factors and requirements include; the alignment between corporate objectives and IS strategy, the underlying motivation for the initialization of the planning process, the maturity level of the organization, the methodology used in establishing the IT investment priorities, the measurement of effectiveness adopted for the IS department, and lastly, the preparation of an implementation plan.

There is no one best way to adopt SISP in organizations. Evidence from the literature has suggested that it is not appropriate for organizations to adopt a standard SISP practices that is only based on a specific approach and methodology. According to the studies by Al-Aboud (2011), Pollack (2010) and Pita, Cheong & Corbitt (2008), since organizations vary from each other in terms of their resources, capabilities and requirements, it is only proper and practical that each organization should attempt to identify the approach and methodology that best suit its requirements as well as purpose of SISP adoption. Furthermore, given the frequent introductions of new technologies and innovations in information systems (IS) and information technology (IT), it would be difficult to develop and maintain a standard SISP process or practices that can be adopted by various types of organizations.

In addition, from the contingency perspective, SISP approaches and SISP contexts are views as contextual or contingency factors (Bechor, Neumann, Zviran & Glezer, 2010; Croteau, Bergerou & Raymond, 2009; Cohen, 2008; Sullivan, 1985; and Earl, 1989). This approach suggests that in most cases planners would select the most appropriate approach and tailor the approach to the specific needs of the organization. Findings of several studies that examined the relationship between SISP and performance have also suggested the effect of context on IS planning. However, the adoption of contingency factors such as SISP approaches and SISP contexts have not received much research emphasis as well as categorization of the contextual factors has not been seriously studied.

Findings of past studies have also indicated the linkage between SISP and organizational performance (King, 1983; Henderson & Sifonis, 1988; Das et al, 1991; Earl, 1993; Segars and Grover, 1998; Smits and van der Poel, 1996; Kearns and Lederer, 2004; Henderson and Venkatraman 1993; Reich and Benbasat 1996; and Croteau et.al 2001). These studies have found that SISP that aligned with the requirements of the organizations helped organizations to improve their performance. Findings of prior studies have showed positive relationship between SISP and performance of the organizations.

In short, the literature indicates that SISP is not only associated to organizational performance but also that approaches and SISP contexts as important variables in SISP. Evidence from previous studies also suggested that SISP approaches and SISP contexts can influence the performance of firms. Furthermore, from the contingency framework perspective, SISP approaches and SISP contexts are viewed as contingency variables that have moderating effects on the relationships between SISP and organizational performance.
THE RESEARCH FRAMEWORK

Figure 1 represents the research framework adopted in this study. The framework was developed based on the views presented in the literature and by using the contingency theory. The contingency framework states that SISP approaches (which consist of SISP agendas and SISP behaviors) and SISP contexts (organizational and technological factors) moderate the relationships between SISP practices and organizational performance.
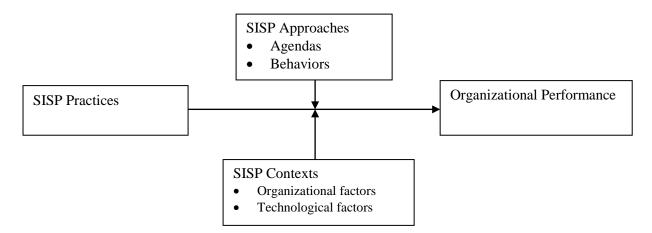
Figure 1: The Research Framework

METHODOLOGY

Procedure and Sample

The Malaysian Administrative, Modernization and Management Planning Unit (MAMPU) Department was assigned by the Malaysian Government to coordinate the development and implementation of SISP in the government agencies. The MAMPU has kept a listing of all government agencies that adopted the SISP. This study used the listings from MAMPU as its sampling frame. The listing consisted of 138 government agencies. Questionnaires were mailed to the selected 138 government agencies. The questionnaires were posted to the Director, Department Head and Information Technology Officer of each government agency. Of the 138 mailed questionnaires, 54 agencies completed and returned the questionnaires.

Questionnaire

In the study, a structured questionnaire consisting of five sections was used to collect the data. The 12 items in section one gathered the information of the respondents and the characteristics of the government agencies. The 11 items in section two measured the SISP practices. The respondents were asked to rate each item on a five-point scale ranging from (1) almost never to (5) almost always.

The 28 items in section three which were adapted from Early (1993) and Boynton & Zmud (1987) were used to measure the SISP approaches (SISP behaviors and agendas). The respondents were asked to rate each item by a five-point scale ranging from 1 = "Almost Never" to 5 = "Almost Always."

In the forth section, another 11 items were used to measure the SISP contexts. The SISP contexts were measured in terms of organization factors (6 items) and technological factors (5 items). For these 11 items, the respondents were requested to rate each item by using a numerical scale ranging from 1 = "Almost Never" to 5 = "Almost Always."

The 22 items in section five were used to measure the performance of the government agencies. The measures included; time saved, improved access to information, increased level of operations, improved delivery of services, improved forecasting, reduced expenditure, improved communication, availability of information, facilitated direct communication, increased cooperation, improved information exchange, facilitated execution of ICT projects, improved the work systems, improved procedures, improved counter

services, less paperwork, improved ICT culture, assisted in training programs, reduced bureaucracy, strengthened human resources and strengthened organizational capacity. A five-point scale ranging from 1= "Poor" to 5 = "Excellent" was employed.

THE RESULTS

Strategic Information Systems Planning Practices
The means and standard deviation (SD) scores of the 11 items used to measure the SISP practices is shown in Table 1. The 11 items served as the basis for querying the SISP practices adopted by the 54 government agencies that participated in this study. As shown in Table 1, the mean scores for the eleven items ranged from 3.05 to 3.95. The high mean values suggest that the government agencies in the study adopted the SISP practices as documented in the literature.

Table 1: Mean and Standard Deviation (SD) Scores of SISP Practices

SISP Practices	Mean	SD
Implementation of SISP involves all departments in the organization	3.73	1.134
Department that defines information technology projects in the SISP has been given responsibility for implementation	3.71	1.110
Provides the necessary infrastructure for the implementation of SISP	3.58	1.101
Provides the necessary info-structure for the implementation of SISP	3.60	1.069
Monitors the implementation of projects in the SISP	3.70	1.072
Provides continuous training to staff in preparation for the execution of SISP	3.05	1.091
Practices the concept of knowledge sharing among staff	3.38	1.038
Adopts transparency in performing acquisition planned in the SISP	3.95	1.069
Makes amendments to the SISP according to the technological advances	3.29	1.038
Financial allocation given priority in executing information system projects that has been planned in the SISP	3.14	1.194
Changes in SISP involved top-down approach	3.16	1.082

SISP Approaches

In the study, the SISP approaches adopted consist of methods that were used by the government agencies to develop and implement SISP. The SISP approaches comprised two dimensions that included SISP behaviors and SISP agendas. The SISP behaviors and agendas entailed the procedures, techniques, and communication between users of information systems in the SISP adoption. The mean and standard deviation scores of the items used to measure SISP approaches (behaviors and agendas) are presented in Table 2 and Table 3 respectively.

SISP Behaviors

Table 2 provides the means and standard deviation scores (SD) of the 15 items that were used in the study to measure SISP behaviors. The figures in Table 2 indicate that the mean values of SISP behaviors ranged from as low as 2.61 to as high as 4.00.

SISP Agendas

Table 3 shows the means and standard deviation (SD) scores of the 13 items used to measure SISP agendas. As presented in Table 3, the figures show that the means scores of SISP agendas ranged from 3.17 to 3.83.

Table 2: Mean and Standard Deviation Scores of SISP Behaviors

SISP Behaviors	Mean	SD
The allocation for information system resources is done by the financial department	3.35	1.243
The allocation of information system resources is done by other department	2.61	1.199
Decisions concerning SISP are normally made by department of information system	3.46	1.074
Each department has the authority to SISP planning	3.06	1.197
Detailed technical analysis uses structured formats	3.27	1.064
Information Technology Analysts dominate analysis of technology	3.27	1.052
New technology legitimacy obtained from technology knowledge	3.36	.959
Organization focuses on the SISP capabilities to change organization processes	3.28	.955
Management are involved in decision making to exploit latest technology	3.29	1.054
Department of Information System acts as source of SISP	4.00	.984
Decision-making for SISP is primarily given to the Department of Information System	3.75	1.013
The internal Information System operation are emphasized by Department of information system	3.90	.928
Management and information system professionals work together in identifying the requirements of the information system	3.60	1.042
Decision making in SISP focuses on identifying organizational needs	3.82	.925
SISP drives organizational behaviors on organization needs	3.54	.929
SISP Behaviors (overall)	3.44	.73

Note: 5-point scale, in which 1 = almost never and 5 = almost always

Table 3: Mean and Standard Deviation Scores of SISP Agendas

SISP Agendas	Mean	SD
SISP content covers the servicing of demand for information system within an organization	3.82	.962
Operational level of SISP is the core contribution to the organization	3.48	.958
SISP content emphasizes on operational demand for information system	3.73	.892
SISP content covers the control of information system resources	3.62	.948
SISP content focuses on the risk management	3.20	.992
SISP content emphasizes the challenges for development information system	3.17	1.045
SISP content increases inter-dependent of information system	3.57	.962
SISP content is a source to increase organization productivity	3.78	.897
SISP content is a source to increase competitive advantage	3.62	.949
SISP content used to identify organizational strategies to be implemented	3.70	.900
Extended lead-time for major information system developments particularly those part of information system	3.18	.934
SISP content becomes a means by organization looking for future information system needs of an organization	3.73	.955
SISP content emphasizes the desire for futurity in information system decision	3.83	.940
SISP Agendas (overall)	3.57	.76

Note: 5-point scale, in which 1 = almost never and 5 = almost always

SISP Contexts

The SISP contexts adopted in this study were used to evaluate the internal and external factors that directly influence the development or improvement of SISP implemented by the government agencies. The SISP contexts were measured by using two dimensions. The two dimensions included organizational factors (6 items) and technological factors (5 items). The following Table 2 and Table 3 list the mean and standard deviations scores of the 11 items used to measure SISP contexts as adopted in this study.

Organizational Factors

Table 4 displays the means and standard deviation (SD) scores of the six items used to measure organizational factors. As indicated in Table 2, the figures show that the means scores of SISP agendas ranged from 3.50 to 3.88.

Technological Factors

Following Table 4, Table 5 presents the means and standard deviation (SD) scores of the 15 items that were used in the study to measure SISP behaviors. The figures in Table 3 indicate that the mean values of SISP behaviors ranged from as low as 2.95 to as high as 3.65.

Table 4: Mean and Standard Deviation Scores of Organizational Factors

Organizational Factors	Mean	SD
Centralized approach in decision making	3.61	1.060
Highly recognizes the potential of information system to enhance productivity	3.88	1.005
Provides strong supports for development of information system application	3.72	1.060
Resources allocated for information system projects	2.79	1.002
Information system strategies and organization objectives are aligned	3.72	1.052
Encourages employees of taking responsibilities for work related SISP	3.50	1.021
Organizational Factors (Overall)	3.54	.88

Note: 5-point scale, in which 1 = almost never and 5 = almost always

Table 5: Mean and Standard Deviation Scores of Technological Factors

Technological Factors	Mean	SD
Adopts the latest technology	3.52	.947
Provides sufficient information system skills for the staff	3.30	1.008
Implemented information system integration holistically across other departments	2.95	1.103
Technical support services are used to deliver support to users	3.65	1.049
The department of information system is restructured to assist the implementation of SISP	3.01	1.146
Technological Factors (Overall)	3.29	.84

Note: 5-point scale, in which 1 = almost never and 5 = almost always

Organizational Performance

Table 6 shows the means and standard deviations (SD) scores of the 22 items that were used to measure the performance of the government agencies. The performance measures included; time saved, improved access to information, increased level of operations, improved delivery of services, improved forecasting, reduced expenditure, improved communication, availability of information, facilitated direct communication, increased cooperation, improved information exchange, facilitated execution of ICT projects, improved the work systems, improved procedures, improved counter services, less paperwork, improved ICT culture, assisted in training programs, reduced bureaucracy, strengthened human resources and strengthened organizational capacity.

As presented in Table 6, the figures indicate that the mean scores for the 22 measures of performance ranged from 3.49 to 3.97. At the general level, these mean scores suggest that most of the government agencies in the study agreed that their agencies have achieved more than satisfactory level of performance after the adoption of SISP in their organizations.

Table 6: Mean and Standard Deviation Scores of Organizational Performance

Organizational Performance	Mean	SD
Saved time	3.86	.910
Improved access to information	3.89	.873
Increased the level of operation	3.78	.822
Improved delivery of services	3.86	.886
Improved forecasting	3.55	.875
Reduced expenditure	3.52	.938
Improved communications internally	3.71	.896
Availability of information for decision making	3.75	.886
Facilitated direct communication	3.84	.902
Increased cooperation	3.72	.921
Improved information exchange	3.74	.950
Facilitated the execution of ICT projects designed	3.72	.876
Improved the work system	3.80	.898
Improved procedures	3.69	.875
Improved counter services	3.65	.935
Less paperwork	3.62	.922
Increased inculcating ICT culture in organization	3.97	.924
Improved ICT culture within the organization	3.93	.909
Assisted in performing training programs	3.74	.901
Reduced of bureaucracy	3.49	.941
Strengthened the management of competency-based human resources	3.60	.933
Strengthened organizational capacity	3.77	.943
Organizational Performance (Overall)	3.74	.784

Relationships between SISP Practices and Performance

Table 7 and Table 8 summarized the results of the correlation analyses between the 11 dimensions of SISP practices and the 22 measures of the performance of the 54 government agencies. As indicated in Table 7, the results show significant positive relationships between the SISP practices and the performance of the government agencies as measured in terms of; time saved, access to information, level of operation, improved delivery of services, improved forecasting, reduced expenditure, improved communications internally, availability of information for decision making, facilitated direct communication, increased cooperation and improved information exchange.

As shown in Table 8, the results of the correlation analyses also indicate significant positive relationships between the SISP practices and the 11 measures of performance. The results indicate that the SISP practices are positively related to the performance of the government agencies as measured in terms of; facilitated the execution of ICT projects, improved work system, improved procedures, improved counter services, less paperwork, increased inculcation of ICT culture, improved ICT culture, assisted in training programs, reduced bureaucracy, strengthened the management of competency-based human resources and strengthened organizational capacity.

Table 7: Relationships between SISP Practices, Time Saved, Access to Information, Level of Operation, Improved Delivery of Services, Improved Forecasting, Reduced Expenditure, Improved Communications Internally, Availability of Information for Decision Making, Facilitated Direct Communication, Increased Cooperation and Improved Information Exchange

SISP Practices	Time Saved	Access to information	Increased the level of operation	Improved delivery of services	Improved forecasting	Reduced expenditure	Improved communications internally	Availability of information for decision making	Facilitated direct communication	Increased cooperation	Improve information exchange
Implementation of SISP involves all departments	.347**	.318*	.379**	.321**	.193**	.242*	.350**	.253*	.347**	.333**	.362**
Department that defines IT projects is responsible for execution	.503**	.604**	.582**	.661**	.415**	.364**	.534**	.620**	.599**	.548**	.615**
Provides the infrastructure for the implementation of SISP	.490**	.496**	.547**	.574**	.397**	.306*	.460**	.488**	.490**	.486**	.437**
Provides the info-structure for the implementation of SISP	.466**	.453**	.504**	.537**	.300*	.257*	.451**	.445**	.466**	.451**	.415**
Monitors the implementation of projects in the SISP	.587**	.575**	.551**	.635**	.464**	.384**	.518**	.598**	.587**	.523**	.519**
Provides continuous training in the execution of SISP	.468**	.444**	.414**	.477**	.303*	.317**	.413**	.438**	.468**	.415**	.409**
Practices knowledge sharing among staff	.454**	.581**	.562**	.606**	.360**	.354**	.476**	.512**	.475**	.608**	.517**
Adopts transparency in performing acquisition in the SISP	.420**	.482**	.449**	.497**	.279*	.249*	.377**	.473**	.486**	.404**	.358**
Upgrade SISP according to technological advances	.543**	.449**	.454**	.460**	.517**	.451**	.486**	.545**	.543**	.369**	.395**
Financial allocation given priority IT projects in the SISP	.551**	.530**	.504**	.556**	.575**	.486**	.556**	.525**	.532**	.514**	.559**
Changes in SISP involved top-down approach	.534**	.512**	.505**	.521**	.488**	.425**	.523**	.548**	.534**	.482**	.552**

Table 8: Relationships between SISP Practices, Facilitated Execution of ICT Projects, Improved Work System, Improved Procedures, Improved Counter Services, Less Paperwork, Increased Inculcation of ICT Culture, Improved ICT Culture, Assisted in Training Programs, Reduced Bureaucracy, Strengthened the Management of Competency-Based Human Resources and Strengthened Organizational Capacity.

SISP Practices	Facilitated execution of ICT projects	Improved work system	Improved procedures	Improved counter services	Less paperwork	Increased inculcation of ICT culture	Improved ICT culture within the organization	Assisted in training programs	Reduced bureaucracy	Strengthened the management of competency-based human resources	Strengthened organizational capacity
Implementation of SISP involves all departments	.386**	.307*	.296*	.211	.234*	.428**	.339**	.376**	.272*	.231*	.349**
Department that defines IT projects is responsible for execution	.501**	.452**	.412**	.467**	.492**	.531**	.524**	.532**	.335**	.334**	.333**
Provides the infrastructure for the implementation of SISP	.524**	.372**	.311*	.299*	.295*	.518**	.531**	.455**	.335**	.354**	.478**
Provides the info-structure for the implementation of SISP	.485**	.336**	.275*	.287*	.288*	.472**	.506**	.376**	.289*	.296*	.441**
Monitors the implementation of projects in the SISP	.518**	.431**	.466**	.403**	.463**	.572**	.565**	.614**	.334**	.371**	.329**
Provides continuous training in the execution of SISP	.336**	.311*	.208	.316*	.436**	.426**	.430**	.266*	.336**	.337**	.281*
Practices knowledge sharing among staff	.464**	.395**	.291*	.363**	.575**	.547**	.529**	.262*	.464**	.368**	.456**
Adopts transparency in performing acquisition in the SISP	.411**	.356**	.350**	.398**	.407**	.464**	.441**	.325**	.411**	.403**	.444**
Upgrade SISP according to technological advances	.610**	.466**	.498**	.443**	.552**	.492**	.505**	.481**	.509**	.589**	.536**
Financial allocation given priority IT projects in the SISP	.606**	.379**	.469**	.401**	.487**	.445**	.513**	.550**	.473**	.466**	.396**
Changes in SISP involved top-down approach	.611**	.381**	.468**	.412**	.517**	.506**	.474**	.526**	.413**	.489**	.434**

Moderating Effects of SISP Contexts on the Relationships between SISP Practices and Performance

In the study, it was hypothesized that SISP contexts moderate the relationships between SISP practices and performance of the government agencies. The hierarchical regression analysis was used to test the moderating effects of SISP contexts (organizational and technological factors) on the relationships between SISP practices and performance of the government agencies. The results indicate that SISP contexts moderate the relationships between SISP practices and performance of government agencies. The results of the hierarchical regression analysis are presented in Tables 9, 10 and 11.

As presented in Table 9, the results suggest that SISP contexts as measured in terms of organizational and technological factors moderate the relationship between SISP practices and performance. The results presented in Table 9 indicate that the R^2 values of organizational and technological factors increased from 46.2% to 60.5% (p<0.001). The significant increased in the values of R^2 implied the moderating effects of SISP behaviors and agendas on the relationships between SISP practices and performance.

Additionally, the B coefficient value shown in Table 10 suggests the relationships exit between organization performance and SISP contexts (behavior and agendas). The results in Table 11 show the model of the relationship as organization performance = 1.250 + 0.001 (SISP practices) + 0.545 SISP contexts (organizational factors) + 0.192 SISP contexts (technological factors).

Table 9: Results of SISP Contexts as Moderator between SISP Practices and
Performance

Model Summary									
				Std. Error	Change Statistics				
Model	R	R Square	Adjusted R Square	of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.680[a]	.462	.452	.56958	.462	44.631	1	52	.000
2	.732[b]	.536	.518	.53384	.075	8.196	1	51	.006
3	.778[c]	.605	.582	.49735	.069	8.758	1	50	.005
a. Predictors: (Constant), SISP Practices									
b. Predictors: (Constant), SISP Practices, SISP Context (Technological Factor)									
c. Predictors: (Constant), SISP Practices, SISP Context (Technological Factor), SISP Context (Organizational Factor)									

Table 10: Results of ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.479	1	14.479	44.631	.000[a]
	Residual	16.870	52	.324		
	Total	31.349	53			
2	Regression	16.815	2	8.407	29.502	.000[b]
	Residual	14.534	51	.285		
	Total	31.349	53			
3	Regression	18.981	3	6.327	25.579	.000[c]
	Residual	12.368	50	.247		
	Total	31.349	53			
a. Predictors: (Constant), SISP Practices						
b. Predictors: (Constant), SISP Practices, SISP Context (Technological Factor)						
c. Predictors: (Constant), SISP Practices, SISP Context (Technological Factor), SISP Context (Organizational Factor)						
d. Dependent Variable: Organizational Performance						

Table 11: Coefficients of the Model

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	1.510	.354		4.272	.000		
	SISP Practices	.665	.099	.680	6.681	.000	1.000	1.000
2	(Constant)	1.318	.338		3.899	.000		
	SISP Practices	.286	.162	.293	1.771	.082	.333	3.007
	SISP Context (Technological Factor)	.459	.160	.473	2.863	.006	.333	3.007
3	(Constant)	1.250	.316		3.957	.000		
	SISP Practices	.001	.179	.001	.003	.997	.236	4.243
	SISP Context (Technological Factor)	.192	.174	.198	1.100	.276	.244	4.104
	SISP Context (Organizational Factor)	.545	.184	.602	2.959	.005	.191	5.236
a. Dependent Variable: Organizational Performance								

Moderating Effects of SISP Approaches on the Relationships between SISP Practices and Performance

Apart from SISP contexts, the study also hypothesized that SISP approaches moderate the relationships between SISP practices and performance of government agencies. The hierarchical regression analysis was used to test the moderating effects of SISP approaches (behaviors and agendas) on the relationships between SISP practices and performance of government agencies. The results suggest that SISP approaches moderate the relationships between SISP practices and performance of government agencies. The results of the hierarchical regression analysis are shown in Tables 12, 13 and 14.

As presented in Table 12, the results show that both SISP behaviors and agendas moderate the relationships between SISP practices and performance. The results shown in Table 12 suggest that the R² values of SISP behaviors and agendas increased from 46.2% to 60.0% (p<0.001). The significant increased in the values of R² implied the moderating effects of SISP behaviors and agendas on the relationships between SISP practices and performance.

In addition, the B coefficient value provided in Table 13 suggests the relationships exit between organization performance and SISP approaches (behavior and agendas). The results in Table 14 show the model of the relationship as organization performance = 0.847 + 0.196 (SISP practices) + 0.594 SISP approaches (behaviors) + 0.073 SISP approaches (agendas).

Table 12: Results of SISP Approaches as Moderator between SISP Practices and Performance

Model Summary									
				Std. Error	Change Statistics				
		R	Adjusted R	of the	R Square	F			Sig. F
Model	R	Square	Square	Estimate	Change	Change	df1	df2	Change
1	.680ᵃ	.462	.452	.56958	.462	44.631	1	52	.000
2	.775ᵇ	.600	.584	.49593	.138	17.591	1	51	.000
3	.775ᶜ	.601	.577	.50025	.001	.123	1	50	.727
a. Predictors: (Constant), SISP Practices									
b. Predictors: (Constant), SISP Practices, SISP Approaches (Behaviors)									
c. Predictors: (Constant), SISP Practices, SISP Approaches (Behaviors), SISP Approaches (Agendas)									
d. Organizational Performance									

Table 13: Results of ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.479	1	14.479	44.631	.000a
	Residual	16.870	52	.324		
	Total	31.349	53			
2	Regression	18.806	2	9.403	38.231	.000b
	Residual	12.543	51	.246		
	Total	31.349	53			
3	Regression	18.836	3	6.279	25.090	.000c
	Residual	12.513	50	.250		
	Total	31.349	53			
a. Predictors: (Constant), SISP Practices						
b. Predictors: (Constant), SISP Practices, SISP Approaches (Behaviors)						
c. Predictors: (Constant), SISP Practices, SISP Approaches (Behaviors), SISP Approaches s(Agendas)						
d. Dependent Variable: Organizational Performance						

ANOVA d

Table 14: Coefficients of the Model

Coefficients a

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	1.510	.354		4.272	.000		
	SISP Practices	.665	.099	.680	6.681	.000	1.000	1.000
2	(Constant)	.869	.344		2.529	.015		
	SISP Practices	.217	.137	.222	1.579	.121	.397	2.518
	SISP Approaches (Behaviors)	.643	.153	.589	4.194	.000	.397	2.518
3	(Constant)	.847	.352		2.406	.020		
	SISP Practices	.196	.151	.201	1.303	.199	.336	2.974
	SISP Approaches (Behaviors)	.594	.209	.545	2.847	.006	.218	4.583
	SISP Approaches (Agendas)	.073	.208	.070	.350	.727	.199	5.027

a. Dependent Variable: Organizational Performance

DISCUSSION AND CONCLUSION

This study attempted to examine the relationships between SISP practices and performance of government agencies in Malaysia. In addition, the study strived to determine the moderating effects of SISP approaches and SISP contexts on the relationships between SISP practices and the performance of government agencies. The results of the indicated not only the positive relationships between SISP practices and organizational performance but also that SISP contexts and approaches moderate the relationships between SISP practices and the performance of government agencies.

Based on the results of the study, the following conclusions can be made. First, the empirical findings of the study indicate that the government agencies that participated in the study had managed to adopt SISP practices. Second, the results show that SISP practices are associated with performance of the government agencies. These findings suggest the importance of SISP to the government agencies. Third, it was also found that SISP contexts and SISP approaches have a moderating effect on the relationships between SISP practices and the performance of government agencies. These results appear to support findings of previous studies that also indicated SISP approaches and SISP contexts does interact and influence the performance of the government agencies (Boyton and Zmud, 1987; Croteau, Bergerou and Raymond, 2009; Sullivan, 1985; Earl, 1989).

Taken together, the results of the study suggest several implications to government agencies. The results of study implied not only the relevance but also the applicability of SISP to government agencies. In addition, the results indicate the important role of SISP contexts and approaches in the development and implementation of SISP in government agencies. The moderating effects of SISP contexts and approaches suggest that when developing and implementing SISP, government agencies need to take into considerations these two moderating variables and also aligned them with their SISP practices.

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