Communications of the Association for Information Systems

Volume 34 Article 84

6-2014

Three Decades of Research on Strategic Information System Plan Development

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Abstract:

Strategic information system planning (SISP), including aligning business and IS/IT strategies, has been the conventional wisdom known for decades to academics and practitioners. Since the 1980s, many tools and models have been developed to facilitate strategic information system planning and implementation. These are development processes that define a set of steps for SISP or approaches that facilitate part of the SISP process. This article employs a systematic review approach and starts with a search of 2730 papers in nine top-ranked scientific databases. After an in-depth study of these papers, a final set of 85 studies is retrieved that focus directly on SISP development. We use this final set of papers to compare the steps proposed in different processes and the relevant approaches for each step. Additionally, an in-depth analysis of development processes has produced a generic seven-phase framework covering activities introduced in the literature. These seven phases are: initiation, business analysis, IS/IT analysis, strategy formulation, portfolio planning, implementation, and evaluation. The paper also classifies approaches that facilitate SISP and concludes with recommendations for practitioners and researchers.

Keywords: Strategic Information System Planning, Information System Planning, SISP, Development.

Volume 34, Article 85, pp. 1439-1467, June 2014

The manuscript was received 17/09/2013 and was with the authors 3 months for 1 revision.

I. INTRODUCTION

Strategic and long-term planning for information systems (IS) and information technology (IT) has been one of the top ten management concerns for decades (Ball & Harris, 1982; Luftman & Ben-Zvi, 2011). The reason for this concern lies in the changes in the structure of business after IS/IT's arrival (Ghapanchi, Khakbaz, & Jafarzadeh, 2008). A survey in 2000, for example, showed that about 50 percent of all big European manufacturers had implemented at least one of the three leading IT initiatives (customer relationship management, e-business, and supply chain management) in their business (Scholz, 2000). The same survey shows that 70 percent of German industries used e-business within 10 years of the introduction of the World Wide Web.

These changes entail that business make huge investments. A survey of 260 Fortune 1000 manufacturing firms shows that, on average, they expend $9.6 million per annum on IT services, which is estimated to be 15 percent of the total cost for research and development (R&D) and about 0.3 percent of total sales (Kleis, Chwelos, Ramirez, & Cockburn, 2012). Cone (2005) also estimate that the investment in IS-intensive financial services sector would be over $450 billion by 2010. The effectiveness of these investments was one of the primary drivers of strategic planning for IS/IT for years (Earl, 1993; Krell & Matook, 2009).

Since the 1980s, academia has also paid attention to this topic and the number of research papers in the field grew considerably after 2010. A search of scientific databases with terms such as: "strategic information system plan", "information system plan", and "SISP" found many more papers in 2012 than 2000. Similar results were retrieved for other related terms.

Our background search (Amrollahi, Ghapanchi, & Talaei-Khoei, 2013) shows that a variety of terms are used interchangeably for strategic IS/IT planning in the literature: strategic information system planning (SISP), information system planning (ISP), information technology planning (ITP), strategic information management (SIM) planning, information resource planning (IRP), and so on (See Table 1). To avoid any misunderstanding, hereafter, we use the term strategic information system planning (SISP) for long-term IS/IT planning.

Development of these plans is an important area, which is reflected in researchers' interest (Ghapanchi & Aurum, 2012a, 2012b). While a significant body of research can be found on methods and tools that assist organizations in developing IS/IT strategic plan, we couldn't find a detailed study of using available approaches to embrace existing methods . As such, we reviewed the literature in methodological development of IS/IT strategy plan. In particular, we searched nine scientific databases with related phrases in an attempt to answer the following research questions:

RQ1. *Which activities or phases have been introduced as part of the SISP process?*

RQ2. *Which approaches have been introduced to facilitate the SISP process?*

This paper's results may help practitioners to compare different processes for SISP development and select or customize them based on the context in which they want to perform the planning. It may also help future research by showing shortcomings in the current body of literature and related gaps.

This paper is organized as follows. In Section 2, we overview strategic planning for IS/IT and introduces some previous reviews. In Section 3, we describe the methodology used for conducting the literature review. In Section 4, we illustrate the results of the systematic literature review and the proposed classification. In Section 5, we discuss our results and provide some recommendations for future research.

II. LITERATURE REVIEW

IS/IT Strategic Planning

Academic work on strategic IS planning dates back to the 1980s and 1990s, which is known as the "strategic information system era" (Pant & Hsu, 1999). The first research papers on the topic usually dealt with the efficiency of IS/IT in competitive business environments (Rackoff, Wiseman, & Ullrich, 1985b; Synnott & Gruber, 1981; Wiseman & MacMillan, 1984). Earl (1993) recognises four research domains for SISP in literature: *aligning investment in is with business goals, exploiting it for competitive advantage, directing efficient management of is resources,*

developing technology policies and architectures. He suggests that the first two areas should deal with strategic information systems planning.

As we mention in Section 1, various terms are used in the literature for SISP as regards our study's purpose. The definitions used in the literature for these terms are also used interchangeably, and Table 1 provides the common terms used in the literature and their definitions.

Table 1: Terms and Definitions in the Literature

Reference	Term	Definition
Boynton and Zmud (1987, p. 59)	Information technology planning	"Organizational activities directed toward (1) recognizing organizational opportunities for using information technology, (2) determining the resource requirements to exploit these opportunities, and (3) developing strategies and action plans for realizing these opportunities and for meeting the resource needs."
Lederer and Mendelow (1988, (p. 445)	SISP	"The process of deciding the objectives of organisational computing and identifying potential computer applications which the organisation should implement."
Lederer and Sethi (1991, p. 104)	SISP	"The process by which [an] organization establishes a long-range plan of computer-based applications in order to achieve its goals."
Earl (1993, p. 1)	SISP	"Aligning investment in IS with business goals and exploiting IT for competitive advantage."
Finnegan and Fahy (1993, p. 127)	Information systems planning	"The broadly-based management activity that provides direction, within an organizational setting for the development and use of information systems."
Tan (1995, p. 124)	SISP	"A systematic methodology that provides a structural guide should be adopted for the process which makes IT a strategic weapon for firm."
Revenaugh and Lu (1997, p. 654)	Information systems planning	"All planning activities that are directed toward identifying opportunities for using IT to support the organization's strategic business plans and to maintain an effective and efficient IS function."
Fallshaw (2000, p. 195)	Information technology planning	"Identification of the external factors that would affect and influence strategic directions; consideration of IT trends and emerging technologies; a review and assessment of the current IT environment; and finally identifying the strategies and actions required to implement this vision."

Previous Reviews on Development of IS/IT Plans

Since the late 1980s, various attempts have been made to review the related literature and compare tools and methodologies for SISP literature (Boynton & Zmud, 1987). Earl (1993) introduces five SISP approaches: business-led, method-driven, administrative, technological, and organisational. These approaches differ in terms of their emphasis, basis, ends, methods, nature, and influence. Salmela and Lederer (2000) also introduce comprehensive and incremental practices in IS planning. They differentiate those plans according to their comprehensiveness, approach to analysis, basis for decisions, planning organisation, and planning control.

Table 2 summarizes the review papers on SISP. As we can see, most of the papers in this table are not review papers per se but surveys or methodologies; however, they provide significant studies of the literature. As Table 2 indicates, these studies pay attention to various aspects of plan development: some papers mention planning processes, others strategic approaches that are used to facilitate part of the planning process. Finally, some papers analyze approaches or groups of methodologies.

Except for these general comparisons or categories, we did not find any research that studied the details or steps of various methods. Moreover, these methods usually paid attention only to classical methods developed before 1990. In order to overcome these shortcomings in the literature and develop a better review framework, this paper pays detailed attention to formal and informal methods of SISP and the stages of development in formal methods.

Table 2: Previous Reviews on Strategic IS/IT Planning				
Reference	**Research output**	**Reviewed pool**	**Comparison focus**	**Review output**
Boynton and Zmud (1987)	Review (general output)	Eleven methods	Analysis and strategy formulation	"Three planning agenda (intra-organizational market analysis, organizational learning analysis, and organizational culture analysis) and two planning behaviours (having key organizational members buy in to the IT planning effort, and identifying and communicating the organizational role of IT) have attracted little attention within the literature" (p. 66).
Earl (1993)	Five category of approaches (specific output)	Five approaches	General	Provides five general categories of methods.
Flynn and Arce (1995)	A CSF tool for planning (specific output)	Five methods	Strategy formulation	"All approaches take organizational goals into consideration, examine the competitive environment and identify information needs. All approaches, with the exception of Information Engineering, also provide an assessment of current systems provision and use and the external technological environment, together with system priorities" (p. 64).
Tan (1995)	Review (general output)	Six methods	Different features	Reviewed methods and tools do not fit with the context of small and medium businesses.
		Six approaches	Practical implementation	
Min, Suh, and Kim (1999)	An integrated SISP methodology (specific output)	Three methods	Objective and few practical features	Proposes a method to overcome weakness of previous methods.
Pant and Hsu (1999)	A reference model and outline for methodology (specific output)	Six methods	Focus and pros/cons	"A comprehensive methodology for SISP will need to incorporate both the 'impact' and the 'align' views" (p. 24).
Salmela and Lederer (2000)	A four cycles method (specific output)	Two approaches	General	Comprehensive planning is a better choice in a turbulent environment.
Pant and Ravichandran (2001)	An e-business architecture planning model (specific output)	Six methods	Pros/cons	Because of the significant shifts in business practices and technological capabilities, current methods have shortcomings in the context of e-business.
Mocker and Teubner (2005, 2006)	Explanation on the understanding of SISP in practice (general output)	30 papers	Approach type	Four categories of approaches: 1) information strategy as a functional departmental strategy, 2) application portfolio as the core of information strategy, 3) information strategy as an enumerative list, 4) information strategy as a system of plans.
Amrollahi, Ghapanchi, and Najaftorkaman (2014)	Generic framework for SISP development	84 papers	Process	Activities for SISP can be categorized in 7 groups.

III. RESEARCH METHOD

This study investigates planning processes and approaches to facilitate part of the SISP process and current trends in literature on SISP's development. To this end, we selected the systematic literature review approach, which is a methodical way to identify, evaluate, and interpret the available empirical studies conducted on a topic, research question, or phenomenon of interest (Kitchenham, 2004). The steps for systematic literature review are: (1) identify resources, (2) select the studies, (3) extract the data, (4) synthesize the data, and (5) write-up the study as a report (Kitchenham, 2004; Kitchenham & Charters, 2007).

To follow these steps, we adopted the method that Ghapanchi and Aurum (2011a) used, which starts with a comprehensive search in scientific databases and, after several stages of exclusion and inclusion, arrives at a final set of papers. As such, we first identified nine scientific databases and searched them with our predefined set of keywords. Our initial search resulted in 2730 papers. We then started to exclude irrelevant papers when reviewing papers' titles, abstracts, and full text. After in-depth study of the papers, we categorized them in two groups and extracted relevant data from the papers in each group. We classify each group of development methods in the following sections.

Sources

We searched nine scientific databases: Science Direct, Scopus, IEEE Xplore, ProQuest, ACM Digital Library, Association for Information Systems electronic library, Springer Link, Business Source Premier, and Emerald. Table 3 shows the final set of papers in each scientific database.

Note that some journals index their papers in more than one of the above databases. This meant that we had some redundant papers in our first set. To deal with this issue, we used our reference management software to find and remove duplicate references and then extracted the above statistics. Thirty-four redundant papers were not removed, however, so we excluded them manually.

Keywords

We searched for the following terms and limited the search to titles, keywords, and abstracts depending on the services offered by the relevant search engines: "strategic information systems planning" or "strategic information systems plan" or "strategic information system planning" or "strategic information system plan" or "SISP" or "information management plan" or "information management planning" or "strategic information plan" or "strategic information planning" or "information system plan" or "information system planning" or "information systems plan" or "information systems planning" or "information technology plan" or "information technology planning".

Table 3: Distribution of First/Final Set of Papers in Different Databases

Data Base	First set of papers	Final set of papers
Association for Information Systems electronic library	68	17
Emerald	30	5
IEEE Xplore	80	9
Business Source Premier	194	5
Pro Quest	290	24
Science Direct	139	7
Scopus	1681	17
Springer Link	235	0
ACM Digital Library	13	0
References which retrieved directly by searching their titles	265	17
Total	2995	102

Exclusion Criteria

The initial search for the above phrases resulted in 2730 papers. We then read the titles and abstracts and excluded irrelevant papers. After these rounds, the research pool decreased to 467 papers. Finally, we removed duplicates and, in another round, referred to each paper's full text to formulate the first list of 85 papers. To make a second list, we verified the relevance of the sources used in those papers in order to find related studies. We found 3806 studies referred to in those 85 papers. Reviewing the titles of those studies, we selected 265 papers that were related to SISP and studied their abstracts, from which we eliminated 209 papers. We read the remaining 56 papers in full text

and selected 17 of them as our second list of papers. We conducted our review based on a final list of 102 papers comprising the 85 papers of the first list and the 17 papers of the second.

Table 4: Stages of Inclusion / Exclusion and Number of Papers in Each Round

Round	Exclusion criteria	Number of papers excluded	Number of papers remaining
Initial list of papers	-	NA	2730
Exclusion based on title	Is the paper related to SISP?	1522	1208
Exclusion based on abstract	Is the paper related to SISP development?	741	467
Removal of duplicate papers	Is the paper duplicated?	34	433
Exclusion based on full text	Is the paper suggest processes and approaches to facilitate SISP development?	349	85
First list	-	-	85
Review the references	-	NA	3806
Exclusion based on title of the references	Is the reference related to SISP?	3541	265
Exclusion based on abstract	Is the reference related to SISP development?	209	56
Exclusion based on full text	Is the reference suggest processes and approaches to facilitate SISP development?	38	17
Second list	-	-	17
Final list	First list + Second list	-	102

In both shortlisting methods, we first excluded those papers that were not related to the topic of our research and excluded papers that used abbreviations such as SISP and search terms such as “strategic planning” for a concept other than strategic planning. In the next step, while reviewing abstracts, we excluded papers that were not related to SISP development and excluded those that addressed topics such as alignment and SISP evaluation.

Finally, we read the remaining papers in full text to form the final set of papers that are the subject of our analysis. Our main criterion for selecting relevant papers was their focus on processes and approaches to facilitate SISP development. For this reason, we excluded case studies and those papers that lacked specific guidelines on the development of SISP while reviewing the papers in full text. The resultant references on which we made our analysis were all references on SISP development that contained either a process for SISP development or an approach to facilitate SISP development. Table 4 illustrates the process of inclusion / exclusion.

As mentioned above, in all rounds of exclusion, we tried to include papers in our final set that directly presented processes, approaches, or guidelines for the development of IS strategic plans.

Data Analysis

After we arrived at the final list of papers, we started the analysis phase. We first differentiated papers that provided a complete and step-by-step process to SISP development from those that provided advice or approaches for facilitating part of the development process. We then performed an in-depth analysis on the content of those papers and developed a seven-phase general framework that covered most of the development activities in the processes cited in those papers. We also categorized other approaches depending on their use in SISP development. Figure 1 illustrates the process of data analysis.

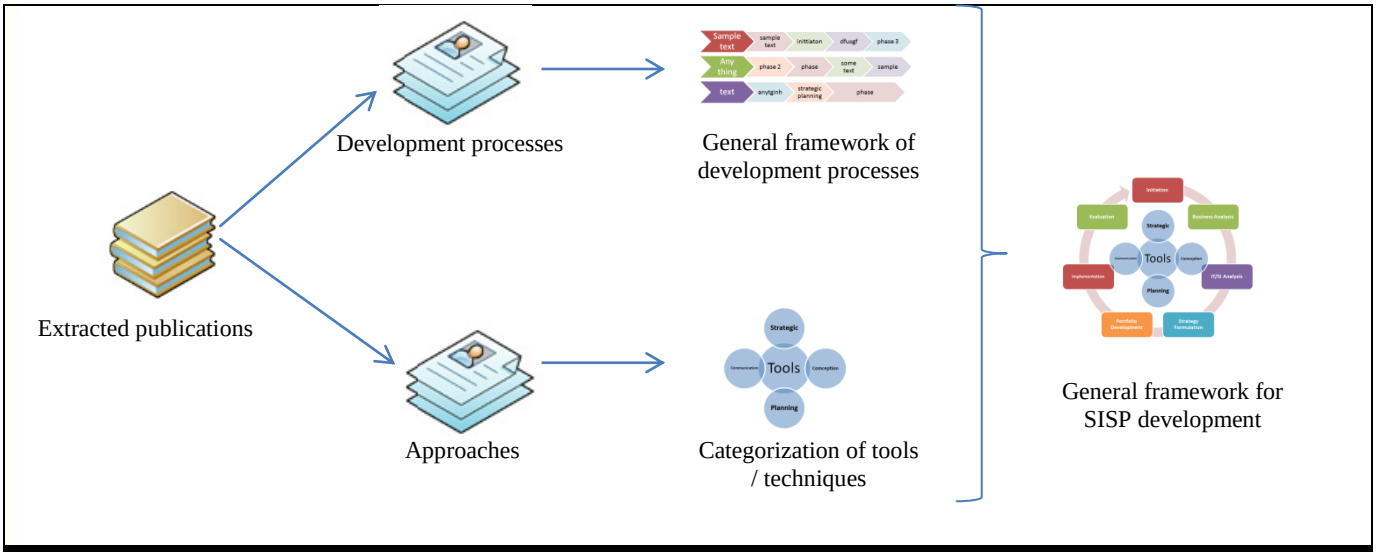

Figure 1. Data Analysis Process

IV. RESULTS

The final set of 102 papers is the basis of the results described in upcoming sections. Figure 2 demonstrates the number of papers published in each year. As seen in the figure, the annual number of papers generally grew. The number in the second half of the 1990s, however, decreased, but started to grow again after 2000 before it reached a stable number after 2010. As we can see in Figure 2, the number of papers in the 2010s is significantly lower compared to rises between 2000 and 2009.

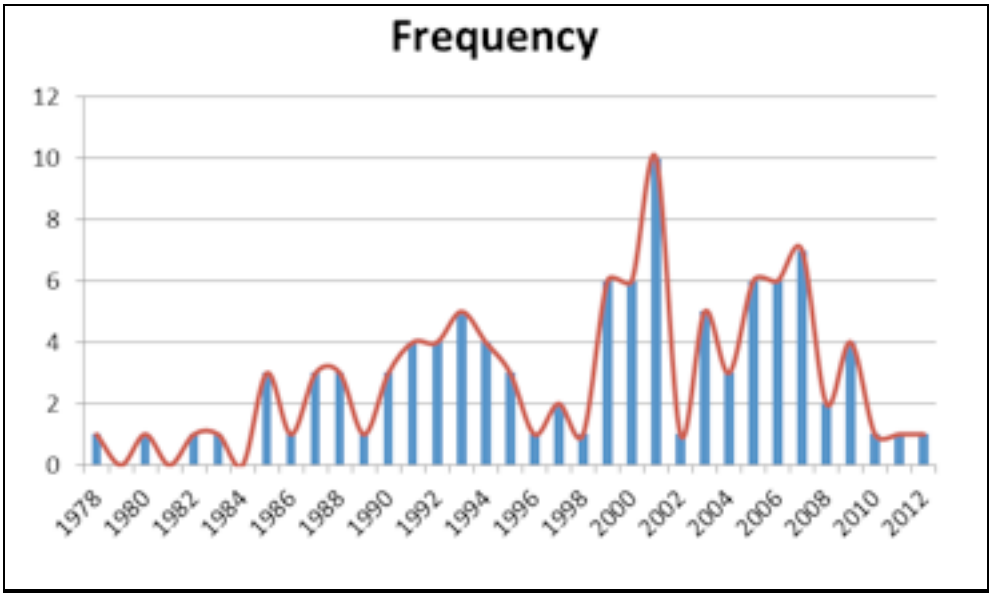

Figure 2. Distribution of the Studies

Figure 3 also illustrates the distribution of papers in the final set according to their researchers' continent of origin. European researchers are the major contributors to the literature in the studied time frame.

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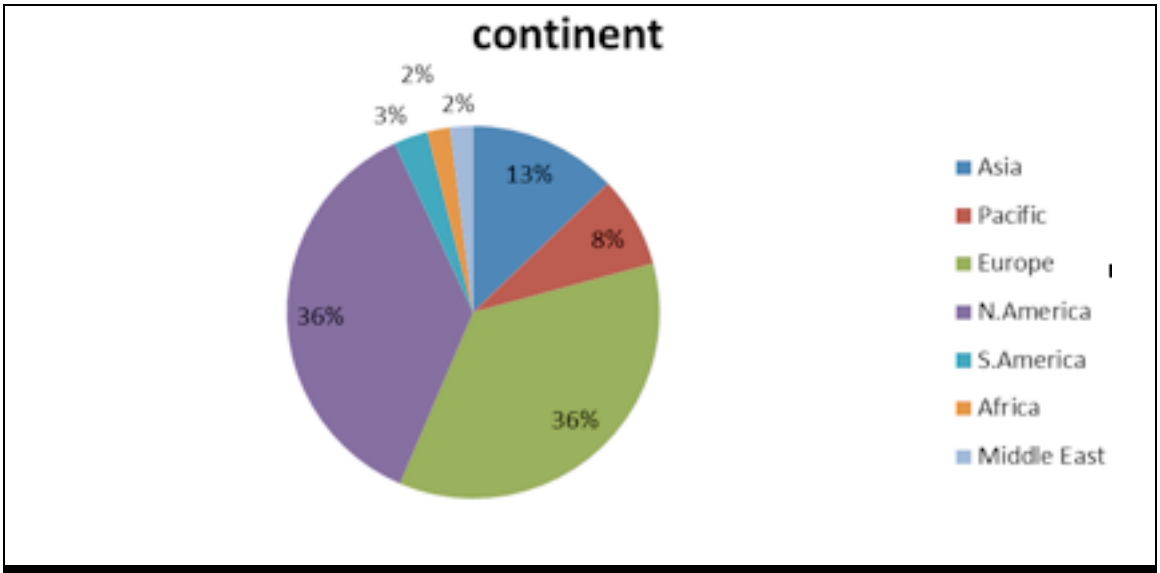

Figure 3. Geographical Distribution of the Studies

The review's results are presented based on the particular suggestions provided by the author in two categories: *processes* and *facilitator approaches*. We study both of them and provide general frameworks for categorizing them.

SISP Process

Lederer and Hannu (1996) define formal methods of IS planning as a set of steps that they call a strategic information planning methodology. They have compared several formal and informal methods to evaluate their effectiveness in different contexts.

Our search resulted in many papers that provide a set of steps (or a process) for SISP development. These papers' outcomes are step-by-step guidelines that usually begin with analysis of the status quo and end in formulation / implementation / evaluation of the IS strategy. After identifying the final set of papers in this category, we conducted an in-depth analysis of the text and identified the steps defined in each reference. The process we followed for this analysis was based on the thematic technique for analyzing qualitative data (Ghapanchi, Wohlin, & Aurum, 2013).

While we reviewed different SISP phases in the literature, we defined several sets of phases, and, by adopting them with activities in different papers, we merged some phases, divided others into different phases, or renamed them. After several iterations, we finally arrived at our final set of phases that covers activities in all processes (see Figure 4). Table 5 shows the titles we devised during several iterations for SISP phases.

Table 5: Different Iterations of Thematic Analysis

Sets of terms	Proposed phases
1st set	Understanding current status → strategic planning → planning desired status
2nd set	Pre-planning → organizational analysis → strategy planning and implementation
3rd set	Pre-planning → analysis → planning → implementation
4th set	Pre-planning → business analysis → technology analysis → IS analysis → business strategic analysis → IS strategic analysis → implementation → evaluation
5th set	Initiation → business analysis → technology analysis → IS analysis → strategy development → implementation → evaluation
Final phases	Initiation → business analysis → IS/IT analysis → strategy formulation → portfolio planning → implementation → evaluation

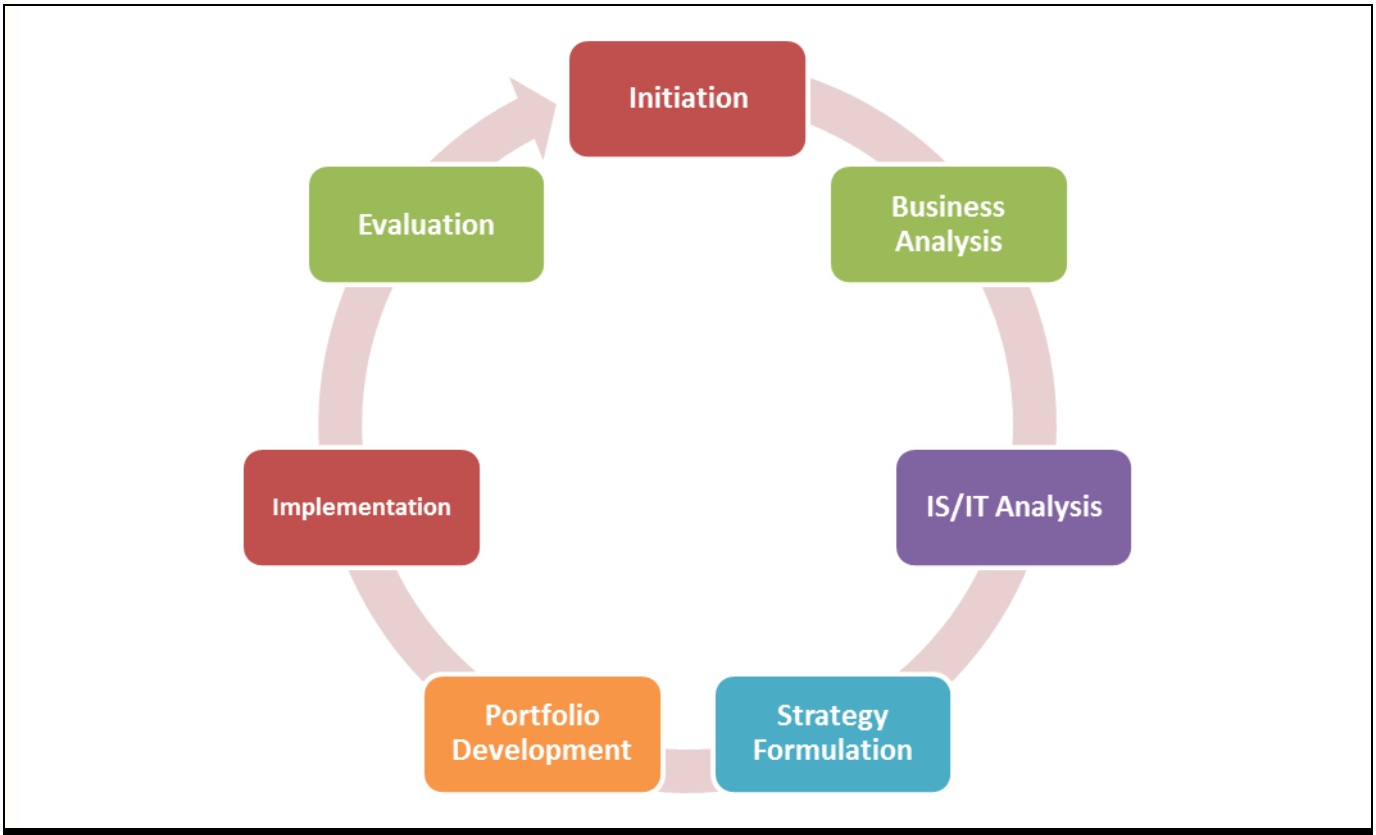

Figure 4. Seven Phases of General Framework for SISP Processes

Many processes do not contain any suggestions for activities or mention activities that are (compared to our framework) related to different phases. Peffers and Tuunanen (2005), for example, mention a general activity named "data collection", but do not differentiate between business data and IS/IT data, so we related the activity to both business and IS/IT analysis activities in our framework.

In Tables 6-12, we map activities in the literature with our proposed seven phases. We performed these mappings in varying ways: sometimes one activity is assigned to one phase only, or, alternatively, several different activities are assigned to one phase. We also found cases in which one activity was related to different phases. For example, Lederer and Gardiner (1992a) suggest "scope definition and organization" for the initiation phase, "business and competitive assessment and present status assessment" for the business analysis phase, "information technology opportunities for IS/IT analysis, information technology strategies, organisation plan, technology plan and information action plan" for the strategy formulation phase, and "project definition and planning" for the portfolio planning phase. Repone (1993) also refers to finding "practical problems and theory" for analysis of both business and IS/IT but two different activities ("multiple method approach" and "information management strategy") for the strategy formulation phase. See Appendix A for all development processes.

In all tables, we indicate activities that could also be mentioned as part of a previous phase with (*), and those that could also be mentioned as part of the next phase with (**).

Initiation

This phase covers activities that are needed before commencing actual development activities. We found 18 papers that include different activities in this phase such as 1) developing the planning team in the organization (Kehoe, Little, & Lyons, 1993) or 2) introducing the aims of the planning project through initial information about the organization that external consultancy team members provide (Lee & Gough, 1993; Morton, 2006).

Some of the other activities that the papers reviewed for this phase suggest are gaining commitment (Li & Chen, 2001), definition of scope (Lederer & Gardiner, 1992a; Peffers & Tuunanen, 2005), and direction (Choi & Bae, 2009; Choi, Han, & Kim, 2010) of strategic plans. Table 6 illustrates all research papers that included this phase as part of their SISP process.

Table 6: Papers that Include the Initiation Phase			
Reference	**Related step(s)**	**Reference**	**Related step(s)**
Martin (1982)	Gain top management commitment / prepare for the study / conduct the kick-off meeting	Ishak and Alias (2005)	The initial phase of SISP planning process
Lederer and Gardiner (1992a, 1992b)	Scope definition and organization	Mocker and Teubner (2005)	Business strategy
Kehoe et al. (1993)	Prerequisites	Peffers and Tuunanen (2005)	Charge from the firm and study scope / participant selection
Lee and Gough (1993)	Introduction to firm**	Bhattacharjya and Venable (2006b)	Analysis of the intervention
Tan (1995)	Preliminary analysis	Morton (2006)	Initiating the SISP consultancy
(Min et al., 1999)	Establishment of planning process	Shirazi and Soroor (2007)	Goal setting
Hackbarth and Kettinger (2000)	Initiate: Kick-off project	Joseph and George (2007)	Determine nature of strategy
Li and Chen (2001)	Gain organizational commitment	Choi and Bae (2009), Choi et al. (2010)	Defining strategic direction
Salmela and Spil (2002)	Evaluating previous planning results and approach / setting plan scope and objectives / selecting participants and planning approach	Mirchandani and Lederer (2012)	Strategic awareness
Bulchand and Rodríguez (2003)	Preplanning		

Business Analysis

SISP development usually involves activities such as study of the business processes, reviewing the strategies, understanding the structure of market, and analysis of competitive advantage. Any activity that deals with study of organzsational or business processes and strategies belongs to this phase.

We found 27 papers that include this phase. Among them include activities such as business and strategy analysis (Kim, Yu, & Lee, 2003a; Surmsuk & Thanawastien, 2007; Tan, 1995) or assessment of competencies (Lederer & Gardiner, 1992a) (see Table 7 for details on this group of papers). Many papers, however, do not differentiate between business and IS/IT competencies or organizational aspects and merge this phase with the successive one.

Table 7: Papers that Include the Business Analysis Phase			
Reference	**Related step(s)**	**Reference**	**Related step(s)**
King (1978)	Organizational objectives / Organizational strategies	Li and Chen (2001)	Conduct organizational analysis and enterprise data modelling**
Martin (1982)	Define the business processes / analyze current business and systems relationships / Interview leading executives / reduce and organize interview data	Kim et al. (2003a)	Business environment analysis
Hackathorn and Karimi (1988)	Organizational analysis**	Bulchand and Rodríguez (2003)	External environment assessment, internal evaluation
Lederer and Gardiner (1992a, 1992b)	Information technology opportunities	Salmela and Spil (2002)	Reviewing existing documents and information resources** / conducting business and technology analyses**
Lederer and Gardiner (1992a, 1992b)	Business and competitive assess-ment / present status assessment	Ishak and Alias (2005)	Analyze internal and external environment
Kehoe et al. (1993)	Analyze business requirements	Peffers and Tuunanen (2005)	Data collection**
Kehoe et al. (1993)	Define current info model / Ana-lyze info quality	Cho and Cho (2005)	Business strategy analysis / pro-cess analysis and redesign / IS analysis and modeling
Mehrez, Howard, Lugassi, and Shoval (1993)	Identification of organizational objectives**	Bhattacharjya and Venable (2006b)	Social system analysis, political system analysis**
Reponen (1993)	Practical problems, theory**	Morton (2006)	Consultant's analysis**
Lee and Gough (1993)	Introduction to firm*	Shirazi and Soroor (2007)	Environmental scan** / internal analysis**
Tan (1995)	Business strategy analysis	Surmsuk and Thanawastien (2007)	Obtain vision, mission, and goal statements
Wexelblat and Srinivasan (1999)	Business needs, requirements, and resources / business strategic plan	Joseph and George (2007)	Change initiatives**
Min et al. (1999)	Strategic business planning	Nitayaprapha and Atkinson (2009)	Appreciate the problem situation**
van der Zee and De Jong (1999)	Who do we want to be? **	Choi and Bae, (2009), Choi et al. (2010)	Analyzing competencies**
Hackbarth and Kettinger (2000)	Diagnose: assess current environment**	Mirchandani and Lederer (2012)	Situational analysis (SIT)**

IS/IT Analysis

As indicated in many processes, the subsequent phase of IS plan development is the analysis or study of current IT and IS in organizations, their drawbacks and their ability to meet current or future challenges in the organization.

This phase may include activities such as introduction to IS (Gwo-Guang & Gough, 1993), identification of IT opportunities (Lederer & Gardiner, 1992a, 1992b; Min et al., 1999), and IS analysis and modelling (Cho & Cho, 2005)

Also, note that many studies mention activities such as data collection (Peffers & Tuunanen, 2005), competency analysis (Choi et al., 2010), and external environment assessment (Bulchand & Rodríguez, 2003), which could be relevant to both business and IS/IT analysis phases. Table 8 shows all 24 papers that include this phase in parts of their provided process.

Table 8: Papers that Include the IS/IT Analysis Phase			
Reference	**Related step(s)**	**Reference**	**Related step(s)**
Hackathorn and Karimi (1988)	Organizational analysis*	Cho and Cho (2005)	Organization analysis
Lee and Gough (1993)	Introduction to IS	Ishak and Alias (2005)	Analyze internal and external IS/IT environment
Mehrez et al. (1993)	Identification of organizational objectives*,**	Peffers and Tuunanen (2005)	Data collection*
Reponen (1993)	Practical problems, theory*	Morton (2006)	Consultant's analysis*
Min et al. (1999)	IT opportunity identification	Bhattacharjya and Venable (2006b)	Social system analysis, political system analysis*
Hackbarth and Kettinger (2000)	Diagnose: assess current environment*	Shirazi and Soroor (2007)	Environmental scan* / Internal analysis*
Li and Chen (2001)	Conduct organizational analysis and enterprise data modelling *	Joseph and George (2007)	Change initiatives*
Salmela and Spil (2002)	Reviewing existing documents and information resources* / conducting business and technology analyses*	Nitayaprapha and Atkinson (2009)	Appreciate the problem situation*
Bulchand and Rodríguez (2003)	External environment assessment, internal evaluation*	Mirchandani and Lederer (2012)	Situational analysis (SIT)*
Kim et al. (2003a)	Knowledge requirement analysis	Choi and Bae (2009), Choi et al. (2010)	Analyzing competencies*

Strategy Formulation

This phase includes all activities that relate directly to the development of the plan. Approaches to facilitate SISP process usually help organizations to formulate their strategy in this phase. The expected output of this phase is a plan that describes the desired status of the organization in terms of vision, mission, competencies, and critical success factors.

Different papers use different terms for this phase. Some of these terms include strategic IT planning (Tan, 1995), strategy formation (Karababas & Cather, 1994; Min et al., 1999), and suggesting extract important enablers (Choi & Bae, 2009). See Table 9 for all terms.

Table 9: Papers that Include the Strategy Formulation Phase			
Reference	**Related step(s)**	**Reference**	**Related step(s)**
King (1978)	MIS Objectives / MIS constraints / MIS design strategies**	Kim et al. (2003a)	Knowledge management strategy establishment / knowledge management architecture design
Martin (1982)	Define an information architecture	Bulchand and Rodríguez (2003)	Strategic interest themes identification / mission and vision statements declaration / strategic axes identification / goals and strategies definition
Hackathorn and Karimi (1988)	Strategy to requirement transformation	Ishak and Alias (2005)	Formulate IS/IT strategy / formulate IS/IT management strategy
Lederer and Gardiner (1992a, 1992b)	Information technology strategies / organization plan / technology plan/ information action plan	Peffers and Tuunanen (2005)	Analysis / ideation workshop / post-workshop analysis
Mehrez et al. (1993)	Identification of organizational objectives* Definition of computer-related goals for each organizational objective / Definition of alternative IS processes for each computer related goal	Mocker and Teubner (2005)	Information resource strategy / information system strategy / information technology strategy
Reponen (1993)	The multiple method approach to strategy generation / information management strategy	Cho and Cho (2005)	ROI (return on investment) analysis and integrated execution planning of IS
Lee and Gough (1993)	Stages of growth**	Morton (2006)	The recommended solution
Tan (1995)	Strategic IT planning	Joseph and George (2007)	Identify relevant entities / identify relevant attributes
van der Zee and de Jong (1999)	How will we get there and what goals do we have to achieve?**	Shirazi and Soroor (2007)	Strategic analysis and choice
Min et al. (1999)	IS strategy formulation	Surmsuk and Thanawastien (2007)	Perform the bottom-up SISP steps / perform the top-down SISP steps / perform ISISP steps / filling in the ICRUD matrix and perform affinity analysis
Wexelblat and Srinivasan (1999)	Information technology strategic plan	Nitayaprapha and Atkinson (2009)	Construct an "ideal type'" model / Delineate the existing managerial process of information systems based on ideal type / reveal embedded value system(s) & identify potential IS issues**
Hackbarth and Kettinger (2000)	Breakout: establish strategic target	Choi and Bae (2009), Choi et al. (2010)	Suggesting extract important enablers (TBEs)
Li and Chen (2001)	Identify business functions, enterprise process model, and critical success factors	Mirchandani and Lederer (2012)	Strategy conception (SC) / strategy selection (SS)
Salmela and Spil (2002)	Aligning IS plans with business objectives / planning the IS/IT infrastructure / planning the IS organization		

Portfolio Development

This phase includes activities that relate to the selection of information systems and the planning for change from the status quo to the desired status in regards to the strategic plan. This phase also includes activities such as obtaining application portfolio (Surmsuk & Thanawastien, 2007), selecting information systems (Karababas & Cather, 1994), identifying business/application processes, and developing an application profile (Li & Chen, 2001), defining and planning the project (Kim, Yu, & Lee, 2003b; Lederer & Gardiner, 1992a), identifying alternative systems, and selecting desired system (Mehrez et al., 1993).

We found 12 references that omit this phase, however. They either stop at strategy formulation without any advice for implementation or go directly from strategy formulation to the next step, "implementation". Table 10 shows the 21 references that include this part.

Table 10: Papers that Include the Portfolio Development Phase

Reference	Related step(s)	Reference	Related step(s)
King (1978)	MIS design strategies*	Hackbarth and Kettinger (2000)	Transition: plot migration path
Martin (1982)	Determine architectural priorities / develop recommendations and an action plan / report results**	Li and Chen (2001)	Identify business functions, enterprise process model, and critical success factors
Hackathorn and Karimi (1988)	Logical to physical transformation	Salmela and Spil (2002)	Evaluating the IS/IT development portfolio / identifying organizational implications
Lederer and Gardiner (1992a, 1992b)	Project definition and planning	Kim et al. (2003a)	Knowledge management implementation planning
Lee and Gough (1993)	Stages of growth*,**	Bulchand and Rodríguez (2003)	Project and specific actions definition
Mehrez et al. (1993)	Identification of alternative systems and selection of preferred system	Mocker and Teubner (2005)	Information function strategy
Kehoe et al. (1993)	Define IS needs and priorities	Morton (2006)	Establishing the business case
Tan (1995)	IT implementation planning	Surmsuk and Thanawastien (2007)	Obtain the final application portfolio from ICRUD matrix
Wexelblat and Srinivasan (1999)	Information technology tactical / operational plan / information technology budget	Shirazi and Soroor (2007)	Restructuring, reengineering, and refocusing the organization
van der Zee and de Jong (1999)	How will we get there and what goals do we have to achieve?*	Nitayaprapha and Atkinson (2009)	Reveal embedded value system(s) & identify potential IS issues*
Min et al. (1999)	Operational analysis and BPR / IS specification	Mirchandani and Lederer (2012)	Strategy implementation planning (SIP)*

Implementation

As mentioned above, most of the papers stop at strategy formulation, yet many others advise on implementing the strategy. Implementing the strategic IS plan may occur in a variety of forms. Organizations usually develop the planned portfolio of their programs either in-house or by outsourcing. However, some limited the implementation phase to document the result to set further actions (Min et al., 1999) or conduct workshops (Peffers & Tuunanen, 2005).

Nine papers that we found in this category provide different activities for this phase including implementation (Bulchand & Rodríguez, 2003; Joseph & George, 2007; Morton, 2006; Reponen, 1993), developing requested information system (Joseph & George, 2007; Li & Chen, 2001), and so on (see Table 11 for detailed information).

Table 11: Papers that Include Implementation Phase			
Reference	**Related step(s)**	**Reference**	**Related step(s)**
Hackathorn and Karimi (1988)	Implementation	Ishak and Alias (2005)	Implementation of SISP planning
Mehrez et al. (1993)	Preparation of request for proposal (RFP) / Selection of a preferred alternative	Morton (2006)	Implementation
Reponen (1993)	Strategy implementation	Shirazi and Soroor (2007)	Strategic control and continuous improvement
Min et al. (1999)	Documentation for implementation	Joseph and George (2007)	Develop information systems / Implement strategy
Li and Chen (2001)	Develop the requested planning outputs / conclude the project**	Mirchandani and Lederer (2012)	Strategy implementation planning (SIP)*,**
Bulchand and Rodríguez (2003)	Implementation and evaluation**		

Evaluation

Many papers present their guidelines as an iterative or evolutionary process that, at the end of each iteration, provides feedback for the next one. This evaluation may take the form of stakeholders' feedback (Joseph & George, 2007), changes in business (Reponen, 1993), or planners' advice to develop measurements to evaluate the effect of strategic planning (Peffers & Tuunanen, 2005). In our final pool, we found eight papers that include evaluation, feedback, or comments (see Table 12 for full details).

Figure 5 illustrates the frequency with which the literature cites each phase. As we can see, business analysis is the most relevant activity in the methods described. IS/IT analysis and strategy formulation activities are also found in almost every reference; nevertheless, implementation and evaluation phase activities are usually missing from proposed development processes.

Table 12: Papers which Included Evaluation Phase			
Reference	**Related Step(s)**	**Reference**	**Related Step(s)**
Martin (1982)	Report results**	Salmela and Spil (2002)	Defining criteria for decision making / authorizing final decisions
Lee and Gough (1993)	Review and comment	Bulchand and Rodríguez (2003)	Implementation and evaluation*
Reponen (1993)	Change in business	Joseph and George (2007)	Feedback
van der Zee and de Jong (1999)	What do we have to measure?	Mirchandani and Lederer (2012)	Strategy implementation planning (SIP)**
Li and Chen (2001)	Conclude the project*		

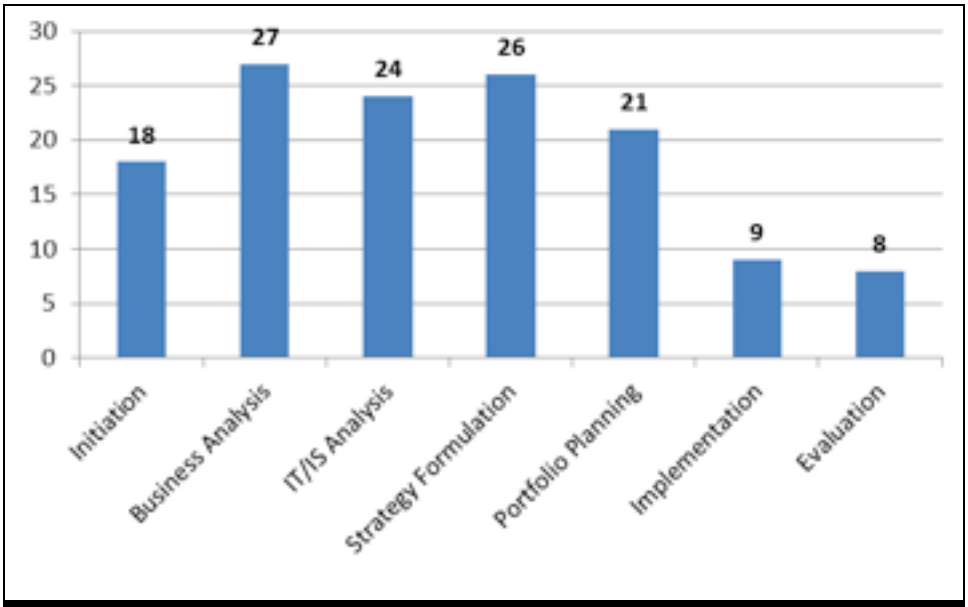

Figure 5. Number of Citations for Each Phase

Approaches to facilitate a phase of SISP process

We cannot understand strategic information system planning by considering formal methods alone (Earl, 1993). Other research also indicates that, in an environment with threats and opportunities, organizations use a more informal approach with continuous adaptation to the availability of resources (Vitale, Ives, & Beath, 1986).

In reviewing the literature on methods for SISP development, we observed that many researchers do not provide a complete, step-by-step process for plan development; instead, they introduce guidelines for one of those activities in SISP development process such as ways for organizational analysis or guidelines on formulating the strategy. Through in-depth study of these papers, we finally categorized this part of the literature into the different groups below. We named approaches that were used mostly for understanding or mapping different points of view or qualitative data in organizations as conception approaches. We also found approaches that were developed to facilitate the flow of information between stakeholders and named them communication approaches. Finally, we found approaches that assist organizations in their strategy formulation activities and approaches that manage the implementation phase. They contain guidelines on how to develop a portfolio of projects and prioritize and implement them, which we termed implementation approaches. Figure 6 details the groups.

Figure 6. Four Groups of Strategic Tools and Techniques

Conception Approaches

We named those methods that aim to provide a picture of current or desired outcomes in terms of written and intelligible documents as conception approaches. These approaches usually facilitate ways for studying qualitative data or complicated social and political systems in organizations.

Hevner, Berndt, and Studnicki (2000) use box structure methods to analyze current and desired systems. Córdoba's (2009) is another example of this category. Córdoba applies the concept of critical systems thinking (CST) to stakeholder analysis before selecting and implementing planning methods. The German theorist Jürgen Habermas developed CST, and many disciplines (including IS) now use the same approach. According to the case study provided by Córdoba (2009), this approach has the potential to boost participation and encourage different stakeholders to express their concerns and values in SISP.

Organizational learning is another topic that is used as a conception tool in SISP. Audy and Lederer (2000) use the principles of organizsational learning in the context of information system planning and concluded that organisational learning may help in creating a 'shared vision' and 'greater participation'.

Communication Approaches

Communication approaches are usually used in the analysis and strategy formulation phase to draw different stakeholders in organisations together. Lomerson and Wingreen (2009) for example introduced Q-methodology as an effective method for capture or analysis of qualitative descriptions of user needs and preparing that for planners.

Soft system methodology (SSM) is also used for SISP communication in much research. Checkland (1988) first developed SSM for documenting problematic social situations in different areas. Since then, it has been widely used as a methodology for design and development of information systems. SSM tools such as rich pictures and cognitive maps, however, are especially used in communicating complicated social structures for SISP. Bhattacharjya and Venable (2006a) adapt these tools to suit the culture and situation of a non-profit organization. They conclude that this approach may help organizations to better understand stakeholders' ideas in the strategic planning process. Cunningham's (2001) work is another example of contextualization theory and soft systems methodology being used to help stakeholders to understand the processes, actions, and behaviors surrounding strategic IS planning.

Strategy Formulation Approaches

Developing techniques to help organizations in the strategy formulation phase of SISP is the subject of many other papers. These approaches are based on different theories but most are sourced in the strategic management literature. For example, van Hooft and Stegwee (2001) study different approaches for strategy development in e-business.

Rawani and Gupta (2001) introduce SAP LAP methodology as a framework that analyzes situational, process, and actor variables to synthesises learning issues with desired actions, and identify expected performance. Although the framework was originally developed for different purposes (Sushil, 1997), the authors claim that, by adding some new features, it has a strong capability of producing a flexible and multi-paradigm approach to IS strategy. Critical success factors methodology has also been extended to the SISP area (Peffers, Gengler, & Tuunanen, 2003). The resultant methodology (called critical success chains or CSC) is claimed to balance different aspects of strategy by taking into account various stakeholders in a firm. The concept of "value chain" and the theory of "strategic thrusts" are also identified as approaches to identify IS strategic opportunities (Bergeron, Buteau, & Raymond, 1991).

Resource-based theory is also used as a basis for extracting IS/IT value for organizations and developing a corresponding SISP (Peppard & Ward, 2004). Duhan (2007) provide a capability-based toolkit that facilitates strategy formulation, a competence sorting model (CSM) for identifying competence-leveraging and competence-building opportunities, and a framework for capability articulation that provides the opportunity to better understand those competencies.

Implementation Approaches

Reviewing the SISP approaches, we found few papers that provide guidelines on how to define, prioritize, and implement projects that can help an organization to achieve the goals identified in the strategy formulation phase. We categorized these papers in the "implementation" category. Henderson and Venkatraman (1993) introduce a framework that helps organizations to integrate their IT resources and improve the strategic fit between IT and business. Goodhue, Kirsch, Quillard, and Wybo (1992) and Agarwal, Roberge, and Tanniru (1994) also identify step-by-step methodology to prioritize implementation of strategic IS projects based on allocated resources. Table 13 summarizes four categories of approaches for facilitating SISP development.

Table 13: Approaches to Facilitate a Phase of SISP Process				
Reference	**Basic approach**	**Basic theory**	**Related phases in formal planning**	**Tool category**
Audy (2001); Audy and Lederer (2000); Huysman, Fischer, and Heng (1994)		Organizational learning	Business analysis, IS/IT analysis, Strategy formulation (desired status)	Conception approaches
Hevner et al. (2000)	Box structures			
Córdoba (2003, 2007, 2009), Córdoba and Midgley (2006, 2008)		Critical systems thinking (CST)		
Kardaras and Karakostas (1999); Nalchigar, Nasserzadeh, and Akhgar (2011)	Fuzzy cognitive maps	Fuzzy theory		
Arsenyan and Buyukozkan (2012)	Fuzzy quality function deployment (QFD)			
Falconer, Castleman, Mackay, and Altmann (2000)		Theory of communicative action	Business analysis, IS/IT analysis, strategy formulation	Communication approaches
Bhattacharjya and Venable (2006a), Cunningham (2001)	Rich pictures and cognitive	Soft system methodology		
Lomerson and Wingreen (2009)	Q-methodology	-		
Bergeron et al. (1991); Rackoff, Wiseman, and Ullrich (1985a)		Theory of strategic thrusts	Strategy formulation	Strategy formulation approaches
Bergeron et al. (1991), Hatten and Hatten (1997)	The value chain	-		
Flynn and Arce (1997); Peffers et al. (2003); Shank, Boynton, and Zmud (1985)		Critical success factors		
Rawani and Gupta (2001)		SAP LAP methodology		
Marshall and McKay (2000), McKay and Marshall (2001)		Virtual organizing		
Peppard and Ward (2004)		Resource-based theory		
Duhan (2007)	Capability-based toolkit	-		
Pun, Sankat, and Yiu (2007)	Expert systems			
Goodhue et al. (1992)	Data planning	-	Portfolio development, Implementation	Implementation approaches
Agarwal et al. (1994)	MIS planning	-		

V. DISCUSSION

This paper presents a comprehensive and systematic review on processes and approaches of SISP development. Unlike previous reviews, we add much new research to the final pool (Ghapanchi, Aurum, & Low, 2011; Ghapanchi & Aurum, 2011b). Unlike other studies, our study pays attention to both step-by-step development processes and facilitator approaches.

We provide a seven-phase framework that covers most the of current formal processes in the literature. We mention these phases (initiation, business analysis, IS/IT analysis, strategy formulation, portfolio planning, implementation, and evaluation) in our review. Our study shows that, although analysis and strategy formulation have been the subject of attention in most of the papers we analyzed, few paid attention to the implementation and evaluation phases. The attention paid to business analysis may show a systematic linkage with SISP and business planning procedure and this contradicts a previous study by Earl (1993) who questioned this link.

Our paper may also add another perspective for comparing five SISP approaches (Earl, 1993). The new perspective is the focus of five presented approaches on one of the presented phases. Table 14 shows different SISP approaches and their focus phase in our general framework.

Table 14: Classification of SISP Approaches (Earl, 1993)

SISP approach	Business led	Method driven	Administrative	Technological	Organizational
Emphasis	Business	Technique	Resource	Model	Learning
Basis	Business plans	Best method	Procedure	Rigour	Partnership
Ends	Plan	Strategy	Portfolio	Architecture	Themes
Metaphor	It's common sense	It's good for you	Survival of the fittest	We nearly aborted it	Thinking IS all the time

We considered the "emphasis, basis, ends, and metaphors of each approach" to map those approaches with our framework and, based on that information, we mentioned that each approach in Earl's (1993) framework is more focused on which phase in our proposed framework. For example, while a business-led approach is mainly focused on analyzing the business environment and ends in a plan, we implied that this approach tends to focus on the business analysis phase in our proposed process. Table 15 contains our suggestion for all approaches.

Table 15: New perspective to Earl (1993) Classification of SISP approaches

SISP approach	Business led	Method driven	Administrative	Technological	Organizational
Focus phase	Business analysis	Strategy formulation	Strategy formulation and portfolio planning	Portfolio planning and implementation	All phases

We also provide taxonomy of approaches for SISP. Although these approaches are not complete process of SISP, they help planners in conducting specific phases of SISP like business and IS/IT analysis and strategy formulation.

Implications for Practice

As previous research indicates, a large gap exists between the practice of SISP and what is presented in academic research (Teubner, 2007; Vitale et al., 1986). The reason for this gap may be the complex and confusing literature, which prevents practitioners from identifying their actual needs when they refer to the academia.

Our study provides a strategic planner with a good guide for comparing and selecting an appropriate process of SISP development. Different planners, depending on the context of their organization and their time and budget limitations, can select a process that best fits their goals. Planners who have already selected a process can also better understand the shortcomings of their current method and can perform alternative activities to ameliorate those shortcomings. The framework may also help consultant companies to select, develop, or modify their process.

The development processes introduced in this article are diverse in details (from two to seven activities) and type (determinants of which can be: outputs and iterative vs. single use) and for this reason a variety of practitioners (including CEOs, CIOs, consultants, and IS/IT personnel) in divers organisations may benefit from current review.

Studies also showed that mandatory government regulations are one of the major drivers of IS investments in many countries. Such investment is less likely, however, to bring competitive advantage for companies (Krell & Matook, 2009). This shows the important role of government and policymakers in IS/IT strategic planning and current research may also help these people to better understand available methods and select the best method for planning advancement policies. Unique aspects of strategic planning for the government sector, however, should be considered. These unique aspects could be its larger time horizon and particular environmental and technological aspects.

Because most research on other aspects of SISP (other than development) is based on older methods, we can infer that after 2000 methods have been less used and this review may help practitioners to access a wider range of methods, especially newer methods that have been less implemented but could be beneficial to their work.

Those practitioners who do not need a complete and formal process of SISP can benefit from this paper through the provided classification. We categorized these approaches in four groups (conception approaches, communication

approaches, strategy formulation approaches, and implementation approaches), and provide detailed specifications and different samples for each group.

Implications for Research

In spite of the attention that academia has paid to SISP development, we found few comprehensive reviews of current approaches in the literature. As such, we fill this gap by providing a comprehensive review of current methods and approaches in the literature. Another shortcoming in the literature is the lack of attention to approaches for facilitating phases of SISP development process. Most of the current reviews only pay attention to SISP development process or studied strategic tools. We respond to this gap with our taxonomy of SISP development approaches.

Our review of processes and approaches for SISP development could benefit future research in several ways. Our classifications may help new researchers to identify a gap in the literature and focus on those aspects of SISP development that were studied less in previous work. We found four important gaps.

The first gap is the unbalanced attention of the literature to different phases: as Figure 5 depicts, many papers ignore the implementation and evaluation phases and authors cease recommendations after the formulation of strategy. We believe, however, that comprehensive research may provide guidelines for implementing strategy and, more importantly, may enable organizations to evaluate the strategic planning process and use corrective actions for implementing it. For this reason, we believe that this shortcoming should be recognized as a gap in the literature and future research should pay more attention to such activities when proposing a development process.

The shortcoming in comprehensive research can be observed in particular regarding approaches for facilitating different phases. Our study reveals that current approaches usually help organizations with business analysis and strategy formulation. New research can also provide new approaches to those phases in SISP development to which the current literature has paid less attention and answer questions such as: “Which approaches may help organizations to better develop their portfolio of projects and plan for their implementation?” and “How could organizations better implement their IS strategies?” Moreover, future research should consider strategic management literature and consider techniques that are developed in that literature as a potential opportunity for future research to facilitate the strategy formulation phase. In particular, portfolio analysis (Freeman, 2010) and balanced scorecard (Kaplan & Norton, 1996) are two important models that can be adopted in SISP context.

Second, compared with 2000-2010 and even 1990-2000, we observed less research after 2010. The reason for this may relate to concepts that were introduced to the industry during that time (e.g., electronic business, dot-com bubble, IT out-sourcing, service-oriented architecture (SOA), Web 2.0, and social web). It should be noted that the advancement in IT has never decreased and new technologies that influence IS/IT strategic planning are still ongoing. Although the arrival of new technologies has brought many advantages for businesses in dealing with their business problems, these new technologies may also cause problems and SISP will help organizations to anticipate, be prepared for, and deal with these problems and challenges. New technologies, especially web 2.0 technologies, may also help firms in strategic planning (Dobusch & Kapeller, 2013; Stieger, Matzler, Chatterjee, & Ladstaetter-Fussenegger, 2012). The above facts show that future SISP research should pay attention to the new technologies and their strategic adoption in firms.

The third gap is related to the research context. Most of literature in the area of IS/IT planning come from the European context and few studies were conducted in South America, Africa, the Middle East, and Asia. Therefore, the element of context highlighting the cultural/geographical perspectives or even the industry-specific requirements were overlooked. This gap indicates a necessity for comparative studies to reveal the contextual facts that impact on IS/IT planning.

Finally, for future investigations, we recommend conducting surveys on actual practices for different phases of SISP development process or categories of approaches and study their popularity among planners, effectiveness, fit in different contexts, and so on. These studies may help future research to better track alignment of SISP development research with practice.

VI. CONCLUSION

In this paper, we use a systematic literature review approach to classify SISP development processes and approaches for development of long-term plans for IS/IT (in this research: SISP). We started by searching nine scientific databases and, after several steps of exclusion, arrived at a final set of 85 papers.

We further analyzed these papers and categorized the final set into two groups of SISP development processes and approaches for SISP development. Our study provides a seven-step general framework for SISP development processes and taxonomy of four categories for informal methods. We discuss the result and identify several implications for practice and research.

VII. LIMITATIONS

This paper's methodology obviously means that its results are affected by the limitations to which its papers were subject. Although we attempted to search all important scientific data bases in the field, because of the popularity of the subject and the huge number of papers, we may have missed some that were not indexed in those databases. It is possible that we missed industrial methods that were not introduced through academic papers.

Different terms and their definitions and usage are another serious concern for authors. As we state, we searched with a comprehensive set of different words and then, in several stages of exclusion, excluded irrelevant papers. Previous research (especially older papers that were published before concurrence on current terminology) may use other terms that prevented their inclusion in our pool. On the other hand, the degree of attention to strategic planning may vary for papers using the terms IS planning and IT planning and their inclusion in our final paper is based on our judgment.

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Editor's Note: The following reference list contains hyperlinks to World Wide Web pages. Readers who have the ability to access the Web directly from their word processor or are reading the paper on the Web, can gain direct access to these linked references. Readers are warned, however, that:

1. These links existed as of the date of publication but are not guaranteed to be working thereafter.
2. The contents of Web pages may change over time. Where version information is provided in the References, different versions may not contain the information or the conclusions referenced.
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APPENDIX A: MAPPING PROCESSES IN THE LITERATURE TO THE PROPOSED FRAMEWORK

Reference	SISP Development Phases (Related phase in our framework*)
King (1978)	Organizational Objectives (BA) Organizational Strategies (BA) Strategic Organizational Attributes (IA) MIS Objectives (SF) MIS Constraints (SF) MIS design strategies (SF/PP)
Martin (1982) adopted from Pant and Hsu (1995)	Gain top management commitment (IN) Prepare for the study (IN) Conduct the kick-off meeting (IN) Define the business processes (BA) Define the data classes (IA) Analyse current business and systems relationships (BA/IA) Interview leading executives (BA/IA) Reduce and organize interview data (BA/IA) Review the Information Systems Management (IA) Define an information architecture (SF) Determine architectural priorities (PP) Develop recommendations and an action plan (PP) Report results (PP/EV)
Hackathorn and Karimi (1988)	Organizational analysis (BA/IA) Strategy to requirement transformation (SF) Logical to physical transformation (PP) Implementation (IM)
Lederer and Gardiner (1992a, 1992b)	Scope definition and organization (IN) Business and competitive assessment (BA) Present status assessment (BA) Information technology opportunities (IA) Information technology strategies (SF) Organization plan (SF) Technology plan (SF) Information action plan (SF) Project definition and planning (PP)
Mehrez et al. (1993)	Identification of organizational objectives (BA/IA/SF) Definition of computer-related goals for each organizational objective (SF) Definition of alternative IS processes for each computer related goal (SF) Identification of alternative systems and selection of preferred system (PP) Preparation of request for proposal (RFP) (IM) Selection of a preferred alternative (IM)
Reponen (1993)	Practical problems, theory (BA/IA) The multiple method approach to strategy generation (SF) Information management strategy (SF) Strategy implementation (IM) Change in business (EV)

Reference	SISP Development Phases (Related phase in our framework*)
Kehoe et al. (1993)	Prerequisites (IN) Analyse business requirements (BA) Define current info model (IA) Analyse info quality (IA) Define IS needs and priorities (PP)
Lee and Gough (1993)	Introduction to firm (IN/BA) Introduction to IS (IA) Stages of growth (SF/PP/IM) Review and comment (EV)
Tan (1995)	Preliminary analysis (IN) Business strategy analysis (BA) Strategic IT planning (SF) IT implementation planning (PP)
Wexelblat and Srinivasan (1999)	Business needs, requirements, and resources (BA) Business strategic plan (BA) Information technology strategic plan (SF) Information technology tactical / operational plan (PP) Information technology budget (PP)
Min et al. (1999)	Establishment of planning process (IN) Strategic business planning (BA) IT opportunity identification (IA) IS strategy formulation (SF) Operational analysis and BPR (PP) IS specification (PP) Documentation for implementation (IM)
van der Zee and de Jong (1999)	Who do we want to be? (BA/IA) How will we get there and what goals do we have to achieve? (SF/PP) What do we have to measure? (EV)
Hackbarth and Kettinger (2000)	Initiate: Kick-off project (IN) Diagnose: Assess current environment (BA/IA) Breakout: Establish strategic target (SF) Transition: Plot migration path (PP)
Li and Chen (2001)	Gain organisational commitment (IN) Conduct organizational analysis and enterprise data modelling (BA/IA) Identify business functions, enterprise process model, and critical success factors (SF) Develop the requested planning outputs (IM) Conclude the project (IM/EV)
Salmela and Spil (2002)	Evaluating previous planning results and approach (IN) Setting plan scope and objectives (IN) Selecting participants and planning approach (IN) Reviewing existing documents and information resources (BA/IA) Conducting business and technology analyses (BA/IA) Aligning IS plans with business objectives (SF) Planning the IS/IT infrastructure (SF) Planning the IS organization (SF) Evaluating the IS/IT development portfolio (PP) Identifying organizational implications (PP) Defining criteria for decision making (EV) Authorizing final decisions (EV)
Kim et al. (2003a)	Business environment analysis (BA) Knowledge requirement analysis (IA) Knowledge management strategy establishment (SF) Knowledge management architecture design (SF) Knowledge management implementation planning (PP)

Reference	SISP Development Phases (Related phase in our framework*)
Bulchand and Rodríguez (2003)	Preplanning (IN) External environment assessment (BA/IA) Internal evaluation (BA/IA) Strategic interest themes identification (SF) Mission and vision statements declaration (SF) Strategic axes identification (SF) Goals and strategies definition (SF) Project and specific actions definition (PP) Implementation and evaluation (IM/EV)
Ishak and Alias (2005)	The initial phase of SISP planning process (IN) Analyse internal and external environment (BA) Analyse internal and external IS/IT environment (IA) Formulate IS/IT strategy (SF) Formulate IS/IT management strategy (SF) Implementation of SISP planning (IM)
Mocker and Teubner (2005)	Business Strategy (IN) Information resource strategy (SF) Information system strategy (SF) Information technology strategy (SF) Information function strategy (PP)
Cho and Cho (2005)	Business strategy analysis (BA) Process analysis and redesign (BA) Organization analysis (BA) IS analysis and modelling (IA) ROI (return on investment) analysis and integrated execution planning of IS (SF)
Peffers and Tuunanen (2005)	Charge from the firm and study scope (IN) Participant selection (IN) Data collection (BA/IA) Analysis (SF) Ideation workshop (SF) Post-workshop analysis (SF)
Bhattacharjya and Venable (2006b)	Analysis of the Intervention (IN) Social system analysis, political system analysis (BA/IA)
Morton (2006)	Initiating the SISP Consultancy (IN) Consultant's analysis (BA/IA) The recommended solution (SF) Establishing the business case (PP) Implementation (IM)
Surmsuk and Thanawastien (2007)	Obtain vision, mission and goals statements (BA) Perform the bottom-up SISP steps (SF) Perform the top-down SISP steps (SF) Perform ISISP steps (SF) Filling in the ICRUD matrix and perform affinity analysis (SF) Obtain the final application portfolio from ICRUD matrix (PP)
Joseph and George (2007)	Determine Nature of Strategy (IN) Change initiatives (BA/IA) Identify relevant entities (SF) Identify relevant attributes (SF) Develop information systems (IM) Implement strategy (IM) Feedback (EV)
Shirazi and Soroor (2007)	Goal setting (IN) Environmental scan (BA/IA) Internal analysis (BA/IA) Strategic analysis and choice (SF) Restructuring, reengineering, and refocusing the organization (PP) Strategic control and continuous improvement (IM)
Nitayaprapha and	Appreciate the problem situation (BA/IA)

Reference	SISP Development Phases (Related phase in our framework*)
Atkinson (2009)	Construct an 'ideal type' model (SF) Delineate the existing managerial process of information systems based on ideal type (SF) Reveal embedded value system(s) & identify potential IS issues (SF/PP)
Choi and Bae, (2009), Choi et al. (2010)	Defining strategic direction (IN) Analyzing competencies (BA/IA) Suggesting extract important enablers (TBEs) (SF)

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Communications of the Association for Information Systems

ISSN: 1529-3181