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## Determinants of IS Planning Comprehensiveness

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# Communications of the Association for Information Systems

CAIS 

## Determinants of IS Planning Comprehensiveness

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### Abstract:

Organizations use different approaches when they plan for information systems (IS). IS planning (ISP) approaches range on a continuum with two alternative approaches as the polar ends: comprehensive to incremental. For different IS-related decisions, organizations may simultaneously use different approaches. While the heterogeneity of ISP approaches has been generally acknowledged in IS research, the contingent factors that lead organizations to choose approaches that vary in comprehensiveness are understudied. Our study explores contingent factors that influence IS planning approaches in organizations. Using interview data from six small and medium-sized organizations, we identify categories of technology- and organization-related factors that affect ISP comprehensiveness and discuss related management and research implications.

**Keywords:** information systems planning, incremental planning, comprehensive planning, planning continuum, IS planning approaches

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### I. INTRODUCTION

Information systems planning (ISP) has been a major challenge for both academics and practitioners for many decades [Earl, 1993; Grover and Segars, 2005; King, 2009]. IS planning helps organizations identify opportunities for IS exploitation, determine required resources, and develop strategies and action plans for realizing these opportunities [Boydton and Zmud, 1987, p. 59]. Scholars argue that ISP can assist organizations even in turbulent environments [Salmela, Lederer, and Reponen, 2000], and many different planning *approaches* have been advocated [Earl, 1993; Otim, Grover, and Segars, 2009]. The ISP approach is a combination of both formal and informal activities that comprise a “mix of [planning] procedures, techniques, user-IS interactions, special analyses, and random discoveries” [Earl, 1993, p. 7]. It encompasses a variety of IS-related decisions that range from day-to-day IS choices at a tactical level, to infrastructure and application planning, to opportunity-seeking and strategy-setting at a strategic level.

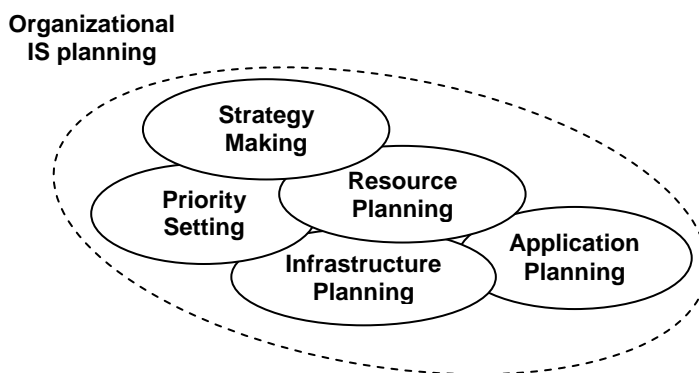
In line with the strategic management literature, in IS research, ISP approaches range on a planning continuum with two alternative approaches or modes of planning as the polar ends: comprehensive vs. incremental [Mitchell and Zmud, 2009]. On one end, a comprehensive approach is characterized by exhaustiveness and inclusiveness [Newkirk and Lederer, 2006a] and includes careful integration of planning decisions prior to any IT investments [Mitchell and Zmud, 2009]. At the other end, an incremental approach supports flexibility and agility [Newkirk, Lederer, and Srinivasan, 2009]. It is characterized by feedback-driven changes in situ, and the planning decisions are made in an ad hoc, emerging process as IT investments unfold [Mitchell and Zmud, 2009]. Several other names have been introduced to describe different approaches to planning in the strategy literature: planned vs. unplanned, deliberate vs. emergent, integrated vs. nonintegrated, and synoptic vs. adaptive [Mitchell and Zmud, 2009].

From an organizational perspective, the core difference between the polar modes of comprehensive and incremental planning is “the level of comprehensiveness characterizing each of these planning modes” [Mitchell and Zmud, 2009; p. 375]. Among planning practices, the planning approach that “attempts to be [more] exhaustive or inclusive in making and integrating strategic decisions” [Fredrickson and Mitchell, 1984; p. 402] would be more comprehensive. Therefore, several planning approaches fall between the polar ends of the planning continuum [Newkirk, Lederer, and Srinivasan, 2003; Newkirk and Lederer, 2006a; Salmela and Spil, 2002]. Organizations do not necessarily employ a single approach organization-wide and may simultaneously use approaches with different levels of comprehensiveness for different IS decisions [Brown and Magill, 1994]. Such approach multiplicity is consistent with organization theory [e.g., Kraatz and Block, 2008; Martin, Frost, and O’Neill, 2006] and IT research [e.g., Kappos and Rivard, 2008] that depicts the organization as fragmented, with pluralistic characteristics.

While the heterogeneity of ISP approaches has been generally acknowledged in IS research [Brown and Magill, 1994; Salmela and Spil, 2002; Sambamurthy, Zmud, and Byrd, 1994], less attention has been focused on the contingent factors that lead organizations to choose low to high comprehensive approaches (for an exception, see Sambamurthy et al., 1994). Not much is known about the organizational or technological factors that may influence such a decision. Studying planning comprehensiveness and its contingent factors is important because more comprehensive approaches to planning demand a greater extent of organizational resources such as money, time, involvement, and commitment. In order to optimize organizational resource allocation and to maximize resource impact, understanding the drivers and impacts of comprehensive decision-making is crucial. This study assesses the appropriateness of comprehensive and incremental approaches, given business and environmental changes. The decision to plan more comprehensively in today’s turbulent environments has associated costs, risks, and consequences. For instance, the business environment and company requirements may have fundamentally changed by the time comprehensive planning is complete and IS investments are made. Thus, identifying and employing appropriate planning approaches can be very important for different IS decisions.

In addition, there is a need for theories to analyze [Gregor, 2006] “what” contingent factors influence IS planning comprehensiveness and classify these factors meaningfully. Management [e.g., Drazin and Van de Ven, 1985; Galbraith, 1973] and IS research [e.g., McKeen, Guimaraes, and Wetherbe, 1994; Teo and King, 1997] have emphasized the importance of studying contingent factors that influence organizational and IS phenomena. Also, it is essential to explain the causal mechanisms by which factors affect IS planning practice [Gregor, 2006]. This observation, coupled with the limited research base on different ISP approaches and their appropriateness within organizations, led to the current study. Although IS planning has several aspects that are worthy of investigation, we focus on comprehensiveness, as this has not been studied extensively in the literature.

In our study, which focuses on small and medium-sized enterprises (SMEs), we make a number of assumptions. First, we explicitly acknowledge that, at any given time, a single organization or strategic business unit can be involved in different IS planning approaches ranging in their comprehensiveness. In addition, we recognize that in organizations, not all types of IS-related decisions are necessarily best made using the same approach. To acquire a new system, for instance, one organization may use a rigorous, comprehensive method [e.g., Ward and Peppard, 2002] while another finds more value in a more incremental approach. Alternatively, a single organization may use a rigorous approach for decision making in one instance but a very quick, incomplete approach in another. Second, we study IS planning as an organizational practice which ranges from strategy making and priority setting to application and infrastructure planning (see Figure 1). In SMEs, IS decisions are often made on an ad hoc basis, and yet the day-to-day IS decisions sometimes may be considered strategic. However, the same decisions about IS applications may be considered tactical for large firms, which also have formal, complementary procedures for IS priority setting and strategy making. Thus, organizational ISP is complex and needs to be examined at several levels in rich organizational contexts. Our study is not limited to application planning, which is a subset of organizational IS planning. Analyzing subcategories of ISP helps us understand the breadth of overall IS planning and the comprehensive or incremental nature of subcategory ISP and overall organizational ISP.



**Figure 1. Organizational IS Planning as the Unit of Analysis**

Our article is organized around the following research question: *What factors influence executives' decisions regarding the comprehensiveness of an ISP approach?* In order to answer this question, six illustrative case studies are conducted. The evidence collected through interviews with key IS planning informants highlights technology and organizational factors that affect manager's decision making regarding the choice of high versus low comprehensiveness in planning. With respect to technological factors, the higher the expected "IT impact," "life expectancy," and "IS integration" of an IT application, the higher is the likelihood that executives utilize a more comprehensive ISP approach. Regarding organizational factors, the availability of organizational slack is found to be positively associated with planning comprehensiveness. In addition, the availability of a trusted external IT consultant appears to be inversely associated with internal IS planning comprehensiveness.

The article starts with a review of the literature on information systems planning approaches. The second section presents the methodological considerations of the study. Next, a within-case analysis of the IS planning practices in each organization is presented. This is followed by inductive analyses and a discussion of the contributions of the research to theory and practice.

## II. CONTINUUM OF IS PLANNING: CONCEPTUAL FOUNDATIONS

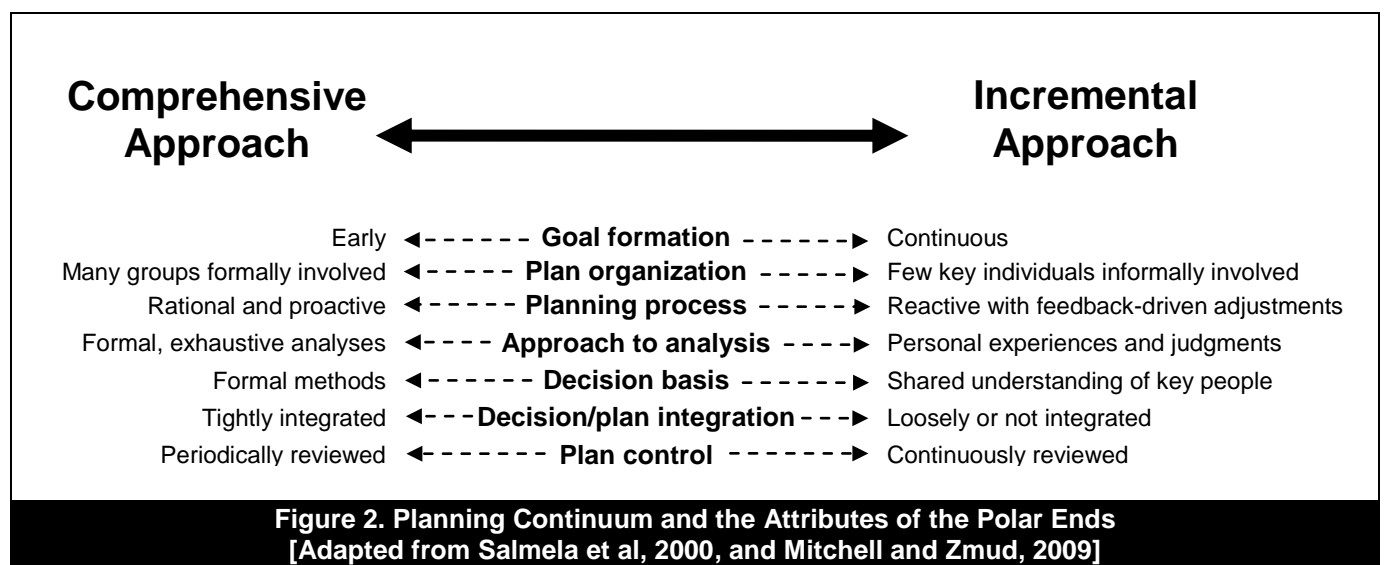
While the importance and benefits of IS planning are often readily understood, determining the actual process that managers use and its appropriateness can be rather complex [Segars and Grover, 1999]. ISP approaches have three core elements to which they give varying amounts of attention: method (this considers the technique, procedure, and methodology of IS planning), process (which concerns actions related to IS plan development, user-IS relationship building, line management participation, and user awareness and education), and implementation (or execution) of the IS plan [Earl, 1993]. Informed by the strategy literature, we view the process of IS planning as falling on a continuum with two polar ends: incremental and comprehensive [Mitchell and Zmud, 2009; Newkirk et al., 2003; Newkirk and Lederer, 2006a, 2006b; Salmela et al., 2000; Salmela and Spil, 2002].

As an ideal type on one side of the continuum, a comprehensive approach in the process of ISP is proactive, exhaustive, and inclusive in making and integrating IS-related decisions [Sambamurthy et al., 1994]. This approach focuses on goal establishment, exhaustive analysis of the internal and external environment, identifying and

evaluating several alternatives, and developing an integrated action plan that leads to the attainment of the pre-specified goals [Mitchell and Zmud, 2009]. It assumes that comprehensive analysis reduces uncertainty and accordingly improves decision quality and performance [Mitchell and Zmud, 2009]. It emphasizes employing the logically best techniques or methods but may pay less attention to process and implementation aspects of planning. Comprehensive planners aim to document integrated IS and business decisions in a formal IS plan [Salmela et al., 2000]. They choose an existing IS planning methodology or develop their own in order to exhaustively analyze the internal and external environment [Earl, 1989, 1993; Newkirk et al., 2009; Raghunathan and Raghunathan, 1990] from both business and IT perspectives. Different people are involved in the planning process to ensure that all types of needs are met. Formally scheduled meetings are held [Sambamurthy et al., 1994]. Several alternative future scenarios may be incorporated and different views and assumptions of key stakeholders may surface [Salmela et al., 2000]. The decisions are based on formal criteria and methodologies that include analyzing environmental trends [Bergeron, Buteau, and Raymond, 1991]. These decisions are documented in a formal plan and periodically reviewed and revised [Salmela et al., 2000]. “Technological,” “method-driven” [Earl, 1993, p. 7; Otim et al., 2009; Segars and Grover, 1999], “systematic” [Doherty, Marples, and Suhaimi, 1999, p. 280], and “sequential integration” [King, 2009; Teo and King, 1997, p. 185] methods are some ISP approaches that are closer to the comprehensive planning end of the ISP continuum.

At the other end, an incremental approach to IS planning incorporates quickness, flexibility, and agility. It comprises a pattern of activities, “not explicitly articulated in advance.” Incremental ISP assumes that comprehensive planning is impossible under the conditions of uncertainty [Mitchell and Zmud, 2009; p. 375]. Big decisions are made by breaking them into small, manageable ones, and analysis and design are recursive and evolutionary based on feedback [Mitchell and Zmud, 2009]. As a result, incremental planners may make decisions on a one-by-one basis [Earl, 1993] using trial and error procedures [Sambamurthy et al., 1994]. The planning team is small and decisions are informally made. Several independent planning groups may be scattered within an organization, and this planning may not follow any specific scheme or model. As a result, personal experience and judgment play important roles in decision making that is carried out on an ongoing basis by managers. In incremental planning, IS decisions are not limited to a formal planning time, and managers are able to continuously make IS decisions at any time. Incremental planners tend to follow certain practices in turbulent environments. They make sense of the environmental risks and opportunities through sharing their initial interpretations of planning issues with informal contacts, often using face-to-face communication [Sambamurthy et al., 1994]. Satisfactory solutions to environmental threats are sought based on available resources and time [Newkirk and Lederer, 2006a]. Incremental planning “is easily confused with mere project planning. And yet, every time one project is selected, it is sequenced with other projects. The competition for project selection continues even during project development and implementation” [Salmela et al., 2000, p. 5]. This planning approach is less vulnerable to resource cuts [Salmela et al., 2000]. The initial planning process is implementation-focused, and related decisions can be made on the spot at any time [Earl, 1993]. “Business-led” and “administrative” [Earl, 1993, p. 7; Otim et al., 2009; Segars and Grover, 1999; Teo and King, 1997] methods are two examples of these approaches.

Figure 2 depicts key attributes of the polar ends of IS planning.





As discussed in the strategy literature (for a review, see Mitchell and Zmud, 2009), the effectiveness of various ISP approaches in today's turbulent business environments can be debated. On the one hand, some scholars argue that comprehensive approaches are best for achieving ISP objectives in turbulent environments because of their emphases on data gathering, integration with business strategies, and thorough analyses (e.g., see Newkirk and Lederer, 2006a, 2006b; Salmela et al., 2000). This is based on the body of strategy literature that argues that strategic decisions should be exhaustive in their internal and external analysis. However, critics argue that comprehensive approaches are not agile and flexible enough to be able to respond rapidly to environmental changes and may consequently lead to "wasted efforts, misdirected investments, and low morale" [Salmela et al., 2000, p. 5]. Some also have criticized these approaches for being costly and distant from daily IS and business needs. In addition, others maintain that incremental planning is not only more efficient but leads to practices specifically suggested for coping with turbulent environments [e.g., see Earl, 1993; Salmela and Spil, 2002]. However, incremental planning critics have warned about failing to address critical needs as well as a poor definition of IS requirements in incremental approaches to ISP [Earl, 1993]. Organization-wide innovations can be missed in incremental planning that emphasizes locally defined IT innovations [Salmela et al., 2000]. Empirical research has not clearly resolved the dispute. For example, while Newkirk and Lederer [2006b] and Salmela et al. [2000] have found that comprehensive IS planning leads to greater success, Earl [1993] and Segars and Grover [1999] found that incremental approaches (business-led and organizational) tend to be more successful than comprehensive ones.

While IS planning processes are known to vary on the continuum with two polar ends, there is little research on the factors that lead executives to choose more or less comprehensive approaches. Hence, there is a need for theories to analyze [Gregor, 2006] "what" factors influence IS planning comprehensiveness. In addition, it is important to explain [Gregor, 2006] the causal mechanisms by which these factors affect IS planning practice. For these reasons, we undertook the current study.

### III. METHODOLOGY

The goal of this study is to explore the factors that influence executives' decisions to employ more or less comprehensive ISP approaches. To answer this question, the study used an embedded, multiple case design [Yin, 2003]. We study multiple cases that permit replication logic, in which each case is considered as an experiment [Yin, 2003] that serves to confirm or disconfirm the conjectures based on the other cases [Eisenhardt and Graebner, 2007]. The main unit of analysis is organizational IS planning practice as a whole. However, as illustrated in Figure 1, understanding such a complex unit requires analyzing several smaller, embedded logical units such as application planning. The application planning unit of analysis is embedded within the organizational planning unit of analysis. While many ISP studies have taken cross-sectional approaches to achieve statistical generalization, we employ a case study method, over time, that aims to build theory using day-to-day decisions, actions, contexts, and content that relate to organizational IS planning and its subcategory processes. Such a design aims for analytical generalization [Yin, 2003] and is particularly appropriate when extant literature is conflicting and an in-depth qualitative exploration of the real-world practice can be illuminating.

#### Case Selection

Cases are selected based on literal or theoretical replication logic in order to illuminate concepts and allow for a compare-and-contrast data analysis approach [Guba and Lincoln, 1994] across different settings. We sought cases that were more likely to utilize approaches not only close to one polar end, but at different points on the continuum between comprehensive and incremental approaches. While organizations can choose to employ a more or less comprehensive overall ISP approach, as discussed in the literature review section, their planning approach is associated with certain costs and benefits. According to the current literature, controversy regarding ISP approach selection may arise when (a) business turbulence increases the dispute regarding the adequacy of an ISP approach [e.g., see Newkirk and Lederer, 2006a, 2006b; Salmela et al., 2000; Sambamurthy et al., 1994], and (b) resource scarcity limits the ability of an organization to undertake a desired ISP approach. Given these two characteristics (turbulence and resource constraints), the SME context is potentially one of the most relevant environments to study, as we look at variation in organizational ISP approaches. The literature shows that SMEs are significantly affected by business turbulence [Ordanini, 2006] and are focused on survival rather than competitive advantage [Powell and Levy, 2006]. In addition, scarcity of resources has been found to be a prevalent challenge faced by SMEs [Bilil and Raymond, 1993; Doukidis, Lybereas, and Galliers, 1996; Levy and Powell, 2000; Ordanini, 2006]. As a result, SMEs are more likely to vary in the approaches used for different IS-related decisions and accordingly, vary in their overall ISP approaches on the planning continuum (i.e., at lower planning levels and at organizational levels).

We studied SMEs that were considered to be high performing based on their profitability and growth. Selecting high performing SMEs gave us greater confidence in the effectiveness of the planning approaches employed in each firm. The cases were selected based on theoretical (produces contrasting results but for predictable reasons) or

literal (produces similar results) replication logic. With respect to theoretical replication, we selected SMEs ranging from small to medium because size has been identified as a contributing factor in planning approaches [Bliili and Raymond, 1993; Doukidis et al., 1996]. Larger firms are expected to utilize more comprehensive, formal approaches compared with smaller ones: Cases B and E (small SMEs) vs. Case A (medium SME) vs. C, D, and F (large SMEs). Cases were also selected based on their information intensiveness. While Cases A, C, and D are in information-intensive industries (IT and insurance), Cases B and F (e.g., community services) have average information intensiveness, and Case B (construction) is low in terms of information intensiveness. We expect to see IS planning approaches vary on the planning continuum depending on the importance of information in certain companies and industries. In terms of literal replication logic, we ensured case variation in terms of public and private firms. We envisioned that this variation would more likely provide insight regarding the contingent factors influencing ISP comprehensiveness and assist us in extending existing theory and elaborating emergent theory. Finally, the six cases represented five industry sectors, and each company differed in terms of its products and services, the role of IT in the business, and its planning activities. This made it possible to compare and contrast factors that might influence executives' decisions regarding appropriate ISP approaches.

### Data Collection

The primary data collection approach involved face-to-face, semi-structured interviews conducted onsite or via Skype. The main unit of analysis was the organizational IT planning practice. The interviews started with general questions on the interviewee's role within the organization and continued on to more specific questions on IS planning processes. Although interviews ranged from forty-five minutes to two hours, on average, each interview lasted approximately one hour. Prior to the company visits, we reviewed secondary sources of data (for example, the website or other publicly available information) about the organizations to gather background knowledge and provide additional sources for data triangulation. The interviews were recorded, transcribed, edited, and saved in a case study database.

We used a "key informant approach" to gather data on the overall ISP approach [Grover, Fiedler, and Teng, 1997; Huber and Power, 1985]. This is consistent with Huber and Power's [1985] suggestion of choosing the respondent who is most informed on the unit of analysis. We assumed that the CIO and CEO are the most informed individuals regarding IS planning practice in small organizations. They can strongly influence the ways in which organizational IS planning is conducted and are appropriate key informants. It should be noted that in our first case (Case A), we interviewed several senior executives. However, since the main unit of analysis was at the organizational level, there was repetition and redundancy in the answers to the interview questions. As a result, with subsequent cases, the interviews were limited to the CEO and/or CIO as key informants. In several cases, we successfully obtained data primarily from a single key informant, the CEO or CIO. In each case, we ensured that we had sufficient information about the planning practices to be able to draw well-informed conclusions. In a small number of cases, when this level of confidence was not reached, another key informant was sought and interviewed. Using the interview questions listed in Appendix A, we examined six SMEs (conducting ten full interviews, holding other brief conversations, and gathering industry and organizational data) in order to explore the factors that influence ISP comprehensiveness.

### Pre-testing and Data Sources

Before collecting data, we validated our interview guide in a pretest involving Ph.D. students and faculty at a Canadian university and the chief information officer of a company not participating in the case research. This allowed us to modify questions as needed, adjust the expected length of the interviews, and become familiar with the recording equipment. As a result, the number of questions was reduced to twelve (see Appendix A). These questions addressed the process of IS planning and its attributes summarized in Figure 2. We selected NVivo 9 to help us iteratively analyze data both within- and across-cases. The coding was done by the lead author and started with general codes such as incremental ISP, comprehensive ISP, organizational size. New codes were generated in the data analysis iteration process (e.g., organizational slack, external knowledge sources, integration, and life expectancy). The coding was discussed with the second author who was not involved in the interviews. In cases of disagreement, the issues were discussed until the two researchers came to a consensus. Table 1 provides the case details.



**Table 1: Company Data**

Company	Sector	Location	Founded	# of Employee	Type	Key Informant	Other Interviewees
A	IT	Canada	1984	200	Private	CEO	Executive VP VP support services VP of development
B	Construction	Canada	1957	60	Private	CEO	Executive VP
C	Insurance	U.S.	1989	500	Private	VP of IT	-
D	IT	U.S.	2004	500	Private	CIO	-
E	Energy	UK	2006	22	Private	CEO	-
F	Community services	Canada	1937	600	Public	CIO	-

**IV. CASE ANALYSIS: VARIATION ON THE CONTINUUM OF IS PLANNING**

The evidence shows that the majority of cases demonstrate variation in their planning approaches. They become more or less comprehensive on the continuum in different IS-related decisions. In this section, a brief summary of the cases and their overall IS planning processes is presented. Table 2 provides more detail on the IS planning attributes of each of the six cases and the conclusions made about the companies' approaches to IS planning.

**Table 2: Selected Evidence for Planning Approach Conclusions**

Firm	IS Planning Attributes	Examples of Comprehensive Planning	Examples of Incremental Planning	Conclusions on IS Planning Approaches
A	<b>Goal formation</b>	Important IT goals are set in the annual meeting at the beginning of the year.	The goals for the IT plan mainly emerge and are not assigned early.	<b>CONTINUUM:</b> Mainly takes an incremental approach, but the planning approach becomes more comprehensive for certain projects
	<b>Plan organization</b>	For important IS decisions several IS and business people are formally involved.	Most IS decisions are made simply by senior managers.	
	<b>Planning process</b>	-	Most decisions are reactive to the situation or are made based on the emerging constraints such as prior vendor selection.	
	<b>Approach to analysis</b>	-	Judgment of senior managers	
	<b>Decision basis</b>	Even for important decisions there is no formal method.	Senior managers' understanding	
	<b>Decision/plan integration</b>	Applies for important decisions	Most decisions are made in situ and are loosely integrated.	
	<b>Plan control</b>	Some IT projects are reviewed annually at the beginning of each year and approved in a senior management meeting.	Typical decisions are made and reviewed daily or continuously.	
B	<b>Goal formation</b>	-	Almost all IT needs emerge over time, and goals are not set in advance.	<b>INCREMENTAL:</b> The firm predominately uses incremental approaches for ISP.
	<b>Plan organization</b>	-	The decisions are made by the IT senior manager and another VP based on their needs.	
	<b>Planning process</b>	-	Reactive actions primarily based on emerging needs	
	<b>Approach to analysis</b>	-	Personal judgment of IT senior manager and the other VP involved	



**Table 2: Selected Evidence for Planning Approach Conclusions – Continued**

Firm	IS Planning Attributes	Examples of Comprehensive Planning	Examples of Incremental Planning	Conclusions on IS Planning Approaches
<b>B</b>	<b>Decision basis</b>	-	No method: shared understanding of the involved individuals	
	<b>Decision/plan integration</b>	-	Nonintegrated IS-related decisions	
	<b>Plan control</b>	-	Reviewed if there is a need	
<b>C</b>	<b>Goal formation</b>	Early identification of the key IS goals		<b>CONTINUUM:</b> Mainly takes a comprehensive approach, but the planning approach becomes more incremental in certain projects
	<b>Plan organization</b>	Some key IS decisions are made which formally involve people from different units.	Very few people (e.g., consultants and the VP of IT) are involved in some decisions.	
	<b>Planning process</b>	The company has a rational, proactive process of IS planning on an 18–24 month cycle.	-	
	<b>Approach to analysis</b>	There is a formal exhaustive custom process for planning.	Some decisions (e.g., less costly or more technical) are made by the VP of IT based on his personal experience, especially after seeking input from an external IT consultant.	
	<b>Decision basis</b>	There is a custom method for IS planning, followed yearly for some decisions.	Some decisions are made locally based on the shared understanding of the VP of IT and his team and/or with external IT consultant.	
	<b>Decision/plan integration</b>	Highly integrated	-	
	<b>Plan control</b>	Periodically reviewed	Certain decisions may or may not be regularly reviewed.	
<b>D</b>	<b>Goal formation</b>	Few goals are determined early.	Emerging needs determine goals.	<b>CONTINUUM:</b> The company mainly employs incremental approaches, but for some decisions the planning becomes more comprehensive.
	<b>Plan organization</b>	Groups rarely become formally involved.	Most of the decisions are made by the CEO and a few VPs.	
	<b>Planning process</b>	They become more proactive when analyzing and adopting emerging core technologies.	Mainly based on the emerging needs and market changes	
	<b>Approach to analysis</b>	More formality is required when making strategic decisions.	Based on the perceptions of a few senior managers	
	<b>Decision basis</b>	No formal method	Mainly the shared understanding of senior managers	
	<b>Decision/plan integration</b>	-	Loosely integrated	
	<b>Plan control</b>	-	Continuously reviewed and revised	
<b>E</b>	<b>Goal formation</b>	No early goal setting	Fully emergent based on engineering department's needs	<b>INCREMENTAL:</b> Purely incremental approach
	<b>Plan organization</b>	-	CEO is the decision maker (in consultation with the VP of engineering).	
	<b>Planning process</b>	-	Entirely reactive	



**Table 2: Selected Evidence for Planning Approach Conclusions – Continued**

Firm	IS Planning Attributes	Examples of Comprehensive Planning	Examples of Incremental Planning	Conclusions on IS Planning Approaches
E	Approach to analysis	-	The judgment of the CEO with recommendations from the VP of engineering	
	Decision basis	No method	Shared understanding of the board	
	Decision/plan integration	-	No integration	
	Plan control	-	Continuously reviewed based on emerging needs from engineering department	
F	Goal formation	Some goals are set early.	Some other goals emerge, especially when there is some slack in the budget. Other goals are forced or created by external stakeholders.	<b>CONTINUUM:</b> Both comprehensive and incremental approaches can be found in several decision occasions.
	Plan organization	For previously agreed-on goals, several groups are involved in the decision-making and implementation processes.	IT department just takes care of the implementation.	
	Planning process	There is a rational process for IS planning.	-	
	Approach to analysis	The analysis is sometimes exhaustive, for example, in terms of the screening of potential solutions.	The systems are sometimes selected based on the institutional pressures coming from the government. For others, personal experiences of the CIO and his team lead to decisions.	
	Decision basis	There is a custom-developed formal method used, for example, for purchasing some of their IT tools.	Stakeholders	
	Decision/plan integration	Mainly integrated	-	
	Plan control	Periodically reviewed	Depending on the availability of financial slack resources, the plan may be reviewed and changed.	

**Firm A** is a privately owned, high-growth technology company active in the global IT industry. This firm employs almost 200 staff on- and off-site. Significant high-level IT expertise is available internally on system development, implementation, maintenance, and upgrades. Interestingly, although Firm A is a medium-sized enterprise, most of its customers are large organizations, and some customers are Fortune 100 companies. As the CEO pointed out, IT plays like “a double edge sword” in Firm A. On the one hand, IT is the nature of their business and they sell IT products and services. They program, debug, and prototype their IT solutions and are also responsible for ongoing system development and upgrades. In addition, on the other hand, as the CEO mentioned, internally they “use a lot of IT tools to help us be better at running our own business.”

The CEO and the vice-president are both involved in strategic IT decision-making. Most IS decisions are made “simply” by senior managers using an informal analysis methodology. As the Executive VP stated, “Essentially we do informal planning called capital planning for IT.” He explained that Microsoft Solutions (MS) is the firm’s first choice in the purchase of IT solutions due to their partnership with this firm. They do not necessarily bother searching for and comparing various market solutions and simply tend to go with MS packages. In some cases, the company has been externally influenced by its parent company which had only recently taken over Firm A. For

example, as the CEO stated, sometimes they have to shift to another software package because *“it just doesn’t make sense to have [the parent company’s] competitor’s product in place.”* Most technology purchases are driven by a business need, e.g., a new contract that requires a new IT platform. In addition, the CEO admitted that his response to most IS questions is, *“Let’s just go buy it and short-cut the process.”* These planning characteristics are consistent with the specifics of incremental ISP discussed earlier.

However, depending on the technology or the business need, Firm A sometimes takes a more comprehensive approach. The CEO explained that in important IS decisions that require evaluation of the technology as well as the business needs, *“IT guys and the business people will then get involved and do very much what a larger business would do ... but is not nearly as rigorous as in a larger shop.”* The executive vice-president elaborated on a more comprehensive process that occurs in the annual formal meetings at which IT projects are approved for the next fiscal year. A list of IT projects emerges from these discussions, and projects are assigned high or low priority. In addition, the CEO clearly indicated that *“there is a little bit of formal planning”* in that *“at the beginning of the year we go through a formal planning exercise in which each department identifies what they need, what strategic things they are going to work on, are there system implications, and things like that.”*

Thus, it can be concluded that Firm A’s ISP is mainly incremental. However, it sometimes takes a more comprehensive approach that involves more internal and external analysis as well as a greater number of people and organizational groups in IS decision making.

**Firm B** is a privately-owned company active in the “industrial building and construction” industry that has existed for several decades. It has 120 staff who are quantity surveyors and cost consultants to a wide variety of construction projects. Accordingly, the company provides customers with feasibility studies, project management, scheduling and planning services, cost management, value management, and construction loan monitoring. Customers are located in fifteen different countries, across five continents. In general, IT plays a purely supportive role in Firm B. Their IT use is limited mainly to Microsoft Office Suite, some project management software applications (e.g., Primavera) and IT infrastructure (e.g., desktops, laptops, printers, and communication devices). They also have proprietary software—a Net-based database report writer internally developed a few years ago. In summary, IT is an important tool that helps to support consultancy business operations.

Firm B takes a mainly incremental approach in almost all IS decisions. It is a small firm that predominantly employs ad hoc planning, and the decisions are made based on an emerging, immediate need for new IT. Their IT decisions are simple and focused primarily on support aspects of the business. As the executive VP commented,

*We don’t have a formal [IT] strategy. Somebody needs a computer, we buy a computer. We have an office that is big enough that if it needs something bigger than a peer-to-peer network, ... we will put in a server. Those kinds of decisions are made pretty much ad hoc.*

Firm B’s reliance on top managers who use an informal analysis methodology is also evident in the CEO’s description of the IS decision-making process:

*When we go to buy a new piece of equipment, we would check with [the IT senior manager] about what current forecasting for the organization is and what would be the next best piece of equipment to buy. He also makes sure that we all have current licenses and that we have enough licenses for each of the workstations within the office.*

**Firm C** is a mid-sized private company active in dental and vision insurance. It underwrites group dental policies and provides access to dental care and dental care professionals through individual and group plans. The company has more than 500 employees and relies heavily on IT for its core, homegrown ERP<sup>1</sup>, as well as an EDI—which exchanges important information between the firm and its more than a hundred business partners. In addition, a variety of internal applications, from communication and phone systems to financial packages, are operational in the firm. Increasingly, Firm C has become a strategic exploiter of IT by investing in new IT platforms, e.g., CRM, and by serving customers through mobile apps. The IT structure is relatively flat and the VP of IT reports to the COO.

Firm C has a relatively formal procedure for IS planning. Every year around October, the VP of IT sits *“with the key players in the business to understand their needs and see their pain points.”* That leads to a *“laundry list of all their requests”* that ranges from new purchases of IT infrastructure to debugging of the existing software applications. Afterwards, the VP of IT holds a workshop that includes senior (C-level) managers, including the CEO. The workshop aims at prioritizing the long list of IT requests. After prioritizing occurs, the VP of IT develops a detailed IT

<sup>1</sup> Enterprise Resource Planning

plan, specifying resource allocations and project schedules, for a span of eighteen to twenty-four months. This is done once a year, and key projects are approved using this relatively comprehensive process. However, not all projects and IT needs are planned through this process. As the VP of IT indicated, for some systems a more unsystematic, incremental approach is taken:

*[With a] 10 or 20 thousand dollar project or software, for example, we usually don't spend as much time. We do informal market research through different resources.*

This unsystematic, continuous process is used for several IS decisions. This approach is employed mainly for low-cost IS projects as well as standard, highly technical IS decisions such as sourcing, upgrades, and licensing. In addition, Firm C also relies on external sources (e.g., IT consultants) for IS decisions. These decisions range from highly technical to managerial recommendations. In general, while Firm C mainly uses a comprehensive approach for IS planning, its overall IS planning approach varies and is sometimes more incremental.

**Firm D** is private company with about 500 employees that is active in the wireless and telecommunication industry. It offers a variety of products and services, including consulting, design, implementation, testing, and optimization of telecommunication networks of several mobile operators and carriers across the U.S. and Latin America. IT plays an important role in Firm D since it is the nature of their business. While many internal IT needs are satisfied using cloud services, the core company's product is an IT solution that continuously changes with changes in the industry, as well as with clients' needs. Therefore, several IS decisions need to be made that range from internal IT needs and sourcing decisions to ones related to IT products and services.

The company generally employs an incremental approach to IS planning. As the CIO commented, *"we don't have, like, a formal plan but we do have a very precise informal plan."* The CEO, CIO, and VP of Engineering continuously review the plan and make revisions based on the emerging needs of the organization in different departments. The CIO mentioned that *"three of us, on a weekly meeting, we get together and we try to review the new developments and see our plan. We review and sit [together] in any week and [discuss] the plan that we have—as I said, it is not a very formal plan."* IS needs emerge and are brought to the attention of a steering committee through each department's manager. This incremental process is used for decisions that are related to internal IT such as the website, tools, and internally-used software. However, the company's IS planning becomes more comprehensive when adopting strategic applications. Then everyone is involved in the process:

*So for those strategic applications that are related to the company, they are company-wide applications or they are related somehow to the strategic goals of the company, we need to have the incorporation of everybody. We need to have the contribution of all the management [or] executive team.*

In sum, this medium-sized company, Firm D, despite the boldness of its incremental approaches, uses IS planning that swings between low and high comprehensiveness on different occasions.

**Firm E** is a small company with twenty-two employees that is active in the wind energy industry. They produce electrical and electronic systems for wind turbines. The company started eight years ago with five employees and successfully grew and expanded its markets. IT plays a support role in the company in two areas. First, employees use several design and processing IT applications that are crucial in their design of electric systems. In addition, they rely heavily on IT for their communication with other branches around the world.

Firm E employs a purely incremental approach, in that the CEO is the main decision maker when it comes to IT adoptions: *"[W]e are a small organization and the budget is controlled by a very few people, basically the management team. Then, for computers, the suggestion would come from the technical team and we'd make the decision. So they don't have the permission to buy things on behalf of the company, and it has to be authorized by the management team,"* the CEO pointed out. The company's needs are for more standard IT infrastructure (e.g., laptops) or applications (e.g., MATLAB, LabVIEW, C++) which are suggested to the board by the VP of Engineering:

*Almost all our employees ... understand computers, [and] all this standard IT stuff. ... if you want to buy a computer ..., again, the suggestion will come from them and mostly in terms of choosing the right computer with the right speed or hard drive, and that sort of stuff. Again, they will make a suggestion to us. And these days, there is not much difference between high performance computers. [So] we don't have a difficult time to make decisions about computers and, ... due to the high level, technical level of the work that we do, we normally go for very high-performance computers.*

Therefore, Firm E predominately employs an incremental approach, and the data provides no evidence of greater comprehensiveness in their planning practices.



**Firm F** is a mid-sized, public organization with 600 employees that was established almost seventy-five years ago. It is a community service agency. It has thirty-two locations and serves more than 35,000 people each year by providing them with housing, training, employment services, etc. IT plays a supportive, back-office role that significantly facilitates providing the various community services to citizens and immigrants. The CIO, whose responsibilities also include human resources, directly reports to the CEO.

In terms of IS planning, the CIO stated: “[W]e have a combination, actually. It’s not, you know, it’s both formal and informal.” On the one hand, more incremental IS planning is undertaken especially in response to government mandates or recommendations for special applications. In these instances, an incremental ISP approach is used, since different organizational groups are not involved internally, nor are different IS solutions analyzed and compared. For instance, the CIO stated:

*[F]unders asking us to implement systems that they need. They need reporting or they need some sort of an overseer for it. In that case, it’s informal but it’s sort of ... planned but it’s not us planning; it’s a funder planning. Our role would be just getting to a contract and making sure that the implementation go[es] as is planned.*

To describe another type of incremental planning, the CIO outlined the situation of a slack budget in a department that led to a local adoption or development of a new IT:

*[I]f there’s a sufficient surplus in the budget and so on, what we do is we prioritize needs for that particular department. And say, [for example], your server’s close to end of the lifecycle. If you have money left, then let’s replace it.*

On the other hand, Firm F also gets involved in a comprehensive planning process “when it comes to business unit applications or their tools.” In these instances, they conduct comprehensive analyses involving multiple people. In addition, using a somewhat comprehensive approach, the IT function has developed a homegrown “method” to compare and rigorously prioritize different IS applications in the market from a variety of internal and external aspects. This is an instance of comprehensive planning which has a formal method and analysis:

*For us [i.e., IT people], we are developing a methodology and approach to create a sort of comparison within these two particular applications. And at the end we say, okay, if you go with application A, you gain A, B, C, D. If you choose B, you gain A but you lose B and C.*

In sum, Firm F oscillates between incremental and comprehensive IS planning in different situations and for different IS needs.

The above six cases show a great deal of variation in organizational IS planning approaches. While two of the cases (B and E) are predominantly using incremental planning approaches, the other four firms vary between high and low comprehensiveness when planning for information systems. In the next section, we use cross-case analyses to identify common contingent factors that influence IS planning comprehensiveness in these firms.

## V. EMERGING CONTINGENT FACTORS

Using cross-case analyses, we now examine the contingent factors that influenced firms’ decisions to take more versus less comprehensive approaches in IS planning. Several contingent factors are revealed in our analyses that can be classified in two main groups: technological and organizational factors.

### IT-related Factors

Three technology-related factors emerged from the data that influence an executive’s decision-making process: the technology’s expected business impact, life expectancy, and likely degree of integration with existing systems and processes.

#### Business Impact

The evidence shows the expected business impact of the IT application influences managers to become more comprehensive in their planning. Cross-case analyses of the six firms indicate that the higher the expected business impact of a certain technology, the more comprehensive is the planning approach.

Several case examples reveal an association between low-impact IT and incremental IS planning in the organizations studied. IT use in Firm B is limited mainly to Microsoft Office Suite, some project management and support software (e.g., Primavera, accounting, and proprietary applications), and IT infrastructure. Thus, IT needs are relatively standard (e.g., hardware upgrades) and stable (e.g., to provide office connectivity), and IT has a low

impact on business processes. The manager who is solely responsible for IT *“tries to keep all the offices at the same level,”* according to the CEO. This manager is the only decision maker when it comes to technical, routine decisions about IT infrastructure. With more business-related IT decisions (such as accounting applications), more departments and personnel are involved and the IT manager is consulted about the technical aspects. He must receive top management approval for business-related IT decisions. Similarly, Firm E employs IT mainly for supportive, low-impact processes. In addition to using IT to support communications, they use standard software applications for design, modeling, and simulation (e.g., MATLAB, LabVIEW, C++). All significant IT-related decisions are brought forward to the board of directors and the CEO, who is the founder and primary decision-maker. Thus, in comparison to the other four firms, the role of IT is less strategic in firms B and E and accordingly, in several instances, the planning approach employed for low-impact IS applications is incremental and limited in its involvement of firm personnel.

In the other four companies (A, C, D, and F), IT plays a more significant role (e.g., several IT solutions in Firm A, ERP in Firm C, and a core mobile IT application in Firm D). Instances of incremental and comprehensive planning can be observed with respect to different high- and low- impact technologies. The evidence from these four cases shows that firms are employing more comprehensive approaches for high-impact IS applications. For instance, the VP of IT in firm C outlines an incremental process for IT projects that are small in scope and impact: *“We usually don’t spend as much time. We do informal market research through different resources.”* In contrast, for a large phone and voice-over IP project, he outlines a more comprehensive process by stating: *“for that, it’s formal, it’s a formal process.”* The CEO of Firm A clearly classifies the planning processes for applications into high versus low business impact situations:

*With issues that are a little closer to the business side of the house, like application issues, we probably give more due diligence than we do on the hardware side. Quite frankly, with the hardware stuff you are typically going to work within a frame of reference to the skills you have and the standards you support.... It is a very different case on the business side because buying a CRM application or maybe buying a time and billing application that we use for our service people touches our customers; that stuff can have a huge impact if you get it wrong [underline added for emphasis].*

Firm D’s CIO repeats the same information using other words:

*So I would say, based on the level of being an operational application or strategic operation, we need to ask our team to be incorporated into the decision-making process. So for those strategic applications that are related to the company, they are company-wide applications or they are related somehow to the strategic goals of the company, we need to have the incorporation of everybody.*

On the one hand, when adopting a high-impact IT application, decision makers may include a variety of detailed considerations in their decision-making processes. Taking into account cross-divisional synergies and consequences, fit with standards and common platforms, ability to upgrade in the future, and the user friendliness of interfaces are examples of these considerations. For instance, when an organization decides to adopt an IT security application (i.e., a strategic system with high business impact), the planning process that deals with the adoption decision requires more comprehensive analysis, including different security threats in the external environment, comparisons of different IT security products, and detailed system adaptability and integration checks. This comprehensive process involves an analysis of the internal and external environment and may take months and involve a variety of internal and external stakeholders.

On the other hand, the IS decision-making process is expected to be less complicated and more straight forward when companies decide on a low-impact technology such as a system upgrade. Hardware upgrades and network infrastructures sourcing generally can be classified as instances of low-business impact decisions. As a result, we observe that the planning process is more likely to be fast, less-inclusive (e.g., involving only IT personnel), and involving limited analysis. In fact, when buying hardware, for example, firms see no need for a comprehensive analysis of the whole market and involvement of all departments in the decision process. As Mårtensson [2006, p. 23] states, *“[S]upport applications are important in order to run the business, but not critical for the success of the business.”* As a result, decisions like these may be made simply, e.g., based on trust in a previous vendor (as occurred with Firm A), dominant brand, or better vendor guarantee.

Decision-making constraints can be even more intense in SMEs that often struggle with resource constraints [Bliili and Raymond, 1993; Doukidis et al., 1996; Ordanini, 2006] and may not have the resources that are necessary for comprehensive planning. In the SMEs we studied, more comprehensive planning processes are used for important IT applications, but incremental approaches are used for nonstrategic IT applications. We observed that strategic IT applications are more likely to receive the tangible (e.g., financial and time) and intangible (e.g., management attention and human) resources that are required for comprehensive planning. Accordingly, based on the evidence

from the cases, we surmise that the IS planning approach is more likely to increase in comprehensiveness when organizations move from support IT applications to strategic IT applications. Thus, we propose:

*Proposition 1: The higher the degree of strategic impact of an IS application, the more comprehensive will be the organizational IS planning approach.*

### Life Expectancy

System life expectancy emerged as an important contingency factor from our data. It increases the likelihood of receiving a higher amount of resources for comprehensive planning. IS life expectancy was brought up by Firm E's CEO, when discussing the factors that may increase IS planning comprehensiveness. After elaborating on the importance of the business impact, he emphasized the impact of the system's life expectancy in the organization and its influence on the decision to adopt. In addition, Firm A's CEO also spoke of system life expectancy:

*Whereas if we are buying software, that ... has a longer shelf life, especially if you are signing up for a maintenance agreement, you are going to get upgrades, you are making a commitment that could last 10, 12 years or longer, depending on how good the vender is at continually updating their package. The services billing package we have been using pretty much since I joined [Firm A], which is 12 years, so that type of commitment that directly impacts your ability to do business, you need to spend a little more time and energy on.*

Some applications are expected to be in operation for a long time and may have long-term consequences for an organization. For instance, choosing an ERP system for a multinational retail company influences a range of decisions in business development and technology-related domains. As a result, organizations tend to gather information and analyze a variety of factors, internal and external to organization, which may help in making the best possible decisions on system adoption, implementation, and assimilation. Failing to involve system stakeholders, or to gather and analyze the relevant information, may lead to adopting and implementing a system that is not aligned with organizational and technological needs and, accordingly, may have long-term negative consequences for the firm. For instance, adopting a core banking system that is not well integrated with a bank's current CRM<sup>2</sup> application may result in a large amount of time and large financial costs for integration with the bank over a long period of time. Hence, we expect that the planning for IT applications that have long-term lifespans is generally associated with a more comprehensive approach. On the other hand, there is likely to be less technological and institutional pressure on IT application planning that influences an organization only in the short-run. Specifically, short lifespan IT projects are more likely to be planned in an informal, incremental approach [Mårtensson, 2006]. For example, it is less likely for an organization to formally involve all business units and gather huge amounts of data about a variety of vendors for a project that involves upgrades to hardware. We observed that decisions that have a short-term life expectancy, or that can be corrected shortly after if needed, are normally made in an informal and incremental manner. The risk involved in these decisions is perceived to be reduced.

The effect of IS life expectancy on the ISP approach can be more intense for an organization with resource scarcity problems. For instance, SMEs generally have limited slack resources and continuously struggle with survival [Blili and Raymond, 1993; Doukidis et al., 1996; Ordanini, 2006]. For these reasons, in contrast to large organizations, there may not be enough slack resources to correct inappropriate decisions. Hence, SMEs may be even more meticulous, vigilant, and comprehensive in the process of planning an application that affects them for a long time. On the other hand, SMEs' general preference for ad hoc, informal, sporadic, and problem-based planning [Blili and Raymond, 1993; Doukidis et al., 1996; Powell and Levy, 2006] may be seen with applications that do not seem to be impactful for the long term (e.g., network infrastructure). Accordingly, we propose that the IS planning approach will become more comprehensive as the planning time perspective moves from the short term to the long term.

Thus we propose that an application with long-term effects on the organization is more likely to receive a greater amount of resources for planning purposes:

*Proposition 2: The longer the life expectancy of an IS application, the more comprehensive will be the organizational IS planning approach.*

### Integration

Degree of integration was the last IT-related factor that appeared to significantly influence ISP comprehensiveness. This factor was initially emphasized by the VP of IT in Firm A:

*It is true that once you select a vender, like HP or Dell, you stick with them ... and usually they will give you their best price up front, and then you are normal after that.*

<sup>2</sup> Customer Relationship Management



With IT-related decisions, managers pay a lot of attention to system integration issues and the possibility of data exchange among systems as well as business functions. Hence, we observed that the decision to purchase new IT was sometimes driven by integration concerns. This could limit the comprehensiveness of IS planning and narrow company searches and market analyses to the few available solutions that have the potential to be highly integrated with extant solutions.

Firm F's CIO elaborated on the importance of integration and system compatibility: "We wouldn't implement something that's going to have an incompatibility issue with the next business unit or other service." He explained that even if they have the budget, they will not go with Apple computers because they "don't have in-house support for it, and the second thing is that it's not compatible with the rest of the agency." The CIO contends that, when planning to adopt a new module, they do not normally go through a comprehensive market analysis of the best available solutions. Instead, he argued that "we contact the vendor that provided the system we already have in place, and see whether they have any solution to it or not. So that would be our first move." The same process was outlined also by Firm A's CIO: "We are a Microsoft co-partner. So if there is an answer in the Microsoft Suite that is obvious, that comes for free, then there is pretty much no discussion, it is a pretty simple thing to do." Otherwise, they will go with more data collection from the market and involve more employees "to go out and do some analysis." Building on the evidence from the Firm A and F, we propose that:

*Proposition 3: The greater the degree of integration between an IS application and the organization's existing IT systems, the less comprehensive will be the organizational IS planning approach.*

### Organizational Factors

In addition to the technology-related factors, two organizational factors emerged from the data that influence IS planning: the availability of trusted external sources of expertise and the availability of organizational slack.

#### External Knowledge Sources

In two cases (C and F), the availability of an IT consultant proved to be an influential factor in managers' IT-related decisions. Firm C's VP of IT emphasized that they have subscribed to Gartner's services which provide them with valuable information with respect to available solutions, technical and organizational requirements, and the advantages and disadvantages of IT applications. He mentioned that:

*[When] we need to do something with a vendor or with a new technology ..., for example, phone system, ... I reached out to the Gartner's analyst who is expert in this area. That's what he does every single day, at least eight hours a day ... when we get to the decision-making process, they know what we are looking for. ... I usually don't involve the [internal] business users in these calls, because I don't want them to get biased. It's just me to be able to lead the team here and the business users better during the requirement gathering process.*

Hence, when the VP of IT makes a call to the IT consultant, he receives a lot of information regarding the technical characteristics of the system as well as its organizational requirements. In other words, in such cases, extensive market data collection about solutions and their characteristics is outsourced to an external entity, i.e., the IT consultant. We observed that such consultation is undertaken even in the areas that the company and its staff are expert in. A similar process was outlined by Firm F's CIO: "[W]e hire a consultant to help us to identify the system. So if the project is big enough and we have enough money, we will bring external expert to help us identify and set up."

This is consistent with institutional IS research that identifies institutional forces (e.g., normative) as important determinants of IS decisions [e.g., Baskerville and Myers, 2009; Khalifa and Davison, 2006; Mignerat and Rivard, 2009; Son and Benbasat, 2007]. Management consultants may influence an organization's decisions (e.g., to invest in a certain technology) and be a normative or mimetic force. They are viewed as experts and norm-setters [Baskerville and Myers, 2009] in the field, and their recommendations are less subject to questioning and comprehensive analysis, especially by SMEs. For instance, as indicated by VP of IT in Case C,

*... when we are doing the requirement gathering, I initiate a call with Gartner, and they are experts in that area. ... By just a half-hour talk with a Gartner analyst, I get tons of information.*

As a result, when trusted knowledge sources (e.g., management consultants) are contacted regarding certain applications, organizations are more likely to take the validity of their recommendations for granted and become less comprehensive in analyzing all aspects of the decision. We expect the overall planning approach to be more incremental in such cases. Drawing on the evidence from Firm C and F, we suggest:



*Proposition 4: The availability of external knowledge sources (e.g., trusted IT consultants) leads to lower comprehensiveness in organizational IS planning.*

### Organizational Slack

Having a slack budget emerged as a factor that encourages organizations to be more comprehensive and exhaustive in their IS planning. The availability of slack in an organization facilitates the allocation of extra resources to support greater planning comprehensiveness, for example, in the form of extra time to explore additional potential solutions, extended market research, and extended people involvement in the planning process. The effect of slack resources on planning comprehensiveness was evident in Firm A when the CEO indicated that when he received extra funding resources he made the ISP practice more comprehensive:

*All of a sudden now [i.e., after being taken over by a large firm] I have got more money to spend. Or potentially I have the money to go hire a team to do something, and I am probably much more inclined to do something strategic ... [that] enhances my ability to deliver.*

Case F also provides support for a positive relationship between availability of slack resources and IS planning comprehensiveness. In cases of availability of slack, the CIO argues that they go for prioritization of the IS needs, rather than taking one-by-one IS-related decisions. The prioritization of IS needs and ensuring alignment of IS decisions with IS and business strategies show increased planning comprehensiveness [Earl, 1993].

*[I]f there's a sufficient surplus in the budget and so on, what we do is we prioritize needs for that particular department.*

This is consistent with the literature [Levinthal and March, 1981] that associates higher amounts of organizational slack with increased organizational search activities, i.e., an instance of comprehensiveness in decision making.

In addition, we note that firm size can be a proxy for the availability of organizational resources [e.g., in Karimi, Somers, and Bhattacharjee, 2007], and our research indicates that firm size also is related causally to planning comprehensiveness. Large organizations are more likely to be able to allocate more tangible and intangible resources required for comprehensive planning. In contrast, small firms may be weak in planning due to the lack of adequate resources [Bili and Raymond, 1993; Doukidis et al., 1996]. Previous studies have found that small firms undertake ad hoc and problem-based planning that is "informal, sporadic and closed," and often rely "on advice from random acquaintances with less skill and/or less experience than the owner himself" [Bili and Raymond, 1993; Doukidis et al., 1996, p. 191; Powel and Levy, 2005].

Our data supports the role of size as a proxy for organizational slack. Among the six cases, Firm B and E, which were small companies, predominantly employed incremental approaches. In contrast, the medium-sized firms we studied, ranging from 200 to 600 employees, increasingly employed more comprehensive approaches as their sizes increased, especially as compared with small firms. In addition, smaller firms tended to have less formal and complete planning processes in general. As the CIO of Firm A indicated, "[D]ecision-making happens a lot quicker in our size [i.e., small size]. Less formal, but quicker." Thus drawing on the evidence from cases A and F, we propose:

*Proposition 5: The availability of organizational slack leads to greater comprehensiveness in organizational IS planning.*

Table 3 provides a summary of the evidence for our propositions, found in each of the six cases. Some of the propositions are articulated using the direct quotes available in the cases (e.g., case D). Others are indirectly implied by the case evidence. For instance, in Firm A and F, the respondents explicitly emphasized that the availability of financial slack resources affected their planning approaches. In the other cases (B, C, D, and E), the indirect support for this proposition can be found when organization size is considered as a proxy variable for slack resources [e.g., in Karimi et al., 2007].



**Table 3: The Sources of Evidence for Each Contingent Factor**

Case	IT-related Factors			Organizational Factors	
	Business impact	Life expectancy	Degree of integration	Availability of external knowledge sources	Organizational slack
<b>Firm A</b>	(+) D Support	(+) D Support	(-) D Support	—	(+) D Support
<b>Firm B</b>	(+) I Support	—	—	—	(+) I Support
<b>Firm C</b>	(+) D Support	—	—	(-) D Support	(+) I Support
<b>Firm D</b>	(+) D Support	—	—	—	(+) I Support
<b>Firm E</b>	(+) I Support	(+) D Support	—	—	(+) I Support
<b>Firm F</b>	(+) I Support	—	(-) D Support	(-) D Support	(+) D Support

D: directly mentioned by the interviewee  
 I: indirectly concluded by the authors using the case data and evidence  
 (+): direct relationship  
 (-): inverse relationship  
 —: No evidence from this case

## VI. CONTRIBUTIONS AND IMPLICATIONS

This study explored factors that influence IS planning comprehensiveness in six small and medium-sized enterprises. Such contexts for IS planning are particularly challenging since SMEs struggle with resource constraints, as well as environmental turbulence. The research resulted in a set of propositions to be tested in future studies. It contributes to the literature on IS planning by introducing predictors of IS planning comprehensiveness. By taking a differentiation perspective on organizations and their planning processes, we explored contingent factors in the SME context that influence executives' decisions related to IS planning approach. Although incremental approaches were predominant in the firms studied, we found that planning became more comprehensive in the presence of five technological and organizational factors. In the six cases, different technological factors (including business impact, IS life expectancy, and degree of integration with existing IT systems) and organizational factors (availability of external knowledge sources, and organizational slack resources) were seen to influence ISP approach comprehensiveness.

The present study has three main limitations. First, the study considers a top-down approach to strategy and IS planning. It does not examine emergent, bottom-up planning practices. Second, six small and medium-sized companies were examined. With six cases described, the conclusions presented are limited in their generalizability. Finally, the validity of the case study methodology relies on "multiple sources of evidence" [Yin, 1994]. Although we interviewed key informants and examined websites, we were not always able to collect data from formal company documents because such reports were sometimes confidential or nonexistent. The informal nature of planning in SMEs meant that we had to rely primarily on the interviews and company websites.

### Implications for Research

This study suggests avenues for future research on the ISP practices of both SMEs and large organizations. First, most of the previous studies on ISP have viewed an organization's planning approach as being either incremental or comprehensive. The aim was often to identify a "best approach" for the firm from among the incremental or comprehensive planning methodology options. A novel aspect of this study is that it draws on the body of research that assumes a multiplicity of ISP approaches in single organizations and further explores the contingent factors that make IS planning more or less comprehensive. Further research is needed to test the contingent factors that influence whether managers pursue planning approaches with low to high comprehensiveness. While five contingent factors emerged from the cases, more detailed investigations are necessary. These may reveal additional factors that come into play, especially in larger firms. Other research may look also at the consequences of choosing a more or less comprehensive planning approach. We did not examine the long-term results of the planning methods used in firms.

Second, we use the emergence of technological factors to extend prior research by suggesting that the unit of analysis of IS planning research also can be "IT application." That is, although IS planning is shaped by organizational factors, it is dependent also on the specific application being considered. Our study is consistent with previous research that considers the "organization" as the unit of analysis [e.g., Earl, 1993; Grover and Segars, 2005; Otim et al., 2009] in IS planning research as the two organizational factors we uncovered (i.e., availability of external knowledge sources and organizational slack) affect IS planning comprehensiveness organization-wide. However, our findings complement the existing research by suggesting that there are important factors at the IT

artifact level (e.g., business impact, technology life expectancy, and degree of integration) that influence ISP approach comprehensiveness within an organization.

Third, further investigation of the propositions is necessary in the context of large organizations. For example, the emerging propositions on the role of factors such as business impact and life expectancy make us question our assumptions about the relationship between organizational slack and planning comprehensiveness [e.g., in Doukidis et al., 1996]. While large organizations are assumed to require comprehensive ISP approaches predominately, this study challenges this assumption, e.g., for IS-related decisions of low strategic importance. Fourth, research is needed to investigate transitions between low and high comprehensiveness of IS planning. For example, strategic issues may change over time in response to internal or external turbulence. A strategic IT application that is planned comprehensively might eventually become a nonstrategic application that can be planned more incrementally at a lower cost in later time periods. The dynamics of change between the two planning continuum ends (comprehensive and incremental) is an important area for future research.

Fifth, future research needs to examine related firm performance outcomes. For instance, while the availability of a trusted external source of information is found to decrease planning comprehensiveness, an external consultant can promote the adoption of an IT innovation partly based on fad and fashion, rather than the real needs of the organization. In other words, while the current study shows a relationship between availability of trusted IT consultants and low comprehensiveness in planning, firms may not necessarily have the best outcomes in such situations. Finally, further research is needed to evaluate the nature and effectiveness of IS planning approaches in firms in different industries and sectors. Studying a larger number of firms in diverse industries would enhance the validity and the rigor of our research outcomes.

### Implications for Practice

For practitioners, this study is expected to provide at least three important takeaways. First, IS planning is not a one-time, global decision that fits all IT planning needs for the organization. ISP can be viewed as a continuous effort that is practiced differently within the organization. The approach selected at any given time depends on a variety of factors such as the impact and life expectancy of the system. Thus, a traditional, global view of IS planning that considers ISP as a comprehensive, organization-wide, top-down, frequently-conducted project may not be the most effective one. Based on our findings, managers need to be attentive to several organizational and technological factors that are subject to change from within and without the organization and make appropriate decisions with respect to the comprehensiveness of ISP in different circumstances and with different technologies. However, top executives may not be able to take the time to do this. Therefore, IS planning becomes increasingly a continuous practice that delegates screening, analyzing, and decision making and becomes decentralized and distributed across the organization to several people, including middle managers, project managers, and groups.

Second, the emergence of business impact as an important determining factor for ISP comprehensiveness implies that managers need to be continuously aware and updated about the strategic importance of their IT applications and make necessary revisions to their IS planning approaches based on the IT's relative, changing importance, and impact. For instance, an organization may initiate comprehensive IS planning with the general goal of implementing an ERP system and radically changing the internal IT operations. Over years and after successful implementation and routinization of some modules, the organization may employ a more incremental approach in the IT-related decisions in these areas. In contrast, for unsuccessfully implemented modules or for ones that are still strategically important (e.g., marketing and sales modules that incorporate e-channels and several customer-related devices), the organization may still take a comprehensive, exhaustive planning approach. Therefore, the IS planning approach for the very same application may be subject to change based on the changes in contingent factors.

Third, our research suggests that comprehensive ISP approaches can be more effective for more strategic applications of IT. Therefore, despite the dominance of incremental approaches in SMEs, these companies can be cautioned against using familiar incremental approaches when strategic IS applications are being planned.

## VII. CONCLUSION

IS planning is important for organizations in today's IT-intensive and turbulent business environments. As a potentially resource-intensive practice, organizations face challenging decisions regarding whether to be more or less comprehensive in their planning approaches. This study provides preliminary evidence on the factors that lead organizations to vary in comprehensiveness on the planning continuum. While this article sheds light on the relationship between several technology- and organization-related factors and the decision to be more comprehensive, it also uncovers several new questions and areas for future research.

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## APPENDIX A: INTERVIEW QUESTIONS

**Table A1: Interview Questions**

How would you describe your role and responsibilities in the firm?
What is the role of IT in your daily operations? What do you expect its future role to be?
Do you have formal business/IT planning? What is the frequency of your IT planning?
Do you have serious process problems in your IT projects' implementation? Specifically, are there issues related to culture or political problems or users' lack of IT understanding?
Do you first develop the IT plan and then select the projects based on your resources, or do you first look at your resources and needs and then plan for IT based on those resources?
In your IT decision-making process, what will you take into account first: implementation, process, or method?
Who is the decision maker? Who participates in ISP process and implementation?
How are you planning for IT? What is your IT planning process? (e.g., buying H/W or S/W)
How turbulent is your external business environment?
How often do you change your IT infrastructure? How is this frequency of change different from the rest of IT systems and applications?
Does this turbulence seriously affect your IT area? What is the impact? In which IT area is the impact more radical or serious?
Do you have some strategic or critical IT projects that you can schedule before waiting for the IS planning process outputs (top 10 IS projects)? Are these projects related to infrastructure OR to solutions/applications?

## APPENDIX B: INSTANCES OF COMPREHENSIVE VS. INCREMENTAL IS PLANNING

**Table B1: Instances of Comprehensive vs. Incremental IS Planning**

Firm	Instances of Incremental Planning	Instances of Comprehensive Planning
A	<i>"This [application] may be the right application, and this may be the right architecture to put it on; I can't afford the 30 or 40 thousand bucks to do that, so I am going to make do with something that isn't quite as efficient, or elegant, or good."</i>	<i>"Stuff that is a little closer to the business side of the house, like the application stuff, we probably do more due diligence on what to buy there than on the hardware side."</i>
B	<i>"We don't have a formal strategy. Somebody needs a computer, we buy a computer. We have an office that is big enough that it needs something bigger than a peer-peer network, well then we will put in a server. Those kinds of decisions are made pretty much ad hoc."</i>	
C	<i>"If it's a higher priority and they want it, for example, the sales department, sales account, we need to do something for them. They have already sold the account, right. This is how sales works. It's high priority. We have to respond to the customer, and there is no way out. So for that, it's very simple."</i>	<i>"If it's a big one, for example, right now we're in the same process, for a phone system and the entire voice over I.P. phone system. It's a half a million dollars deal. For that, it's formal, it's a formal process. We're basically—all right, let me talk about the formal process ... for bigger projects it's [a] more formal project."</i>

**Table B1: Instances of Comprehensive vs. Incremental IS Planning – Continued**

Firm	Instances of Incremental Planning	Instances of Comprehensive Planning
<b>D</b>	"We don't have, like, a formal plan, but we do have [a] very precise informal plan."	"So for those, you know, a strategic application that are related to the company, they are company-wide applications or they are related somehow to the strategic goals of the company, we need to have the, you know, incorporation of everybody. We need to have the contribution of all the, you know, management team, executive team."
<b>E</b>	"Because we are a small organization and the budget is controlled by a very few people, basically the management team, then for computers, the suggestion would come from the technical team and we make the decision. So they don't have, you know, the permission to buy things on behalf of the company, and it has to be authorized by the management team."	-
<b>F</b>	"We have a combination, actually. It's not, you know, it's both formal and informal. Some of them are more formal."	"We need to make [a] proper decision on this particular issue and one of the things I have done is, which I can probably, when I finish I can share it with you afterward, is that what I have done is I have created three different categories of factors to review. One category is called organization or corporate factors. One is program for business unit factors. ... For us as IT is what we are doing, we are developing a methodology and approach to create sort of comparative-comparison within these two particular applications. And at the end we say, okay, if you go with application A, you gain A, B, C, D. If you choose B, you gain A but you lose B and C."

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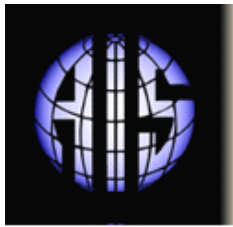
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