

An Empirical Investigation of Capability Factors Affecting Strategic Information System Planning Success

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ABSTRACT

Strategic information systems planning (SISP) is more difficult in today's world of rapid change and uncertainty. The dynamic changes in the environment require a fit between SISP and internal resources of the firm. A need exists to study SISP success based on a broad set of organizational attributes of firm. In this regard, a resource-based view (RBV) has gained increasing dominance in the strategic management field and views organization as a bundle of resources. Reviewing SISP literature reveals little on what the essential Information Systems' formulation (IS) capabilities for SISP are and how they affect success. In this study, the relationship between capability factors and SISP success are explored. Capability factors were compiled through literature review and validated by using interviews. Hypotheses were developed and tested utilizing responses collected from 167 medium to large Iranian organizations. Using PLS for data analysis, the results show the important role of capability factors in SISP success that could be beneficial for both practice and research.

Keywords: Capability Factors, Organizational IS Capabilities, Resource-based View (RBV), Strategic Information, Strategic Information Systems Planning (SISP)

INTRODUCTION

Today, organizations are facing more economic uncertainty, more complex technologies and more hastily innovations. Additionally, development requirements have forced organizations

to use more effective and efficient Information Systems. Annually, a large amount of organizational expenditures is spent on Information Systems' (IS) formulation, implementation and maintenance (Carr, 2004; Nash, 2008). Investment in information systems requires a large amount of firms' capital but studies have shown that almost half of the IS initiatives are unsuccessful.

DOI: 10.4018/jsita.2012040101

successful (Nash, 2008; Ward & Peppard, 2002). Basically, those failures are the result of poor strategic information systems planning (SISP) (Bechor et al., 2010). To make those investments more effective, SISP has been adopted prior to IS implementation (Tianmei & Baowen, 2007). Thus, information system strategic planning has become a critical success factor of many companies. According to Bechor et al. (2010), SISP is the strategic thinking process that determines the most desired information systems (ISs) for organizations to enhance and implement long-term IS policies and activities. Despite a lot of research in the topic area (e.g., Segars & Grover, 1998, 1999; Grover & Segars, 2005; Bechor et al., 2010; Newkirk et al., 2003, 2008; Warr, 2006; Cerpa & Verner, 1998; Sabherwal & King, 1995; Pyborn, 1983; Chi et al., 2005; Wang & Tai, 2003; Cohen, 2008), SISP is still ranked as highly critical issue for firms.

There are frequent calls for studying the interrelationships between organizational aspects and SISP success (Lee & Bai, 2003; Lee & Pai, 2003). Although, there are some studies (e.g., Duhan, 2007; Lee & Pai, 2003) that paid attention to SISP success research based on organizational aspects, their narrow perspective is the main weakness of such those studies. The evidence from previous studies indicated that research focused on the relationship between firm-wide organizational aspects and SISP success is still limited. A major weakness of these studies was that the researchers did not perceive organization as a bundle of activities, resources, assets, and processes which directly or indirectly affect SISP success. Studies of the organizational side of the SISP success are not comprehensive enough to consider all factors. Possibly, incorporating the Resource-Based View of the firm (RBV) will enable better filling of this gap due to consideration of the firm as a set of resources and capabilities.

RBV perspective has gained increasing dominance in the strategic management field and views organization as a bundle of resources (Sambamurthy & Zmud, 1994; Lee et al., 1995; Ross et al., 1996; Feeny & Willcocks, 1998a, 1998b; Bharadwaj & Sambamurthy, 1999,

Bharadwaj et al., 1999; Bharadwaj, 2000; Chen, 2001; Bassellier et al., 2001; Morris, 2006; Calderia & Dhillon, 2010; Doherty & Terry, 2009; Stoel & Mohanna, 2009). Based on RBV's strategic logic, the organization's operative rationale for achieving its goals is through coordinated deployment of its resources. By applying RBV in IS management, the notion of IS capability emerges that considers developing and leveraging business value through IS. As Peppard and Ward (2004) have proposed, this can be assumed as the fourth era in IS management field.

Based on the discussions above, two areas of questioning arise. The first are related to the need to consider organizational aspects of the firm in SISP success studies. The second area is a result of the application of RBV theory to investigate SISP. Both of these suggest that it would be valuable to conduct an examination of the role of capability factors (i.e., organizational aspects in RBV theory) on SISP success. As an outcome of insufficient empirical studies, the literature reveals little about the relationship between RBV constructs (e.g., IS capabilities) and successful SISP. Thus, there is a clear need for an empirical research to explore those constructs and their relationship between each other.

THEORETICAL BACKGROUND

Though there is a broad range of research on IS capability and on SISP success, particular literature on the relationship between IS capability and SISP success is scarce (Duhan, 2007). The following section explores the main conceptualizations of IS strategic planning success as found in the literature. The aim of this exploration is to appropriately adopt a conceptual model, based on RBV theory, for IS strategic planning success to be utilized in this study.

Since there is no established model for organizational capabilities on SISP success, a review of related literatures was conducted to identify the capability constructs related to SISP success. Following the investigation of IS capability link in SISP theory as suggested by

Duhan (2007), we explored the existing SISP success predictors. Based on previous studies, a broad range of factors have been identified affecting SISP success. Totally, one hundred and five organizational activities were derived from the previous researches and constitute a general list of SISP success predictors. The predictors can be grouped into several dimensions. Most of the predictors were related to the planning dimension of SISP success. Other predictors were related to the management aspects of SISP. Knowledge and skills, IS-business strategic integration, IS internal relationship and IS external relationship were other major groups.

Acknowledging the complexity of both SISP success and IS capability constructs, the research is based on a conceptualized a multi-dimensional IS capability framework for SISP success. The study incorporates the common list of IS capabilities. As Morris (2006) suggested, nine common IS capabilities (i.e., cost effective IS operations, IS development, IS technical knowledge and skills, IS infrastructure management, IS strategic Change management, IS-business Strategic integration, IS-business internal relationship, IS alertness, and IS external relationship) were considered. Then, each SISP success predictor derived from our literature review was assigned to one of those IS capability dimensions. Ultimately, all 105 SISP success factors were assigned into related groups. Accordingly, six (of nine) distinct organizational IS capabilities were revealed by the above categorization to be important for SISP success that are: IS external relationship, IS internal relationship, IS technical skills and knowledge, IS planning and change management, IS-business strategic integration, and IS infrastructure management. Besides, the abovementioned categorization was subject to further validation by using an interview. Therefore, some interviews were conducted and the emerged constructs were validated as well.

RESEARCH MODEL

The causal relationships between extracted IS capabilities and SISP was formulated into the research model (Figure 1) which depicts the relationship between organizational IS capability constructs and SISP success. The emerged conceptual model of IS strategy success is consistent with Lee and Bai's (2003) suggestion to proceed toward the exploration and identification of key "organizational attributes" related to SISP to improve planning success. Adopting Lee and Bai's (2003) approach in this study, organizational IS capabilities are seen as the source of SISP success. Figure 1 demonstrates the research model in which six organizational IS capabilities namely IS external relationship, IS internal relationship, IS technical skills and knowledge, IS planning and change management, IS-business strategic integration, and IS infrastructure management affect SISP success.

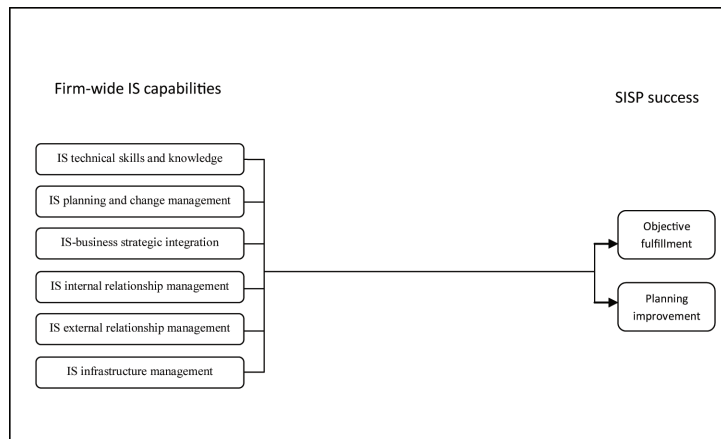
Hypotheses Development

SISP Success

Measuring success or effectiveness of planning systems is a theoretical issue across organization research fields (Warr, 2006). Measuring SISP success attracted many researchers' attention in late 1980s and early 1990s. Research on SISP success measurement could not simply be established on financial measures like Return On Investment (ROI) because similar to any other strategic planning it contains several intangible outcomes.

Moreover, SISP has an ongoing nature, a broad focus, and involves different outcomes and requirements (Segars & Grover, 1998). In order to fill these requirements, goal-centered dimension represent planning outcomes as "ends" and improvement dimension represents process adaptability as "means" of effectiveness assessments. Generally, these two dimensions

Figure 1. Research model



(assessment against objectives and improvement in planning capabilities) are consistent with most of the SISP evaluative literature (King 1988; Hufnagel, 1987; Earl, 1993). The abovementioned multi-item dimensions of SISP success construct has widely been used in SISP research (Bechor et al., 2010). Generally, using SISP success construct in terms of objectives fulfillment and capability improvement is popular among SISP studies. Besides, strong support was provided for the model through several statistical and empirical testing (Grover & Segars, 2005). In other words, previous SISP success studies have confirmed that SISP objective fulfillment and SISP improvement represent SISP success properly. In this paper, these factors have been adopted as dependent variable (Figure 1).

IS External Relationships Capability

IS external relationships capability is the capacity to manage the relationships between organization and suppliers, customers, and partners (Bharadwaj, 2000; Bharadwaj et al., 1999; Ross et al., 1996; Rockart et al., 1996; Powell & Dent-Micallef, 1997; Feeny & Wilcocks, 1998; Wade & Hulland, 2004; Morris, 2006). This capability consists of collaborations with external suppliers (Feeny & Wilcocks, 1998), understanding both technology and competitive

opportunities (Bharadwaj et al., 1999), and management of inter-organizational relations in order to deliver valuable IS resources.

In SISP literature, some SISP success predictors support this capability. For example, in SISP field using services of partner firms' such as external consultants could result in SISP success (Bechor et al., 2010; Lederer & Sethi, 1996; Abu Bakar et al., 2009). By doing so, the ability of firm to capture consultants' knowledge can activate and leverage other abilities of the firms (Zahra & George, 2002). Moreover, monitoring competitors ISs, assessing external opportunities, and also utilizing IS in a competitive manner have been proven to be important elements in SISP success (Lederer & Sethi, 1996). In summary, the ability to manage external relationships is a significant organizational IS capability for SISP success. Therefore, the following hypothesis is presented:

H1a, b: There is a positive causal relationship between "IS external relationships capability" and SISP Success in terms of (a) objectives fulfillment and (b) planning improvement.

IS Internal Relationship Capability

IS internal relationship management capability indicates the ability to make useful internal

relationships between IS users and IS providers in a firm in order to promote rich dialogue and positive interactions among the groups. Most of the SISP success studies reviewed had some evidences indicated the importance of IS internal relationship capability. From literature, SISP success predictors that are related to this capability are: good relationships between users and IS department, taking SISP people into account in conducting SISP (Teo et al., 1997), uniting stakeholders through a joint vision (Bechor et al., 2010), fostering team members' agreement (Lederer & Sethi, 1996), inter-communication (Zijad et al., 2009), good CIO-CEO relationships, inter-organizational cooperation (Bakar et al., 2009), and effective communication (Lee & Pai, 2003). Those collaborations will increase respect and trust among the organization and planning team members and consequently leverages knowledge flow among members. Moreover, a good CIO-CEO relationship positively affects SISP success (Abu Bakar et al., 2009). Therefore, the next hypothesis is proposed:

H2a, b: There is a positive causal relationship between "IS internal relationships capability" and SISP Success in terms of (a) objectives fulfillment and (b) planning improvement.

IS Technical Knowledge Capability

"IS technical knowledge and skills" capability represents the ability of firm to ensure that IS employees have, deploy, and manage complex, advanced, and inimitable knowledge and technical skills in supporting the technology plan of the firm (Ross et al., 1996; Mata et al., 1995). Accordingly, one element of this organizational IS capability is the ability to expand IS knowledge and skill assets that can be seen in the experience and expertise of the personnel and also in the firm's processes and policies (Bharadwaj, 2000). Another element includes continuous training in order to enhance IS knowledge and skills associated with current systems and processes (Ross et al., 1996). In

spite of IS personnel mobility, some skills such as organizational level knowledge and technology integration skills are less imitable (Wade & Hulland, 2002). Thus, such inimitable organizational skills and knowledge can enhance the probability of SISP goals achievement.

Basically, the quality of IS planning team and other organizational members in terms of having sufficient knowledge and experience and innovative thinking ability is a key element to SISP. By increasing the knowledge of team members and top managers about IS, they interpret SISP goals better. Specifically, there are some evidence of IS technical skills for SISP success in previous studies that are: competent and educated team members (Basu et al., 2002), having qualified personnel (Teo et al., 1997), using services of expert employees and training them (Lederer & Sethi, 1996; Zijad et al., 2009). As Zijad et al. (2009) stated, one of the main issues of SISP success is related to the education, skills, and the quality of organization's members. Therefore, the next hypothesis is proposed:

H3a, b: There is a positive causal relationship between "IS technical knowledge capability" and SISP Success in terms of (a) objectives fulfillment and (b) planning improvement.

IS Strategic Change Management Capability

IS strategic change management capability refers to organization's ability to predict future growth and changes to select appropriate platforms (i.e., software standards, hardware, and network) and policies (Feeny & Wilcocks, 1998). Previous researchers have defined IS strategic change management capability as understanding business situation (Ross et al., 1996) and ability to manage IS change (Benjamin & Levinson, 1993). According to Bharadwaj (2000), this capability also includes understanding how to use technology and how to manage and motivate IS employees. A key element of this capability is constructing an

organizational culture that appreciates new IS opportunities and welcomes change. IS strategic change management capability also facilitates filling the gap between IS responsibilities and the firms' functional areas (Wade & Hulland, 2004).

Indeed, facilitating change through IS is a key purpose of SISP. This capability has some evidences in studies of SISP. Some of SISP studies emphasized more on planning capability (e.g., Lederer & Sethi, 1996), while others focused more on change management (e.g., Basu et al., 2002). Because of its nature, SISP involves planning, change management, and conflict resolving components. For example, the importance of determining the necessity of planning, predefining objectives, determining planning team with all responsibilities, controlling the planning process, reviewing plan recommendation and plan implementation periodically, and joining implementation phase has been shown in SISP literature (Lederer & Sethi, 1996; Teo et al., 1997; Lee & Pai 2003; Basu et al., 2002; Zijad et al., 2009). Additionally, based on Warr's (2006) discussion, more comprehensive objective for SISP will result in more SISP success. Since such objective comprehensiveness needs more planning efforts, it can be concluded that capability in IS planning and change management will affect SISP success. Therefore, based on above discussion, the following hypothesis is presented:

H4a, b: There is a positive causal relationship between "IS strategic change management capability" and SISP Success in terms of (a) objectives fulfillment and (b) planning improvement.

IS-Business Integration Capability

IS-business integration capability represents the ability to produce a shared vision between IS and business. Some elements of this capability are enabling process integration (Bharadwaj, 2000), dynamic strategic alignment (Powell & Dent-Micallef, 1997), discussing and making IS-business strategic vision (Bharadwaj et al.,

1999), IS-business consulting and mutual understanding (Ross et al., 1996), and both IS and top managers' involvement in firm's strategic planning (Feeny & Wilcocks, 1998).

IS literature provides strong support for the relationship between IS and business alignment and SISP success. Most of the studies in reviewed literature have some evidences that represent IS-business integration capability. Those evidences are: linkage between IS plan and firm plan (Baker, 1995), various planning team members from different departments (Bechor et al., 2010), participating in business strategic planning, providing organizational support, business plan reviewing, meet business goals (Lederer & Sethi, 1996), IS-business alignment (Zijad et al., 2009), and organizational commitment (Abu Bakar et al., 2009). In the same way, Basir and Norzaidi (2009) discussed that strategic alignment has a very strong influence on SISP success. In more detail, alignment attributes (i.e., communication, partnership, competency measurement, scope and architecture, governance, and skills) have been found to be important elements for SISP success. The alignment attributes will provide a common vision and mutual understanding between businesses and IS members and finally will result in SISP objectives fulfillment. Therefore, the related hypothesis is as follows:

H5a, b: There is a positive causal relationship between "IS-business integration capability" and SISP Success in terms of (a) objectives fulfillment and (b) planning improvement.

IS Infrastructure Management Capability

IS infrastructure capability is the ability of firms to set and maintain a flexible IT infrastructure for supporting current and future activities of the firms (Mata et al., 1995). The nature of IS infrastructure types that have been proposed in RBV-IS studies are those that are hard to imitate and complex (Wade & Hulland, 2004). IS infrastructure capability focuses on two as-

pects: (1) technical components flexibility, and (2) technical components efficiency. Previous researchers have supported the positive impact of IS infrastructure capability on strategic performance improvement, competitive advantage, and IT project success (Xu et al., 2010).

SISP predictors that are related to the IS infrastructure management capability are: sufficient resource allocation (Baker, 1995; Basu et al., 2002; Bechor et al., 2010; Lederer & Sethi, 1996), resource identification for new tools, and considering functional and cross-functional needs (Lederer & Sethi, 1996). IS infrastructure management capability not only provides essential physical resources, but also manages them properly. Such capability provides flexibility and support for both SISP objectives fulfillment and other firm-wide capabilities such as IS planning and change management (Jain, 2007) and is expected to positively affect SISP success. Therefore, the related hypothesis is as follows:

H6a, b: There is a positive causal relationship between “IS infrastructure capability” and SISP Success in terms of (a) objectives fulfillment and (b) planning improvement.

RESEARCH METHODOLOGY

A quantitative methodology was used to examine the relationship between organizational IS capabilities and SISP success. Survey method in the form of Likert scale questionnaire has been widely used in IS research (Bechor et al., 2010). In this study, choosing a survey with questionnaire allowed us to gather required data to test the hypotheses. Previous validated items were used in the development of the questionnaire. Accordingly, pre-test and pilot test has been done as the next step in development of survey instrument. Meanwhile, validity and reliability were tested to ensure the research design appropriateness.

CIOs and senior IT executives of medium-to-large Iranian organizations were respondents

in our survey. Key informants have been widely used as respondents in empirical IS studies (Grover & Segars, 2005). Previous researchers have shown that CIOs (e.g., Top IT professionals, IT director, vice president of IT, or similar titles) are the main informants for information related to IS/IT in the firms (Chi et al., 2005; Segars & Grover, 1998). CIOs are regarded as having the most knowledge about IS/IT and SISP in organizations. Meanwhile, Senior IT executives are the only feasible, realistic way to obtain research data in many organizations (Chi et al., 2005). Thus, questionnaires were addressed to CIOs and senior IT experts.

Sampling frame identification for this study was the next step in this research. Basically, medium-to-large organizations are more likely to afford information systems and they are more likely to engage in SISP. Furthermore, there is more data available on those organizations and generally those firms are more information intensive (e.g., Banks and large manufacturers) and practice SISP more actively (Segars & Grover, 1998). This was the criteria for choosing medium-to-large firms. For survey administration, obtaining data from “online tools” was the first priority in this research that has advantages in terms of flexibility and effectiveness. Particularly, some researchers stated that online methods are comparable and even more effective in certain situation (Verma, 2005). For this purpose, we tried to identify sampling frame based on formal reports of related ministries and other formal and informal resources.

The survey instrument was sent to a sample of 2000 medium-to-large Iranian firms, of which 181 responded, within 2 months, of which 167 responses were complete after data screening. The respondents composed of CIOs (46.7%) and senior IT executives (53.3%) who work for medium (59.2%), large (16.8%), and very large (24%) firms. Approximately, 54.5% of the respondent firms were state-owned and 45.5% were from private sector. Table 1 presents respondent firms according to the seven different industry types.

Table 1. Respondent firms according to the industry types

Industry	Number of respondent	Industry % out of total
Government	17	10.2
Education	25	15
Health	12	7.2
Manufacturing	44	26.2
Technology & media	33	19.8
Transport and distribution services	14	8.4
Financial and Insurance services	22	13.2
Total	167	100.0

DATA ANALYSIS

PLS (partial least squares analysis) was selected to analyze the data. As a statistical technique, PLS is appropriate for exploratory and predictive models (Wetzels, Odekerken-Schröder, & Oppen, 2009). Moreover, PLS has prediction ability rather than just explaining the constructs' variability. This characteristic makes PLS more useful especially when the theory is still developing (Chin, 1998b). Furthermore, using PLS optimizes the constructs' predictability.

In PLS, factorial validity is assessed with EFA (Exploratory Factor Analysis) to verify that (1) each item loads only on one factor with acceptable coefficient (loading above 0.70), (2) this one factor is the same for all related measurement items, and (3) measurement items are related to the appropriate theoretical factors (Gefen & Straub, 2005). The results of EFA analysis are shown in Table 2. Using EFA analysis and considering related rule of thumbs, all measurement items were aligned properly with their related theoretical factors. Therefore, all items were retained in the model.

Besides, the internal consistency of all items was examined in terms of convergent validity and discriminant validity. For convergent validity, it is recommended that loadings must be above 0.70 (Nunnally, 1978). In this study, all items of organizational IS capabilities and SISP success showed adequate convergent validity according to their loadings (Table 3).

Since items of IS external relationship capability, IS internal relationship capability, IS planning and change management capability, and IS-business integration capability were highly correlated, we decided to combine them in form of one unique construct titled "firm-wide IS planning and relationships capabilities". This combination allowed us to avoid discriminant validity issues.

In addition, to examine the discriminant validity, the AVE (average variance extracted) was also analyzed. AVE is the ability of the items in a block to explain the latent construct. As is suggested in PLS, all constructs had AVE of above 0.5 (Fornell & Larcker, 1981). If the square root of a construct's AVE is greater than the other constructs' correlation, it can be assumed that constructs have sufficient discriminant validity. All constructs had an AVE square root higher than other constructs' correlations showing adequate discriminant validity. Constructs' AVE, composite reliability, and Cronbach Alpha and constructs' correlations are shown in Table 4.

RESULTS OF HYPOTHESES TESTING

Having ascertained the measurement model, the structural model was performed. Using bootstrap re-sampling, path coefficients were re-estimated also. Generally, supported hypotheses indicated that organizational IS capabilities can

Table 2. Factor structure matrix of loadings and cross-loadings

	P	S1	K	S2	In.
q15	.785	.302	.107	.107	.101
q16	.767	.321	.119	.158	.241
q14	.746	.209	.164	.260	.087
q17	.654	.270	.327	.209	.187
q19	.624	.220	.357	.215	.269
q29	.619	.376	.325	.132	.281
q18	.597	.222	.331	.212	.353
q27	.577	.325	.336	.328	.266
q28	.567	.420	.273	.184	.292
q26	.564	.244	.423	.256	.174
q24	.528	.498	.373	.166	.097
q9	.338	.702	.202	.054	.259
q5	.235	.687	.182	.260	.000
q2	.212	.682	.272	.091	.142
q1	.207	.658	.089	.236	.207
q4	.181	.633	.243	.182	.259
q6	.376	.598	.264	.278	.055
q3	.388	.595	.236	.164	.329
q8	.362	.562	.109	.287	.390
q10	.296	.497	.155	.350	.327
q21	.132	.153	.843	.141	.162
q20	.232	.284	.820	.150	.121
q22	.232	.230	.794	.072	.175
q23	.300	.277	.746	.202	.093
q12	.241	.200	.148	.853	.201
q11	.198	.239	.181	.820	.135
q13	.256	.300	.233	.739	.161
q32	.221	.144	.121	.122	.833
q30	.160	.250	.143	.125	.812
q31	.251	.216	.183	.158	.805

P: planning and relationships capabilities, **S1:** SISP success in terms of objective fulfillment, **S2:** SISP success in terms of planning improvement, **K:** IS knowledge and skills capability, **In:** IS infrastructure management capability

explain a significant amount of variance in the SISP success in terms of objective fulfillment ($Rsq = 0.68$), and planning improvement ($Rsq = 0.39$). Figure 2 and Table 5 indicate path coefficients of the model.

As shown in Figure 2, two main hypotheses were supported empirically. Firstly, firm-wide IS relationships and planning capabilities were positively associated with SISP success in terms of both objective fulfillment and plan-

Table 3. Descriptive statistics and loadings

Construct	Indicator	Mean	S.D.	Loading
P				
Working with external stakeholders to leverage shared IT resources to create high-value IT capabilities?	q14	4.568862	1.655509	0.772
Constantly gathering external information for strategic responses ahead of competition?	q15	4.155868	1.675377	0.7873
Integrating IT with other resources to enhance systems for proactively staying alert to the market?	q16	4.237665	1.731574	0.8453
Building respect between IT providers and IT users?	q17	4.54491	1.642642	0.8292
Building internal partnerships (shared project responsibility) between IT providers and IT users?	q18	4.390659	1.659001	0.822
Building internal working relationships between the IT providers and IT users?	q19	4.626467	1.625926	0.8338
Accurately anticipating IT strategic change that is relevant to the firm?	q24	4.378623	1.665678	0.8114
Making sure that the firm's IT plans will deliver high-value IT strategic change?	q26	4.606407	1.635808	0.7982
Management from IT and business integrating IT and business strategy to attain strategic alignment?	q27	4.249281	1.618334	0.858
Management from IT and business creating a shared vision of the role of IT in the business strategy?	q28	4.401198	1.753	0.8314
Management from IT and business jointly planning how IT will enable the business strategy?	q29	4.332814	1.857375	0.8556
K				
Making sure that IT personnel hold the IT technical skills/knowledge needed to support the IT plan?	q20	4.82006	1.654873	0.9391
Making sure that IT personnel hold the IT technical skills/knowledge needed to support current systems?	q21	5.15497	1.490253	0.8867
Integration (and/or transformation) of the firm's legacy systems with new IT?	q22	4.895569	1.573876	0.8968
Making sure that IT personnel hold the IT technical skills/knowledge needed to support the complexities of technology integration?	q23	4.620419	1.583675	0.8974
In				
Providing an IT infrastructure that is responsive to current business needs?	q30	4.626886	1.664517	0.9092
Providing a flexible IT infrastructure that allows for quick modification in support of the IT plan?	q31	4.423234	1.667896	0.9365
Providing an IT infrastructure that allows for the seamless integration of IT services across the firm?	q32	4.337545	1.727017	0.8821
S1				
Adapting the goals/objectives of IS to changing goals/objectives of the organization?	q1	4.634731	1.49843	0.7613
Maintaining a mutual understanding with top management?	q2	4.662455	1.716521	0.7531

continued on the following page

Table 3. Continued

Maintaining a mutual understanding with top management on the role of IS in supporting strategy?	q3	4.125749	1.679715	0.8376
Flexibility to adapt to unanticipated changes?	q4	3.963114	1.631391	0.7638
Development of a “blueprint” which structures organizational processes?	q5	3.879222	1.836039	0.7356
Maintaining an understanding of changing organizational processes and procedures?	q6	4.224311	1.764276	0.7676
Maintaining open lines of communication with other departments?	q8	4.383234	1.674531	0.8158
Coordinating the development efforts of various organizational subunits?	q9	4.383234	1.845661	0.8215
Contributing to the organizational performance compare to other firms?	q10	4.656826	1.62701	0.779
S2				
Ability to anticipate surprises and crises?	q11	4.541976	1.699053	0.9219
Ability to understand the business and its information needs?	q12	4.771018	1.634163	0.9493
Adapting technology to strategic change?	q13	4.888922	1.571742	0.9187
P: IS planning and relationships capabilities, S1: SISP success in terms of objective fulfillment, S2: SISP success in terms of planning improvement, K: IS knowledge and skills capability, In: IS infrastructure management capability				

Table 4. Constructs' AVE, composite reliability, and Cronbach Alpha and construct correlations

Construct	Composite Reliability	AVE	Cronbach Alpha	S1	S2	P	In.
S1	0.93	0.83	0.91	0.91			
S2	0.95	0.86	0.92	0.63	0.92		
P	0.95	0.67	0.95	0.81	0.62	0.81	
In.	0.93	0.82	0.89	0.59	0.42	0.58	0.90
P: IS planning and relationships capabilities, S1: SISP success in terms of objective fulfillment, S2: SISP success in terms of planning improvement, K: IS knowledge and skills capability, In: IS infrastructure management capability, *The bold items are AVE roots.							

ning improvement. Secondly, IS infrastructure management capability was shown to be positively associated with SISP only in terms of objective fulfillment. Unexpectedly, the relationship between IS knowledge and skills capability and SISP success was not supported empirically. The supported hypotheses are shown in Table 5.

DISCUSSION

In this study, different firm-wide IS capabilities were identified through literature review and interview that could enhance the probability of SISP success. Based on previous literature and interview data, a research model was developed to predict SISP success based on organizational

Figure 2. Final research model

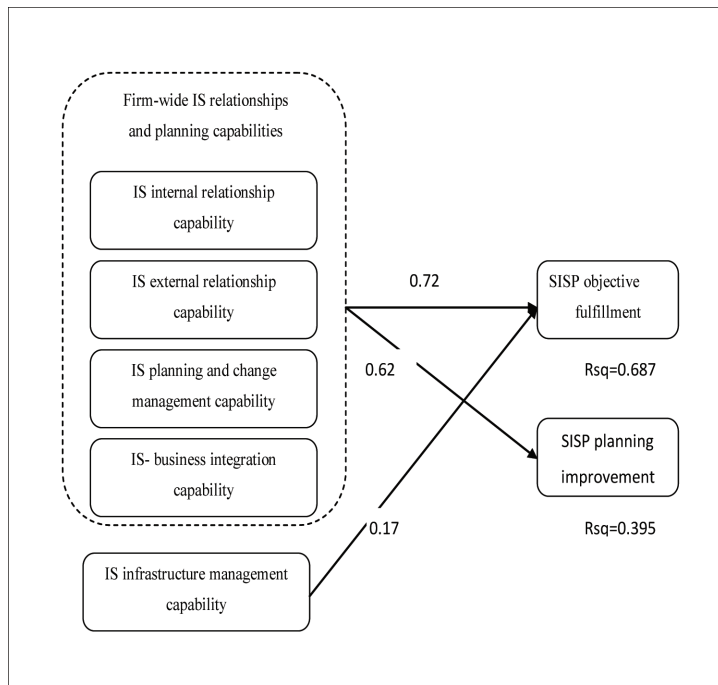


Table 5. Supported hypotheses, path coefficients, and T-statistics

Hypothesis	Entire sample estimate	Mean of subsamples	Standard error	T-Statistic
IS relationships and planning capabilities (i.e., strategic change management, IS-business integration, and external and internal relationships) → SISP success in terms of objective fulfillment	0.715	0.7175	0.0468	15.2897***
IS relationships and planning capabilities (i.e., strategic change management, IS-business integration, and external and internal relationships) → SISP success in terms of Planning improvement	0.629	0.6342	0.0528	11.9089***
IS infrastructure management capability → SISP success in terms of objective fulfillment	0.173	0.1749	0.0531	3.2559**

** : p<0.05, ***: p<0. 01

IS capabilities. Data were collected via a survey from medium-to-large Iranian organizations. The relationship between those organizational IS capabilities and SISP success was examined. Using visual PLS, data were analyzed to investigate the relationship between six organizational IS capabilities and SISP success in terms of

objective fulfillment and planning improvement. The analysis indicated that of those IS capabilities, IS planning capabilities and IS infrastructure management capability were good predictors for SISP success in medium-to-large Iranian organizations. In other words, SISP success in terms of objective fulfillment

and planning improvement was substantially and significantly explained by organizational IS capabilities. Approximately, those IS capabilities explained a significant amount of the variance in SISP (about 70%). Generally, the results indicated that organizational IS capabilities can affect SISP success.

CONCLUSION

The relationships developed in this study deal with a significant theme in existing information systems literature that is: understanding how firms can increase their performance and make their plans more successful through their resources and capabilities (Bharadwaj, 2000; Peppard & Ward, 2004; Wade & Hulland, 2004). Capabilities have been suggested to be important elements in the success of information systems (Caldeira & Dhillon, 2010; Eikebrokk & Olsen, 2007; Morris, 2006; Tarafdar & Gordon, 2007) and seem to have the potential to be incorporated in the study of SISP success (Duhan, 2007; Lederer & Salmela, 1996). Generally, literature mirrors little effort to answer the questions of “what kind of skills and abilities, knowledge, and qualification or capacity of IS (i.e., IS capabilities) is necessary for organizations to have a successful SISP?”

In this study, RBV was used to develop a capability-based framework for SISP success. Briefly stating, IS planning and relationships capabilities (i.e., external and internal relationship management capability, IS planning and change management capability, IS-business integration capability), and IS infrastructure management capability could significantly predict SISP success in medium-to-large Iranian firms' context. It thus shows differential outcome depending on particular firm-wide IS capability, and enhances the belief that planning is a multi-activity and complex function. In this field, the study, suggests that firms can increase their SISP success by developing and enhancing their different organizational IS capabilities.

For interpreting the findings of this study, some research limitations must be taken into account. First, this study has been conducted

among medium-to-large Iranian organizations. Therefore, analysis extension to other contexts must be done carefully. Furthermore, there might be other organizational IS capabilities that can affect SISP success in different contexts, thus those capabilities studied here may not be the only ones.

Finally, this study contributes to the SISP practice by motivating planners to consider organizational side of planning via resource-based view of the firm. By developing their awareness of organizational IS capabilities, planners enlarge their perspective and thus encounter with planning problems more precisely. The researchers believe that this research provides an approach for interpreting the relationship between organizational resources in terms of IS capabilities and SISP success. Using the findings of this study, hopefully, future studies will examine presented questions.

FUTURE RESEARCH

This study contributes to the future research by encouraging researchers to examine and provide explanation for the lack of influence of some firm-wide IS capabilities on SISP success. Future research also could be enhanced by examining the relationships developed in this study in other fields, by other respondents, or even by other approaches.

There are some questions that might be important in future research. For instance, is there any factor moderating the basic link between organizational IS capabilities and SISP success? What organizational situations make organizational IS capabilities more influential? Or, what specific practices can strengthen the link between organizational IS capabilities and SISP success. Furthermore, we speculated about failure reasons to support some of the expected effects. However, those speculations must be tested in future research. That is, the effect of those IS capabilities that was not supported in this study and also other possible capabilities must be considered in future research. Perhaps replacing quantitative approach with closer examinations such as qualitative research, where

provides more detailed information, would help. Future research also can focus on business perspective and thus survey top managers or similar business executives and compare their data with data obtained from CIOs. Although, future research must validate the findings of this study by gathering data from medium-to-large firms, but collecting data from small companies can also provide some comparison opportunities.

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