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Effective Attributes of Successful Strategic Information Systems Planning for Public Organizations in Middle East-Preliminary Study

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Abstract: Rapid changes in information technology and business environment challenge the ability of organizations to undertake strategic planning for information systems and information technologies. Strategic information systems planning requires experienced human resources and growing heavy investments. Strategic information systems planning has turned into one of the top issues currently facing top management. Organizations are seeking ways to improve strategic information systems planning. This preliminary study was an attempt to identify effective attributes that may contribute to Strategic information systems planning success in state organizations in Middle East countries. The key attributes that may affect Strategic information systems planning success were identified by reviewing earlier research studies. Confirmatory factor analysis and fitness test were performed on the study conceptual model by applying constructive formulation modeling technique and using LISREL software and the results indicated fitness of the conceptual model. Identified attributes were grouped into three classifications: (1) General organizational attributes including change management and information systems maturity; (2) Interactive organizational attributes including top management participation and commitment and chief executive officer and chief information officer relationship and (3) Strategic information technology/information systems planning dimensions comprising of environmental assessment and strategic alignment. Three primary hypotheses and six secondary hypotheses of this preliminary Study will be examined the significance of the relationship between independent variables (effective attributes) and strategic information systems planning.

Key words: Strategic information systems planning, SISP success, effective attributes, strategic planning

INTRODUCTION

Strategic Information Systems Planning (SISP) refers to the process of identifying information systems/information technology (ITVIS) attributes that may help an organization in setting business objectives and implementation of business plans (Bechor *et al.*, 2010).

A review of studies conducted in information systems management reveals that SISP is one of the top ten issues facing corporate managers and information systems specialists (Niederman *et al.*, 1991). SISP may serve as the main drive for consolidation of information technology applications that have the potential to increase competitive advantage of an organization (Bai and Lee, 2003).

Lederer and Sethi (1996) showed that SISP failure in organizations is detrimental to their investment in information technology. Such failure leads to definition of

incompatible projects that may ultimately lead to creation of inflexible, redundant and deficient information systems. They defined SISP as the process of identifying a portfolio of computer applications that may help an organization to realize its corporate objectives (Lederer and Sethi, 1996).

SISP integrates information systems into organizational planning, incorporates information technology into business objectives and defines the required information that help the organization achievement its short-term and long-term objectives (Wang and Tai, 2003).

Public organizations require SISP in order to implement overall objectives that rely on development and utilization of strategies that rely on information processing and information technologies.

The present study was an attempt to identify effective attributes in successful strategic information systems planning in public organizations of Middle East

countries. This preliminary study was conducted to serve as a model for implementation of strategic objectives of the public organizations.

RESEARCH BACKGROUND

SISP has captured attention of researchers due to the extensive application of information systems by many organizations in order to improve efficiency and gain competitive advantage. Notwithstanding SISP importance and benefits, the reported number of failures is rather high (Pita *et al.*, 2009). A review of causes that have contributed to SISP failures reveals that, in most cases, not enough attention had been paid to organizational issues that affect SISP (Pita *et al.*, 2009; Lee and Bai, 2003). There are few studies on organizational aspects of SISP (Lee and Bai, 2003). Among a few research reports on the subject (Basahel, 2009; Bechor *et al.*, 2010; Pita, 2007), a small number is devoted to examining SISP in Asia, especially in Middle East countries (Khani *et al.*, 2012).

Various research methodologies have been developed, proposed and applied during the past decades. Yet, organizations are still facing problems in dealing with issues involving information technology and information systems. The reason being that most of these problems are not technological related. Rather, they stem from lack of enough attention to the relation between organizational issues and information technology attributes (Lee and Bai, 2003).

SISP is too complicated a process to be managed merely by technological advancements (Mentzas, 1997). Teo and Ang (2000) pointed out that SISP is highly content dependent and should be looked at from

organizational point of view (Teo and Ang, 2000). The effectiveness and quality of information technology and information systems planning are dependent not only on planning process but also on the nature of information systems processing and organizational characteristics.

SISP encompasses long-term planning perspective for investments, human services, technical skills, plus software and hardware requirements to enable an organization to take advantage of opportunities that may arise. Most studies of SISP focused mainly on specific issues facing information systems planning, namely, research methodologies, benefits and difficulties, effectiveness assessment, stages of growth, rule of strategic committee, research proposals, processing and content dimensions, coordination with business planning and the planning process (Raghunathan and Raghunathan, 1994; Lederer and Sethi, 1996; Segars and Grover, 1998).

The results of case studies on successful SISP show that organizational attributes plus strategic IT/IS planning dimensions contribute to the successful implementation (Lee and Bai, 2003; Peppard and Ward, 2004; Brown, 2010; Kunnathur and Shi, 2001; Abu Bakar *et al.*, 2009).

Interactive organizational attributes (top management participation plus alignment of top management and information systems management) have positive affect on strategic alignment. This positive effect is the determining attribute in SISP success (Grover and Segars, 2005; Basu *et al.*, 2002; Chi *et al.*, 2005; Brown, 2010). Interactive organizational attributes positively influence SISP success directly and through the effects it has on strategic alignment. These attributes form the theoretical model of this study as depicted in Fig. 1.

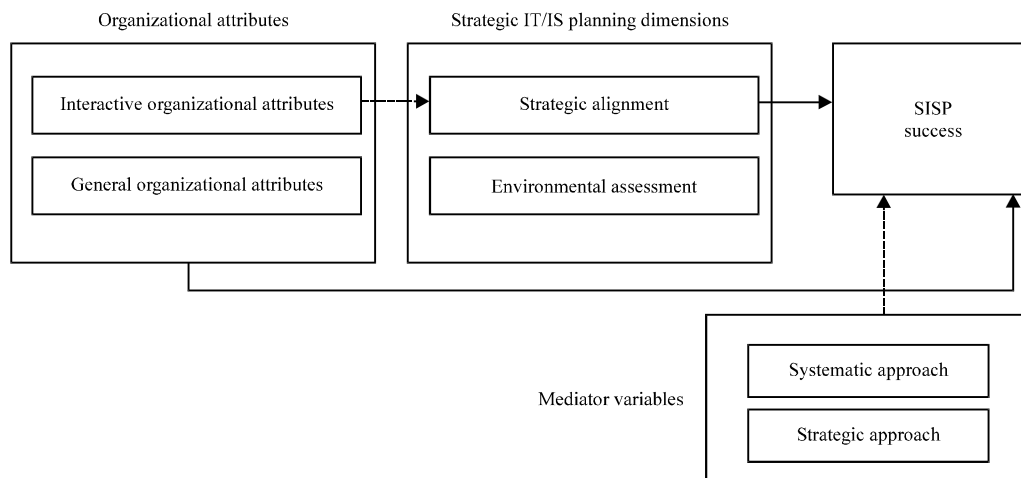


Fig. 1: Conceptual model of study

This model will be examined the influence of mediating variables that may define the relationships among study variables from systematic approach as well as strategic approach.

RESEARCH SIGNIFICANCE

Private enterprises have extensively used SISP with keen attention to its economic benefits (Lederer and Sethi, 1988). The complexities inherent in current information life cycle have made planning extremely essential but complicated (Clark *et al.*, 2000). Public or public organizations have realized the importance of adapting a strategic approach toward information technology. Public services may be improved by strategic utilization of information technology.

Public entities that are engaged in providing public services are expected to perform their duties at quality levels comparable to the private sector. Bajjaly (1998) found out that public agencies that are experiencing with SISP tend to use information systems more strategically. These agencies receive more support from US federal government (Bajjaly, 1998).

Many of the past related research conducted on public sector focused on SISP methodology (Dufner *et al.*, 2002; Dufner *et al.*, 2005; Ishak and Alias, 2005) and evaluation (Byrd *et al.*, 1995; Bajjaly, 1998; Basir and Nordin, 2006; Ismail *et al.*, 2007). Public and private sectors may not share similar organizational objectives and planning outlook. Their stakeholders may take part in strategic information systems planning for different reasons (Dufner *et al.*, 2002). Gaining a better understanding of the differences between SISP in private sector versus public sector may require further studies (Abu Bakar *et al.*, 2009).

SUCCESSFUL SISP

SISP success in an organization can be evaluated through examining the periods of development that organization achieved its objectives (Raghunathan and Raghunathan, 1994; Kunnathur and Shi, 2001). One key strategic objective of SISP is to utilized information technology according to the business requirements (Segars and Grover, 1999; Teo and Ang, 2000; Hirschheim and Sabherwal, 2001). This is how enterprises use information technology in order to achieve competitive advantage (Min *et al.*, 1999). A strategically aligned SISP may help an organization to identify strategic applications, correctly assess the return on investment

and develop the proper information technology architecture (Earl, 1993). Research on SISP assists organizations in anticipating the new advances in information technology in order to prepare and allocate enough resources for investment in new technologies (Premkumar and King, 1994).

SISP may be used to improve communication of news about and outlook of information technology from employees to top management (Raghunathan and Raghunathan, 1989). This communication is required to gain top management support and commitment for new investments in information technology. A good communication channel to top management and their commitment to support information systems may extend IT outlook in an organization (Raghunathan and Raghunathan, 1989).

Every SISP objective receives equal weight and attention when its success is measure by a combination of objective development and objective realization (Chi *et al.*, 2005). A review of earlier SISP research is necessary for identifying SISP success attributes. Lederer and Sethi (1996) reported that planning organization and implementation are two important attributes in SISP. Segars and Grover (1998) identified alignment, assessment, coordination and capability as effective attributes in SISP success. The first three attributes represent SISP objectives and the last one represents its progress during the period of measurement. Raghunathan and Raghunathan (1994) extended successful planning model used in strategic management to conceptualize and validate SISP success. Table 1 shows the SISP success dimensions adapted from literature reviews for this study.

RESEARCH VARIABLES

Earlier studies and research reports were reviewed in order to make a list of critical success attributes in SISP. Six key success attributes were selected based on frequency of reference in research literature. The present study examined the relationship of these attributes with SISP success and measured their effects on SISP success in public organizations. These attributes formed the basis of research hypotheses in this study. Table 2 shows research variables and the sources where they were adapted from.

Change management: Change management deals with methods, models, techniques, tools, skills and other scientific forms used in any activity. Change management has applications in many disciplines

Table 1: SISP success dimensions

Scale	Explanation
Alignment	IS and business strategy linkage to facilitate such IT/IS development and acquisition that is concordant with competitive requirements of the organization
Analysis	Understanding the organization's internal operations (e.g., procedures, processes and technologies)
Cooperation	(SISP) stakeholders cooperation to decrease potential conflict between them after general agreements
Improvement in capabilities	Improving planning capabilities over time (e.g., by learning)
Contribution	Contributing to various organizational attributes (e.g., decision making and profitability)

Source: Segars and Grover (1999)

Table 2: Research variables and their sources

Variables		References
Independent variables		
General organizational attributes	Change management	Lee and Bai (2003) Kunnathur and Shi (2001) Teubner (2007) Peppard and Ward (2004)
	Information systems maturity	Teubner (2007) Peppard and Ward (2004) Brown (2010)
Interactive organizational attributes	Top management participation and commitment	Basu <i>et al.</i> (2002) Chi <i>et al.</i> (2005) Kunnathur and Shi (2001) Brown (2010) Abu Bakar <i>et al.</i> (2009)
	Chief Executive officer (CEO) and Chief information officer (CIO) relationship	Kunnathur and Shi (2001) Grover and Segars (2005)
Strategic IT/IS planning dimensions	Environmental assessment	Chi <i>et al.</i> (2005) Teubner (2007) Brown (2010)
	Strategic alignment	Teo and Ang (2000) Keams and Lederer (2000) Chi <i>et al.</i> (2005) Teubner (2007) Grover and Segars (2005) Abu Bakar <i>et al.</i> (2009) Brown (2010)
Mediator variables	Systematic approach	Lundeborg <i>et al.</i> (1979)
	Strategic approach	Liedtka (1998) Satia <i>et al.</i> (2000)
Dependent variable	SISP success	Chi <i>et al.</i> (2005) Grover and Segars (2005) Abu Bakar <i>et al.</i> (2009)

including psychology, sociology, business management, engineering, industry, system engineering, organizational behavior and the like (Nickols, 2007).

Information systems maturity: An important issue is to decide how information systems maturity affects strategic information systems planning. SISP maturity depends on the maturity of information systems activities and techniques adapted for information systems planning in an organization. Top management develops better understanding of strategic decision making for information systems where an organization experiences higher level of information systems maturity (Cerpa and Verner, 1998).

Top management participation and commitment: Top management understanding, participation and commitment contribute to SISP success (Earl, 1993;

Kearns, 2006). Conversely, poor understanding of SISP on the part of top management coupled with their lack of support and commitment are the main cause of SISP failure and its poor strategic alignment (Basu *et al.*, 2002).

CEO and CIO relationship: Absence of proper relationship between information systems management and top management leads to SISP failure. Yet, proper relationship between the two management groups provides for strategic alignment information systems with corporate strategies and guarantees strategic adaptation of information systems (Lederer and Sethi, 1996).

It is paramount for top management to gain enough understanding about information technologies and for information systems managers to learn about business objectives in order to facilitate the timely detection of opportunities and threats facing the organization (Lee *et al.*, 2005).

Environmental assessment: The environmental attributes that are to be identified and assessed are: (1) Internal business environment (business strategies plus key business activities and processes); (2) External business environment; (3) Internal information technology environment (portfolio of existing information applications) and (4) External information technology environment. Since competitors can easily adapt information technologies, therefore, organizations need dynamic strategies for implementation of information technology that are flexible enough to adapt to ongoing changes in environment (Lederer and Sethi, 1991).

Strategic alignment: One important aspect of SISP is the alignment of information systems planning with organizational business plan (Teo and Ang, 2000). Strategic alignment in an organization is defined by the relationship between its business plans and its information systems plans (Premkumar and King, 1992). Strategic alignment exists when organizational information resources support its business objectives and enables an organization to strategically use information systems to take advantage of opportunities (Kearns and Lederer, 2000).

System thinking: Society and organizations are the primary and secondary elements of a social system. Society is made of a collection of its many organizations. It is the primary complex system comprising of secondary

systems called organizations. Understanding this relation is called system knowledge, accepting this relation is called system approach and adapting to this relation is called system behavior. System knowledge, approach and behavior are required for social living. Those who are unable to adapt to this cycle may pose problems to the social system. What happens when such individuals take command of some organizations as important elements of a social system? (Walker, 1992).

Strategic thinking: Strategic thinking is a new term in the world of technology. There is no definite and encompassing definition for this term. But, everyone agrees that strategic thinking is fundamental to formulation of innovative and effective strategies. Hamel and Prahalad (1989) believe that strategic thinking is a special form of thinking that could be thought of as strategy architecture skills.

RESEARCH HYPOTHESES

Figure 2 shows the relationship between research variables. The present study has three primary hypotheses and six secondary hypotheses. These hypotheses are defined based on the relations between study variables. Study hypotheses will be examined the significance of the relationship between independent variables and SISP success in public organizations. Study hypotheses are as follows:

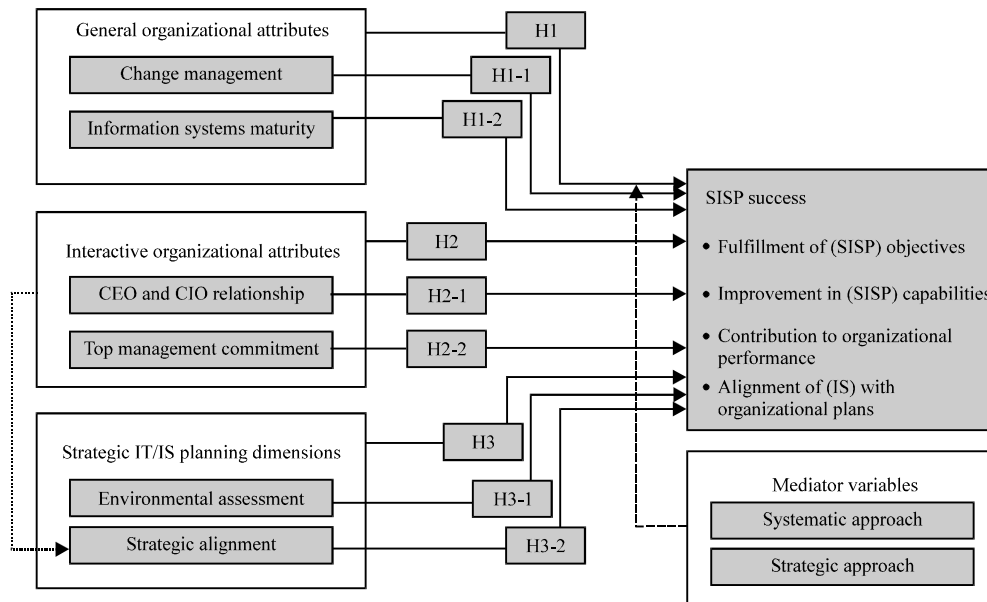


Fig. 2: Influential attributes in SISP success in public organization

- **H1:** General organizational attributes have significant relation with SISP success in public organizations
 - **H1-1:** Changer management has significant relation with SISP success in public organizations
 - **H1-2:** Information systems maturity has significant relation with SISP success in public organizations
- **H2:** Interactive organizational attributes have significant relation with SISP success in public organizations
 - **H2-1:** CEO and CIO relationship has significant relation with SISP success in public organizations
 - **H2-2:** Top management participation and commitment has significant relation with SISP success in public organizations
- **H3:** Strategic IT/IS planning dimensions have significant relation with SISP success in public organizations
 - **H3-1:** Environmental assessment has significant relation with SISP success in public organizations
 - **H3-2:** Strategic alignment has significant relation with SISP success in public organizations

RESEARCH METHODOLOGY

This research was an applied study based on its objectives. It was a descriptive and a survey study based on its data collection approach. It was a correlation research as study variables are analyzed based on research objectives. Data analysis examined the relationships between various study variables and measured their correlation.

The scope of this study was limited to information systems, information technology, strategic planning, change management, organizational communication, plus strategic planning for information systems and information technology. The literature related to the areas covered by the scope of this study was examined in order to provide the conceptual framework for this study.

Data collection method was survey and data collection tool was questionnaire. Collected data was organized and summarized using EXCEL software. Data analysis was carried out by using SPSS and LISREL software.

Study questionnaire was designed based on attributes extracted from the related books and articles. Measurement indices and their dimensions were defined in the same way. The survey package consisted of a covering letter and a questionnaire. The covering letter

explained: (1) The main objective for conducting the survey, (2) Why a questionnaire was being used for data collection and (3) Why recipient should take part in this study and filling out the questionnaire.

The second page of covering letters provided a list of terms and keywords used in the questionnaire with their definitions in order to help recipients get acquainted with the subject and understand its terminology.

The questionnaire was organized into two parts: (1) Demographic questions about respondent including education, position and experience and (2) The main questions about SISP and their measurement indices. Respondents were asked to evaluate questionnaire items based on seven-Likert-scale ranging from very low to very high.

Data analysis included confirmatory factor analysis and path analysis as part of deductive statistics used in constructive approach for formulating a model. Data analysis was carried with the help of LISREL software to assess the fitness of conceptual model and test the study hypotheses. Single sample t-test was used with the help of SPSS software to examine the current status of every attribute, its effect on SISP success and its applicability to the organizations under study.

Study population and sample: Study population included senior information processing specialists, system analysts, top management, senior managers and information systems managers from several Middle East countries including Iran, Pakistan, Turkey and Azerbaijan. Total population was 160 subjects. The sample size was determined at 113 subjects by Hagen, Morgan and Krejcie table.

Reliability: Reliability of questionnaire was measured by Cronbach Alpha. Reliability of the questionnaire items was calculated at 0.91 by SPSS software. This number showed high reliability of study questionnaire.

Validity: Content validity was used to measure questionnaire validity. The first draft of questionnaire was distributed to 25 individuals to express their opinion about its validity and make suggestion when applicable. The expert group consisted of 15 university instructors in the fields related to this study, 5 high ranking information systems managers working for public organizations in countries under study-each with over 20 years of work experience and 5 experts in strategy development for information technology and communication-each with over 10 years of related experience. The expert group totally confirmed the content validity of the study questionnaire.

Table 3: Fitness test of conceptual model

Change management					General organizational factors
Item	CHM1	CHM2	CHM3	CHM4	β
ML λ	0.74	0.81	0.64	0.42	0.79
t-Value	6.47	7.21	5.46	3.14	
Information systems maturity					
Item	ISM1	ISM2	ISM3	ISM4	
ML λ	0.90	0.67	0.34	0.56	
t-value	8.21	4.2	2.35	3.15	
χ^2	df	p-value	GFI	AGFI	RMSEA
14.25	18	0.69845	0.93	0.87	0.00
Top management participation and commitment					Interactive organizational factors
Item	TMS1	TMS2	TMS3	TMS4	β
ML λ	0.59	0.44	0.52	0.83	0.82
t-value	4.74	3.44	4.14	6.85	
CEO and CIO relationship					
Item	CCR1	CCR2	CCR3	CCR4	
ML λ	0.55	0.48	0.56	0.41	
t-value	4.41	4.25	4.49	3.52	
χ^2	df	p-value	GFI	AGFI	RMSEA
12.99	18	0.42315	0.88	0.76	0.00
Environmental assessment					Strategic IT/IS planning dimensions
Item	EA1	EA2	EA3	EA4	β
ML λ	0.83	0.95	0.35	0.52	0.63
t-value	6.34	7.15	3.23	4.41	
Strategic alignment					
Item	SA1	SA2	SA3	SA4	
ML λ	0.55	0.65	0.80	0.50	
t-value	4.48	5.15	6.12	4.01	
χ^2	df	p-value	GFI	AGFI	RMSEA
44.32	59	0.31315	0.85	0.83	0.011
Strategic information systems planning (SISP) success					
Item	SS1	SS2	SS3	SS4	
ML λ	0.59	0.48	0.52	0.83	
t-value	4.82	3.61	4.13	7.11	
χ^2	df	p-value	GFI	AGFI	RMSEA
3.86	5	0.61174	0.98	0.95	0.00
Systematic approach					
Item	SYA1	SYA2	SYA3	SYA4	
ML λ	0.67	0.76	0.53	0.85	
t-value	5.16	5.86	4.06	8.61	
χ^2	df	p-value	GFI	AGFI	RMSEA
8.9	11	0.23564	0.98	0.95	0.003
Strategic approach					
Item	STAP1	STAP2	STAP3	STAP4	
ML λ	0.85	0.82	0.52	0.83	
t-value	8.67	8.07	5.13	8.11	
χ^2	df	p-value	GFI	AGFI	RMSEA
22.16	24	0.49523	0.93	0.91	0.014

Confirmatory factor analysis: Confirmatory Factor Analysis (CFA) was used to test fitness of the conceptual model before engaging in data analysis. CFA was carried out through path analysis for every known attribute. This analysis was conducted with the help from LISREL software using the constructive measurement model. Table 3 shows the result of the fitness test on study model. The results indicate fitness of the conceptual model.

The statistics are presented: the χ^2 statistic (Chi-square) and its associated degrees of freedom (df) and level of significance, Goodness of Fit Index (GFI), Adjusted goodness of Fit Index (AGFI), Root Mean Square Error of Approximation (RMSEA). All these

indicators show that the constructs have good convergent validity. In fact outcomes have found significant relationships between latent variables and observed variables in this research model.

DISCUSSION

Information technology/information systems planning are to reflect business mission, objectives and strategy. Likewise, business plan of an organization should serve as a guide for information systems planning together with application planning for information technology and specialized technologies.

The effect of environmental assessment on SISP success requires effective coordination between outside attributes and information technology objectives with further coordination of SISP success has objective relation with environmental assessment and strategic alignment. SISP dimensions determine its success or failure. Interactive organizational attributes are strongly related to strategic alignment. These attributes determine the extent of strategic alignment.

The effect of interactive organizational attributes on SISP success underlines the important role of interactive and relational principles on success of organizational processes.

Researchers have reported that the absence of sufficient participation in strategy implementation is the highest contributor to SISP failure. Another contributor to SISP failure is mentioned to be the lack of top management participation in planning and implementation of IT/IS strategy (Chi *et al.*, 2005; Brown, 2010; Abu Bakar *et al.*, 2009).

Conflict between CEO and CIO may also lead to failure of information system projects. The conflict may stem from attitude differences related to information technology and organizational issues. As Lederer and Sethi (1996) found out, the absence of a proper relation between top management and information systems managers will invariably contribute to SISP failure. Conversely, a desirable relationship between the two creates a strategic alignment for successful implementation of strategic information systems (Lederer and Sethi, 1996).

Top management should endeavor to increase its understanding of what benefits could potentially be realized from information technology. Likewise, information systems managers should adequately get acquainted with the business objectives laid out by top management so that they help each other for timely identification of opportunities and threats (Grover and Segars, 2005).

Relating to changes in information technology poses a serious challenge in dealing with today's professional information systems. In spite of the fact that information systems address the challenges of change, yet, there is no universal solution for addressing the mediating relations between various changes.

SISP maturity is dependent on the maturity level of information systems and the methodology adopted for information systems planning in an organization. The top management in organizations with highly mature information systems has a better understanding of the importance of strategic decision making for information systems.

Similar to findings of this study, well known scholars in this field believe that organizational specialization in SISP and utilization of information technology should be considered in SISP studies (Teubner, 2007; Peppard and Ward, 2004; Brown, 2010).

CONCLUSION

The results obtained by present preliminary study revealed that General organizational attributes (change management and information systems maturity), interactive organizational attributes (i.e., top management participation and commitment and CEO-CIO relationship) and strategic IT/IS planning dimensions (i.e., environmental assessment and strategic alignment) are influential attributes in SISP success. Study Objective was realized by identification of vital attributes that contribute to SISP success. On the base of study methodology and selected statistical tools, after pilot test and field activities (questionnaires distributions), statistical results extract and study findings will be contributed.

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