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The Relationship between Knowledge Sharing Behavior and the Effectiveness of Information Systems Strategic Planning (ISSP): An Empirical Study in Taiwan

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ABSTRACT

“Improving information systems strategic planning” remains among one of top ten issues facing IS/IT executives and corporate general managers. As e-business strategies have received growing attention from enterprises, information systems strategic planning (ISSP) is now considered critical in developing a successful e-strategy. However, numerous researchers have examined the relationship between various factors and the effectiveness of information systems strategic planning, the effects of knowledge sharing behavior on the effectiveness of information systems strategic planning still have little been examined. The main purpose of this study is to examine the relationships between knowledge sharing and the effectiveness of information systems strategic planning. Furthermore, we explore the factors influencing knowledge sharing behavior among stakeholders in the ISSP process. Data were collected by a questionnaire survey sent to the IS directors of 805 large companies in Taiwan. Survey results indicate that knowledge sharing behavior influence of the effectiveness of information systems strategic planning. The implications of this finding for practice and future research are also examined herein.

Keywords: Information systems strategic planning (ISSP), e-business strategy, knowledge sharing

1. INTRODUCTION

ISSP has been identified as essential in integrating IT into an organization to increase a firm's strategic competitive advantage (Huysman *et al.*, 1994; Lederer and Sethi, 1996; Mentzas, 1997; Levy *et al.*, 1999). With the recent growth in interest in e-business and e-commerce, information systems strategic planning (ISSP) is widely viewed as an effective means of implementing a successful e-strategy (Lee and Pai, 2003). As the information technology environments and information systems applications are growing complex, the ISSP process that cannot be only handled by information systems professionals. A strategic IS/IT planning team which comprised of business managers, IS managers, user managers and unit managers can help the organization to achieve consensus through effective communication and interaction and achieve their information systems decision-making goals. Since these stakeholder groups have specific different explicit knowledge and implicit knowledge, how to effectively manage the knowledge and enhance knowledge sharing among stakeholders to be one of the most important issues in the ISSP process. Four types of knowledge must be integrated in the ISSP process, including business knowledge, organization-specific knowledge, IT/IS knowledge and management competencies. Furthermore, much research has been conducted in the area of ISSP in recent years. However, the relationship between knowledge sharing behavior among stakeholders and information systems strategic planning has been seldom examined empirically.

The main purpose of this study is to examine the

relationship between knowledge sharing behavior and the effectiveness of information systems strategic planning. Moreover, this study also examine the factors affecting the knowledge sharing among stakeholders in the IS strategic planning process. The hypothesized relationships were empirically tested using a field survey of Taiwan's large firms.

2. THEORETICAL BACKGROUND

Information systems strategic planning has been described as a managerial and interactive learning process for integrating information systems considerations into the corporate planning process, aligning the application of information systems to business goals, developing detailed information systems plans and determining information requirements to achieve business objectives (Earl, 1989; Galliers, 1991; Teo and King, 1997; Cunningham, 2001). A growing amount of empirical work that has been conducted examining the relationship between ISSP and organizational context. However, there has been little empirical research that investigates the effects of knowledge sharing behavior among stakeholders on the effectiveness of information systems strategic planning. A lot of various types of knowledge must be integrated in the ISSP process such as IT/IS knowledge and business knowledge. Such knowledge may be “tacit” or “explicit” (Nonaka, 1994). Tacit knowledge resides in the minds of different stakeholders and has not been documented in a structured form, but such knowledge is important to the planning process. For example, the CIO possesses IT knowledge and experience, the CFO possesses organization-specific knowledge concerning finance and accounting, and CEO possesses business executive

knowledge and experience. These senior executives accumulate their IS/IT strategic planning knowledge over time through interactive learning processes. Different varieties of tacit knowledge exist in the minds of different interest groups, all with their own expertise, positions, perceptions, and powers. Consequently, these differences may result in difficulties in cooperation, and may affect the effectiveness of ISSP. To achieve the consistently planning objectives, “knowledge sharing” is necessary to the ISSP process.

3. RESEARCH MODEL AND HYPOTHESES

Based on the literature reviews, the research model (Figure 1) was first built, using knowledge management, behavioral, and IS planning theory as reference disciplines. The research model has three major parts, including knowledge sharing behavior, the factors affecting the knowledge sharing behavior and the effectiveness of information systems strategic planning.

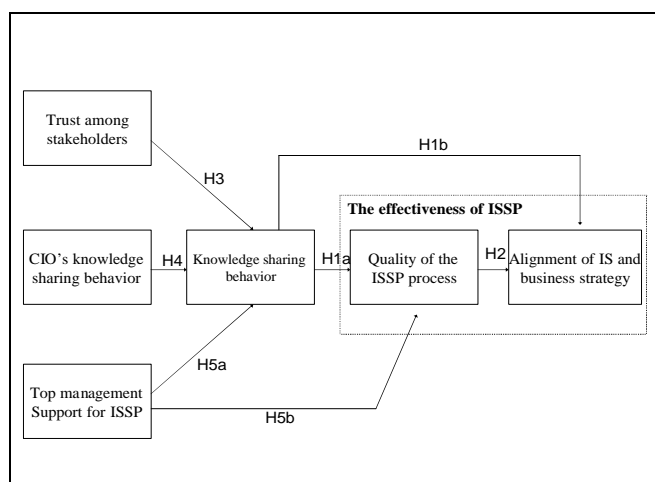


Figure 1 Research model

Each stakeholder group in the IS/IT strategic planning process is perceived to have specific backgrounds and expertise (Earl, 1993). Consequently, knowledge sharing among different groups not only generates creative ideas but also reduces conflict (Hackney and Little, 1999). Furthermore, a general consensus and acceptable results for all group members can be reached, ensuring that all members of an organization participate effectively in IS/IT strategic planning. Moreover, effective knowledge sharing has been presented in the literature as one means for improving innovations and performance. Connelly and Kelloway (2003) argued that knowledge sharing is emerging as an important concept and is often cited as an antecedent of innovation. Huysman *et al.* (1994) indicated that ISSP is an innovative process. Knowledge sharing behavior among interested groups could help an organization to enhance its managerial capability, change organizational structures and reach a consensus of IS use and management (Kearns and Lederer, 2000). It is generally argued that these knowledge sharing influence creative IS/IT planning in organizations (Hackney and Little,

1999; Salmela *et al.*, 2000). Significantly, a successful IS/IT strategic planning process should consider knowledge sharing behavior among different stakeholder groups. Thus, we hypothesized:

H1a: Knowledge sharing behavior significantly and positively affects the quality of the ISSP process.

H1b: Knowledge sharing behavior significantly and positively affects the alignment of IS and business strategy.

As technology continues to evolve, grow and become increasingly complex, the information systems strategic planning process becomes complex and difficult to handle. Alignment of the information systems strategy and business strategy is generally considered the key to successful information systems strategic planning (Henderson and Venkatraman, 1993; Earl, 1993; Segars and Grover, 1999). Notably, a comprehensive information systems strategic planning process produces a higher quality information system plan that ensures better plan implementation, and in turn improves the alignment of the information systems and business strategies (Lederer and Salmela, 1996; Pun and Lee, 2000). Thus, we hypothesized:

H2: The quality of the process significantly and positively affects the alignment of IS and business strategy.

“Trust” has been as a key factor for social exchange process (Blau, 1964; Munch, 1993). There is no any contract or astriction exist in knowledge sharing among stakeholders in the planning process, therefore; trust among stakeholders is key to successful knowledge sharing. The trust will be established if the benefits can be get with each other in exchange process, then it will facilitate the knowledge sharing among stakeholders. It is likely that different stakeholders will have different reasons for wanting an ISP study to take place (Galliers, 1991; Ruohonen, 1991). CIOs being mainly concerned with the implementation of strategy, while user managers are not satisfied with the ISSP process perhaps because they seek more influence and general managers emphasize SISP method issues because they find strategy-making far from easy (Earl, 1990; Ruohonen, 1991). The goals and consensus will not be achieved if the trust among stakeholder groups is not existed. Thus, we hypothesized:

H3: Trust among stakeholders significantly and positively affects knowledge sharing behavior among stakeholders.

The CIO has been described as the corporate officer who truly understands the interconnection of the information flow to the business (Benjamin *et al.*, 1985; Stephens *et al.*, 1992). In some firms, IT expertise and knowledge exist in the minds of a few senior IS managers and are not communicated to others in the

firms. Top managers or user managers do not know enough about the strategic use of IT and are not familiar with IS/IT strategy issues and should learn more about IS/IT issues. Better CIO's knowledge sharing not only facilitates the integration of different views from stakeholder groups, but also facilitate these stakeholders more cooperative. From the above, we can understand that CIO's knowledge sharing can promote organizational members to understand what IS and IT can do for the company and be willing to take advantage of IS/IT opportunities when they arise, and then further promote the intention of sharing knowledge for other stakeholders. Thus, we hypothesized:

H4: *CIO's knowledge sharing behavior significantly and positively affects knowledge sharing behavior among stakeholders in the planning process.*

Top management support is considered a prerequisite for every successful IS discipline. Beatty *et al.* (2001) indicated that as in all innovative endeavors in the organization, top management support is extremely important. Earl (1993) also indicated that top management support is necessary for a successful ISSP since top management is responsible for a wide range of organizational processes and activities. Top management must not only realize that IT is not a panacea for all organizational problems, but also should be viewed IT as a resource to be deployed judiciously to support or influence business strategies in terms of streamlining business operations, reengineering business processes, forging electronic links with suppliers and customers, etc (Teo and Ang, 1999). Since top management support of the importance of IT/IS is a prerequisite for securing the commitment and involvement of top management. Thus, we hypothesized:

H5a: *Top management support for ISSP significantly and positively affects knowledge sharing behavior among stakeholders.*

H5b: *Top management support for ISSP significantly and positively affects the quality of the ISSP process.*

4. RESEARCH METHOD

4.1. Sample and Data collection

The sample adopted was the Corporate 1000 (the 1000 largest manufacturing and service companies in Taiwan), published by Commonwealth Magazine in 2003. To ensure the questionnaire was received by IS directors and to encourage a better response rate, two research assistants spent about three weeks telephoning these 1000 companies. Only those companies with formal IS departments qualified as participants. Such firms were then asked to provide the name of the IS director to whom a questionnaire should be mailed. Using this procedure, a list of 805 firms from various industries was compiled. Questionnaires were mailed to the 805 IS

directors. A cover letter explaining the objective of the study and a stamped return envelope were enclosed. Follow-up letters were sent about three weeks after the initial mailings. The decision to use the IS executives as informants herein is supported by previous research conducted by Segars and Grover (1998) and Gottschalk (1999).

4.2. Measure development

The research variables were defined as briefly as possible with multiple indicator items. From the literature on social exchange, knowledge management and IS management theory, we adopted the variables that have been used and validated by other researchers. All variables were measured with multiple items on a five point Likert-type scale, ranging from (5) strongly agree to (1) strongly disagree.

4.3. Pre-testing

The questionnaire was refined through two rounds of rigorous pre-testing. The pre-testing process focused on instrument clarity, question wording and validity. During the first round of pre-testing, five MIS doctoral students and three MIS professors were interviewed. During the second round of pre-testing, a revised questionnaire was pre-tested by three senior IS executives from manufacturing, banking and retail industries.

5. RESULTS

5.1. Sample characteristics

Of the 805 questionnaires distributed, 151 completed usable questionnaires were returned, for a response rate of 19%. The respondents are all information systems executives, and had worked in the information systems field for an average of 15.3 years. The respondents came from diverse industries, with manufacturing representing 17.1%, banking/finance/insurance 25.8%, computers/communication 23.8%, and the remainder coming from various other backgrounds such as real estate, construction, health and transportation. This result implies that ISSP is carried out in a wide variety firms.

5.2. Reliability and validity of research variables

Internal consistency (Cronbach's alpha) was calculated in order to assess the reliability of all constructs. The results in our study indicate that all the constructs are greater than 0.7. The constructs are therefore considered to exhibit adequate reliability (Nunnally, 1978). The content validity of questionnaire was established through a series of personal interviews with multiple IS executives. Construct validity was determined using factor analysis of the items comprising each construct. Principal component factor analysis with VARIMAX (orthogonal) rotation was used to determine if all

items measuring a construct cluster together and selection of factors with eigenvalues greater than one. Items with loadings of less than 0.5 on any factor were dropped from subsequent analyses. The results of the factor analyses for independent variables confirm that each construct is distinct from other constructs.

5.3. Hypothesis testing

The hypothesized relationships depicted in research model were tested using multiple regression analysis. No apparent colinearity problem among independent variables exists, as the variance inflation factors (VIF) for all independent variables are smaller than 3 (Neter *et al.*, 1997).

As predicted by H1a, knowledge sharing behavior significantly and positively affects the quality of the ISSP process ($\beta=0.22$, $p<0.01$). Moreover, knowledge sharing behavior significantly affects the alignment of IS and business strategy ($\beta=0.29$, $p<0.001$), supporting H1b. Furthermore, the quality of the ISSP process has a significant positive effect on the alignment of IS and business strategy. Thus, H2 is supported. As proposed H3, trust among stakeholders shows a positive relationship with knowledge sharing behavior ($\beta=0.31$, $p<0.001$). Consequently, H3 is supported. Moreover, H4 is supported since the CIO's knowledge sharing behavior has a significant positive effect on knowledge sharing behavior ($\beta=0.17$, $p<0.05$). Finally, top management support for ISSP has a strong significant effect on knowledge sharing behavior and the quality of the ISSP process, so H5a ($\beta=0.43$, $p<0.001$) and H5b ($\beta=0.37$, $p<0.01$) are supported.

6. DISCUSSION

Results of this study demonstrate that knowledge sharing behavior significantly affects the quality of the ISSP process (H1a) as well as alignment of IS and business strategy (H1b), implying that as ISSP become more important to organizations, effective knowledge sharing among stakeholders is required. ISSP requires views from a range of stakeholders and the knowledge sharing of these stakeholders to achieve common goals. Furthermore, different managerial groups should participate in planning, increasing mutual understanding and sharing the use of the information (Lederer and Mendelow, 1988; Reponen, 1993). ISSP is an iterative, ongoing and complex process that cannot be handled by just one person in an organization (Auer and Reponen, 1997). An effective knowledge sharing mechanism can help planning participants share their implicit and tacit knowledge, and to achieve their decision-making goals. According to a recent study based on resource-based theory conducted by Kearns and Lederer (2003), the results showed that knowledge sharing processes of strategic IT alignment influence two sets of outcomes (including business plan reflecting the IT plan as well as

IT plan reflecting the business plan) and then yield competitive advantage for organizations. The findings of this study suggest that both practitioners and researchers should direct significant effort understanding shared knowledge, the factor which had the strongest influence on the quality of the ISSP process and alignment of business and IS strategies.

Trust among stakeholders was originally hypothesized to be related to knowledge sharing behavior. The results provide substantial evidence of this hypothesis, implying that mutual trust among stakeholders is essential to successful teamwork. Trust is a major component of the cooperative competency that is established in organizational theory (Sivadas and Dwyer, 2000). It has been defined as the confidence a department (or stakeholder) has in the ability and motivation of the other department (or other stakeholders) to produce positive outcome for the organizations. The key objective of ISSP is to establish a strategic IS plan that is satisfactory to different groups. However, ISSP is so complex that it cannot be accomplished if the organization lacks mutual-trust among stakeholders. During planning, stakeholder groups are mutually interdependent and each has specific tasks and responsibilities. Accordingly, organizations require mutual-trust to achieve planning goals and ensure that the IS plan is implemented as expected.

CIO's knowledge sharing behavior was found to be positively and significantly associated with the knowledge sharing behavior among stakeholders (H4). Similar findings have been proposed by previous researchers such as Stephens *et al.* (1992) suggest that the CIO operates as an executive rather than a functional manager. They further indicated that CIO is an active participant in strategy planning and acts as a bridge between the information group, the functional areas, and external entities. According to Teo and Ang (2001), senior information systems executives fail to win top management support because they talk in technical jargon that top management do not understand. IS executives should bear in mind that top management are more interested in knowing how IT can help leverage the company's competitive position. As a result, we can understand that CIO may focus on strategic issues rather than technical issues while sharing his IT knowledge with CEO.

Top management support for ISSP was found to positively and significantly affect the knowledge sharing among stakeholders and the quality of the ISSP process. The result was consistent with early findings of similar studies that indicated that top management is found to be an important facilitator for effective IS strategic planning (Premkumar and King, 1992).

The results indicate that the causal relationship exists between the quality of the ISSP process and alignment of IS and business strategies. That is, the alignment

between IS strategy and business strategy improves with the quality of the ISSP process. The results are consistent with reports in the literatures (King, 1988; Premkumar and King, 1994; Lederer and Salmela, 1996). Since the quality of the ISSP process is a prerequisite of planning alignment, the factors affecting the quality of the ISSP process must be understood when undertaking ISSP. This study hypothesized the knowledge sharing behavior positively and significantly affects the quality of the ISSP process, the empirical evidence support this hypothesis.

7. CONCLUSIONS

To achieve the consistently planning objectives, knowledge sharing is necessary to IS/IT strategic planning. One important question is that of how knowledge sharing can be achieved in the IS/IT strategic planning process. According to Nambisan *et al.* (1999), numerous organizational mechanisms exist that can enhance knowledge sharing and transfer, including IT steering committee and strategic IS/IT team. Based on Mentzas (1997), this study suggested that four different types of strategic IS/IT teams should be specified when implementing an IS strategy, namely, functional, technical, guidance and coordination teams. Additionally, information technology can play a central role in knowledge sharing process (Hislop, 2002). In the ISSP process, some IT applications may help planning participants to share and transfer their knowledge. Such applications may include groupware, intranet and web-based applications (Bai and Lee, 2003). Furthermore, the cross-participation (CEO participate in IT planning and CIO participate in business planning) is necessary to elucidate the tacit knowledge that often remains undiscovered and is not shared in the organizational knowledge base (Johannessen *et al.*, 2001) and to make this personal knowledge explicit at the organizational level (Kearns and Lederer, 2003).

This study has the following limitations: First, the subjects of this study are IS executives in Taiwan. Consequently, cultural differences may exist between Taiwan's situation and other countries. Second, this study use CIO as an informant. The CEO was not used as an informant in this study **because** of the CEO possibly not being familiar with some of the detailed characteristics of information systems strategic planning examined in our research variables. The effectiveness of ISSP in this study includes technology-led measure items, thus making it difficult for CEOs to respond knowledgeable. Previously, most respondents in ISSP empirical research were CIOs (Premkumar and King, 1994; Segars and Grover, 1999; Gottschalk, 1999). In contrast, IS executives are more likely to be aware of and knowledgeable about the research variables, especially the measurement of ISSP success. Third, the sampling population included large businesses in Taiwan. However, the IS maturity of large organizations is greater than that of SMEs, meaning that the results herein may have

limited generalizability for SMEs.

Future research should focus on four areas, as motivated by limitations of the present study. First, future researchers might attempt to understand the conclusions about the knowledge sharing factors of this research through structured interviews in case studies of IS directors from ongoing or recently completed ISSP projects. Researchers might ask subjects why these factors are associated with the effectiveness of ISSP. Second, future researchers could consider more general factors that affecting knowledge sharing behavior such as task coordination, rewards and political behavior. Third, the subjects of this study are IS executives in Taiwan. Cultural differences may exist between Taiwan and other countries. Future research should be similarly carried out in other countries.

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