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THE RESEARCH OF EFFECTIVE FACTORS ON IS PLANNING CAPABILITY OF IT ORGANIZATION

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Abstract

In fast-paced business environments, most businesses rely on IT. Business units continuously require planning, development and management of IS aligning with their business strategies. In this continuous process, an IS organization performs business analyses as well as planning and application functions for IS environments in a position of mediator between both business and IT units. In recent years, monitoring and evaluation of developed information systems has become an important tasks, which is inevitable and essential for making IT investment decision. This organization is generally referred to as an 'IS strategic planning team', 'IT planning team', 'information strategic team', and 'IT strategy planning team', etc., and is collectively referred to as an 'information strategic organization'.

This paper aims to identify 'IS Planning Capability' as the most important critical factor for information strategic organizations and examined how different factors that can affect planning capability, and further impacts on IS planning satisfaction in business units.

Keywords: Strategic IS unit, IS Planning Capability,

1. Introduction

Use of Information Technology (IT) in business and organizations has shifted to knowledge society and sped the change to a networked society. In general, business unit is operated based on their business processes while IS unit or organization, providing and operating information systems according to business requirements. Planning, developing and operating information systems corresponding to business requirements through effective communication and efficient coordination have emerged as critical aspects to sustain organisation's competitive advantage. In other words, a reciprocal dependancy between business and IT functions is an important factor in providing business IT users with the optimal IT service, assuring service continuity and quality of IS organization.

To provide the best IT service corresponding to diverse business requirements, components and types, a mediating unit known as an 'information strategic team' or 'IS strategic planning team' is recognized to be essential for aligning between business and IS units and performing functions of IT planning and cooridnation.

However, there may be communication problems between two parties, i.e. IS organization and different business units. These problems may cause IT service quality deterioration, failures in development of satisfactory service actively reflecting business requirements, and service failures through absence of timely, precise services and processes, late delivery for development, operation, maintenance, etc.

In so far, there have been no previous studies on planning capability, the most important task among characteristic tasks of an organization mediating business and IT units, determinant factors affecting planning capability, and influences of mediating organizations' planning capability may impacts on user satisfaction of IS, etc.

The study designates an organization that mediates between business and IS units as described above an 'IS strategic planning units' and examines aspects that these organizations can retain for planning capability, and that affect service satisfaction of IS users. This research study provides a guide to factors that improve planning capability of IS strategic planning unit. By establishing a causal relationship between mediating planning capability and IS user satisfaction. In short, the study will contribute to development of IT planning team where business users can be satisfied. Hence following research questions are proposed:

RQ 1: What are internal/external antecent factors that determine IS planning capability of 'IS strategic planning unit'?

RQ 2: How different levels of IS planning capability is co-related with IS users' satisfaction?

2. Theoretical Background and Research Hypothesis Development
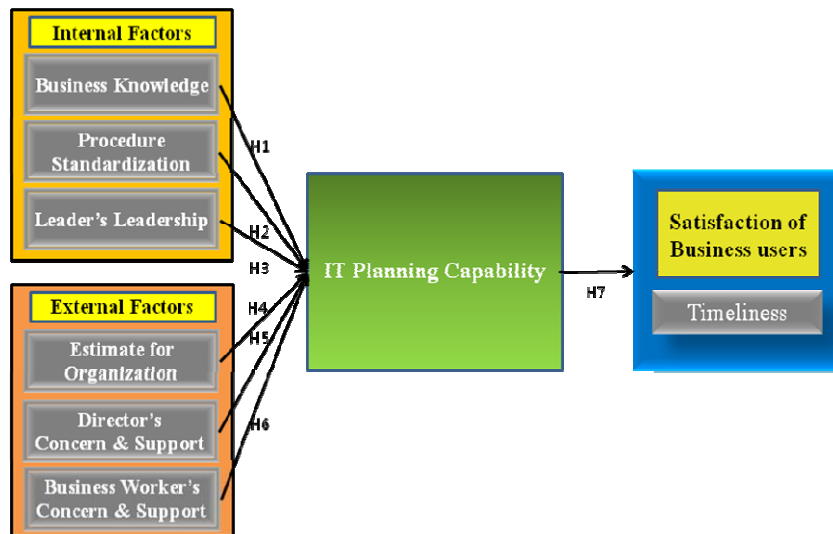
2.1 Research Model

Figure 2-1 Research Model

To answer the research questions proposed in the study, a research model comprising seven hypotheses in Figure 2-1 is presented.

2.2 Definition and Literature Review of IS Planning Capability

2.2.1 Literatures on IS Strategic Planning Team

Management strategies to resolve communication problems occurring in process of establishing business strategies and achieving goals of the business are defined as 'Relationship Management' (RM) [15]. In the case of conflict within a business, it is assumed that communication between both units will be smooth if there exists a system or organization to mediate and make a decision, and ultimately be of great help in achieving strategic goals of the business. Lee (2005) defines IS strategic planning unit as a team having a coordination role of determing how to develop information resources to achieve strategic goals of the business. Through his study, 'A study on Development of IT Strategic Planning Function (2005)', he broadly defines functional aspects of IS strategic planning unit under three different activities: Plan, Do, and See. They are summarized as follows:

Table 2-1 Functional Aspects of IS Strategic Planning Unit

Plan	• Establish a systematic and well organized plan with the least amount of resources within a short time to maximize implementation effect of strategies • Establish a practical plan to efficiently and effectively implement information and communication infrastructure
	development strategies
Do	• Take a role of problem identifier related to construction and operation of information and communication infrastructure in cases where problems occur in information systems • Smooth reciprocal communication as a project owner with responsibilities shared between business and IT divisions • Take a role of mediator and intermediary to maintain agreement without friction and conflict
See	• Evaluate qualitative and quantitative effects of information systems constructed and operated by internal development or outsourcing after establishing information strategies and implementation plans • Aim at effective distribution of limited resources that lead to proper decisions thereafter and improve business competitiveness

2.2.2 Literature Study on IS Planning Capability

This paper proposed 'IS Planning Capability' as a measurement variable to evaluate Operational Effectiveness and tasks of IS strategic planning units by defining using Lee (2005)'s functional aspects of IS planning units as defined above. The study focused on planning capability based on a previous study finding [3] that IS planning is the most critical tasks undertaken by an IS strategic planning organization.

According to studies by McFarlan (1983), King (1983), and Lederer and Sethi (1998), commonly proposed characteristics used to

evaluate planning capability are 'Analysis Capability', 'Lead Capability', 'Coordination Capability', etc. Firstly, 'Analysis Capability' means a capability to systematically analyze, evaluate, and propose possible solutions to problems using all internal and external quantitative and qualitative information, and include capability to predict a possible exceptional situation during task performance and distinguish a main problem area [3]. In other words, understanding organizational factors using information input into information system planning and fulfilling needs depend on Analysis Capability. This Analysis Capability is the capability to understand organizational strategies, and internal and external characteristics, and fulfill fundamental needs to ultimately achieve goals of the organization. Thus, Analysis Capability is an important factor for sucess in information system planning.

Secondly, 'Lead Capability' means the capability to form and lead in an external competitive environment as organizations introduce new products, technology, or management skills, etc. It is defined as the capability of organizations to lead in competitive environments ahead of competing organizations with creative products or management skills, etc.[3]. For IS planning, this Lead Capability helps plan information systems needed for the organization more creatively, and may be used as a competitive weapon which other organizations cannot imitate.

Lastly, 'Coordination Capability' means a capability for 'Coordination' which has lexical meanings of 'mediation', and 'equivalence' for two or more groups. 'Coordination Capability' is defined as the capability to more efficiently manage construction and operation tasks for information systems through mediation and control of organizations, and to mediate between IT and business units to help them coordinate effectively, which allows IT units to develop systems meeting business requirements. Johnston and Vitale (1988) explain the importance of coordination between organizations in their study findings, showing that frequent and prompt information exchanges by a mediator/intermediary between organizations bring several competitive advantages such as prompt decision-making and responses, close mediation and control of business operations, and accompanying cost reduction. Jane Coughlan et al. (2005), Venkatraman and Ramamujam (1987), McGinnis (1984) etc., as previously mentioned, also conclude in their studies that communication capability between business and IT units, and mediation capability are important factors affecting performance of information systems.

In conclusion, it is shown that organizations may operate efficiently if IS planning capability, described as 'Analysis Capability', 'Lead Capability', and 'Coordination Capability', are efficiently demonstrated. In effect, it is assumed that IS planning capability has an important impact on IS performance and business user satisfaction.

2.3 Antecent Factors on IS Planning Capability

The study proposed independent variables affecting IS Planning Capability into two aspects: internal and external. The former defines as the IS strategic planning team itself, in other words, the internal characteristics of within the unit while the latter aspect focused on 'external factors of organization.'

2.3.1 Internal Factors of Affecting IS Planning Capability
1) Business Knowledge (BK)
Coughlan and Lycett (2005) suggested that the greater the interest in and higher the level of IT knowledge business organization members have, the more comprehensive and in-depth discussion IT sector members can have [29]. In other words, the members of higher the level of business knowledge the higher the possibility they propose effective use of IT corresponding to business strategies. In the end, it is predicted that members of the business sector can have even more in-depth discussion [13].

In other words, if a member who has experience and knowledge of both IT and business is a member of an IT unit, it is predicted that more analytical and innovative ideas can be proposed when planning IT strategic tasks based on in-depth understandings of both sides of IT and business, and that communication problems between both business and IT units can be more smoothly coordinated.

There are several study findings suggesting persons who have expert and technical knowledge related to information and communication infrastructures, and many experiences of development and management of information and communication, are generally suitable as members of an IS strategic planning team (The Ministry of Information and Communication, 2004). Thus, it is perceived that members of IS strategic planning team have a higher level of IT understanding. Therefore, the study establishes knowledge and understanding of business as factors exclusive of IT understanding of organization members and the first hypothesis is as follows:

Hypothesis 1: If members of an IS strategic planning team have a higher understanding of business, then planning capability may be better.

2) Procedure Standardization (PS)

Among studies on variables to operate organizations effectively, the most widely recognized ones are 'Complexity', 'Decentralization', 'Formalization' by Robbins (1985), etc., as described in previous section.

Among these, Formalization means the extent tasks in an organization are performed by official regulation and procedure. It is explained as the degree to which procedure, regulation, and communication, regulating actions of organization members, are documented and tasks in an organization are standardized. If specific procedures ares formalized and documented during decision-making, it is recognized that task implementing procedures are standardized and assumed that planning tasks of IS strategic planning team can be more effectively implemented. By applying standardized characteristics of an organization as described above, the following hypothesis is established:

Hypothesis 2: If the extent of standardization of task implementation procedures of an IS strategic planning is higher, then planning capability may be better.

3) Leader's Leadership (LL)

All organizations in business have a system established to achieve strategic goals of the organization, and the system has an 'organizational leader' taking the role of chief manager fully in charge of decision-making and issue discussion [25].

Quinn and McGrath (1985) categorized culture of organizations into four different elements, 'Group Culture', 'Developmental Culture', 'Hierarchy Culture', 'Rational Culture', and divide leadership of an organizational leader into four types, namely rational achievement, realistic team design, empirical professional, and idealistic innovation pursuit type, and studied types of ideal leadership to effectively run organizations in connection with each leadership and cultural type [8].

Through previous studies, leadership of organizational leaders is representatively categorized under four different types, 'considerate', 'innovative', 'organizational leading', and 'transactional' [1]. This study represents the four types under the single word 'Leadership' by implication. If an organizational leader of an IS strategic planning has capability to lead and coordinate members, it is assumed that planning capability of an IS strategic planning team is well established. A hypothesis is proposed as follows:

Hypothesis 3: If the leadership capability of an

organizational leader, a chief manager in charge of an IS strategic planning team, is higher, then planning capability of an IS strategic planning team may be better.

2.3.2 External Factors of Affecting IS Planning Capability

1) Estimate for Organization (EO)

Karimi (1988) suggested that if the size of a business is generally larger, then human and financial resources are greater, and structures and functions of an organization in business are well developed. In addition, there are previous studies showing that the extent of budget investment for hardware and software of IS has an indirect effect on business performance using IS [25]. King and Prekumar (1994) present that the extent of invested IT budget is an important factor for planning IS. Thus, by applying the study results on invested budget for organizations as described above to an IS strategic planning, the following hypothesis are proposed:

Hypothesis 4: If the extent of invested budget in an IS strategic planning team in business is greater, then planning capability of IS planning team may be better.

2) Director's Commitment & Support (DCS)

Sethi and Lederer (1988) recognized the extent of commitment and continous support by a CEO and organizational management as sucess factors. Pyburn (1983) suggested that the leadership capability of a CEO is an important factor in operating an organization efficiently. Thus, by applying the study results on commitment and support of management as described above, the fifth hypothesis is established as follows:

Hypothesis 5: If management has greater commitment and contious support for an IS strategic planning team, then planning capability of an IS strategic planning team may be better.

3) Business User's Commitment & Support (BCS)

Franz and Robey (1986) suggest in their study that there is a meaningful causal relationship between participation of business users and success of IS. Commitment and support of business users occur when they are participated a role or certain tasks in an IS project. When they hope to address their own needs, and to take on an important role in successfully realizing the system, and when system requirements are unclear, these user involvement consideres as an important factor [31]. Therefore, by applying study results on commitment and

support of business users, the sixth hypothesis can be suggested as follows:

Hypothesis 6: If commitment and support of business users for an IS strategic planning team are higher, then planning capability of an IS strategic planning team may be better.

2.4 Studies on User Satisfaction for IS Strategic Planning

2.4.1 IS User Satisfaction

Many studies on IS among previous studies propose user satisfaction as an evaluation measure for IS performance [12]. Jarvenpaa (1985), etc. also propose user satisfaction as a variable to evaluate IS, and Iivari (1994) emphasize that user satisfaction for information provided by an IS is a proper variable to measure successful implementation of an IS. This study also selected user satisfaction as an independent variable ultimately affected by effective operation of an IS strategic planning team. Information system users here are limited to those of business organizations in charge of business not within IS planning team or IT unit. For this reason, the study ultimately aims to identify influences affecting business user satisfaction of an IS through planning capability.

2.4.2 Components of Information Systems Quality

Considering many previous studies, IS quality is generally used as a measurement variable to gauge user satisfaction of IS [24]. Previous studies like Pitt (1988), etc. generally divide information System Quality into three factors, System Quality, Service Quality and Information Quality.

1) System Quality

System Quality is the first factor among IS qualities, and there are a number of studies on quality of systems themselves. Previous studies on measurement of System Quality recognize that technical factors such as stability, reliability, availability, responsiveness, and timeliness of a system are important factors in deciding System Quality [4, 12].

2) Service Quality

Previous studies establish that reliability of services provided by planning divisions and professionalism of the IS developers in charge, accuracy and availability of maintenance and repair, responsiveness of members of a computing division, support and training for users, problem solving ability, etc. are important factors in evaluating Service Quality [7, 11, 23, 24].

3) Information Quality

Information Quality means quality of the output of information systems provided to users [5]. In here, information characteristics provided by IS are divided into timeliness, reliability, understandability, newness, accuracy, convenience, applicableness, conciseness, validity, usefulness, sufficiency, etc. [5, 14, 30].

2.4.3 User Satisfaction on IS Strategic Planning

Several quality measurement variables for IS are derived from three factors, namely System Quality, Service Quality, and Information Quality. Among them, five representative measurement variables are abstracted and summarized as follows:

First is ease of use of IS. Second is usefulness of information provided by IS. Third is timeliness of IT service provided by IS. Fourth is accuracy of IT service provided by IS. Fifth is reliability of IT service provided by IS. Among the above five factors, 'ease of use' and 'usefulness of information' are quality measurement factors determined by technical and functional characteristics of the implemented system itself, and the varaiable, 'timeliness' of services generally contains comprehensive meaning of providing 'accurate' and 'reliable' services at the 'proper' time. Thus, accuracy and reliability are regarded as prior conditions of timeliness. For this reason, by controling and arranging other variables, the study uses the 'Timeliness (TL)' variable as a measure of user satisfaction for IT planning service provided by IS strategic planning team.

In this research other factors are excluded and only 'timeliness' is adopted as a measurement variable. This is because the study recognizes not technical quality of the system itself for evaluation, but how well an IS strategic planning took on a role of mediator between business and IT organizations, and if the IT organization provided business users with IT planning service in a timely manner as 'satisfaction', and aims at measuring a causal relationship between organization planning capability and user satisfaction.

If planning capability of an IS strategic planning team is performed well then it is assumed that timely accurate IT services will affect user satisfaction of buseinss users. Hence following hypothesis can be proposed.

Hypothesis 7: IS Planning Capability (PC) of an IS strategic planning team is performed well, IS user satisfaction may be higher.

3. Research Design

3.1 Design of Variables

In line with the research model proposed previously, variables consist of a total of six independent variables which relate to internal and external factors, and dependent variables which are Mediating Effect for 'IS Planning Capability' and

'Business User Satisfaction for IT Planning Tasks'.

For internal factors, five measurement items are established in accordance with three independent variables. For external factors, six measurement items are established in accordance with three independent variables. Three measurement items are established for Mediating Effect. Lastly, one measurement item, 'IT planning output or timeliness' of service, provided to users' is established as a dependent variable. Detailed items and components are presented in Appendix 1.

4. Data Collection and Analysis

4.1 Data Collection Method

As a data collection method, a 'questionnaire survey' was conducted by a professional research organization consigned a sample of 200 firms having IS strategic planning team in charge of IT related planning, coordination support, evaluation, etc. in a position of mediator between business and IT units among KOSPI-listed companies in each industry cluster of banks, securities, insurance, electricity, electronics, IT, communication service, steel, etc. The survey sample included managerial employees working within IS strategic planning teams, whose positions rank from department level managers to executives.

The survey was performed from June 1 to 6 of 2009, and contained a total of 41 questions, consisting of 34 questions in four parts and 7 questions on demographic.

Prior to distribute the questionnaire, content analysis for measurement items in the questionnaire was reviewed and completed through interviews with academic and industry staff in charge for pre-tests.

4.2 Demographics of Samples

Response rate of the survey was 76% with res pondents from 152 businesses among the sampl e of 200 firms. A distribution chart of the indu stries of businesses that responded shows that t he Petroleum and Chemical industry comprised the most of the total at 21.1%. The distributio n of the rest of the industries, exclusive of 'oth er', consisted of Construction, Distribution, Elec tricity/Electronics, and Securities, in that order.

Details are in [Figure 4-1] as follows: As the boundary of sampling frame was limited to managerial employees (including executives), most were employees higher in rank than department managers, and 98 respondents, or 64.5% among all 152 respondents, were employees at the 'assistant manager' level. Among all 152 respondents, a total of 120, or 78.9%, answered that their position is 'team leader'. Furthermore, generally, a team in an organization having a 'team
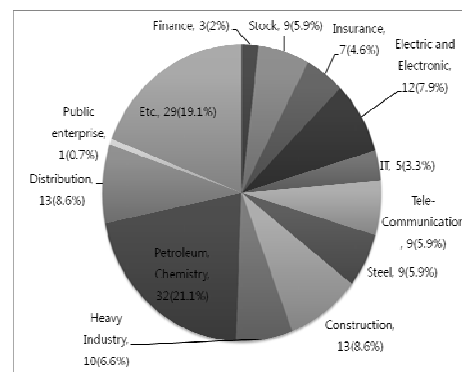

Figure 4-1 Demogrpahics of Collected Samples

system' often has several subdivided organizations, or 'parts'. 23 (15.1%) responded that they were a 'part manager' in charge of the team. What should be noted closely is that there was no respondent who answered 'team member' given that the sample was limited to the 'managerial level', and not general members.

The results for 'years of employment' of respondents were as follows: Years of employment in IS strategic planning team was represented as a survey question. For this, 122 (80.3%) among the total of 152 respondents have responded that their employment year was 'more than 5 and less than 10 years'. 132 out of all 152 businesses (86.8%) responded that the annual IT budget over sales revenue of the relevant business was 0.1% ~ 0.5%, 7 businesses (4.6%) responded 1.1% ~ 2.0%, and 6 businesses (3.9%) responded 0.6% ~ 1.0%, in that order. The demographic results in relation to the size of IS strategic planning team are as follows: 150 among a total of 152 businesses responded 'less than 10', and this is an absolute value having a distribution of 98.7 %.

4.3 Reliability and Validity of Measurement Variables

To verify the reliability of measurement variables, this study used Cronbach's α, a coefficient representing internal consistency of measurement items. According to Nunnally (1978), there is no absolute standard to evaluate reliability of measurement variables. However, it is suggested that a factor value of Cronbach' α of more than 0.6, shown in a general Exploratory Study, is an appropriate level. In the case of using measurement items of preceding researchers without alteration, the factor value of Cronbach' α should be greater than 0.7 to assure reliability of measurement items.

Analysis results for reliability of measurement variables using collected data through survey measurement factors are found in Table

A2-1 of Appendix 2. Reliability of independent variables, a mediating variable, and dependent variables was greater than 0.7 in all. This shows that the reliability level for application of this study model is very high.

Next, this study confirmed Construct Validity showing how measurement method accurately measures the construct. According to study results by Comrey (1973), Factor Loading of aspects are generally numeric values showing which variables are related to specific aspects. If values are greater than 0.45 and less than 0.54, they are 'Fair', greater than 0.55 and less than 0.62, they are Good, and greater than 0.71, they are Excellent. Three measured items among Factor Loading for all variables fell in the range greater than 0.63 and less than 0.70, and they were evaluated as Very Good. All of the remaining measured items were greater than 0.71. Thus, Construct Validity of this study was evaluated as Excellent.

4.4 Verification of Research Hypothesis

Results of the proposed research model are summarized in Figure 4-2 as follows.

To test hypotheses 1 through 6, multiple regression analysis was executed.

As shown in Table A2-2, it was found that among internal antecedents, only one variable, Business Knowledge has a statistically significant effect on IT Planning Capability (0.25, $p < 0.01$) and the other variables were rejected (thus H1 is supported).

When it comes to external antecedents, Director's Concern & Support (0.16, $p < 0.10$) and Business Worker's Concern & Support (0.18, $p < 0.10$) were found to have a statistically significant effect on IT Planning Capability and the other variable was rejected (thus H5 and H6 are supported). Adjusted R^2 was 0.33 which means an explanatory power of antecedents on IT Planning Capability. Put another way, antecedents are explaining IT Planning Capability of information strategic organization by about 33%.

On the other hand, we tested the causal relationship between IT Planning Capability (PC) and Timeliness (TL), the reflector of Satisfaction of Business Users. As shown in Table A2-3 in Appendix 3, there was a statistically significant causal relationship on them (0.30, $p < 0.01$). It means that Hypothesis 7 is supported. Adjusted R^2 was 0.28 which means that IS Planning Capability explains Timeliness by about 28%.

To test the mediation effect of IS Planning Capability between independent variables and a dependent variable, we used the methodology proposed by Baron & Kenny (1986). This technique assesses mediating effects through a 3-step regression analysis.
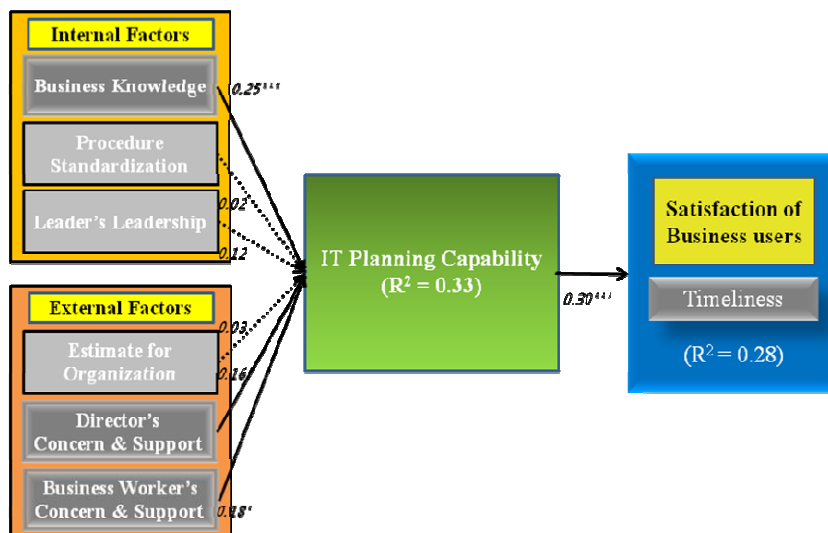
Figure 4-2 Result of Research Model [그림 수정 Concern=>Commitment]

Table 4.1 Measurement Results of Mediating Effect of IS Planning Capability Variables (Independent Variables: Business Knowledge; BK)

Step	Dependent Variables	Independent Variables	β	Result	F-value	R^2
1.1	PC	BK	0.402***	Accepted	30.376***	0.161
1.2	TL	BK	0.517***	Accepted	87.312***	0.373
1.3	TL	BK	0.163	Rejected	106.524***	0.416
		PC	0.327***	Accepted		

| BK: Business Knowledge |
| PC: IS Planning Capability |
| TL: Timeliness |

The first step is regressing the mediator variable on the independent variable; the second step is regressing the dependent variable on the mediator; the third step is regressing the dependent variable on both the independent variable and the mediator [6].

If the results of these three regression analyses satisfy the following four conditions, mediating effects are confirmed;

First, the first regression analysis must indicate that the independent variable has significant influence on the mediating variable. Second, the second regression analysis must indicate that the independent variable has significant influence on the dependent variable. Third, the mediating variable must have significant influence on the dependent variable. If these conditions all hold in the predicted direction, then the effect of the independent variable on the dependent variable must be greater in the second equation than in the third. Perfect mediation holds if the independent variable has no effect when the mediator is controlled [6].

By definition, the perfect mediation effect means the situation in which causal relationship between antecedents (e.g., Business Knowledge) and a dependent variable (e.g., Timeliness) can be explained only through a mediating variable (e.g.,

IT Planning Capability). On the other hand, partial mediation effect means the situation where causal relationship between antecedents and a dependent variable can be explained not only through their direct relationship but also through a mediating variable.

According to results summarized in Table 4-1, it was found that the IS Planning Capability (PC) variable has a 'Perfect Mediation Effect' between independent variable, Business Knowledge (BK) of IS strategic planning team and dependant variable, Timeliness (TL).

In addition, according to results summarized in Table 4-2, it was found the IS Planning Capability (PC) variable has a 'Perfect Mediation Effect' between Director's Commitment & Support (DCS) and Timeliness (TL).

Lastly, according to results summarized in Table 4-3, the IS Planning Capability (PC) variable has a 'Perfect Mediation Effect' between Business worker's Commitment & Support (BCS) and Timeliness (TL).

It means that the impacts of Business Knowledge (BK), Director's Commitment & Support (DCS) and Business worker's Commitment & Support (BCS) on Timeliness can be explained only by the level of IT Planning Capability (PC).

Table 4-2 Measurement Results of Mediating Effect of IS Planning Capability Variables
(Independent Variables: Director's Commitment & Support; DCS)

Step	Dependent Variables	Independent Variables	β	Result	F-value	R^2
2.1	PC	DCS	0.417∗∗∗	Accepted	36.667∗∗∗	0.211
2.2	TL	DCS	0.288∗∗∗	Accepted	17.577∗∗∗	0.128
2.3	TL	DCS	0.119	Rejected	75.390∗∗∗	0.379
		PC	0.281∗∗∗	Accepted		
DCS: Director's Concern & Support
PC: IS Planning Capability
TL: Timeliness

Table 4-3 Measurement Results of Mediating Effect of IS Planning Capability Variables
(Independent Variables: Business worker's Concern & Support; BCS)

Step	Dependent Variables	Independent Variables	β	Result	F-value	R^2
3.1	PC	BCS	0.346∗∗∗	Accepted	37.648∗∗∗	0.191
3.2	TL	BCS	0.299∗∗∗	Accepted	15.489∗∗∗	0.089
3.3	TL	BCS	0.042	Rejected	44.212∗∗∗	0.362
		PC	0.579∗∗∗	Accepted		
BCS: Business worker's Concern & Support
PC: IS Planning Capability
TL: Timeliness

As a matter of course, three independent variables (Procedure Standardization, Leader's

Leadership and Estimate for Organization), already rejected during verification process of hypothesis 1 – 6, were excluded when the mediation effect was tested.

5. Conclusion

5.1 Summary

The study selected 'IS Planning Capability' as the most important business task among tasks implemented in IS strategic planning teams, and established internal influencing factors and external influencing factors in information strategic organizations which can affect this planning capability as independent variables. In addition, the study selected 'timeliness' as an index to measure business user satisfaction, and established research hypotheses for a causal relationship among variables to explore how the relation between independent variables and IS Planning Capability can affect 'timeliness' representing business user satisfaction.

Through a survey results of hypothesis testing after establishing a proposed research model, it was found that independent variables established have a positive effect on IS planning capability, and furthermore, on business users of an information system. Through study results, it was suggested that 'business understanding of IS strategic planning members', among internal influencing factors, has a positive effect on planning capability of an IS strategic planning team. This shows information strategic organization members implementing planning and supervising operation tasks in a position of mediator between business and computing organizations should clearly understand the industry cluster within which the business falls, and greater understand the business strategy and whole business tasks of the business. In addition, the study shows that to plan an information system with which business can be satisfied, IS strategic planning teams should take the role of experts, representing business situations and opinions based on a wide and concise understanding of the business environment, business description, and characteristics of business tasks in discussion with a computing organization during the planning process of an information system on behalf of business.

The study also shows that Director's Commitment & Support (DCS), and Business worker's Commitment & Support (BCS), among external influencing factors, have a positive effect on IS Planning Capability of IS strategic planning team. This shows that to smoothly implement specific planning tasks, an IS strategic planning team in a position of mediator between business and IT units should implement a whole business

strategy and be supported by management, including the CEO managing the business on the whole and business organizations performing business practices. In other words, commitment and support of business and management organization surrounding an IS strategic planning team can be expressed as a requirement and expectation for constructing an IS in the end. If an IS strategic planning team plans a system within which these requirements and expectations are well reflected, it is concluded that business users of this system ultimately can be satisfied.

Unfortunately, a total of three variables, including two internal influencing factors (The extent of standardization for implementation procedure of organizational tasks, leadership of information strategic organizational leader) and one external influencing factor (the extent of budget support for the organization) among a total of 6 variables were rejected. It is assumed that these three variables, unlike the other variables selected in results, were not selected because these are factors greatly affected by organization type, components, task characteristics, etc. of many businesses participating in the survey, thus resultant values in the survey were varied.

This study summarizes two managerial implications as follows: First of all, this intitial research study is attempted to identify a causal relationship by establishing internal and external influencing factors on planning capability of an IS strategic planning team. Secondly, this study empirically supports the need for a mediating organization. This allows academia and industry to recognize a required role of an IS strartegoc planning team.

5.2 Limitations

There are two limitations summarized in this study. First, this study focused only on 'planning tasks of IS' as an index to measure effectiveness of operational tasks of an IS strategic planning team. Like reasons given in the conclusion for why three variables among independent variables were rejected, it is seen that only a specific task, 'planning tasks', was focused on and generalized under the assumption that each business can have different operational methods and types of organization. Thus, there exists a limitation in the study that Contingency Variables were not considered. Secondly, user satisfaction was only evaluated by a measurement index, 'timeliness.' Needless to say, it was decided to focus on 'timeliness' while establishing the study model and hypothesis, and found that timeliness can represent user satisfaction, a dependent variable, through factor analysis. However, characteristics other than timeliness could be seen as measurement factors to

measure user satisfaction of those provided with IT planning related output and services from an IS strategic planning team.

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Appendix 1. Design of Study Variables

1. Internal Factors of Organization

Three measurement variables, Business Knowledge (BK) of organization members, Procedure Standardization (PS), and Leader's Leadership (LL) and a total of five subdivided measurements were established.

Table A1-1. Operational Definition and Measurement Items of 'Internal Factors of Organization' Variables

Measurement Variable	Operational Definition	Measurement Item	Explanation	Related Study
Business Knowledge	The extent of understanding of information strategic organization members	The extent of knowledge of organization members for business tasks	The extent of understanding of information strategic organization members of business strategy and industry characteristics of related business	Henderson (1990); Lederer & Sethi, (1988)
Procedure Standardization	The extent of implementing organizational tasks according to official regulation and procedure	The extent of formalization of documentation for organizational tasks	The extent of tasks officially documented within information strategic organization	John R.Schermerhorn et al. (1985)
		The extent of standardization of organization tasks	The extent of standardization of task implementation procedure within information strategic organization	Robbins (1985)
Leader's Leadership	The extent of leadership capability of leaders on organization culture and members	Power influencing organization culture by leadership of organizational leader within information strategic organization	The extent of influence by leadership of an information strategic organizational leader for culture formation	Quinn & McGrath (1985); Cameron & Freeman (1999); Kim, Ho-jeong (2003);
		Power influencing organization members by leadership of organizational leader within information strategic organization	The extent of influence of leadership on information strategic organizational leader for members of information strategic organization	Quinn & McGrath (1985); Cameron & Freeman (1999); Kim, Ho-jeong (2003);

2. Organization External Factors

Three measurement variables, Estimate for Organization (EO), Director's Concern & Support (DCS), and Business Worker's Concern & Support (BCS) were established along with two measurement items for each variable.

Table A1-2 Operational Definition and Measurement Item of
'External Factors of Organization' Variables

Measurement Variable	Operational Definition	Measurement Item	Explanation	Related Study
Estimate for Organization	The extent of budget invested to specific organization within business for developing structure and function of organization (Karimi, 1988)	The extent of budget invested for hardware and software of information system	The extent of budget invested in an organization for construction, design, and operational tasks for hardware and software of information system	Raymond (1985)
		The extent of budget invested for planning tasks of information systems	The extent of budget invested in information strategic organization for planning information system	King & Prekumar (1994)
Director's Concern & Support	The extent of concern and support by management including CEO in all situations of planning, constructing, operating, maintaining information systems	The extent of concern and support of management	The extent of concern and support of CEO and management for information strategic organization	Sethi & Lederer (1988)
		The extent of leadership capability of management	The extent of leadership capability of CEO among management for effective operation of whole organization in business including information strategic organization	Pyburn (1983)
Business Worker's Concern & Support	The extent of concern and support for information strategic organization by business organization	The extent of concern of business organization for information strategic organization	The extent of concern by business organization members for projects, conferences, tasks organized by information strategic organization	Franz and Robey (1986); Wixom B. H. and H. J. Watson (2001);
		The extent of support by business organization for information strategic organization	The extent of support by business organization members for projects, conferences, tasks organized by information strategic organization	Franz and Robey (1986); Wixom B. H. and H. J. Watson (2001);

3. IS Planning Capability (PC) of an Information Strategic Organization

IS Planning Capability (PC) of information strategic organization was established as a measurement item to measure Operational

Effectiveness (OE) of an information strategic organization. IS Planning Capability (PC) means the extent of Analysis Capability to propose alterations through analysis and evaluation of an organization's problems (Analysis Capability), the extent of leadership in an external competitive environment (Lead Capability), and the extent of coordination capability, mediating smooth communication between computing and business organizations (Coordination Capability).

Table A1-3. Operational Definition and Measurement Item of 'IS Planning capability of Information Strategic Organization' Variable

Measurement Variable	Operational Definition	Measurement Item	Explanation
IS planning Capability of information strategic organization	The extent of capability to propose alterations by analyzing and evaluating organizational problems (Analysis Capability), the extent of capability to lead in an external competitive environment (Lead Capability), the extent of capability to mediate communication between computing organization and business organization (Coordination capability)	Analysis Capability among IS Planning capability of information strategic organization	The extent of flexibility for change, the extent of capability to find problems, understand, and propose proper alterations for the problems
		Lead Capability among IS Planning capability of information strategic organization	The extent of capability to find new technologies and services for information systems, the extent of capability to lead in industry cluster
		Coordination Capability among IS Planning capability of information strategic organization	The extent of smooth mediating capability to deliver requirements of business organization users to developer in charge of computing organization and smoothly deliver development related opinions of developer in charge of computing organization to business organization users

4. User Satisfaction for IT Planning Service Provided by Information Strategic Organization

User Satisfaction (US) for IT planning service provided by an information strategic organization means the extent of business user satisfaction for IT planning services, reflecting timeliness and accuracy, provided through effective operation of an information strategic organization.

As a measurement item, Timeliness (TL) (Bailey and Pearson,1983, Rainer and Watson,1995, Iivari and Koskela,1987) of IT planning output or services provided to users .was established

Table A1-4 Operational Definition and Measurement Items of 'User Satisfaction of IT Service Provided by Information Strategic Organization' Variable

Measurement Variable	Operational Definition	Measurement Item	Explanation	Related Study
User Satisfaction of IT planning	The extent of reflecting timeliness of IT planning services provided through effective operation of an	Timeliness of IT planning output or services provided to	The extent of timeliness and accuracy of output and services provided by information strategic organization,	Bailey and Pearson,1983; Rainer and

service	information strategic organization	users	meeting requirements of business users	Watson (1995); Iivari and Koskela (1987)

Appendix 2 Analysis of Reliability and Validity of Measurement Variables

Table A2-1 Analyzed Results of Factors and Reliability

Construct	Item	Business Knowledge	Procedure Standardization	Leader's Leadership	Estimate for Organization	Director's Concern & Support	Business Worker's Concern & Support	Planning Capability	Timeliness	Cronbach's alpha
		1	2	3	4	5	6	7	8	
Business Knowledge	BK1	0.811								0.808
	BK2	0.852								
	Bk4	0.822								
Procedure Standardization	PS4		0.774							0.824
	PS2		0.820							
	PS1		0.801							
Leader's Leadership	LL3			0.753						0.782
	LL4			0.803						
	LL2			0.742						
	LL1			0.755						
Estimate for Organization	EO3				0.681					0.942
	EO2				0.726					
	EO1				0.754					
Director's Concern & Support	DCS1					0.780				0.754
	DCS2					0.859				
Business Worker's Concern & Support	BCS2						0.871			0.874
	BCS3						0.727			
	BCS1						0.621			
Planning Capability	PC2							0.832		0.729
	PC1							0.765		
	PC5							0.675		
Timeliness	TL1								0.754	0.871
	TL2								0.745	

Table A2-2 Regression Analysis of Independent Variables for IS Planning Capability

Model		Standardized Coefficient (β)	t	Level of Significance	VIF	Result
1.00	BK	0.25	6.94	0.00	1.37	Accepted
	PS	0.02	0.22	0.83	1.16	Rejected

LL	0.12	1.63	0.11	1.21	Rejected
EO	0.03	0.41	0.68	1.05	Rejected
DCS	0.16	1.88	0.06	1.53	Accepted
BCS	0.18	1.87	0.07	1.34	Accepted
Dependant Variables(IS Planning Capability)					

Table A2-3 Regression Analysis of Independent Variables for Timeliness

Model		Standardized Coefficient (β)	t	Level of Significance	Result
1.00			2.12	0.04	
	PC	0.30	15.74	0.00	Accepted
Dependant Variables(Timeliness)					