SERVICE QUALITY EVALUATION INDICATORS FOR ASP-BASED PROJECT MANAGEMENT INFORMATION SYSTEM

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ABSTRACT: It is very important for performance of information system that we make an effort to raise user's satisfaction by continuously grasping user's requirement by evaluation of PMIS based on ASP service quality and reflecting this to information system. However, It is lack that developments of suitable evaluation index of PMIS based on ASP service quality. Hereupon, In this study, we propose the evaluation indicators. First, The evaluation area is classified by form the foundation of D & M IS Success Model (2003); system quality, information quality, service quality. Second, The detail evaluation item which include considerations which are gotten through investigation of the construction industry and PMIS based on ASP is grouping by form the foundation SERVQUAL which is a service quality evaluation tool proposed PZB(1988). It is suitable to evaluate PMIS based on ASP service quality in construction industry and able to evaluate various aspects.

Keywords: D&M IS Success Model (2003), Evaluation Indicators, PMIS (based on ASP), SERVQUAL

1.   INTRODUCTION

1.1.   The Overview and Purpose

We live in information-oriented society. Construction industry must therefore cope effectively with sudden change of business environment. However, the construction industry still ranks the lowest in the corporations' information technology according to a survey by National Information Society Agency in 2007. While construction industry in GDP increased over 17%, the level of information technology is still underdeveloped. For the construction industry is becoming bigger and more complex in the recent years, necessity to become more information-oriented is also increasing. Some major corporations are developing PMIS on their own, many construction companies are not able to develop PMIS and lack effort to be information-oriented. However, to achieve true information technology, participation of all participants is necessary. ASP which provides necessary features and a competitive price for project period is more efficient than development by itself in the light of development expenses and operation members.

According to 'ASP industry condition in 2006' that examine of Korean IT rental association, market size of domestic ASP industry increased from 107.10 billion won in 2002 to 233.90 billion wons in 2006. And opinion that

ASP will use occupy 30.59% within 2 year is showed. As necessity of ASP is gradually increased, we should secure clear utility, reliability, confidence of use about information system. To solve this issue, I know that process grasping requirement of users and reflecting to information system by regular and continual evaluation is necessary for performance of information system through studies which related information system based on ASP
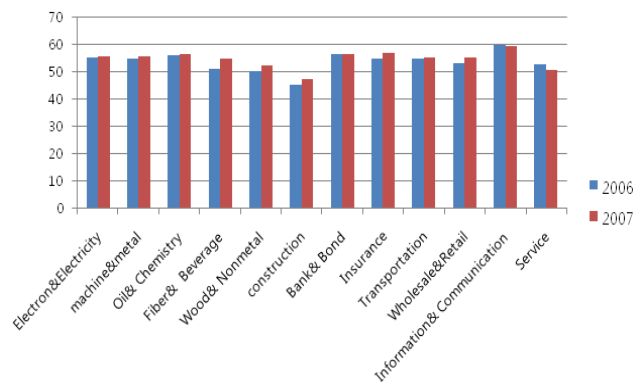

Figure 1. Change of information-oriented level classified by type of business (National Information society Agency in 2007)

This study proposes an evaluation of PMIS based on ASP service quality, as a leading study for analysis between user satisfaction and relation decision factor of PMIS based on ASP service quality.

1.2. Method & Area of Study

1.2.1. Area of study

1) PMIS in Construction industry is classified into PMIS which is developed by the construction corporations themselves and PMIS based on ASP and PMIS which is specified large size project (Mun, Jeong-Ho 2003). Because the characteristics of construction industry is ① frequent changes of activity, ② lack of operational members ③ temporary organization. ASP which provides necessary features and a competitive price for project period is more efficient than development by itself in the light of development expanses and operation members.

The scope of this study is limited to PMIS based on ASP (Application Service Provider) and usefulness of study is increasing.

2) Garvin(1984) classified different types of service quality into 5 approaches [See Table 1] and Klous(1985) classified according to product and customer's satisfaction. These two methods are becoming more prominent.

Table 1. Approach method of service quality

Pre-experience approach	It is analysis impossible concept that can know through experience.
Focusing product approach	quality is concept that can be evaluated by gathering desirable feature of product and regarded as variable that can measure quality clearly.
Focusing user approach	Quality is seen as subjective concept that differ according to seen person's eye, and is regarded as a good quality when different desire of consumers and need is satisfied well
Focusing manufacture approach	It is concept that evaluate quality according to the standard if design and standard of product are decided by thing associated with engineering method and process of manufacture.
Focusing value approach	Product that defines quality substantially by expense and price, is have good quality when it offers suitableness in satisfied price.

However, the information technology in the construction industry lacks consideration for requirement by staff-in-charge and user's business and convenience (Kim, Gyeong-Rae 2001), but instead relies on the creator of the informational technology system rather than the end-user.. This study focuses user satisfaction by user group.

1.2.2. Method of study

The purpose of this study will be achieved through method of study and procedure as following:

First, investigate and analyze existing circumstances of construction industry and PMIS based on ASP through literature and statistical data investigation to draw suitable area and item to PMIS based on ASP. It is use footing of evaluation indicators development.

Second, gather Both evaluation items that is drawn through investigating literature related IT Success Model and measurement tool of service quality (SERVQUAL, SERVPERF) and items which are reflected when PMIS based on ASP is evaluated. and draw evaluation area and details item.

Third, after examining experts opinion about drawn evaluation indicators, build the final evaluation indicators of PMIS based on ASP and analysis model of their importance.
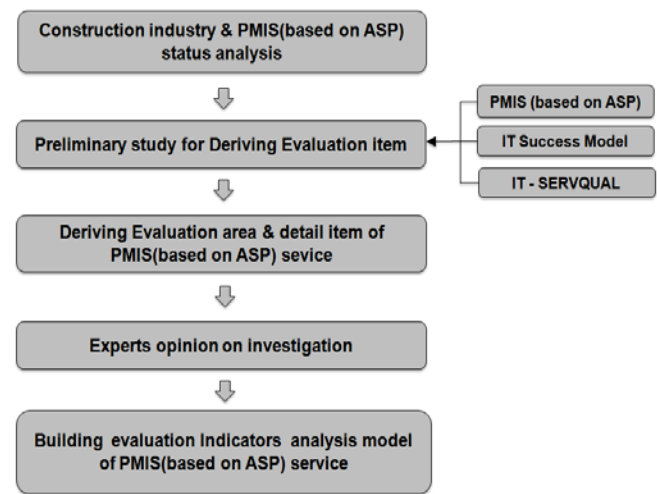

Figure 2. Flow of study

1.3. Expected Effect

It is very important for performance of information system that we make an effort to raise user's satisfaction by regularly and continuously identifying user's demands by evaluating PMIS based on ASP service quality and reflecting this to information system. To get adequate and reliable evaluation results, evaluation items that are suitable evaluation purpose have to be selected.

This study's propose is to propose evaluation indicators which is able to evaluate PMIS based on ASP service quality in various aspect as a leading study for analysis between user satisfaction and relation decision factor of PMIS based on ASP service quality. Using evaluation indicators is able to evaluate quality level of PMIS based on ASP and satisfaction of end users. Then we are able to analyze user's requirements which are main factors by analyzing relationship between evaluation indicators and satisfaction of end-users. We use this analysis results as guideline for successful system development by receiving feedback continuously. Improvement in service quality of PMIS based on ASP affected user's satisfaction and this may guide PMIS based on ASP by success soon and accomplish information-oriented in the construction

industry.

2. PRELIMINARY STUDY

The theoretical background of this study is, first of all, because the existing evaluation of service quality is studied in service industry, I studied about PMIS based on ASP and construction industry for Deriving evaluation item which is suitable for PMIS based on ASP in construction industry and directing evaluation purpose. Second, I studied about the success model of information system that Evaluation areas and items of service quality which is suggested this study have its roots in it. Finally, service quality which is dealt with this study is defined and SERVQUAL and SERVPERF which is evaluation tool of service quality are analyzed.

2.1. Study of ASP-Based PMIS

To evaluate information system, because the target's purpose, expectation effect, and success factor or obstructed factor become evaluation factor, I analyzed concept, introduction purpose, expectation effect and obstructed factor of PMIS based on ASP through literature investigation. ASP is usually defined as "service of offering lease system which operate and support relevant application and IT infrastructure through network if customers pay using expenses by contracting lease contract without directly establishing application which they need in the company."

The purpose of introducing PMIS is to cultivate total business management capacity by supplying synthetic and systematic information and connecting which other system to normalized function by unit business focusing the process control (Mun, Yeong-Il, 2002) PMIS's utilization is unavoidable in construction industry ASP. so ASP is expected method that get strategic effect through the core competence strengthening and customizing as well as economic effect of these cost-saving and technological effect of following access of a leading technology and elevation of service quality. In spite of this expectation effect, factor that obstructed activation of PMIS based on ASP is as following.
(1) Security of company information.
(2) Limit to customizing.
(3) Lack of communication function between in/outside organization.
(4) Lack of integration between tools that do process management.
(5) Lack of process, cost management.
(6) Absence of Model for special business extent such as businesses of subcontractor.
(7) Interruption between PMIS based on ASP and related system.
(8) Lack of standardization for information format.

2.2. Information System success Model

DeLone and McLean(1992) arrange success factors of information system through literature study that is presented to move and suggested IS success model of DeLone and McLean which is composed six independence variables which is performance measurement element in study for relationship between information system and user's satisfaction.
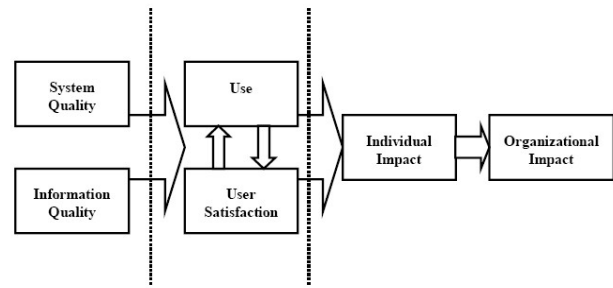

Figure 3. D&M IS Success Model
(DeLone & McLean, 1992)

D & M IS Success Model explained that 1) system quality and information quality have influence on use of system and user satisfaction; 2) use of system and user's satisfaction have influence on each other; 3) use of system and user's satisfaction have influence on individual performance, and; 4) impact of individual performance is impact of organization performance.

IS Success Model of D & M was quoted in several researches, but was also criticized because the success model had gathered main variables through literature study rather than result by some theoretical basis. After 10 years, DeLone and McLean suggested updated IS success model which is reflected criticism of researcher and current state.
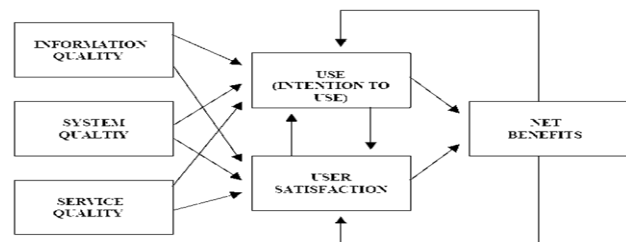

Figure 4. D&M IS Success Model
(DeLone & McLean, 2003)

The updated model added service quality as independence variables because IT is increasing importance of service, adding concept of Service by using Internet. so updated model is composed seven independence variables.

Beside D&M, Liu and Arnett (2000) presented Information Quality, Learning Capability, Playfulness, System Quality, System Use, Service Quality as factor influencing in website success. Negash (2002) also presented Information Quality, System Quality, and Service Quality. (Jung, In-su 2007)

The factors which influenced the user's satisfaction as success variables of IS are composed information quality, system quality, service quality through literature study. I studied about three factors.
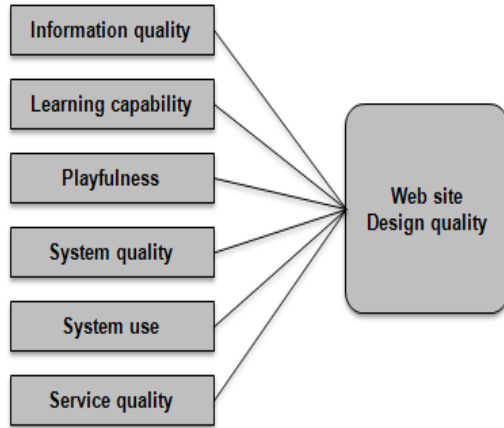
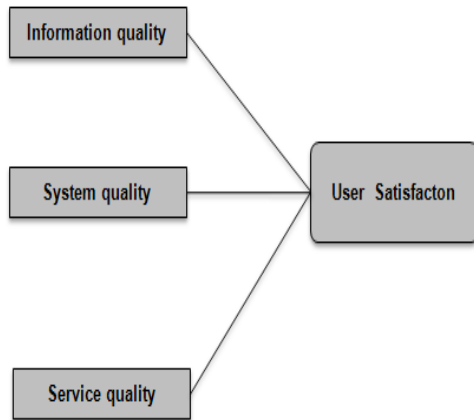**Figure 5.** Success factor for Design Quality of Web sites Liu&Arnett(2000)

Figure 6. Impact factor of IS user's satisfaction Negash(2002)

2.2.1. System Quality

System quality means performance of system itself that processes information. This relates to how the system operates while in use of information system. (Bailey & Pearson 1983; Ivas & Olson 1984; Srinvasan 1985). The investigation of existing researches shows detailed factors in system quality evaluation as accuracy, efficiency, ease of use, convenience of access. When hardware and software worked without defect, system quality is increasing.

Table 2. Preliminary study of System quality

Section	Evaluation Factor	Researcher
Domestic	Easy of Use, usefulness, aesthetics, functional, certainty, responsibility, accessibility, Stability, convenience, sympathy	Jung, In-Su(2007)
	Convenience, accuracy, accessibility, swiftness, , stability, compatibility	Kim, Gu(2006)
	Speed, reliability, solubility	Kim, Jung-Gun (2007)
	processing speed, stability, errorless	Park, Jung-hyeon etc.(2002)

	Convenience, reliability	Joe, Man-Hyeong etc,(1997)
	Easy, accessibility , accuracy, softness, flexible, reliability, efficiency	Han, Yeong-Chun etc.(1997)
Oversee	accuracy, flexibility, reliability, sophistication integration, efficiency, ease of use, convenience of access, database contents	DeLone & Mclean(2003)
	flexibility, interoperability, functionality	Edward W.N. Bernroider(2008)
	rapid access, quick error recovery, correct operation & computation, security, balanced payment, coordination	Liu & Arnett(2002)
	reliability, response time, easy of use, easy of studying	Belardo, Karwan, & Wilace(1982)
	response time	Conklin Gotterer, & Rickman(1982)
	Access convenience, system flexible, System Integration, response time	Bailey & Pearson (1983)
	Response time, system reliability, system accessibility	Srinivason (1985)

2.2.2. Information Quality

Information system (Bailey & Pearson 1983; Srinvasan 1985). Information system saves, stores, processes and manages information resources and supply useful information for diverting decision-making to individual or group. When information system supply is applied as useful resource in business, it shows its true value. Information quality is important element that decides information system success than information system itself (Swanson1987). In many researches, detail evaluation items for system quality can be divided into swiftness of information acquisition and usefulness of information resource. Also, Zmud (1978) developed various evaluation indicators for information quality and analyzed what factors are important through empirical study. So analysis result is accuracy and timeliness which are important factors in deciding information quality.

Table 3. Preliminary study of Information quality

Section	Evaluation Factor	Researcher
Domestic	Accuracy, utilization, precision, currency, compendiousness, consistency, analysis possibility, faithfulness	Jung In-Su(2007)
	Accuracy, reliability, adaptation, relativity,	Kim Gu(2006)

Section	Evaluation Factor	Researcher
	timeliness, completeness Importance	
	Accuracy, composition form, completeness, timeliness	Kim Jung-Gun (2007)
	Accuracy, appropriateness of composition, comprehensiveness of information, timeless of information offer	Park Jung-hyeon etc.(2002)
	Timeliness, accuracy	Joe Man-Hyeong etc,(1997)
	Accuracy of information, immediacy, completeness, integrity, appropriate form, understanding etc.	Han Yeong-Chun etc.(1997)
Oversee	usefulness, readability, clarity, format, appearance, accuracy, currency, completeness, timeless, comparability, usability.	DeLone & McLean(2003)
	integrated and better quality of information	Edward W.N. Bernroider(2008)
	business profitability, improved decision quality and performance, perceived benefits information offer	Liu & Arnett(2002)
	accuracy, completeness, consistency, timeless	Ballou & Pazer(1985)
	Effectiveness of information, reliability, quality of information offer style, quality of information offer	Zmud(1978)
	Accuracy of output, adaptation, repetition, easy of use, contribution of decision-making	Olaisen(1990)
	intrinsic, accessibility, contextual, representational	Diane et al.(1997)

2.2.3.   Service Quality

Service quality is defined as general attitude and decision related to the merits of service.(PZB 1988) The study about information system mainly accomplished in marketing or business management. However, the study about Project Management Information System (PMIS) is lacking in construction. Because PMIS based on ASP form of outsourcing of information system, it provided with various kinds of services such as A/S, equipment of hardware or software, supporting network, maintenance as well as product. Therefore, service quality is important success indicator of information system. Evaluation tool is SERVQUAL which are developed by PZB (1988) and SERVPERF which is developed for criticizing SERVQUAL

Table 4. Preliminary study of service quality

Section	Evaluation Factor	Researcher
Domestic	Variety, accessibility, responsiveness, swiftness, reliability, kindness, reactivity, convenience, supporting	Jung, In-Su (2007)
	Immediate reception, reliability, confidence, sympathy	Kim, Jung-Gun (2007)
	Service swiftness, time observance of employee, professional, sympathy	Park, Jung-Hyeon (2002)
	technological support, contribution in achievement of objective of organization	Joe, Man-Hyeong et. al (1997)
	Information center's operation, user teaching and support etc	Han, Yeong-Chun et. al (1997)
Oversee	tangible, reliability, responsiveness, sympathy, confidence	PZB (1988)
	Quick responsiveness, assurance, reliability, empathy	Liu & Arnett(2002) DeLone & Mclean (2003)
	system reliability, availability of service	Edward W.N. Bernroider (2008)
	reliability, responsiveness, assurance, sympathy	Kettinger & Lee (1997)

In comparison with this paper, Kim, Ye-Sang (2006) analyzed IS's satisfaction, focusing on the end-user. This study divided factors into satisfaction of IS, using effect and use effect realization and company's information support as evaluation area for satisfaction analysis and suggested results through correlation analysis. The difference in my paper is the evaluation area which is divided into system quality, information quality, service quality and propose evaluation indicators, used to evaluate service quality in various aspect for PMIS based on ASP. Jung, In-Su (2007) suggested evaluation model as preliminary study for satisfaction analysis of CALS system. It is the same that evaluation area is system

quality, information quality, service quality. But, this study classifies evaluation indicators on the basis of SERVQUAL and added detail items which is considered feature of construction industry and PMIS based on ASP

2.3. Service Quality

2.3.1. Concept of   Service Quality

Gronroos (1982) divided meaning of service quality by technological quality and functional quality. Technological quality is what the consumer identifies with the activity itself that provides convenience by services. Functional quality is what the consumer identifies with the convenience is provided, through the service. The ASP based on PMIS service quality which is object of this study is technological quality, meaning that the activity that offers ASP base on PMIS itself. Service quality of evaluation area is functional quality that means method that is provided with convenience.

2.3.2. Measuring Service Quality (SERVQUAL & SERVPERF)
1)   SERVQUAL

SERVQUAL is Service measurement model. This model composes quality of service decision factor by tangibles, reliability, responsiveness, assurance, sympathy 5 dimension and choose 22 detail item.(Parasuraman & Zeithhaml & Berry, 1988). SERVQUAL bases on 'Expectation - inconsistency theory', and defines difference between Perception and expectation about customer's service as following that it is service quality.

Service Quality (SQ) = Perceived Quality (PQ) - Objective Quality (EQ)

SERVQUAL is usually used to a service quality measurement tool in a lot of service related field etc.. as well as marketing in terms of concentrative administration is available evlauation and measures whole level of service that customer is late in enterprise's situation and extracts specific items in point factor or the factor for quality control.

Table 5. Dimension of SERVQUAL

Service quality 10 dimension	SERVQUAL dimension	Definition of SERVQUAL dimension
Tangibles	Tangibles	Physical facilities, equipment, employee, appearance
Reliability	Reliability,	Ability that can believe and achieve exactly promising service
Responsiveness,	Responsiveness,	Attitude to helps customer and provides timeless service
Ability	Assurance	Ability that convey

Courtesy		employee's knowledge and manners, trust and pride
Credibility		
Security		
Competence	Sympathy	Individual attention and interest which the company offers to customer
Communication		
Understanding customers		

After that, a lot of researchers criticized about SERVQUAL through succession study. as following that It is SERVQUAL's limitation.
(1) Repetitive research about Perception and expectation and difference of realization between questions.
(2) Relative importance about composition factor of quality.
(3) Low reliability and propriety of measuring service quality by using difference between perception and expectation
(4) Difficulty about prediction of expectation
(5) Emphasize evaluation of process quality and lack evaluation of outcome quality

2)   SERVPERF

Cronin & Taylor(1992) suggested SERVPERF that only measure performance result of service in critical side of SERVQUAL. evaluation method of SERVPERF keeps 22 questions and removes expectation concept and only evaluates performance of service

Service Quality (SQ) = Performance (P)

SERVPERF doesn't measure expectation concept. so questions decreases than SERVQUAL's, quality of service estimation enabled. Yun Seong-Uk(2003) suggested analysis result that SERVPERF is suitable than SERVQUAL through/ Kettinger(1997) suggested that SERVPERF is proper than SERVQUAL. (Nam Yyeong-Jun, 2007) SERVQUAL and SERVPERF is generalized evaluation tool for service quality. But. when we evaluate service quality, It do not apply as it is it. we consider various important factor of the field. so we develop suitable evaluation tool . Therefore, To utilize SERVQUAL, service quality dimension is reclassified as a type of Industry. and used words is corrected. SERVQUAL supplies departure point of item development. However, to apply evaluation, review of reliability and propriety is necessary.(Caman, J.M. 1990)
This study set out from necessity realization of an estimation tool that can estimate quality of service in reply under proposition that provide service that is an information system PMIS based on ASP. service quality can divide into two dimensions of outcome quality and process quality. outcome quality is that what customer is offered from production process and process quality is that how customer is offered from production process. like that, customer's perception about service quality is made up by all process and outcome. so when we evaluate service quality, we have to consider all

dimensions.(Lee yu-jea, Lee jun-yeop: 2001). But, study about measuring ASP service quality has proceeded focusing only in process quality dimension by utilizing SERVQUAL or SERVPERF. Purpose of this study develops evaluation tool for PMIS based on ASP that is based five dimensions of SERVQUAL and considered quality decision factors of construction, PMIS based on ASP. So this tool is suitable and able to evaluate process quality and outcome quality

3. THE ESTABLISHMENT OF EVALUATION INADICATORS FOR ASP-BASED PMIS SERVICE QUALITY

3.1. Deriving Evaluation Area & Item

I examined about information system success model and a service quality evaluation tool through preliminary. In this study, I classified into system quality, information

quality, service quality as evaluation area based on Updated D & M IS Success Model (2003). And to derive detail item of three areas, I gathered success factors of information system and evaluation items of service quality. Because existing study was mainly achieved in business management or marketing, This items are involved consideration items when evaluate through investigation and analysis of PMIS based on ASP. Then Derived items are grouping by SERVQUAL which is evaluation tool of service quality. In other words, I classified into system quality, information quality, service quality as evaluation areas based on Updated D & M IS Success Model (2003) and grouped detail evaluation items and indicators by utilizing SERVQUAL. Then I derive evaluation tool which is able to evaluate both outcome quality, process quality and suitable as following Table 7.

Table 6.   Evaluation Area & Item of ASP-based PMIS

Final Object	Evaluation Area	Evaluation item	Detail Evaluation item	Evaluation indicator	Researchers
Service Quality evaluation of PMIS based on ASP	System quality	IS integration	Connection	Degree of connection with other function	
				Degree of connection with system of head office/other spot	Kim Y.S. (2006)
			communication	Degree of communication elevation between department in enterprise	
				Degree of communication elevation with project participators	Kim Y.S.(2006)
			Compatibility	Degree of standardization document format	
				Degree of compatibility with other kind of software	Kim G.(2006)
		IS Convenience	Easyness	Degree that is constructed so that can use easily system everybody	Kim G. (2006) Joe M.H. (1997), Han Y.C. (1995)
				Degree that is apt to be uploaded /downloaded in system data	
				Degree of connecting related knowledge position for promotion of business utilization	
				Degree of easyness inserting Data	Belardo, Karwan, & Wilace (1982)
			accessibility	Degree of possibility for visually grasping present condition	Han Y.C. 1995)
				Degree of approach difficulty to system	Jung I.S. (2007), Kim Gu(2006) Liu & Arnett(2002) Bailey & Pearson (1983) Srinivason(1985)
			Efficiency	degree of decreasing consumptiveness business that happen from time to time	
				degree of decreasing business	

			repetition	
		Swiftness	Degree that system is rapidly processing information	Kim Y.S. (2006)
	IS tangibles	aesthetic	Degree of screen search function composition that is Visually easy	
			Suitable degree of button, symbol, character size, image size etc.. of screen	
		international	Degree of global standardization	
		Functional	Degree that useful knowledge contents are readied. so that user can take advantage of wantingknowledge	
		expressivity	Degree of is proper method that System offer information resource to user	
		consistency	Degree of Consistent screen system composition	
	IS assurance	Accuracy	When handle business, Degree of decreasing happened mistake	Kim Y.S. (2006) Han Y.C.(1995)
			Degree that system handle information as user wants	
		Stability	Degree that System performance is continuously keep fixed state.	Jung I.S. (2007), Kim G. (2006) Park J.H. (2002)
		Utilization	Degree that system is using well as purpose of system	Jung In-Su(2007),
Information quality	IR Swiftness	Timeless	Degree that information resource is timely offered	Kim G. (2006) Kim J.G. (2007), Park J.H. (2002) Joe M.H (1997), Ballou & Pazer(1985)
		Nowness	Degree that information resource is offered by real-time	Jung I.S. (2007), Han Y.C. (1995)
	IR usefulness	Accuracy	Degree of right and certain information that is registered to system	Jung I.S. (2007), Kim G. (2006), Kim J.G. (2007), Park J.H. (2002) Joe M.H. (1997), Ballou& Pazer(1985)
		usefulness	Degree of greatly contributing information that is registered to system in business	Liu & Arnett(2002)
			improvement degree of addend value business efficiency (analysis, plan, expection, strategy establishment etc.)	
		Relation	Degree that contents are suitable in own business	Kim G. (2006)
		completeness	Degree that contents can be used in business as it is without correction	Kim G. (2006) Kim J.G. (2007) Han Y.C. (1995), Ballou & Pazer(1985)
Service quality	service responsiveness	reaction	Degree that Proper solution about problem is offered	
			Degree of reaction for customer's discomfort	

		Swiftness	Degree of quickly offering technological support such as A/S, maintenance, post management	Jung I.S. (2007), Kim S.H. (2006) Liu & Arnett(2002)
		customization	Degree of reflection of requirement	Kim Y.S. (2006)
			Degree that system can operate as user wants	Kim J.G. (2007)
	service sympathy		Degree of offering application that is suitable for Customer enterprise's feature and business	
		supporting	Degree of possession Newest H/W and S/W	Jung Y.S. (2005), Han Y. C. (1995),
			Degree of equipment possession for offering service of rehabilitation , Security and backup offer	
			Degree of User education and support	
	Service reliability	security	degree of protection own data that user feels (degree of danger recognition about information leakage	Jung I.S. (2007), Kim J.G. (2007) Liu & Arnett(2002)
		professional	Degree of expert knowledge possession of service offers	Park J.H. (2002)

3.2. Building the analysis model of importance for evaluation indicators

according following [Figure 7.]. This study described for step 1 building evaluation model for service level & user's satisfaction of PMIS based on ASP.
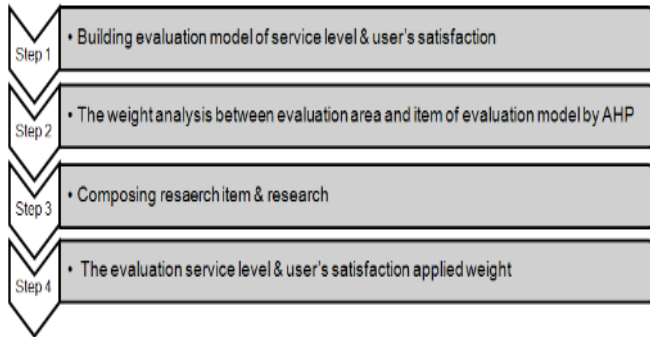

Figure 7. Flow of PMIS (based on ASP) service & user's satisfaction evaluation

Each area and item is necessarily considered. I selected hierarchic analytical method (AHP : Analysis Hierarchy Process) as calculating relative weight of each area or item. AHP analysis technique which is developed by T.L.Saaty in early 1970s can do decision-making that is effective about complex problem by simplifying process of decision-making. To apply AHP technique, we should be preceded best do problem class. (Choei Jae-Hwang, 2007) Purpose for most comprehensive decision-making is established in top-level. Next level is composed various factors which affect in purpose of decision-making. These factors become specific as it is to be in low level. (Jung S.J., Han B.S, 2006)
Hierarchical structure of evaluation indicators for PMIS based on ASP is composed 3 level such as [Figure 8]. Level 1 is system quality, information quality, service quality that is evaluation area, and Level 2 is evaluation items, Level 3 is details evaluation items by each items.

4.   CONCLUSION & SUCCESSION STUDY

It is very important for performance of information system that we make an effort to raise user's satisfaction by continuously grasping user's requirement by evaluation of PMIS based on ASP service quality and reflecting this to information system. However, It is lack that developments of suitable evaluation index of PMIS based on ASP service quality.
Hereupon, In this study, I derive evaluation tool which is able to evaluate both outcome quality, process quality and suitable to evaluate PMIS based on ASP service quality in construction industry as following Table 7. Valuation items and model that present in this study will be used in evaluation of ASP base PMIS's service quality and satisfaction. In hereafter, I will study succession study of construction such as building preliminary items and model through expert's interview, analyzing weight of importance, composing research item & research, final quality level and satisfaction evaluation that apply weight
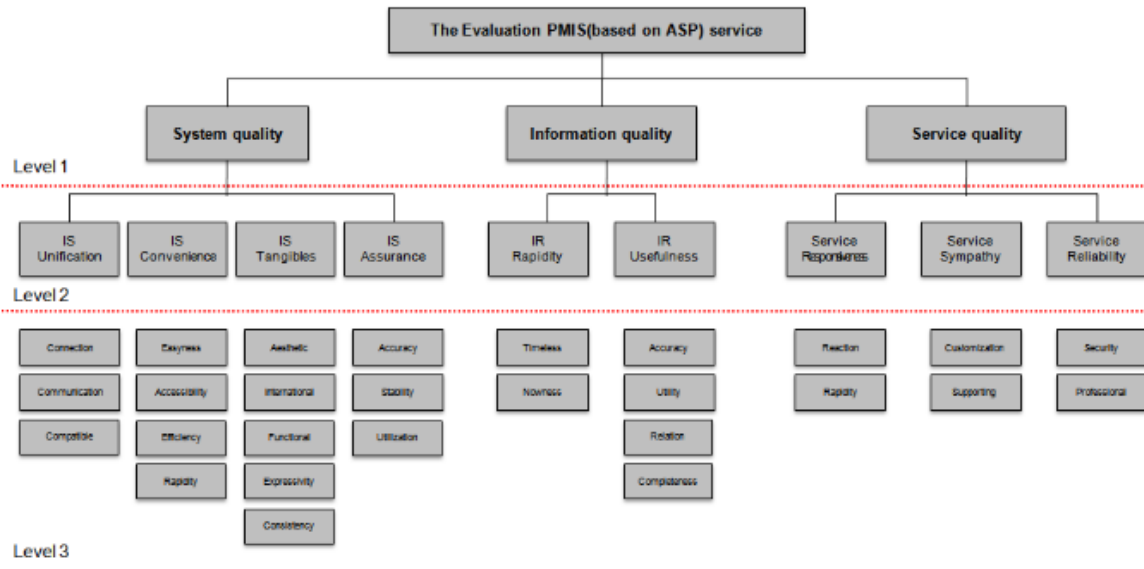
Figure 8. The class of evaluation indicators for PMIS (based on ASP) service quality

REFERENCES

[1] Chang Liu, Kirk P. Arnett(2000) "Exploring the factors associated with Web site success in the context of electronic commerce" Journal of information management , Volume 38 pp.23~33

[2] Choi, J.H. (2007), "The Development of Performance Indicators for the Institution of Information Transfer based on BSC and the Analysis of Their Importance." Journal of Korean society for library and information science Volume 41 issue 4 pp.273~294

[3] DeLone & McLean (2003) "Information system success: A ten-year update" Journal of management Information system Volume 19 issue 4 pp.9~30

[4] Edward W.N. Bernroider (2008) "IT governance for enterprise resource planning supported by the DeLone-McLean model of information systems success" Journal of information management , Volume 45 pp.257~269

[5] Han, Y.C. (1997), "Measuring the Effectiveness of Information Systems: An Empirical Study", Journal of Business Research, Volume 12 issue 1 pp.257~288

[6] Jang, H.J. (2005) "A Study on the Development of Performance Evaluation Indicators in Local Government Services-using Analytical Hierarchy Process Method", Paper of a master's degree

[7] Joe, M.H. (1997), "An Empirical Analysis on the success Indicators and model of IS "Journal of Korean administration, Volume 31 issue 1 pp.145~162

[8] Jung, I.S. (2007) "Establishment of Analysis Model for User Satisfaction on Construction CALS System, Architectural Institute of Korea, Volume 27 issue 1 pp.769~772

[9] Jung, Y.S. (2004), "An Empirical Analysis on the success Factors of ASP Services"Korean institute of information system, Volume 14 issue 2 pp.25~53

[10] Kim J.G. (2007), "Exploring the Success Factors of ASP based Information System: From the Perspective of Two Factor Theory", The e-business studies, Volume 8 issue 1 pp.21~34

[11] Kim, G. (2006), "A Scale Development for Measuring User Satisfaction with GKMS", Journal of the Korean association for policy analysis and evaluation, Volume 17 issue 4 pp.117~148

[12] Kim, S.H. (2006), "An Exploratory Study on the Measurement of ASP Service Quality in small firm" Journal of Information system review Volume 8 issue 3 pp.175~200

[13] Kim, Y.S. (2006), "A Survey of the Satisfaction Level of Construction Information System from Users' Viewpoints on Construction Site", Korean institute of construction engineering and management, Volume 7 issue 4 pp.126~136

[14] Kwon, S.D. (2006), "The Study on the Critical Success Factors of the Adoption and User of the ASP-based ERP Systems" Journal of Information technology applications & management Volume 13 Issue3 pp.29~57

[15] Lee, H.S. 「The Empirical Study Research (Han Gyeong Sa, 2006)

[16] Lee, S.J. (2000) "The Effect of user gap between users expectation and perceptions on the users satisfaction of IS" Society of Korean industrial and system engineering pp.275~282

[17] Lee, Y.J. (1994), "A Study on Service Quality: Focusing Concept & Measurement" Society of Korean industrial and system engineering P249~283

[18] Park, J.H. (2002), ""The Empirical Analysis on Success model of ASP based Information System"
Society of Korean industrial and system engineering pp. 366~376

[19] Park, J.Y. (1999), "A Study on the Relationship between User Satisfaction and Quality Measurement of IS Service" Journal of Korean Association of business Education, Volume 20. pp. 147~164

[20] Park, M.S. (2000), "A Research for End-user satisfaction Evaluation on Information System"
Journal of Korean institute of computer information Volume 5 issue 4 pp.154~160

[21] PZB (1998) " SERVQUAL: A multiful-item scale for measuring consumer perceptions of Service quality", Journal of Retailing Volume 64 issue 1 pp.12~40

[22] Yu, J.H. (2001), "Success Factors for Implementing Construction Project Management Information System (PMIS) based on the Characteristics of Construction Management Tasks" Architectural Institute of Korea, Volume 20 issue 5 pp.103~110