IT컨설팅 서비스 품질 측정에 대한 타당성 검증에 관한 연구

서 현 석*

The Validity of IT Consulting SERVQUAL Measurement Tool

Hyunsuk Suh*

Abstract

This paper examines the validity of the newly developed IT consulting SERVQUAL measurement tool. In an attempt to measure the IS customers' expectations and perceived quality of the services they received, the researchers developed a diagnostic tool of SERVQUAL based on the solid theoretical background, which can specifically be applied to the IT consulting service sector. This on-going research so far, has been applied to six (6) different organizations that have received IT consulting services over the past years.

From the preliminary data collected, the correlation and the factor analyses were conducted to understand the underlying concept and refinement of the measurement tool. Although the correlation analysis showed a little tendency of collinearity among some of the variables, all showed sound relationship of the proposed hypotheses. The exploratory factor analytic approach was chosen because it does not set any priori constraints on the estimation of components or the number of components to be extracted. The number of different factor solutions was extracted and tested to see which solution represents better grouping of the variables. The Crombach's Alpha was computed on different combinations of the factor solutions to ensure validity. The results show 8-dimensional IT consulting SERVQUAL measures which they are, assurance, knowledge & skill, customer relationship, support, empathy, process management, expertise, and education, seem more appropriate than the originally proposed 6 dimensions.

The study approach was non-experimental cross-sectional research design. The longitudinal design of follow-up studies to periodically revise and refine current measure is strongly recommended for fine tuning of the tool.

Keywords : IT Consulting Service, Service Factor Analysis, and Validity of the Measure

논문접수일 : 2005년 8월 17일 논문게재확정일 : 2005년 9월 8일

* 주저자, 중앙대학교 경영학과 교수, (156-756)서울특별시 동작구 흑석동 221번지 중앙대학교 경영대학,
Tel : 019-205-3560, Fax : 02-813-8910, e-mail : hssuh@cau.ac.kr

1. Introduction

Recently, consulting market has been growing rapidly with the high annual growth rate of 16%. The demand for IT consulting is also increasing in tendency as the enterprises are introducing the information technology to achieve core competency in the market. However the level of satisfaction from the customers on the services IT consulting companies offer do not coincide the growth rate of service. Even the consideration of the foreign consulting companies being the provider of the superior service value, does no longer safely hold as true, due to their performances and high costs are gradually challenged from the servicees. As part of the overall success of the service practice, the service quality has been highlighted from the service suppliers, marketers and not to mention, it's demanders.

The fundamentals of the service quality follow the paradigm such that, the initial service expectation must be met or exceeded by the perceived outcome levels of the service experience. The work of Parasuraman, Zeithami, and Berry (abbreviated as PZB) [1985, 1988] developed an extensive theoretical base that offers a reliable and useful approach for measuring perceived service quality. The scale, SERVQUAL, offers a well-documented multidimensional approach for measuring perceived service quality in a service sector using difference score approach. Due to the popularity of the tool, the researchers and investigators have applied it to the diverse service fields.

However, a number of problems with the SERVQUAL tool has been found such that it suffers from conceptual and empirical difficulties. Thomas P. Van Dyke and his colleagues [1997] suggested that these difficulties come from the obscurity of the boundary between the conceptual and empirical category due to their close-interrelationship. The factors contributing to the conceptual problems are as stated below.

(1) The gap analysis from the service expectation to its perceived quality is not easy to conceptualize.
(2) The improperness of using a single measure of service quality across different industries from the viewpoint of content validity.

The empirical problems are by and large, the result of these conceptual difficulties, most notably the gap scores using the original five dimensions of service quality : the tangibility, reliability, responsiveness, assurance, and empathy. The empirical difficulties can result in the low reliability, unstable dimensionality, and poor convergent validity.

In recent years, a number of modified versions of SERVQUAL-based instruments for complementing those problems have been developed and become increasingly popular in IS area. Yoon et al. [2002] suggested 'IT consulting SERVQUAL' for measuring the service quality in IT consulting business. Their study was motivated by the fact that the right tool to measure the service quality in IT industry has never been attempted. In an effort to apply the work of PZB to the area of consulting, especially in the IT fields, the original five (5) dimensions are carefully reviewed for modi-

fication. As a result, the newly revised six (6) dimensions are deduced : the Assurance, Responsiveness, Reliability, Empathy, Process, and Education. The item 'Tangibility' has been omitted in the new measurement, instead the 'Process' and 'Education' variables are added because of their appropriateness in the fields.

The objective of the study is to explore the role of the 'IT consulting SERVQUAL' in the context of IT service fields to see how accurately the newly developed tool is measuring what it purport to measure. Therefore, defining the underlying construct of the 'IT consulting SERVQUAL' tool and its validation through field data are the primary focus of the paper. In the following, the chapter 2 reviews the theories and definitions of SERVQUAL. The chapter 3 presents the description of the proposed study model. The chapter 4 analyzes the result of the field data. The chapter 5 explores the implication of the results on chapter 4. The chapter 6 discusses the results of the study. The contribution and limitation of the study will also be highlighted.

2. Literature Review

2.1 Definition of Servqual

The quality of the service is decided upon, how well the provided service is meeting the expectation of the customer's perception. Therefore the high-quality service can be defined as the level of customer's "experience" exceeds to that of "expectation". In this state, the customers are constantly satisfied with the services provided by the service suppliers [James, et al., 1983]. Grőnroos defined service quality as a perceived judgment, resulting from an evaluation process where customers compare their expectations of the service they perceive [Grőnroos, 1984].

However, due to the unique features of service : performance-oriented, intangible, heterogeneous, inseparable, and perishable, it is not only difficult to measure but also to control the quality of the service. [PZB, 1985].

Estimating service quality has 3 phases : (1) building up a conceptual foundation for understanding service quality, (2) designing models to measure service quality, (3) refining the measurement methods developed in the 2nd phase, and moving from a static to a dynamic model of service quality [Grőnroos, 1993]. PZB reported measuring the quality of service is ambiguous. Based on the consideration that the service quality could be estimated during the process when the service is progressed, PZB designed a measurement instrument named as SERVQUAL [PZB, 1985 ; 1988].

PZB stated that SERVQUAL is a generic instrument with good reliability and validity and broad applicability on the variety of service industries. The SERVQUAL acts as a diagnostic tool for uncovering broad areas of company's service quality for their shortfalls and strengths. The SERVQUAL scale as a measurement instrument of service quality has attracted numerous related studies of both academic researchers and practitioners in the work sites. However due to the diversity of the service industries, one measurement scale can not appropriately fulfill needs of different service sectors. Therefore, recent researches on

the measurement of service quality are moving towards to the modification of the original scale to better fit to the specific fields of service.

2.2 Develpments of Servqual

PZB developed SERVQUAL in 1988 and then subsequently refined the SERVQUAL they presented after their exploratory study of 5 nationally-known companies and they built blocks of the SERVQUAL based on the perception-minus-expectation score conceptualization [PZB, 1988 ; 1991]. SERVQUAL simply targets to compare customers' expectations and their perceptions of actual performance, and to measure a specific long-term attitude at a single point in time. The expectations component of SERVQUAL is a general measure and pertains to customers' normative standards - i.e., the service levels customers believe excellent companies in a sector must deliver. On the other hand, the perception component pertains to customers' perceptions of a given company's service within the sector [PZB, 1993].

While the researchers' conceptual work initially identified 10 dimensions ; reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding, and tangibles, their analysis distilled theses dimensions to 5, which they named (1) *tangibility* : the appearance of physical facilities, equipment, personnel, and communication materials, (2) *reliability* : the ability to perform the promised service dependably and accurately, (3) *responsiveness* : the willingness to help customers and to provide prompt service, (4) *assurance* : the knowledge and courtesy of employees and their ability to convey trust and confidence, and (5) *empathy* : the provision of caring individualized attention to customers [PZB, 1985 ; 1988]. The 22-item of SERVQUAL instrument presented by PZB was intended to be elicited two times, once to measure service expectations and a second time to measure perceptions of service performance. The operationalization of the service quality structure represents the gap between two 7-point SA/SD (strong agree to strong disagree) Likert scales. One can measure the expectations of customers to service companies in general, and the other the perceptions of customers about the particular company whose service quality is to be assessed. The difference between the expectation rating and the perception rating represent a measure of perceived service quality [PZB, 1988 ; 1991]. The higher the score of perception-minus-expectation is, the higher the perceived level of service quality will be.

As mentioned in prior, the number of follow-up studies of establishment, evaluation and test of versions of SERVQUAL have been come out. Asubonteng et al. reviewed 25 various published SERVQUAL tests and reported conflicting results [Asubonteng et al., 1996]. A number of studies were started from concerns about the efficacy of SERVQUAL in various fields, and these concerns of many researchers were basically categorized into two classes. One is the dimension structure and its stability, and the other is the appropriateness of operationalizing service quality as a gap score [Asubonteng et al., 1996 ; Babakus and Boller, 1992 ; Carman, 1990 ; Dabholkar et al., 1996]. In 1990, Carman expressed concern over the measurement of serv-

ice quality across the multiple service functions, the treatment of the expectations measurement, and the omission of importance in the measurement of service quality though he said the stability of the SERVQUAL dimensions was very impressive. Also, he said the scales should be refined by factor analysis and reliability tests before commercial application of SERVQUAL. Babakus and Boller questioned SERVQUAL's applicability across a wide variety of services, its dimensionality, the appropriateness of operationalizing service quality as a gap score, and the specific measurement properties associated with SERVQUAL in 1992. The studies are summarized in <Table 1>. Through those concerns, some researchers presented kinds of modified SERVQUAL models more suitable to particular service areas.

〈Table 1〉 Studies on Factor Structure and Gap Score Analysis

Issue	Author	Summary
Factor (Dimension) Structure Issues	PZB [1988 ; 1991] ZPB [1990]	As follow-up studies about service quality, they developed original SEVQUAL model, and then composed their model of a mix of positively phrased and negatively phrased items in the first work, and then they excluded negatively phrased (reverse-scored) items because the negatively phrased items had consistently higher standard deviations than the positively items, and were not as meaningful as the positively phrased items.
	Headley & Miller [1993]	They induced 6 basic dimensions instead of using the traditional 5 dimensions presented by PZB, and explored the possibility of a link between perceived service quality and a patient's (customer's) future intent to complain, compliment, repeat purchase and switch providers. To clinical setting, they applied the dimensions of dependability, empathy, reliability, responsiveness, tangibles, and presentation
	Lytle and Mokwa [1992] Clow, fischer, & O'Bryan [1995]	They induced 7 basic dimensions. Lytle and Mokwa presented an integrative model of health care quality in which they divided 3 benefit levels (core, intangible, tangible), and then these 3 benefit levels into 7 dimensions. Clow et al. created a 7-dimension model for measuring dental service quality; expectations, image, outcome, satisfaction/dissatisfaction, service quality, situation, tangibles, and they found the patients' image of the dentist, tangible cues, situational factors, and patient satisfaction with prior service encounters have the greatest influence on expectations of service, whereas marketing variables, such as price and advertising, appear to have no effect.
	Carman [1990]	He replicated PZB's 1988 study with answering six questions of interest to the retailer user. He tested SERVQUAL by introducing some variation of the original scale in four different service settings. In all cases, items in the original 10 dimensions were retained. Based on criteria of face validity and factor analysis eigenvalues greater than one, he recommended that items on 7 or 8 of the original 10 PZB dimensions (rather than 5) be retained until factor analysis shows them not to be unique. In short, he admitted SERVQUAL's good stability, but said PZB's dimensions are not completely generic.

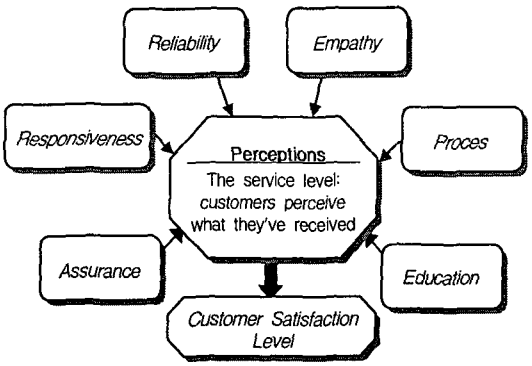
〈Table 1〉 Studies on Factor Structure and Gap Score Analysis (계속)

Issue	Author	Summary
Factor (Dimension) Structure Issues	Finn & Lamb [1991] Babakus & Mangold [1992]	They reported the results of tests against 5-dimension model of PZB are not good. Babakus and Mangold reviewed the potential problems of 5-dimension SERVQUAL Model, and also conducted empirical research for checking the validity of SERVQUAL. They found the dimensionality of service quality might depend on the type of services under study, and so concluded a number of methodological problems likely exist with SERVQUAL, due to the wording of the items and defining a construct on the basis of difference scores.
	McAlexander et al. [1994]	They examined the efficacy of four models for measuring service quality. They found that purchase intentions are influenced by both patient satisfaction and patient assessments overall service quality, and then concluded that SERVPERF methods are superior to SERVQUAL methods in dental practices. They used 10-dimension model of SERVQUAL.
	Licata, Mowen, & Chakraborty [1995]	They subdivided 5 basic dimensions into 12 dimensions fitting to medical service by using Marketing Lens Model (MLM); competence, reliability, understanding, credibility, access, listening skills, facilities, personal association, responsiveness, patient preference, specialist affiliation, geographic convenience.
	Brian, Letty, & Mandeep [2000]	They outlined the development and potential use of a modified SERVQUAL scale, CSC SERVUQAL, which can be used as part of an ongoing program of service quality improvement for career services centers on college campuses. They also suggested that the mixing reverse-scored items (negatively phrased items) might result in the problem in the instrument.
Gap Score Analysis	ZPB [1990]	They identified four areas that may lead to a gap between customer expectations and perceptions, (1) not knowing customers expectations, (2) specifying quality standards not consistent with what management believes to be customers' expectations, (3) service performance not in keeping with service quality specifications, and (4) service performance not in keeping with marketing communications.
	Cronin & Taylor [1992 ; 1994] Teas [1994]	They investigated the conceptualization and measurement of service quality and the relationships between service quality, consumer satisfaction, and purchase intentions. They argued the performance of gap score measurement is not much better than the performance of perception scores alone (i.e., SERVPERF) and so using gap score measurement is somewhat superfluous nevertheless it is still appealing for marketing managers.
	PZB [1994]	They responded the concerns of Cronin & Taylor [1992], and Teas [1994] empirically and conceptually. Consequently, although they approved gap score approach needed improvement, the alternate approach proffered by Cronin & Taylor, and Teas is also doubtful. They also suggested a set of research agenda for unresolved issues, and better understanding of service quality assessment.
	Brian, Letty, & Mandeep [2000]	They said it is very important that marketers, organizations, keep endeavoring to ensure that the level of service provided meets or exceeds the level expected by their customers, and to reduce the gap if it is detected. Therefore, the gap score approach identifying imbalances between customer expectations and perceptions has been widely used.

3. Study Design

3.1 Study Model

The current study put an effort to establish a model that fits for the causal pathway from IT consulting service quality to customer satisfaction. This study formed a groundwork from the previous studies of PZB and other follow up studies (Refer to <Table 1>), of 5-dimensional SERVQUAL model, in which they are (1) tangibility, (2) reliability, (3) responsiveness, (4) assurance, and (5) empathy. Carefully examining hese 5 entities, the 'tangibility' was excluded due to the contents being improper and less valid to the IT consulting field. Instead the 'Process' and 'Education' are added for their appropriateness and applicability in the relevant fields. Total of 36 indicators derived from the 6 independent variables and 4 items to measure the level of 'Customer Satisfaction'. The study model is illustrated below.



<Figure 1> Study Model

To test the validity of the study model, the following hypotheses are developed.

H1 : High-level of assurance will lead to High-level of assurance will lead to high level of customer satisfaction.

H2 : High-level of responsiveness will lead to high level of customer satisfaction.

H3 : High-level of reliability will lead to high level of customer satisfaction.

H4 : High-level of empathy will lead to high level of customer satisfaction.

H5 : High-level of process will lead to high level of customer satisfaction.

H6 : High-level of education will lead to high level of customer satisfaction.

3.2 FIELD

The study was conducted under the supervision of 'A' consulting company in Korea. The 'A' consulting company was founded in 1991, started to provide its customers, such consulting services as ISP, BPR, CRM, SCM, KM, and other IT solutions. With different organizations within the company such as industry, solution, and strategy groups, the company has accumulated years of experiences in the domains of strategy, process innovation, implementation, and change management. Equipped with almost 300 consultants and numerous standardized methodologies, the company is one of the fastest growing consulting firms in Korea.

3.3 SAMPLE AND METHODOLOGY

The sample population is composed of the customers who have received and participated in the IT consulting projects : e-Biz, IT MP, ERP

<Table 2 Demographic Statistics>

Gender	**Male**		**Female**		**Skewness** (3.094)
	33 (92%)		3 (8%)		
Age	**21~30 yrs**	**31~40 yrs**	**41~50 yrs**	**51 yrs~**	**Skewness** (0.190)
	(0%)	(44%)	(53%)	(3%)	
Working Years	**~1 yr**	**1~3 yrs**	**3~5 yrs**	**5 yrs~**	**Skewness** (-3.752)
	(0%)	(3%)	(11%)	(86%)	
Position	**Team Member**	**Team Manager**	**Executive**		**Skewness** (0.354)
	(39%)	(50%)	(11%)		
Department	Administrative Informatization, Informatization group, IT, Cyber Academy, Cyber Center, Work Renovation, SRM part GM group, KM Strategy, Management Planning, Financial Affairs Management, The Department of Culture, Medical Information, etc.				
Job Specification	PM, Team Manager, Electronic Document, Planning, IT Planning, MFG, Next Generation Promotion Team, Program Development, e-Biz, Prescription, System design, Payroll, etc.				
Participation Level of Project	**0~25%**	**26~50%**	**51~75%**	**76~100%**	
	(20%)	(20%)	(0%)	(60%)	

modeling, implementation, etc., from the year 2002. A total of 40-item questionnaire survey was developed and distributed to measure both the quality of the consulting service and the customer satisfaction. The demographic information of sample population is described in <Table 2>.

The 36 respondents from 15 different project locations were voluntarily participated on the study. As shown in <Table 2>, the male respondents outnumbered the female with the distribution positively skewed. Also, as shown in department and job specifications, the people on the number of diverse job positions have participated on the study. The distribution curve for the working years showed negative skewness. This means the respondents participated in the study are well experienced and have specialties in their work fields. The 60% of the respondents were fully involved in the project which makes more experienced and fully knowledgeable workers have participated on the study.

4. Data Analysis

4.1 Descriptive Statistic

The <Table 3> represents descriptive statistics on our study sample. The average response score range from 4.37 to 6.17 (Refer to <Table 5>). Most items in the questionnaire showed relatively high responses. However, some of the

items, such as "Benchmarking (P5)", "Overall Education & Training (ED1)", and "New Process (ED3)" scored relatively low : 4.44, 4.37, and 4.54 respectively. Overall, the "Education" showed lowest scores among all areas with the minimum response score of 1 and the mean score of 4.62.

The high internal consistency score for all independent and dependent variables showed the satisfactory threshold of 0.8~0.9. This means, each scale is soundly measuring the single idea.

〈Table 3〉 Descriptive Statistics

Independent Variables	Mean	Min/ Max	Cronbach's α
Assurance	5.52	2/7	0.8257
Responsiveness	5.46	3/7	0.8281
Reliability	5.65	2/7	0.9257
Empathy	5.54	2/7	0.9167
Process	5.30	2/7	0.9278
Education	4.62	1/7	0.9554
Dependent Variables			
Satisfaction	5.22	3/7	0.8553

〈Table 4 Descriptive Statistics for Dependent Variables〉

Dependent Variables	Mean	Std. Dev.	Min/ Max
S1. Overall Satisfaction	5.33	0.83	3/7
S2. Reselection	5.06	0.95	3/7
S3. Satisfaction to expectation	5.31	0.82	3/7
S4. Recommendation	5.17	0.94	3/7

〈Table 5 Descriptive Statistics for Independent Variables〉

Independent Variables	Mean	Std. Dev.	Min/ Max
A1. Project deadline	5.89	0.89	4/7
A2. Possible solutions	5.28	1.06	3/7
A3. Satisfactory output	5.39	0.87	3/7
A4. Quality assurance	5.53	1.28	2/7
RS1. Proactive project leading	5.03	1.08	3/7
RS2. Active problem solver	5.58	1.13	3/7
RS3. Quick response	5.78	1.15	3/7
RE1. Industry knowledge	4.86	1.33	2/7
RE2. IT knowledge	5.58	1.00	3/7
RE3. Presentation skill	5.58	1.08	4/7
RE4. Communication skill	5.36	0.99	3/7
RE5. Business perspectives	5.53	1.03	4/7
RE6. Confidentiality	6.14	0.88	4/7
RE7. Respect to customer	6.17	0.91	3/7
RE8. Harmonious relationship	6.17	0.94	3/7
RE9. Trust	5.75	1.05	3/7
RE10. Organizational support	5.39	1.25	2/7
RE11. Teamwork	5.56	1.13	2/7
RE12. Managerial role	5.69	0.87	4/7
EM1. Core pending request	5.53	1.08	3/7
EM2. Customer's business goal	5.56	0.88	4/7
EM3. System development	5.60	1.12	2/7
EM4. Strategy alignment	5.44	0.89	3/7
P1. Team role setting	5.80	0.93	4/7
P2. Team professionality	5.26	0.92	3/7
P3. Scheduling	5.78	0.87	4/7
P4. Project scope	5.44	1.21	2/7
P5. Benchmarking	4.44	1.24	2/7
P6. Change management	5.06	1.03	3/7
P7. To-be Model	5.14	0.93	4/7
P8. Mediator role	5.09	1.03	3/7
P9. Overall process	5.53	1.03	3/7
ED1. Overall education & training	4.37	1.33	1/7
ED2. Project scope	4.79	1.32	2/7
ED3. New process	4.54	1.14	2/6
ED4. Additional training	4.76	1.60	1/7

To further explore the nature of data, severity analysis has been conducted. The severity measure is the percentage of employees who scored 6 or 7 in a Likert scale from 1 to 7. The moderately severe score is the percentage of employees who scored 5, 6, or 7 in a scale from 1 to 7. The results indicate that such variables as "project deadline (A1)", "satisfactory output (A3)", "confidentiality of the documents (RE6)", "respect customer (RE7)", "good customer relationship (RE8)", "clear team role (P1)", and "project time and schedule (P3)" high moderately severe score (more than 90%). The results of the severity analysis are shown in Appendix 1.

4.2 Correlation Analysis

For observing the correlation between factors, or between factors and items, or between items, the Peasron Product Moment correlation was performed across the independent and dependent variables. This is to see if hypothesized links in the proposed model are agreeable.

As found in <Table 6>, the correlation between independent variables and customer satisfactions appears all highly positive and are significant at 0.01 level. Therefore, all six hypotheses hold for their justification.

To further explore the underlying concept of the independent-dependent relationships, the indicators in the customer satisfaction were individually compared with independent variables. The results in <Table 7> show that the variables "assurance" and "satisfaction to expectation" were not significantly correlated. All other relationships seem to be significant at 0.01 level, except that the "responsiveness" and "satisfaction to expectation" is significant only at 0.05 level. The correlation analysis results are presented in <Table 6>, and <Tables 7>.

〈Table 6〉 Correlation Coefficients between Independent Variables and Overall Customer Satisfaction

	Assurance	*Responsiveness*	*Reliability*	*Empathy*	*Process*	*Education*
Customer Satisfaction Level	0.606**	0.620**	0.781**	0.716**	0.780**	0.665**
Significant (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000

주) ** The correlation is significant at 0.01 level

〈Table 7〉 Correlation Coefficients between Independent Variables & Each of Customer Satisfaction Item

Dependent Variables		Overall satisfaction	Reselection	Satisfaction to expectation	Recommendation
Independent Variables	***Assurance***	0.719**	0.533**	**0.311**	0.466**
	Responsiveness	0.682**	0.446**	0.392*	0.562**
	Reliability	0.708**	0.627**	0.611**	0.672**
	Empathy	0.661**	0.503**	0.687**	0.564**
	Process	0.741**	0.647**	0.594**	0.632**
	Education	0.584**	0.575**	0.547**	0.497**

주) * The correlation is significant at 0.05 level
** The correlation is significant at 0.01 level

4.3 Factor Analysis

The exploratory factor analytic approach is chosen over confirmatory approach due to the advantage of, it does not set any priori constraints on the estimation of components. To the interpretation of the solutions, the latent criterion, the percentage variance, and scree plot techniques are all applied to accurately analyze the solution from the various perspectives.

The principal component extraction with verimax rotation was applied. Six-factor solution was extracted through various iterations. However the careful examination of the rotated component matrix, brings about the question on validity of the number of factors extracted is appropriate. With only six factors, some parts of the study model may still need explanation. So the factor extraction was manipulated starting from 5 up until 8-factor solutions. The 9-factor solution was tried but failed. The computer was not able to iterate. Looking carefully at the factor loading and the clusters of indicators, 8-factor solution seems appropriate for the current model. The summary of 8-factor solution is described below. The results of the factor analysis are shown in Appendix 2.

(1) A2 (provision of possible solutions), A3 (provision of satisfactory output), RS1 (proactively lead on project improvement), RS2 (proactively helping to solve customer's problems), P3 (project time and scheduling), and P4 (defining the project scope) tend to represent one concept.
(2) RE1 (industry knowledge), RE2 (IT knowledge), RE3 (presentation skill), RE4 (communication skill), and RE5 (the ability to view the problems from the business mind) tend to represent one concept.
(3) RE6 (confidentiality of project information), RE7 (show respect to customers), and RE8 (harmonious relationship with customers) tend to represent one concept.
(4) RE10 (organization support), and RE12 (project manager's leadership) tend to represent one concept.
(5) EM1 (reflecting customer's core request on the project), EM2 (understanding customer's vision, business goal, and work process), and EM3 (understanding customer's intention on the project) tend to represent one concept.
(6) P1 (clear team role setting), and P2 (high qualificaiton of the team members), P8 (good mediator role when conflicts occur), and P9 (smooth run of the project) tend to represent one concept.
(7) P5 (sufficient references), P6 (proper reaction when changes occur during the project), and P7 (suggesting proper "To-Be" model) tend to represent one concept. And finally,
(8) ED1 (overall education & training), ED2 (inform customers of the project scope), ED3 (educate customers of the new process), and ED4 (additional training) tend to represent one concept.

The indicators of the variable 'Education' which are ED1, ED2, ED3, and ED4, almost always clustered together, representing one concept, no matter how many factor solutions were being manipulated. On the other hand, the indicators of such variables such as 'Reliability' and 'Process' seem to divided up into several

different concepts. Especially, the variable, "Process" seems to broken down into different combinations of the cluster when different number of factor solutions were manipulated.

The further analysis on induced factor solution was not conducted due to inadequate number of sample data being collected. For the adequacy of the sample size for factor analytic technique to gain power should exceed 70. Considering current sample size being only 36, this will not help much for entering into details of numerical equations and figures. However it is important to continue examining the data through factor analysis to provide further insights on the new tool. The naming of the 8-factor solutions on the result of the study are described below.

4.4 Naming After New Factor Solution

The factor solution 1, which is composed of indicators from such variables as 'assurance', 'responsiveness', and 'process' represents such key words as the provision of satisfaction to customers, helping, leading, exact time schedule, and proper scope. The name 'Assurance' may seem appropriate representing the concept of these words. Therefore, the partial indicators from the variables of assurance, responsiveness, and process are newly merged into and formed the variable name, assurance.

The factor solution 2, which is composed of the part of the indicators in the variable 'reliability', such as, the industry knowledge, IT knowledge, presentation skill, communication skill, and business mind seem to cluster into one concept. However the 'communication skill' (RE4) seems to be little short on its factor loading score to be included in the group. But, its concept seems to well-coincide with rest of the indicators in the group, thereupon decided to remain in the same group. Here, only 5 out of 8 original indicators of the variable 'reliability' are clustered. Looking at such key words as knowledge, and skill, the new group is named as 'Knowledge and Skill'.

The factor solution 3, which is composed of the part of the indicators in the variable 'reliability', such as, the confidentiality, respect, and harmonious relationship with customers seem to cluster into one concept. This group is decided to be named as the 'Customer Relationship'.

The factor solution 4, which is composed of indicators as the organizational support and leadership of the project manager, are named as 'Support'.

The factor solution 5, which is composed of indicators of the variable 'empathy', such as, reflecting customer's core request, understanding customer's business goals, and understanding customer's business system seem to cluster into one concept. This group was decided to carry with the original name, which is 'Empathy'.

The factor solution 6, which is composed of the part of the indicators in the variable 'process', such as, the clear role setting and high qualification of the teammates, good mediator role when conflicts occur, and smooth run of the project seem to agree with 'Process Management' of the project. Therefore it was decided as the new name of this group.

The factor solution 7, which is composed of the part of the indicators in the variable 'process', such as, the sufficient references on ad-

vanced cases, proper reaction when changes occur during the project, and suggesting proper "To-Be" model to the customers. This group is decided to be named as 'Expertise'.

The factor solution 8, which is composed of all the indicators of the variable 'Education', remained the same.

5. Conclusion

The original study model suggested that 6 endogenous variables, which they assurance, responsiveness, reliability, empathy, process, and education, have causal path to the customer satisfaction in consulting industry. Although the number of sample population was not sufficient, the study showed interesting results. After factor analysis has been conducted, the following results were driven. Instead of 6 variables, the newly reformed 8 variables seem more logical and appropriate to include and group the existing indicators. The renamed variables are Assurance, Knowledge and Skill, Customer Relationship, Support, Empathy, Process Management, Expertise, and Education. The variables such as responsiveness and reliability are vanished from the original model.

Even though the variables of assurance, empathy, process, and education survived after the factor analysis, the composition of the indicators in these variables has relocated and regrouped, except the variable education. The 'education' almost always seems to cluster with the original combinations of indicators no matter how many factor solutions were tried and driven. The high alpha score of .95 showed confidence of this cluster.

The number of indicators dropped from the study model are, A1 (project deadline), A4 (quality assurance) from the variable 'assurance', and RS3 (quick response) from the variable 'responsiveness', and RE9 (trust), RE11 (teamwork) from the variable 'reliability', and finally EM4 (alignment on information strategy with that of business) from the variable 'empathy'. The results show that 'keeping project deadline' and 'managing quality assurance' were dropped from the assurance. This is because these two items are the required duty for today's consulting company when they deliver output to their customers. Another words, the project has a predefined definite deadline, which no matter what happens, this date must be kept. And every consulting project team has a person called QA, who keeps close watch on the quality of the outputs his teammates are producing. The QA is the highly experienced person on the same industry and similar projects that he/she may not involve during the whole project, but keeps close watch on the quality of the project on a regular basis. These reasons may have worked on the respondents (customer) that the items are not considered as assurance of the project success, but part of the mandatory base of the project.

The RS3 (quick response) is dropped because the original variable 'responsiveness' is completely dropped. The RE9 (trust), RE11 (teamwork) are also dropped. Note that the original variable 'reliability' is also gone. The indicators within reliability have been regrouped into 'knowledge and skill', 'customer relationship', and 'support'. None of these new variables may issue admissions to the items as trust and teamwork.

Finally, EM4 (alignment on information strategy with that of business strategy) was dropped out of 'empathy'. Looking at the items in empathy, there is a common theme of a 'customer's perspective', except EM4. This can be interpreted as, the 'empathy' was perceived by the respondents, as the individual's perspective, and not on some macro-level of company's mission and vision.

6. Limitations and Contributions

The important contribution of the study is the new measures of IT consulting SERVQUAL measurement tool being developed, tested, and in the process of refinement. The development of the current model started from the prior studies conducted in the service industry. It was evident that although many tools have been developed in the service sector, none fit for the consulting industry. Therefore, in an effort to develop the right tool for the industry, a group of consulting research team already developed a new SERVQUAL measures, and in this research, this tool has been tested against field to ensure the validity of it. Although the number of sample population in the study was not sufficient enough to confidently conclude the findings, but within more years ahead, this problem will be settled. The reasons for the sample size being small are, the measurement tool has recently being applied to the fields, not an overflow of cooperation from the customers on the study due to the confidentiality of the information on each project, and finally even the collected data being 'no-where' once the project is over and the consultants are withdrawn from the project.

However the current study was the first attempt to validate what had been developed earlier. Namely the 6 dimensions of independent variables of the study model were tested for validation in the consulting industry. Through the analysis of the field data, the results indicated the original 6 dimensions needs to be revised and customized to fit to the characteristics of the industry. The new 8 dimensions of part old and part new, with new names on those dimensions, seem logically more appropriate and make sense to be applied to the fields then the 6 dimensions. These 8-dimensional IT consulting SERVQUAL which they are, assurance, knowledge & skill, customer relationship, support, empathy, process management, expertise, and education again will continually be tested and refined as data from more projects are being collected. The study approach was non-experimental cross-sectional research design. This was to investigate the association between service quality and customer's level of satisfaction. The longitudinal design of follow-up studies to periodically revise and refine current measure is strongly recommended for fine tuning of the tool.

References

[1] Asubonteng, Patrick, Karl J. McCleary, John E. Swan, "SERVQUAL revisited : A critical review of service quality", *Journal of Services marketing*, Vol. 10, No. 6, 1996, pp. 62-81.

[2] Brian T. Engelland, Letty Workman, and Mandeep Singh, "Ensuring service quality for campus career services centers : A modified SERVQUAL scale", *Journal of marketing Education*, Vol. 22, No. 3, 2000, pp.

236-245.

[3] Carman, James M., "Consumer perceptions of service quality : An assessment of the SERVQUAL dimensions", *Journal of Retailing*, Vol. 66, No. 1, 1990, pp. 33-55.

[4] Clow, K.E., Fischer, A.K., and O'Bryan, D., "Patient expectations of dental services", *Journal of Health Care Marketing*, Vol. 15, No. 3, 1995, pp. 23-31.

[5] Cronin, J. Joseph Jr. and Steven A. Taylor, "Measuring service quality : A reexamination and extension", *Journal of Marketing*, Vol. 56, No. 3, 1992, pp. 23-31.

[6] Cronin, J. Joseph Jr. and Steven A. Taylor, "SERVPERF versus SERVQUAL : Reconciling performance-based and perceptions-minus-expectations measurement of service quality", *Journal of Marketing*, Vol. 58, January 1994, pp. 125-131.

[7] Finn, David W. and Charles W. Lamb, "An evaluation of the SERVQUAL scale in retail setting", *Advances in consumer research*, Vol. 18, edited by R. H. Solomon. Provo, UT : Association of Consumer Research, 1991.

[8] Grőnroos, C., "A service quality model and its marketing implications", *European Journal of marketing*, Vol. 18, No. 4, 1993, pp 36-44.

[9] Headley, D.E. and Miller, S.J., "Measuring Service Quality and Its Relationship to Future Consumer Behavior", *Journal of Health Care Marketing*, Vol. 13, No. 4, 1993, pp. 32-41.

[10] Licata, J.W., Mowen, J.C., and Chakraborty, G., "Diagnosing perceived quality in the medical service channel", *Journal of Health Care Marketing*, Vol. 15, No. 4, 1995, pp. 42-49.

[11] Lytle, R.S. and Mokwa, M.P., "Evaluating health care quality : The moderating role of outcomes", *Journal of Health Care Marketing*, Vol. 12, No. 1, 1992, pp. 4-14.

[12] McAlexander, J.H., Kaldenberg, D.O., and Koenig, H.F., "Service quality measurement : Examination of dental practices sheds more light on the relationships between service quality, satisfaction, and purchase intentions in a health care setting", *Journal of Health Care Marketing*, Vol. 14, No. 3, 1994, pp. 34-40.

[13] Parasuraman, A., Zeithami, V.A., and Berry, L.L., "A conceptual model of service quality and its implications for future research", *Journal of Marketing*, Vol. 49, 1985, pp. 41-50.

[14] Parasuraman, A., Zeithami, V.A., and Berry, L.L., "SERVQUAL : A multiple item scale for measuring consumer perceptions of service quality", *Journal of Retailing*, Vol. 65, No. 1, 1988, pp. 12-40.

[15] Parasuraman, A., L.L., Zeithami, V.A. Berry L.L., "Refinement and Reassessment of the SERVQUAL scale", *Journal of Retailing*, Vol. 67, No. 4, 1991, pp. 420-450.

[16] Parasuraman, A., L.L., Zeithami, and V.A. Berry L.L., "More on improving service quality measurement", *Journal of Retailing*, Vol. 69, No. 1, 1993, pp. 148-147.

[17] Parasuraman, A., Zeithami, V.A., and Berry, L.L., "Reassessment of expectations as a comparison standard in measuring service quality : Implications for further research", *Journal of Marketing*, Vol. 58, January 1994, pp. 111-124.

[18] Simon S.K. Lam, and Ka Shing Woo, "Measuring service quality : a test-retest reliability investigation of SERVQUAL", *Journal of the Marketing Research Society*, Vol. 39, No. 2, 1997, pp. 381-396.

[19] Teas, R., "Kenneth, Expectations as a comparison standard in measuring service quality : An assessment of a reassessment", *Journal of Marketing*, Vol. 58, No. 1, 1994, pp. 132-139.

[20] Tomas P. Van Dyke, Leon A. Kappelman, and Victor R. Prybutock, "Measuring information systems service quality : Concerns on the use of the SERVQUAL questionnaire", *MIS Quarterly*, June 1997, pp. 195-208.

[21] Zeithaml, Valarie A., A. Parasuraman, and Leonard L. Berry, *Delivering quality service : Balancing customer perceptions and expectations*, New York, Free Press, 1990.

[APPENDIX]

1. APPENDIX 1 SEVERITY ANALYSIS

Item	Item Content	Moderately Severe[%]	Severe[%]
A1	Observance of the project deadline	**91.7**	72.2
A2	Provision of the possible solutions when problem occurs	72.2	47.2
A3	Provision of the satisfactory output to customer's request	**91.7**	38.9
A4	Managing the quality assurance to current project	80.6	61.1
RS1	Actively leading customers on issues for the improvement	69.4	33.3
RS2	Actively helping customer when needed	83.3	58.3
RS3	Quick response to customer's requests	83.3	72.2
RE1	Sufficient industry knowledge of the customer's business	63.9	30.6
RE2	Sufficient IT knowledge	88.9	52.8
RE3	Excellent presentation skill.	83.3	47.2
RE4	Excellent communications among TFT members, practitioners, and executives at the project	80.6	47.2
RE5	Solving the problems with IT as well as business perspective	80.6	52.8
RE6	Securing customer's confidential information	**94.3**	80.0
RE7	Treating customer courteously with respect to their opinions	**97.2**	80.6
RE8	Maintaining good relationship with customers	**94.4**	83.3
RE9	Customer's trust in project performance	86.1	66.7
RE10	Project being supported from the organizational level	77.8	55.6
RE11	Excellent teamwork of consultants	86.1	61.1
RE12	Excellent leadership and management of project manager	91.4	60.0
EM1	Reflecting customer's pending requests to the project	83.3	58.3
EM2	Understanding customer's vision, business goal and work process	88.9	52.8
EM3	Understanding customer's requests on system development and improvement	85.7	60.0
EM4	Alignment of Information strategy with business strategy	85.3	55.9
P1	Clear project team role setting	**91.4**	62.9
P2	Selecting highly qualified project team members for its purpose	82.9	45.7
P3	Setting exact project time and schedules	**91.7**	66.7
P4	Defining the exact target process scope	80.6	52.8
P5	Sufficient reference of the more advanced cases	52.9	17.6
P6	Well-management of the process change and its remedy	65.7	42.9
P7	Suggesting the appropriateness of the "to-be" model	69.4	38.9
P8	Act as a mediator when conflicts occur among the project related people	73.5	41.2
P9	Smooth progression of the overall project process	83.3	63.9
ED1	Embedding training program in the project scope	48.1	18.5
ED2	Sufficiently inform customers of the project outline/ coverage / contents to the customer	55.2	37.9
ED3	Educating information to the customers in the field for operating the new system process	53.8	23.1
ED4	Extra education programs to include all the employees who are directly and indirectly involved in the project	58.6	37.9
S1	How satisfied are you for the overall consulting services you received?	86.1	47.2
S2	If you had to choose a consulting company for the similar project, would you choose the same consulting company again?	69.4	33.3
S3	Have you received the consulting services you needed at the time the project has been initiated?	86.1	44.4
S4	Would you recommend the same service to your dearest friend or partners?	72.2	44.4

2. APPENDIX 2 FACTOR ANALYSIS

	Component							
	1	2	3	4	5	6	7	8
A1	-3.128E-02	.392	-7.912E-02	.233	.766	.200	9.602E-02	-8.438E-02
A2	.172	.268	.172	.620	.580	1.273E-03	.186	-3.027E-02
A3	.375	.178	.491	.536	.330	.203	-.335	7.273E-02
A4	.238	.410	.155	9.742E-02	.744	.250	-2.465E-02	.142
RS1	.104	.103	.238	.812	.286	.194	4.546E-02	-4.138E-02
RS2	9.691E-02	.255	.413	.601	.505	-5.890E-02	9.297E-02	-.198
RS3	.130	.147	.227	.207	.893	6.985E-02	5.218E-02	7.654E-02
RE1	.389	-.148	.608	.495	-.114	.277	6.918E-02	2.640E-02
RE2	.197	.152	.912	8.024E-02	.101	1.561E-02	5.444E-02	-3.981E-02
RE3	.277	.168	.774	.358	.141	-.168	3.626E-02	8.575E-02
RE4	.552	.152	.467	.307	4.654E-02	.379	.284	.307
RE5	.458	.238	.504	.393	.204	5.602E-03	.336	.152
RE6	.135	.698	.157	7.324E-02	.468	.159	1.386E-02	.114
RE7	.299	.738	.215	.287	.263	.156	.122	5.141E-02
RE8	.403	.641	.432	7.404E-02	.121	.403	-1.423E-02	-8.223E-02
RE9	.291	.299	.378	.333	.286	.399	9.217E-02	.527
RE10	.149	.421	1.279E-03	5.300E-02	.191	.818	9.832E-02	-1.774E-02
RE11	.375	.468	5.300E-02	.605	7.122E-02	.301	-4.154E-02	-7.404E-02
RE12	.471	.197	9.861E-02	.215	.275	.708	.109	.123
EM1	.486	.293	.539	.202	.201	.393	.247	2.139E-02
EM2	.347	.222	.586	.248	.315	.222	.406	4.877E-02
EM3	.532	.102	.667	.139	.189	.243	.289	.133
EM4	.197	.468	.296	.219	.332	.247	.524	3.420E-02
P1	.240	.733	.138	.235	.234	.124	.182	-6.773E-02
P2	.224	.639	6.471E-02	.480	8.324E-02	.178	.175	-.417
P3	.230	.483	4.246E-02	.722	6.724E-02	-7.811E-02	.155	.214
P4	.127	.127	.440	.739	.205	9.808E-02	.263	.184
P5	.590	.105	.360	.203	-4.865E-02	9.685E-02	.548	-.100
P6	.639	.273	.251	.486	.285	.161	7.247E-02	6.654E-02
P7	.478	.473	.280	.266	8.008E-02	.293	.479	3.739E-02
P8	.271	.787	2.278E-02	.132	.300	.145	-6.502E-03	.126
P9	.393	.582	.189	.179	.303	.150	.407	.259
ED1	.838	.445	.169	.144	-1.649E-02	5.543E-02	5.113E-02	-1.888E-02
ED2	.784	.296	.267	.354	.213	.114	-5.427E-02	6.416E-02
ED3	.801	.272	.298	.147	.172	.202	.164	-9.098E-02
ED4	.873	.188	.248	2.123E-02	.107	.153	.109	.103

저자소개

서 현 석

서울대학교 산업공학과를 졸업하고, University of Wisconsin Madison에서 Socio-technical Systems Engineering 분야에서 석사 및 박사학위를 취득했다. 경영컨설팅을 거쳐 현재 중앙대학교 경영학과 마케팅 교수로 재직하고 있다. 주요관심분야는 마케팅전략, 마케팅 조사방법론, 및 SLM(Service Level Management) 등이다.

◈ 이 논문은 2005년 8월 17일 접수하여 1차 수정을 거쳐 2005년 9월 8일 게재확정되었습니다.