A Study of Customer Satisfaction on Mobile Banking Service*

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Abstarct

Our goal is aimed at positive-analyzing how quality level of mobile banking service is composed of by 22 questions from SERVQUAL of existing PZB. As a result of positive-analysis, 4 different factors -reliability, empathy, tangibilities, assurance- were deduced, different with 5 levels.
Responsiveness is absorbed other dimensions. Also, we tried to find out the appropriate method between SERVQUAL method, showing the difference between the consumers' expectations and the assessment of the actual performance, and model of SERVPERF, measuring performance recognized points while dealing with the concept of SERVQUAL to scale the service qualities of mobile banking.

***Key Word** : Mobile Banking, SERVQUAL, SERVPERF, Service quality*

1. Introduction

Mobile Banking means that the financial services are carried out through electronic procedure by mobile devices, applied mobile communication technology, for electronic processes to do financial services[14]. In here, mobile device is the typical equipment like cellular phone or PDA, having the characteristics of mobile and making the mobile communication. Generally, the word "mobile banking" combined with 3 words, "wireless", implying wherever something can be used, "online", meaning whenever something can be used, and "banking" from the financial services[2].

In this research, as mobile banking implies the word, wireless + online + banking, existing information of financial services, providing of financial trade, in the meantime, it can be understood that the expansion of newly financial services can be made through their synergy. In this studies, through the comparisons SERVQUAL showing the difference between the consumers' expectations and the assessment of the actual performance and SERVPERF, performance-based measurements, there is our goal to find out the appropriate model for measuring the qualities of mobile banking services.

2. Literature Studies

Customer's satisfaction and perceptions about the qualities of services are influenced by the environment that service will confront. In here, the environment implicates the interactions including all the inner/impersonal components of human and providers of service[9]. We implemented the literature studies about quality of customer services, mobile commerce services and banking services.

2.1 Qualities of customer services

2.1.1 SERVQUAL

The goal of mobile banking services provides the discriminated services to users because of its specialties. The reason why we accentuate the importance of service qualities is that the customer's satisfaction about the services is the majority part as a competitive element. After Parasuraman(1998) defines the concepts of service qualities, he invented the measurement of various items, called SERVQUAL, as tool for finding this[11,12]. SERVQUAL consists of 5 dimensions, tangibilies, reliability, responsiveness, assurance and empathy and 22 inquiries like Table 1. These components suggest the SERVQUAL tools of 22 inquiries and made of structures, measured through the difference(score:G) between expectation:E and perceived:P in each dimension.

In MIS field, Satisfaction of information service function users (USISF) is rising as a matter of concern. Information Service Function

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of organization (ISF) that is accommodated to the users who have the rights of actual determination for the uses and introduction of information system [8].

<Table 1> Servqual factors

factors	definition
tangibilies	Devices, physically used facilities
reliability	Ability to do promised service precisely and reliably
responsiven ess	Strong will to provide immediate service to help the customers
assurance	Ability and knowledge of employee to arise the credibility and confidence
empathy	Private Concerns and protections to customers or service providers

To this study, they induced the combination of SERVQUAL and USISF: Through this process, measurement of UIS (user information satisfaction) tells us the applications of SERVQUAL as measurement results, supplying meaningful aspects of reliability and empathy based on SERVQUAL to USISF.

There have been many arguments about using SERVQUAL to measure the qualities of information systems [6]. Opponents insist that abnormality and suitability are so capricious that it causes the unreliable measurements. Affirmatives insists that it has reliability and stability according to the experimental results, and supporting the diagnosis power of measurement through the difference between expected service and recognized one.

2.1.2 SERVPERF

SERVQUAL confronted the criticism of scholar. The main story is the problem of measuring expectation, i.e. it's their refutation that the service quality can be measured by using the difference of core aspects of SERVQUAL, between "expectation and perception" [3,5]. Cronin (1992) invented Performance only Scale/SERVPERF and used this as a tool of analyzing as a view that quality of service is conceptualized and measured by attitudes under the theory that quality of service is performance. And he tried to criticize the SERVQUAL from not identifying the results, doing analysis of definite components to confirm the 5 main dimensions of service quality. However, the this criticism of SERVQUAL PZB (1994) made clear that perception about the service quality depends on performance and expectation by quoting the studies of Bolton & Drew(1991) to the insist that expectation about the service does not need to be measured separately because measurement for the recognition just can be the better measurement for better quality of service [5]. Among these discussions, most important thing is about the way whether we will use the differential points between expectation and recognition or explicit measurement of only perception to the performance. The goal of our study is to find the high-adequacy model, suggested as methods of measurements, for the measurement of mobile banking service quality through the comparison between SERVPERF, only measuring performance-based and SERVQUAL, model for divergence between expectation and perception of performance. Also, quality of mobile banking service has different characteristic with SERVQUAL, developed for measuring the service quality of existing industry, thus, we did antecedent studies related to the quality of banking service and mobile commerce service which can reflect the specific environment of mobile banking.

2.3 Quality of Banking Service

Sathye(1999) disclosed the primary factors, influencing to the understanding of customers about the internet banking in Austria. He made hypothesis about the security concern, the awareness of service and its benefits, the ease of use, the resistance to change, reasonable price, and availability of infrastructure as main factors, but positive results was that the recognition about the security, service and the benefits about these aspects was the core factor [15].

Broderick (2002) wanted to understand the factors, influencing the service qualities customer recognized through the examples of England's Internet banking. He chose 5 factors as main one, in results, the degree and the level of customer participation influences most to the quality of service experiences [4].

Besides these things, articles of the positive research about the factors, influencing to the service quality of internet banking, was published. Joseph (2003) made clear the main research variables, in the order of accuracy, security, accessibility, convenience, confidence in the bank,

ability to handle complaints, personalized to customers' needs, and visual appearance, to the application of bank service [7].

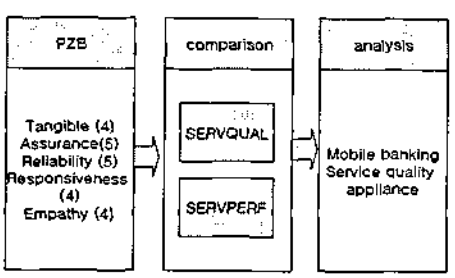
Pousttchi (2004) studied to find out the 4 conditions which can satisfy the needs and expectations of customers on the basis of adaptiation, usability, possibility to personalize, security through the view of mobile application and banking [14].

2.4 Quality of mobile commerce service

Pagani(2004) proposed 3rd generation model of consumer adoption of third generation mobile multimedia services through the literature research about the information technology[10]. He verified the model based on the qualitative expedition research through 24 focused group in 6 markets. The result that used TAM model was in the order of perceived usefulness, ease of use, price, speed of use as determinant factor of important acceptance.

<Table 2> Levels of Mobile banking Service Quality

variables	dimensions	Components	Related Studies
Independent var.	tangibilities	Input device, small screen, User friendly interface	[4],[7],[10], [1],
	assurance	personality (authorization) security customer privacy	[15],[4],[7], [14]
	reliability	confidence in the bank,price, mobility, Ubiquity, Compatibility, , Contents variety	[15],[4],[7], [10],[1], [14]
	responsiveness	Speed of use, Instant feedback, accuracy	[4],[7],[14] [10] ,
	empathy	Customer participation	[4],[15],
Dep. Var.	satisfaction	Satisfaction of mobile banking service	



<Figure 1> Research Model

Kim (2001) made the measurement tool based on the concept of SERVQUAL to scale the degree of wireless internet service satisfaction [1]. Through literature studies, they measure the the degree of wireless internet service satisfaction based on the SERVQUAL concept after abstract the main factors of wireless internet. As a result, factors, affecting to the degree of service satisfaction, was resorted to the technology of provider, diversity of service, economic efficiency, and characteristics of contents as same in the table.

3. Research Model

This research systematized the determination factors, Tangibility, Reliability, Responsibility, Assurance, Empathy, suggested as a basis of service quality measurement, to scale the satisfaction degree of mobile banking services. Through positive analyzing this, we want to find out the appropriate model to measure the mobile banking services from the comparison between SERVQUAL, using the difference of expectation-recognition, and SERVPERF, going through only performance-recognition measurement.

4. Results

4.1 Analyzing Method

We did positive analysis based on the 78 among 100 questionnaires implemented from Jan. 20th, 2004 to Feb. 28th. In the questionnaire, we did invent the questions, consisting of 22 points, on the basis of abstracted factors through existing antecedent studies and existing SERVQUAL measurement tools and made the expectations per each point to 7 points likert) measurement(1:Very Negative 7:Very Positive). Variables in the questionnaire will confirm the responsibility and credibility and we did Cronbach's alpha analysis and factor analysis to study whether the dimension from the field of mobile banking appears identically as the dimension of existing PZB. Treating the results from factor analysis as the main factor, we compared the model, only measured by recognition (performance point:P) when we scale the quality of service and examine the level of service qualities in the field of mobile banking, with the model, measured by subtraction value between expectation and

recognition(GAP:E-P) to know which model is better to use to explain the satisfaction of mobile banking users through the comparison of R^2 value in the regression analysis.

4.2 Analyzing the credibility and responsibility

In our study, we confirmed th reliabilities and construct validity, the component concepts, used in the manipulated definition, of points deducted from antecedent study. We used factor analysis, the method to assess the responsibility of component concept, and Cronbach's alpha to measure internal consistency reliability for credibility analysis. Principal component analysis is used for the model of factor analysis, the minimum factor of condensing information as much as possible. We also used the Varimax method to secure the independency among factors for the factor-revolving method at this time.

If factor loading, obtained through factor analysis, is over 0.4, there is construct validity.

First, Table 3 shows the result that we analyzed the level of SERVQUAL based on the difference between expectations of customers toward mobile banking service and recognized performance. Contrary to the study of PZB, it shows the 4 levels exactly, not 5.

<Table 3>SERVQUAL Factor Analysis

dimension	Inquiries	Factor loadings	Eigen value	var rate(%)	Cronbach's alpha
Customer-oriented	9	.833 .808 .803 .761 .710 .691 .673 .613 .568	10.049	45.676	.927
assurance	5	.914 .901 .669 .630 .421	2.518	11.446	.875
reliability	4	.783 .743 .710 .619	1.618	7.356	.847
Tangibles	4	.826 .816 .781 .702	1.294	5.880	.861

If we present the characteristics of level for the measurement of SERVPER, it's going to be same as <Table 4>. Table shows that points of performance also formed 4 levels as similar to <Table 1>.

<Table 4>SERVPERF Factor Analysis

Level	Inquiries	Factor loadings	Eigen value	Var. Rate(%)	Cronbach's alpha
reliability	6	.770 .762 .760 .734 .687 .678	14.140	64.271	.948
empathy	6	.856 .826 .723 .687 .668 .583	1.826	8.3	.947
assurance	6	.844 .824 .730 .620 .605 .547	1.156	5.253	.945
tangibilies	4	.848 .846 .834 .722	1.053	4.784	.940

In the case of Babakus (1992) in the antecedent study, we couldn't find 5 factors that PZB suggested. In the case when we use exploratory factor analysis, various patterns of factors were appeared not only 2,3,4,7, but also even simple level factor according to the situation. This type of result was found in the PZB (1994) studies.

As the measurement tool of mobile banking service quality, our study, positive-analyzing SERVQUAL model and SERVPERF model, measured and analyzed the 5 factors through exploratory factor analysis method. As a result, situation shown in the level of SERVQUAL measurement of <Table 3> is that empathy and responsiveness, named by PZB are bound to one factor. Because these categories shows the providing of immediate service to the customers and the service providing which reflects the understandings of customers, this is called Customer-Oriented. In <Table 4>, 4 factors are consisting of the level of SERVPERF because it was cohered to empathy and credibility by each points.

After taking a closer look at the credibility of factors, we can say that credibility is relatively high if coefficient of Cronbach's alpha is usually over 0.6 [3]. <Table 3> shows the very high credibility, 0.84~0.94, as a coefficient of

Cronbach's alpha to the component levels of SERVQUAL measurement. Against this condition, against above condition, Cronbach's entire alpha coefficient in the level of SERVPERF measurement of <Table 4> is more than 0.94 of SERVQUAL; we could know that coefficient is relatively high credibility.

4.3 Regression Analysis

Between the method, measured only by recognition point (P), and another method, measured by subtraction value (recognition from expectation: (Gap:E-P) when we measure the quality of mobile banking service, we can show to understand which method can explain the comparison of service satisfaction of customer through coefficient of determination "R^2". First of all, to know the determination coefficient of SERVPERF, we did regression analysis which treated the satisfaction degree of customer as dependent variable and also did 4 point, deducted from factor analysis, as independent variable and then also did regression analysis to know the determination coefficient of SERVQUAL in the same condition as above.

We did Forward Method Linear Regression in the regression analysis for hypothesis approval. Forward Method Linear Regression is distinguished with others because when we run the regression analysis through substituting the independent variables one by one it can choose the group of independent variables which can explain dependent variable appropriately most. Before we do regression analysis, we should consider one thing, Multicollinearity among independent variables. Multicollinearity can be identified from confirming the correlations among independent variables [3]. After doing correlation analysis to the 4 independent variable factors in our study, the problems of multicollinearity among independent variables were solved because there's no significant Pearson's correlation coefficient. The result of regression analysis including the influential power of each factor variables will be in the Table 5 & 6.

<Table5> SERVQAUL results of regression analysis

Included variable	Beta	t	Sig
constant	4.808	42.919	0.000
assurance	-4.74	-4.084	0.000

<Table6>SERVPERF results of regression analysis

Included variable	beta	t	Sig
constant	4.849	58.526	0.000
Reliabilities	.538	6.145	0.000
Assurance	.361	4.331	0.000
Tangibles	.369	3.955	0.000
empathy	.315	3.840	0.000

Like the values of <Table 5> and <Table 6> in the model of SERVPERF, 4 levels, consisting of quality of services, were shown to influence to the satisfaction degree of mobile banking and R^2 value ,showing appropriateness of model, was also 0.578, high value. However, on the contrary to this, model of SERVQUAL shows that assurance factor among 4 levels, components of mobile banking service quality, is the only factor which influences to the service satisfaction degree of customers. R^2 value(0.182) lacks of the power of explanation more than model of SERVPERF. When we integrate these conditions, we could know that SERVPERF model whose first consideration was performance-recognition measurement shows better results than SERVQUAL model through the difference between expectation-recognition through comparison/judgment aspect in the view of suitability. This condition accords with research of Cronin related to the discussion of superiority between two models in precedent.

5. Conclusion and Limitation

Our goal is aimed at positive-analyzing how quality level of mobile banking service is composed of by 22 questions from SERVQUAL of existing PZB. Also, we tried to find out the appropriate method between SERVQUAL method, showing the difference between the consumers' expectations and the assessment of the actual performance, and model of SERVPERF, measuring performance recognized points while dealing with the concept of SERVQUAL to scale the service qualities of mobile banking. As a result of positive-analysis, 4 different factors were deduced, different with 5 levels. Tangibilies and Assurance among basic levels were measured identically, Responsiveness and Empathy from the rest of levels bound together in SERVQUAL and Responsiveness of existing 5 dimensions was absorbed into Reliability and Empathy separately in the SERVPERF model. As cleared in the

antecedent studies, we could know that the patterns of various factors can be appeared like 2, 3, 4, 7 depending on the situation of studies if we use exploratory factor analysis. Related to the dominancy of tool of service quality measurement, our study was accorded with existing antecedent study and as a result of comparing R^2 through regression analysis to compare the influences of SERVPERF model and SERVQUAL model to the degree of customer's satisfactions, explanation power of SERVPERF was superior. This result was just conclusion of conceptional view, and it goes without saying that application study is really needed to improve the quality of service and to find high-reliable measurement tool from now on. Also, target population of questionnaire is so insufficient that we couldn't do the positive-analysis. Thus, we should need to do high-reliable studies through colleting of the populations as many as possible.

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