

A Study on the Quality Factors and Customer Satisfaction of Mobile Banking Service using Kano Model*

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I. Introduction

Mobile banking is a system that allows customers to conduct financial functions such as check balances, pay bills, and transfer accounts with their mobile devices. As smart phone industry has grown rapidly, mobile banking as well grows at high rate. Nevertheless, mobile banking has not been one of the main area of researches for many years. Moreover, the prior researches have focused on identifying which factors affect customer satisfaction, but they have not been validated on how the impact of each factor changes depending on the degree to which the customer's requirements are met.

The purpose of this study is to distinguish factors that show differences between satisfaction levels depending on the customer requirements, using Kano model. Considering the fact that raising service quality level entails cost, insights of prior researches might lead mobile banking managers to inefficient way of business. The

* This research was financially supported by the Institute of Information and Operations Management, Seoul National University.

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result would give meaningful insights to mobile banking managers to fulfill customers' satisfaction efficiently.

II. Theoretical Background

2.1 Mobile banking

Mobile banking has its origin in internet banking. Mobile banking, which belongs to internet banking, gained its popularity with development of mobile devices, such as smart phones(Noh and Jang, 2011). Both mobile banking and internet banking are based on internet, the main difference is that users are able to use the former in motion in any place, while the latter is unable to. Thus, mobile banking is one step advanced service to customers, and the number of users of mobile banking has increased and will be increasing because of the popularity of smart phone.

2.2 Mobile banking service quality

Most studies on mobile banking service quality tried to find out the factors which affect to customer satisfaction, willingness to use, intention of using service. Zhou (2012) argued that mobile banking qualities would affect to trust, and trust affects to usage intention directly and indirectly through flow experience, and usage intention finally affects to actual use of service. Zhou (2012) also figured out how mobile banking quality affects to initial trust with self-efficacy as a moderating variable. Riquelme and Rios (2010) found out the factors that can influence adoption of mobile banking among current users of internet banking, with considering gender as a moderating variable. Chung and Kwon (2009) verified that system quality and information quality have an influence to customer satisfaction, while information presentation has no impact on customer satisfaction. Also, they noticed that trust works as a moderating variable between qualities and customer satisfaction (Chung and Kwon, 2009). Lin (2013) determined the relative importance of mobile banking quality factors with using fuzzy analytic hierarchy process (AHP). Noh and Jang (2011) found out mobile banking qualities and perceived trust affect to reuse

intention, and gender works as moderating variable between mobile banking service qualities and perceived qualities.

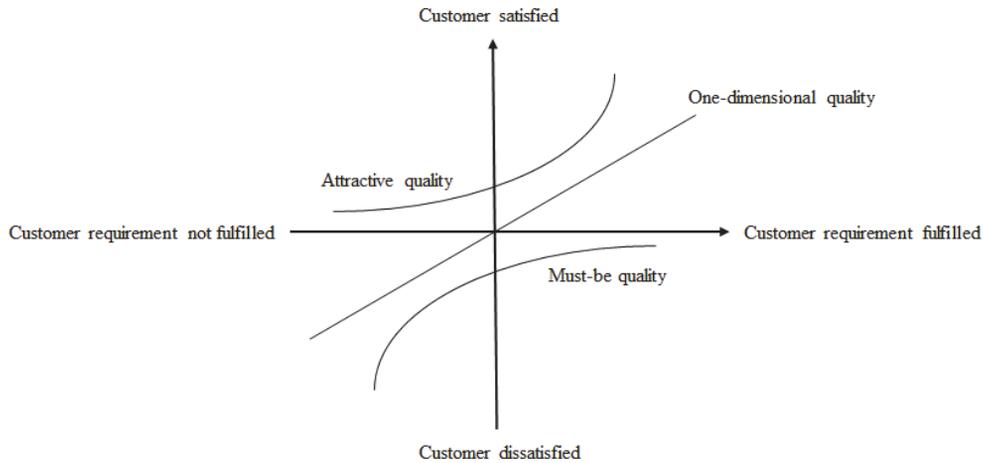
2.3 Kano model

Kano model is used for evaluating customer preferences of factors, when those level of preferences goes different (Shane, 2008). Product(service) attributes could be divided into six categories: must-have, reverse, linear, questionable, exciter, indifferent. Must-haves are attributes that do not provide any additional satisfaction to customers as factor level goes up, but makes customers dissatisfied if factor level goes down below specific point. In contrast, exciters(attractives) are attributes that lack of factors does not change customers satisfaction, but high level of factors provide satisfaction to customers. Indifferents are attributes that do not affect satisfaction whether they are high or low. Linears are those attributes whose presence of factor increases satisfaction and lack of factors decreases it. If high level of attributes decreases and low level of them increases satisfaction, the attributes belongs to reverse. Lastly, questionable attributes are those which could not defined to have positive or negative influences on satisfaction. Table 1 summarizes brief explanation of how Kano model classify factor preferences, and Figure 1 shows how each attributes affect to customer satisfaction (Kano, 1984; Hartono and Chuan, 2011).

〈Table 1〉 The evaluation of Kano model

Customer requirement		Dysfunctional				
		Like	Expect	Neutral	Live with	Dislike
Functional	Like	Q	A	A	A	L
	Expect	R	I	I	I	M
	Neutral	R	I	I	I	M
	Live with	R	I	I	I	M
	Dislike	R	R	R	R	Q

A, attractive: L, linear: M, must-have: I, indifferent: R, reverse: Q, questionable.



〈Figure 1) The characteristics of Kano model

Kano model is used to figure out factor characteristics of a product or service. Recently, Zhu et al. (2011) used Kano model to formulate classification model for smart phone's satisfaction factors. Until now, however, there has been no such model used into study of Mobile banking industry to figure out precise factor characteristics. Results of previous studies only proved standardized single factor coefficients to customer satisfaction.

III. Research methods

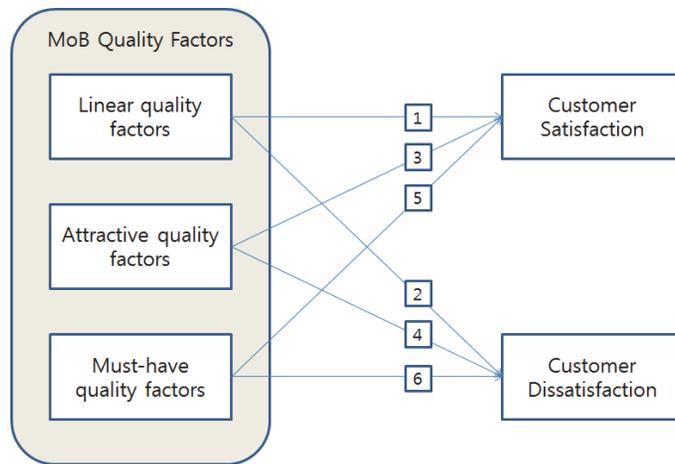
While some quality factors might affect linearly to customer satisfaction, others could affect in quadratic way to the same variable. Also the latter would be divided into two classification, one makes customers satisfied when a quality is high but does not make them dissatisfied if the quality is low(attractives), while the other increases dissatisfaction level higher when the quality is low but does not affect to customers satisfaction even it goes higher(must-haves).

Though Kano model distinguishes factors into 6 categories, the factors of mobile banking are reclassified. The reason of reclassification is that the quality factors of mobile banking in this research are verified as variables in prior researches which

positively related to customer satisfaction. Therefore, both 'live with', 'dislike' in functional question and 'like', 'expect' in dysfunctional question and indifferents are removed: factors of mobile banking are supposed to be categorized into one of 3 categories: must-have, linear, and attractive(exciter).

3.1 Research model and hypotheses development

Quality of mobile banking would include linearly increasing factors, attractive factors, and must-have factors. The research model could be shown as <Figure 2>.



<Figure 2> Research model

In this research, the factors which affects to customer satisfaction is based on prior researches about mobile banking quality. To classify quality factors into linears, attractives, and must-haves, the hypotheses are developed as follows.

Hypothesis 1: There are mobile banking quality factors which affects satisfaction and dissatisfaction similarly (1 = 2)

Hypothesis 2: There are mobile banking quality factors which affects satisfaction more than dissatisfaction (3 > 4)

Hypothesis 3: There are mobile banking quality factors which affects satisfaction more than dissatisfaction (5 < 6)

3.2 Empirical test

Paired t-test comparing functional questions and dysfunctional questions are conducted to find out whether differences exist, based on the mean of two questions (functional mean - dysfunctional mean). The questionnaires are composed with 4-point likert scale from 1 (does not affect to satisfaction/dissatisfaction) to 4 (strongly affect to satisfaction/dissatisfaction). Then, the mean difference are calculated from (effect to satisfaction when quality level is high - effect to dissatisfaction when quality level is low). If it shows positive values of mean difference, the factors are regarded to be attractives, and the negative values designate the factors are must-have. If t-test verifies there is no difference, the factors are linear. The mobile banking quality factors are expected to be categorized into three sectors, as explained above.

3.3 Data

The data of this research is based on survey to whom ever used mobile banking. The total number of samples were 120, and 11 of them are removed which include missing or faithless values. Therefore, 109 samples were used in this research. There was only one person out of 109 who uses smart pad when using mobile banking, while all others use cell phones. 7 respondents replied they use mobile banking more than twice a day, while 13 use less than once per month. While 13 respondents have used mobile banking less than one year, 2 have used more than 10 years. The demographic characteristics of respondents are shown as Table 2. Measurement scale and items of questionnaires of the survey are shown in the appendix A.

〈Table 2〉 Demographic characteristics of respondents

Classification	Number	Percentage(%)	
Age	20's	91	83.5
	30's	16	14.7
	40's	2	1.8
	50's	2	1.8
Gender	Man	86	78.9
	Woman	23	21.1
Occupation	Student	53	48.6
	Office worker	42	38.5
	Private business	3	2.8
	Unemployed	11	10.1

IV. Results

Based on questionnaires of Kano model, paired t-test is conducted to identify whether there are significant differences between satisfaction level about high and low quality factors. The result is shown as Table 3.

〈Table 3〉 Result of paired t-test

Quality Factors of mobile banking		paired t-test		
Number	item	t	p (significance probability)	mean difference
1	INF1	-2.255	0.026**	-0.257
2	INF2	-0.980	0.329	-0.092
3	INF3	-1.712	0.084*	-0.156
4	INF4	-0.094	0.925	-0.009
5	SEV1	-1.596	0.113	-0.156
6	SEV2	1.268	0.207	0.110
7	SEV3	0.380	0.705	0.037
8	SEV4	4.781	0.000***	0.477
9	SYS1	0.415	0.679	0.037
10	SYS2	1.314	0.192	0.110
11	SYS3	0.598	0.551	0.055
12	SYS4	2.792	0.006***	0.284
13	REP1	0.844	0.401	0.092
14	REP2	1.786	0.077*	0.193
15	REP3	-0.709	0.480	-0.064
16	SA1	-1.149	0.253	-0.092
17	SA2	-1.741	0.084*	-0.147
18	SA3	-1.963	0.052*	-0.156

INF1, INF3, SEV4, SYS4, REP2, SA2, and SA3 showed statistically significant differences of satisfaction level when each factor is high and low. Among those items, negative mean difference signify the factors are must-haves, while positive value means the factors are attractives. Others which showed no difference are considered to be one-dimensional factors. The result is summarized as Table 4.

〈Table 4〉 Mobile banking quality factor classification based on satisfaction level

Two-dimensional quality factors		One-dimensional quality factors
Attractives	Must-haves	Linears
Service personalization Visual attraction Reputation	Information relevancy Information accuracy Payment safety Environment safety	Information sufficiency Information recency Service reliability Service promptness Service professionalism Loading speed Easiness of use Easiness of navigation Mobile banking awareness Mobile banking reputation of honesty Safety of encryption and technologies

V. Conclusion

5.1 Implications

This study has the following implications. First of all, this study distinguishes factors that can affect mobile banking service quality, suggesting what quality should be focused on to satisfy customers. Managers at firms can improve customer satisfaction more efficiently by aligning their time and resources to appropriate factors, depending on their current level. For attractives, customer satisfaction could be increased dramatically if it meets or even exceeds customer requirements. For must-haves, on the contrary, it might be efficient to meet appropriate level of requirements without investing excessive manpower and costs. Finally, the linear factors should be tried to satisfy the customer's requirements.

5.2 Limitations and future research

Despite its implications, several limitations could be pointed out. First, the number of samples utilized in this study is significantly lower than the number of mobile banking users, with most samples are limited to those in their 20s. Therefore, it may be a good study to obtain more samples and present more reliable analysis results in future studies. Second, the study only identified three factors that could affect mobile

banking quality, but did not substantially identify its impact. Thus, it may be a good study to understand the effect on actual customer satisfaction by using regression analysis for the two-dimensional factors identified under the Kano model.

The properties of each factor in the Kano model are not always constant and can vary over time. Therefore, it would be a good suggestion for researchers to track changes in the relationship between the degree of meeting customer needs of future factors and customer satisfaction.

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〈Appendix A〉 Measurement scale and items

Information quality (INF)

INF1: This mobile banking provides me with information relevant to my needs.

INF2: This mobile banking provides me with sufficient information.

INF3: This mobile banking provides me with accurate information.

INF4: This mobile banking provides me with up-to-date information

Service quality (SEV)

SEV1: This mobile banking provides dependable services.

SEV2: This mobile banking provides prompt services.

SEV3: This mobile banking provides professional services.

SEV4: This mobile banking provides personalized services.

System quality (SYS)

SYS1: This mobile banking quickly loads all the text and graphics.

SYS2: This mobile banking is easy to use.

SYS3: This mobile banking is easy to navigate.

SYS4: This mobile banking is visually attractive.

Reputation (REP)

REP1: This mobile banking is well-known.

REP2: This mobile banking has a good reputation.

REP3: This mobile banking has a reputation for being honest.

Structural assurance (SA)

SA1: I feel confident that encryption and other technological advances on the mobile internet make it safe for me to use mobile banking.

SA2: I feel assured that legal and technological structures adequately protect me from payment problems on the mobile internet.

SA3: Mobile Internet is a robust and safe environment in which to use mobile banking.

Customer satisfaction

One item asks the degree of overall satisfaction of the service offered with 7-point Likert scale.