SERVICE QUALITY OF MOBILE BANKING SYSTEMS

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Abstract:

This study aimed to promote the use of mobile transaction services and summarize 13 service items affecting mobile banking transactions, functional programs, and accessibility programs. Furthermore, this study designed questionnaire using ANP (the Analytic Network Process). Three experts from the financial industry and academia with more than five years of working experience were invited to compute the weights and find out the optimum program accordingly. Suggestions were proposed for functional programs that could be provided to the banking industry as a basis for decision-making regarding service systems and service quality enhancement, thus further boosting user confidence in the transaction platforms of mobile banking systems.

Keywords: Mobile banking system; Service quality; ANP

1. INTRODUCTION

M-Commerce refers to the implementation of various transactions of monetary value through a mobile network, and can be regarded as a subset of E-Commerce. Lee and Chung (2009) argued that the main change in financial institutions is the change of channels. Lin and Yang (2009) pointed out that the increase in the quantity of mobile phones and the progress in the communication technology of mobile phones represent the growing trend of mobile commerce. Kim et al. (2009) and Gu et al. (2009) suggested that the focus of investment service providers and consumers on mobile banking systems in recent years has been due to their characteristics of a high level of convenience and interactivity, as well as freedom from locational limits. Hence, they can be regarded as emerging mobile commerce applications. Chen et al. (2010) argued that with the development trend of mobile financial services, more and more new financial services will be provided to customers in the future. Kang et al. (2011) indicated that the change of customers from counter-based transaction banking services to the use of online banking system reflects the customers' confidence and perceived satisfaction of online banking systems. Under the trend of financial globalization, the mobile transaction environment implicates high level of competition. Shih et al. (2010) stated that M-banking is the implementation of transactions between the bank and its customers through mobile equipment. Mobile banking systems are an emerging mobile commerce application. It will be a daunting task for banks to encourage their customers to continuously use mobile banking system services and attract new users. Shih (2010) pointed out that psychological risk is the major indicator for consumers in the evaluation of using mobile transaction systems. It was also found that discounts and gifts are relatively less important incentives, and that spatial interests and the time benefits of mobile transactions are the major attractions. In recent years, more and more people have begun using mobile phones to complete mobile transaction services, combining online functions with backstage service systems. Although the standardization level of mobile phone service is higher and more convenient than that of personnel services, service stability cannot be maintained in case of abnormal conditions. Zhu et al. (2002) and Lee et al. (2000) argued that that may affect the customer evaluation of a bank's overall service quality in more serious cases. In addition, it will also harm the sustainable operation and long-term competition of a bank. Chong et al. (2010) indicated that banks should improve their security and privacy, which will then increase the user trust.

As smartphones have become increasingly popular, mobile banking systems have received increased attention from banks, investment service providers and consumers. Therefore, this study used the ANP method as the analysis tool, with the main purpose of finding out the optimum program for mobile banking system transaction services. It was believed that the use of mobile financial services would affect the willingness and sustained use of the service.

2. Literature Review

2.1 Service Quality

The characteristics of service quality, which include intangibility, inseparability, variability and perishability, are different from those of tangible goods. In particular, regarding the intangibility of service, customers will have a perceived risk, and thus they will not trust the service provider. Hence, it is more difficult to measure service quality as compared to tangible goods. How to effectively measure service quality is an important issue. Parasuraman et al. (1985) proposed the PZB model to explain service quality from the perspective of the consumer, arguing that service quality is the gap between the expected service level and the actually perceived service level of the customer, and that the level of service quality is subject to the subjective judgment of the customer. In 1988, Parasuraman et al. made modifications to the PZB model and proposed the SERVQUAL scale, which consists of 22 question items in 5 dimensions, arguing that service quality is the gap between the customer's expected service and perceived service. Anderson and Sullivan (1993) studied the perceived service quality is the antecedent of satisfaction and high customer satisfaction is regarded as the source of corporate profit. Andrew et al. (2002) argued that service quality is the level of satisfying customer needs and expectations. Glaveli et al. (2006) pointed out that successful service quality is the best tool of global competition. The above literature shows that service quality has been receiving increased attention from managers and users. In particular, how to effectively measure service quality has become an important issue.

2.2 Mobile Transaction Service Quality

Karmarkar (1999) pointed out that the banking industry could definitely improve market competitiveness if they further use information technology to develop mobile commerce and understand the needs of customers to create value for them. Gandy (2000) argued that the financial services provided by the banking industry via E-commerce will affect the banks' relationships with their customers, and that this will then change the bank's structure and the development of E-commerce. The five dimensions of the SERVQUAL scale proposed by Parasuraman et al. (1988) include reliability, responsiveness, assurance, empathy and tangibles. Therefore, the SERVQUAL scale is applicable to the service quality of traditional brick and mortar stores. However, the specific characteristics of E-commerce are completely different from those of the physical service industry. Zeithaml et al. (2002), through focus group interviews and two-stage empirical study, developed the E-SERVQUAL scale to measure website E-service quality, arguing that the range of E-service quality includes the seven dimensions of efficiency, system availability, fulfillment, privacy, responsiveness, compensation and contact. Parasuraman et al. (2005) used the Amazon.com and Walmart.com online stores as the empirical study subjects to develop a scale of online shopping website service quality by modifying the E-SERVQUAL of Zeithaml et al. (2002). This new scale had a focus on E-service quality before, during and after the transaction. Service recovery is also an important link of the service. Hence, the seven dimension were further classified into the core service-related E-S-QUAL (E-Core Service Quality) and

service recovery-related E-RecS-QUAL (E-Recovery Service Quality Scale) subscales, in order to cover all of the characteristics of E-service quality. The E-S-QUAL scale includes the four dimensions of efficiency, fulfillment, system availability and privacy, and the E-RecS-QUAL scale includes the three dimensions of responsiveness, compensation, and contact.

3. Research Method

3.1 Questionnaire Design

The questionnaire was divided into two parts. The first part contained demographic items, including gender, working unit/employer, title, and years of working experience. The second part contained the mobile transaction service quality survey items and was modified in accordance with the E-S-QUAL scale proposed by Parasuraman et al. (2005) and the purposes of this study, in order to measure mobile banking transaction service quality. It consisted of 13 question items in four dimensions, including efficiency, fulfillment, system availability and privacy. The question items of the questionnaire underwent a consistency test and the values were below 0.01 in all cases, indicating that the questionnaire was in line with the consistency testing principles.

3.2 Analytic Network Process (ANP)

ANP (the Analytic Network Process), proposed by Saaty (1996), is an extension of AHP (the Analytic Hierarchy Process) integrated with network systems. Saaty (2004) took into consideration the dependency or feedback relationship of decision-making problems. Saaty (2008) also pointed out that the ANP method uses a relatively systematic method to incorporate the feedback mechanism into the AHP method, thus allowing researchers to deduce the priority sequence according to the relative importance of the factors of various groups. The AHP method considers both the upper and lower levels and assumes that the elements of the levels are mutually independent. However, previous studies have found that the AHP method neglects the correlation of criteria and sub-criteria, cannot construct the relevance, and is not logical.

Therefore, the ANP method proposed by Saaty (1996) can overcome the shortcomings of the traditional AHP method. Tzeng et al. (2007), Wu and Lee (2007) and Wu (2008) argued that the ANP method can evaluate and analyze interdependent relationships with multiple criteria. The ANP method assumes the elements of the same or different decision-making criteria are mutually dependent or have a feedback relationship. The steps of the proposed ANP method are as follows.

Envelope the research framework

This study determined the goals in accordance with the problem and found out the criteria and sub-criteria. When applying the ANP method, the system is first classified into two parts. The first part is

known as the control level and includes the goal, the criteria and the sub-criteria. The decision-making criteria are regarded as being mutually independent and dominated only by the goal elements. The control elements may have no decision-making criteria but must at least have a goal element. The weight of each criterion of the control level can be obtained by using the traditional AHP method.

The second part of the system is the network level, which consists of the clusters or components dominated by the control level. Its internal structure is a network structure of mutual influence.

(2) Paired Comparisons between the criteria and sub criteria

After constructing the decision making problem model and dependency relationship, this study conducted a pairwise comparison of the criteria and sub-criteria. Saaty (2006) proposed using a score of 1-9 to determine the relative importance, with 1 representing the same level of importance of two criteria and 9 representing the relatively extreme importance of one criterion against another.

(3) Supermatrix Formation

After the pairwise comparison of the clusters and criteria of Step (2), similar to AHP method, the Eigen vector of each criterion in the control level can be calculated. All of the Eigen vectors can be represented by a matrix, that is, a supermatrix. When the horizontal vectors of a supermatrix are normalized to 1, it is known as a stochastic matrix (unweighted supermatrix). A randomized matrix is known as a weighted supermatrix. The advantage of the weighted supermatrix is that its maximum Eigen vector is 1, which can therefore allow computations of matrix operations to be more easily performed.

(4) Selection of Best Alternative

When various feasible programs listed by the decision-making problem have effects on the system clusters, they should be listed in the supermatrix for operation, in order to get the limiting supermatrix of the feasible programs. According to the weights of the feasible programs and the relative weights of the criteria, the overall weights of each program can be calculated to get the optimum program.

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