International Business Management 7 (5): 414-418, 2013
ISSN: 1993-5250

A Multi-Criteria Analysis of Factors Affecting Performance of Electronic Banking in Iran

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Abstract: Today electronic banking is going to be a very important and integral part of banking system. It also, has a great effect on performance and efficiency of banking system. To achieve an efficient banking, there have to be some knowledge and information about the effective criteria related to the system. Therefore, this study was conducted using Analytic Hierarchy Process (AHP) to find what criteria are important to electronic banking system. First a pair-wise comparison matrix was developed and sent to the bank staff of bank Saderat. Afterwards, the responses were gathered and analyzed in expert choice software and finally the responses were combined to calculate the importance weight of the criteria. According to the results, the criterion security and reliability had the highest value (0.282) criterion satisfaction of costumers had the value of 0.228, the criterion training had the value of 0.211 and the criterion awareness had the value of 0.175 which are the most important criteria, respectively. The other two criteria, quality and quantity and convenience had the value of 0.064 and 0.040, respectively and thus are not so important to the system. As a conclusion, the result of this study can be helpful to managers when deciding to use electronic systems in their banking system.

Key words: Electronic banking, analytic hierarchy process, assessment, bank Saderat, Iran

INTRODUCTION

The importance of Electronic Banking (EB), as a financial services delivery channel is growing because of its wider reach and low cost per transaction. Electronic Banking (EB) is one of the newest and least-researched but most-promising delivery channels for retail banking services. In most of the countries, there is an increase in the number of EB customers. The reason of this growth can be examined from two viewpoints. The first viewpoint is that of the bank customer. EB is an inexpensive or free service that can be accessed at any time and designed to help consumers easily manage their accounts, transfer money between their accounts pay their credit accounts and bills and perform other self-service tasks, such as investment transactions. The second viewpoint is that of bank management. Being in an intense, competitive environment necessitates differentiation, cost effectiveness and speed in order to survive. These motives cause banks to move towards EB services that provide innovative technological products and offer wider choices with lower costs than those of other delivery channels. Implementation of EB services with greater efficiency and quality can improve a bank's name recognition, innovative image and customer loyalty.

Facing pressure within the banking sector, banks are trying to keep their existing customers and win new ones. There are some specific factors that promote the acceptance or continued use of the EB channel of a bank by its customers. Without doubt, being aware of these factors and their importance provides a potential competitive advantage to bank management. Identifying the factors that influence on an efficient performance of electronic banking, defining the effects of these factors on electronic banking and assessing the importance of them from the managers' point of view necessitate an effective decision-making process. This study proposes an integrated Multi-Criteria Decision Aid-based (MCDA-based) evaluation that executes such a process through the stages of structuring the problem, constructing the decision model and analyzing the problem.

In the literature, few studies were reported. Polatoglu and Ekin (2001) conducted an exploratory study of customer acceptance of EB services. Reliability (security, privacy) accessibility (instant feedback, quick transactions, access from anywhere) and savings (low or no cost, time saving, self-service) are determined as the factors that affect the customer acceptance of EB services.

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Liao and Cheung (2002) identified the attributes related to customers' attitude toward the usefulness of EB and their willingness to use it in Singapore. The defined attributes are security (authorized access, customer information kept confidential, restrictions on high value transactions, strong commitment to security measures) accessibility/convenience (access from anywhere, access at any time, wide variety of services) user friendliness (easy to follow instructions, simple procedures, light hard and soft ware requirements) user involvement (user experience and skill) speed (quick response) user experience and skill.

Sohail and Shanmugham (2003) examined the current trends in the e-Commerce revolution that has been set in motion in the Malaysian banking sector. They reported on empirical research conducted in Malaysia to study the customers' preference for EB and the factors influencing the adoption of EB. They claimed that the factors security, user experience and skill, trust (correction of erroneous transactions, banks' compensation for losses due to security infringements, banks' response rate to queries) accessibility (speed, access from anywhere) convenience (time saving) reluctance (willingness to adopt technology enhancement, level of awareness of current trends, attitude towards chance) ease of use and low or no cost (cost of PC, cost of internet connection) influence the adoption of EB. Suh and Han (2002) stated that in other research, ease of use and usefulness had been determined to affect the acceptance of various information systems by consumers. They introduced trust as a third factor that can be considered to be fundamental in determining the acceptance of EB.

Howcroft *et al.* (2002) made a more general research on not only EB but also other bank alternative delivery channels in the UK and analyzed consumer attitudes towards these channels. A questionnaire was designed to reveal information about which channels consumers had used and about the factors that consumers believed to be important for enabling or preventing adoption of these channels. Security, accessibility, service quality, low or no cost, time saving, access at any time, recommend and lack of face to face contact are determined as the factors effecting the customer decisions.

Centeno (2004) studied the dynamics of adoption of internet services in general in the Acceding and Candidate Countries (ACC) of the European Union (EU). The factors security, privacy, trust, user experience and skill and willingness to adopt technology enhancement are utilized in order to reveal the dynamics of adoption.

Cheng *et al.* (2006) investigate how customers perceive and adopt EB in Hong Kong. The study analyses the data using Structured Equation Modeling to evaluate the strength of the hypothesized relationships among the constructs which include perceived ease of use and perceived web security as independent variables, perceived usefulness and attitude as intervening variables and intention to use as the dependent variable.

Corrocher (2006) examines the determinants of adoption of EB among Italian retail banks. The empirical analysis indicates that the adoption of EB depends upon the characteristics of traditional banking activities. The most significant effects of product innovation on competitive advantage derive from outward orientation on the demand side (Woodruff, 1997). The product-offering firm's first task should be identifying and measuring the factors that targeted consumers perceive to be important and determining the relationships among these factors.

All the earlier mentioned studies investigated the factors that affect EB from different perspectives in different countries, as well as the importance of them. For evaluating the numerous factors, Analytic Hierarchy Process (AHP) has become one of the most widely used multi-criteria decision support system to help user by breaking down these complicated decisions into a hierarchy (Meszaros and Rapcsak, 1996; Saaty, 1980). This methodology is a powerful and flexible decision making process to help decision makers set priorities and make the best decision when both qualitative (intangible) and quantitative (tangible) aspects of a decision need to be considered (Gercek *et al.*, 2004; Marinoni, 2004; Malczewski, 2006). Considering the importance of electronic banking in the new systems of banking, this study was conducted to investigate and evaluate the factors affecting electronic banking in Iranian bank by AHP method to help managers in making their financial and functional decision.

MATERIALS AND METHODS

This study was conducted in Guilan Province, Northern Iran. This research investigated the factors affecting electronic banking system used in all the bank Saderat located in the province. To do this, first the factors were to deal with electronic banking in Iranian bank were collected through the literature review of research already conducted on Iranian bank. Considering the literature there were 6 factors or criteria out of the whole related factors frequently used in the previous research. The researchers mentioned the factors can be effective on electronic banking, however an evaluation needed to provide some clear data about which factor is really important and which one is not important to

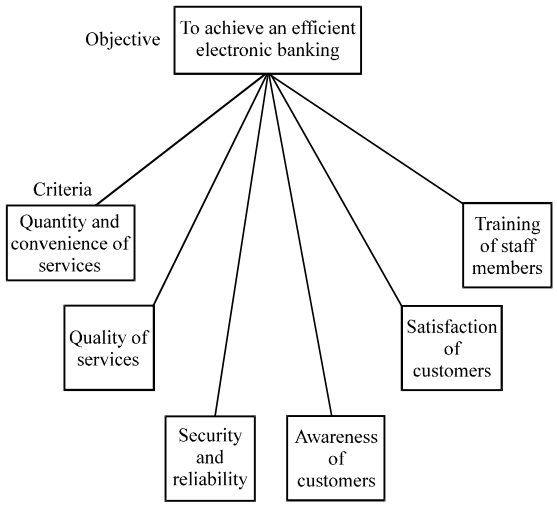

Fig. 1: Flowchart of multi-criteria evaluation of this study

electronic banking. Not much evaluation done about the importance of effective factors in the country. So in this study, a multi criteria evaluation technique, AHP method conducted to weight and rank the criteria affecting on electronic banking in Iran (Fig. 1).

A pair-wise comparison questionnaire of the criteria collected before was developed and sent to the panel members whom invited to the research to rank the criteria regarding to their effect and importance in the assessment procedures. They were asked to compare and weigh the 6 criteria against each other based on their knowledge and professional experiences. The responses were then gathered and analysed in the Expert Choice (EC) software. The consistency ratio of the responses were examined in the software and if acceptable (Saaty, 2000) were, then combined to obtain the final weights of all the criteria.

Finally, considering the weights calculated by EC, the criteria were ranked regarding their priority level and their importance on electronic banking, thus the most important criteria were determined for the bank Saderat of Guilan Province.

RESULTS

The factors collected and were to be effective in electronic banking system in Iranian bank were, including of the criterion security and reliability, criterion satisfaction of costumers, criterion training of staff members, criterion awareness of customers, criterion quality of services and quantity and convenience of the services.

The 6 earlier mentioned criteria were considered to conduct a multi-criteria evaluation of electronic banking

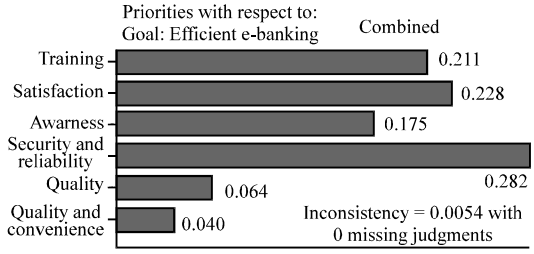

Fig. 2: The importance weights of criteria in electronic banking

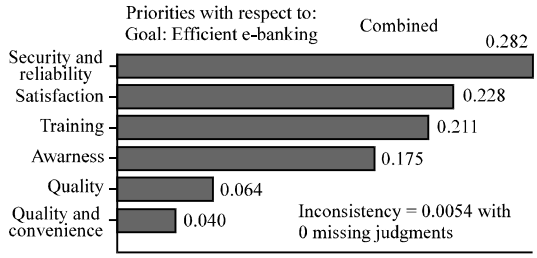

Fig. 3: The importance weights of criteria in electronic banking with respect to priority levels

in Iranian bank. About 61 participants out of the all participants from bank Saderat of Guilan filled the questionnaire in a way that the consistency ratio was acceptable (<0.1 which Saaty (2000) defined that as good consistency). Afterwards, the judgments of 61 participants were combined into one as an average and thus the final weight of criteria were obtained as Fig. 2 and 3.

Figure 2 shows the importance weights of the criteria based on judgments of participants. As showed in Fig. 2 in the combined weights listed on the graph, the criterion security and reliability had the highest weight value of importance (Fig. 3) and thus the most important factor to be considered in managing an electronic-based banking.

Also to make a better decision on selecting important factors, researchers calculated a value of importance percent for each criterion which indeed shows the number of participants who gave the highest value to a special criterion. In another words by considering the 61 judgments, researchers found out how many times a special criterion had the highest value in the 61 export results. For example, 26 participants have given the highest weight value to criterion security and reliability which shows an importance percent of 41.80% in Fig. 4. Researchers, calculated the importance percent for all the 6 criteria to see which one are more important regarding the judgments of our expert. Figure 4 shows the result of this calculation.

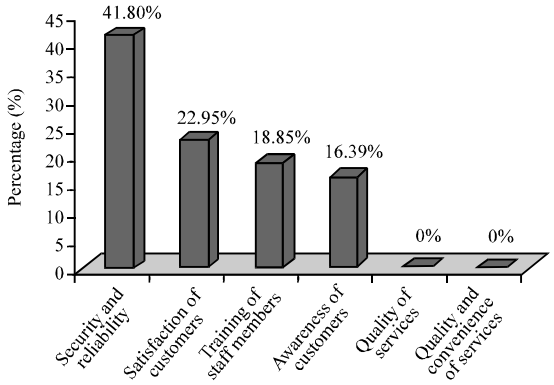

Fig. 4: The importance percent of criteria regarding the judgments of participants

As shown in Fig. 4 the criteria, security and reliability, satisfaction of customers, training of staff members and awareness of customers had the highest value in many times and thus important to electronic banking. But, there was no participant to give the highest weight value to the criteria quality of services and quantity and convenience of services. So, these two criteria had 0% for as their important percent, thus not so important to electronic banking in Iranian bank.

DISCUSSION

Using electronic banking instrument has been on an increase in different country. To achieve an efficient management of this kind of banking there have many research in many countries to define what factors are important for this purpose. Lack of information about electronic banking management and its related factors in Iranian bank made the researchers to conduct, such a research to include staff members of Iranian bank into the multi-criteria evaluation process to define what factors are important and affecting electronic banking management in bank Saderat of Iran.

According to the result most of the participants (61 participants) helped us by their knowledge and experts in fulfilling the questionnaire stage of this study. There were some participants who did not fill the questionnaire or in a way that consistency ratio was >0.1 and thus ignored. For the other 61 participants the consistency ratio was acceptable and well <0.1 (Saaty, 2000).

According to final export of importance weight (Fig. 3) almost 90% of total weight allocated to 4 criteria including security and reliability with weight value of 0.282, satisfaction of customers with weight value of 0.228, training of staff members of bank with weight value of 0.211 and the criterion awareness of customers with weight value of 0.175 were more important criteria than the two others. The two other criteria quality of services and quantity and convenience of services had the weight values of 0.064 and 0.040, respectively.

Based on the result of AHP in this study, the criterion security and reliability is the most important and affective factor in electronic banking management. As Polatoglu and Ekin (2001) in Turky, Sohail and Shanmugham (2003) in Malaysia and Liao and Cheung (2002) in Singapore proved security to be an important factor in electronic banking given the customers preferences and considered that as the first factor to be taken into account in management.

Also Centeno (2004), revealed that the factors including security, privacy and trust are the three most important factors according to customer's viewpoint in the European Union (EU).

The data exported in the EC software were used once more to calculate the importance percent of each criterion which shows how many participants gave the highest weight value to each criterion. According to, result criterion security and reliability had the value of 41.8% which shows 41.8% of participants believed that security and reliability would be the top factor. Similarly, for the criterion satisfaction of customers there has been a value of 22.95% of importance percent. There have been 18.85% of participants who gave the highest weight value to the criterion training of staff members of bank and also there have been 16.39% of participants who gave the highest weight value for the criterion awareness of customers. However, there have not been any of participants to give the highest weight value for the criteria quality of services and quantity and convenience of services, thus there is no importance percent for these two criteria (Fig. 4).

CONCLUSION

Thus considering these results, it can be concluded that the criteria quality and quantity of services are not so, important in electronic banking management and thus are not in priority in management process.

As a conclusion the 4 criteria (i.e., security and reliability, satisfaction of customers, training of staff members of bank and awareness of customers) are the important factors for electronic banking in Iranian bank of Saderat. However, among them the criterion security and reliability had the highest weight value in most of the export results in this study and previous research. So, it should be defined as the most important criterion. It is, therefore managers of bank are highly recommended to give a high priority to this criterion in the application of electronic banking instrument and management procedure to be able to achieve the objective of electronic banking which is efficient banking while save time and money.

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