SERVICE QUALITY ANALYSIS:

AN APPLICATION ON ONLINE BANKING

AND ATM FACILITIES

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Abstract—**This study tries to identify the effects of services offered by Malaysian banks through online media and ATMs on customer satisfaction. 500 students from different universities in Malaysia including University of Malaya, University Kebangsan Malaysia, University Putra Malaysia, Multimedia University Malaysia and Limkokwing University chosen as a sample frame of the study.**

Questionnaires are distributed among them and they are asked to respond to questions which ask about their perception as well as experience for their banks.

Two analyses are employed to fully reflect the effect of online and ATM services on their satisfaction level. The first one was service quality model which compares the difference between satisfaction and expectation level in order to find out which dimensions need to be improved.

Second analysis was Two-Way ANOVA analysis which tried to identify the relationship between demographic factors and the study's outcome. Finally, the study determined which factors have the most effect and which factors have the least effect on customer satisfaction level

Keywords: online banking, ATM, customer satisfaction and service quality.

I. INTRODUCTION

This study will provide the background of the research area. It contains general concept of the Internet banking, automated teller machine (ATM), evolution of Internet banking in Malaysia, customer satisfaction and service quality.

II. EVOLUTION OF E-BANKING IN MALAYSIA

The Internet is a new way to deliver banking services. At first, online banking services demanded some facilities such as computer and software to offer their services. It was introduced in 1980s. Development in information technology and telecommunication have resulted a revolution in Malaysian banking industry. This revolution in the Malaysian banking sector started since 1970s. One of the most important changes that took place in Malaysia was the introduction of Automated Teller Machines, ATM, in 1981. After presence of ATM, Tele-banking and PC- banking were introduced in 1990s. The next step of this revolutionary process was the internet banking. On June 1st, 2000, Malaysian Central bank or Bank Negara Malaysia (BNM) allowed all domestic banks to offer a full range of products and services over the internet to their customers. Finally, on June 15, 2000, Malayan banking Berhad (Maybank), the largest domestic bank in terms of asset has become the first bank to offer internet banking service in Malaysia through its own portal, www.maybank2u.com. This service offered many financial services to customers. Customers were able to pay their bills, check their balance and transfer money to other accounts. It provided daily customer support service via email as well as telephone line from 6 A.M to 12 midnight. Another domestic bank is the Hong Leong bank that introduced internet banking in December 2000 and it provides not only all previously Phone banking services but also offers the option of accessing to all history transaction on its websites, www.hlbb.hongleong.com.my. They also provide customer service via email and telephone line that is available daily from 7am to 11 pm. Third bank that offered internet banking in Malaysia was Southern Bank. (Southern bank later acquired by Bumiputra Commerce Bank. Then, these two banks along with CIMB Investment Bank created a universal bank which is currently called CIMB Bank). Alliance bank is another bank which offered internet banking toward the end of 2001 via www.alliancebank.com.my. A recent inspection about the Malaysian bank's websites indicates that all domestic banks which were called anchor banks have a website and offer online banking services. Others banks are Am bank, AFFIN, Public, EON and RHB Bank Berhad in Malaysia.

III. ATM AND EVOLUTION IN MALAYSIA

ATM is the abbreviation of automated teller machine which acts as a teller in a bank who takes and gives money over the counter and it was the first well known machines to provide electronic access to customers. With the appearance

of automated teller machine, banks are able to serve customers outside the banking hall because ATMs are placed inside or near the banks and also outside the banks such as shopping malls, restaurant, airports or any places that people may gather. ATM is designed to manage the most important function of bank. ATM services includes some function such as cash withdrawal, balance enquiry, bill payment, cash and cheque deposit, saving and credit account. With appearance of ATMs, some limitation of time and geographic location has been resolved. ATMs undoubtedly are one of the most popular delivery ways for banking services in Malaysia. (Balachandher.K.G, Santha.V, Norhazlin.I, Rajendra.P, 2000).

IV. CUSTOMER SATISFACTION AND SERVICE QUALITY

Customer satisfaction is a crucial topic to success in any business either traditional or online (Ho and Wu, 1999). Customer satisfaction is more critical in internet companies because customers demand a high quality products or services and if they are unsatisfied, it is easy for them to move away to another site and leave those companies forever. Thus, the internet companies need to know the customer's requirements for satisfactory level. Some parameters of customer's satisfaction include numbers of clicks needed to find what they want, amount of information they need, response time and speed of webpage.

Service quality has found as one of the significant factors in distinguishing services and products. Service quality is an important tool to measure customer satisfaction (pitt et. al, 1995). There is a close relationship between service quality and customer satisfaction. Customer satisfaction can be protected by providing products or services with high quality (Getty & Getty, 2003; Gupta & Chen 1995; Tsang & Qu, 2000). One of the famous tools to assess customer satisfaction is SERVQUAL model by Zeithaml et.al, (2000) but this model cannot used in internet banking because it has different service delivery process. E-SERVQUAL model is developed by Zeithaml, Parasuraman, and Malhotra's (2000) to cover all customers' communication on websites.

V. LITERATURE REVIEW

E-service quality can be explained as an overall customer evaluation about e-service delivery in the marketplace which is virtual (Santos, 2003). One of the main reasons for the improvement of e-services quality is that customers have the opportunity to access the company's website from different places around the world and will be able to compare the company's service with others company's offering. So, online customers' expectation is higher than traditional customers (Santos, 2003). On the other hand, companies have the opportunity to attract and develop the relationship with customers from anywhere. Delivering high e-service quality is important but there is some problem in how it can be defined and how it can be measured. There are different methods to study about electronic services. Each of these methods employs different dimensions to conduct the research. For instance, one the methods use 5 dimensions for its study. The explanation of five dimensions of service quality changes when customers deal with technology

instead of service personnel (Parasuraman and Grewal, 2000). Traditional SERVQUAL model evaluate and measure the performance of firms and businesses that did not use online facilities to run their business but E-SQ is an instrument similar to the SERVQUAL model that developed for measuring the quality of online services. E-SQ introduced to cover all aspects when customers confront with a Website: The extent to which a Website facilitates shopping, purchasing and delivery. There are a lot of studies on measuring the e-service quality. For instance, Lociacono et al. (2002) develop nine dimensions of e-service quality and this scale called WEBQUAL with these dimensions: Information, interactivity, trust, response time, website design, intuitiveness, flaw, innovativeness. Yang and Fang (2004), identify difference between dimension of online service satisfaction and dissatisfaction. Dimensions are Quick response to enquiries, comfortable navigation and trustworthiness. Zeithaml et al. (2000, 2002) and Parasuraman et al. (2000) conducted a research on e-service quality based on earlier research on traditional service quality and developed an E-S-QUAL scale based on 7 dimensions. They later extended their research and created another model with 11 dimensions that are: Trustworthiness, quick response, accessibility, flexibility, comfortable navigation, efficiency, assurance, security, site design, price information and customization. This model resembles a lot to SERVQUAL instrument, but it has new dimensions that related to online services. In this model, reliability, responsiveness, assurance, access, assurance and customization are also the quality dimensions of the traditional SERVQUAL model but there are some new dimension that related to technology such as comfortable navigation, efficiency and design of the web pages.

VI. RESEARCH QUESTIONS

1. How does reliability of online banking and ATM services affect the level of customer satisfaction in Malaysia
2. What is the relationship between customer satisfaction and security level of online banking and ATM services in Malaysia?
3. How do convenience and ease of use from online banking services and ATMs affect the level of customer satisfaction
4. What is the relationship between costs of online and ATM transaction with the level of customer satisfaction?
5. What are the overall strength and weakness dimensions of online and ATM services in Malaysia?

VII. RESEARCH OBJECTIVES

Based on questionnaire that will be distributed among 500 respondents, this study will be fulfilled the following objectives:
1. To find the strength and weakness dimensions of Online Banking and ATM services in Malaysia.
2. To study the most important dimensions of quality services offered by Online Banking systems and

ATMs that affects the satisfaction level of customers in Malaysia.

VIII. DETERMINING SERVICE QUALITY PERCEPTION AND EXPERIENCE

In this research, perceived service quality model, which is the difference between customer's expectation and satisfaction, is used as a research strategy. Respondents should complete two different types of questions. One category asks questions based on their perception or expectation of a service delivered to them and another category asks them some questions bases on their satisfaction or experience. So SQ introduces service quality whereas P and E introduce perception and expectation respectively.

Service quality = perceived – experience

SQ: Service Quality, P: Customers' Perception, E: Customers' Expectation. So, $(P – E = SQ)$, is a scale to examine the expectation or perception of a customer about the quality of specific product or service (SQ).

> 1. Negative Q indicates that there is a gap in service quality.
> 2. Positive Q indicates that the satisfaction level of consumers is higher than their expectation.

IX. TWO –WAY ANOVA ANALYSIS

Second strategy which used in this strategy is Two-Way ANOVA analysis in order to find out the connection between some independent variables and dependent variables of the study. Independent variables which are chosen include: **IV1: Age, IV2: Gender, IV3: Race, IV4: Marital status** and **IV5: Education level**

Study divides the outcome or dependent variables into two categories of satisfaction and expectation. For instance, ANOVA analysis will find the relationship between race (independent variable) and reliability of bank (dependent variable or outcome) from two aspects of satisfaction and expectation. Dependent variables include E-SERVQUAL dimensions as well as SERVQUAL dimensions. ANOVA analysis tries to find out whether each of independent variables like age and race has significant impact on outcomes such as reliability, access, trust, privacy and so on. Furthermore, it will identify which of the components of independent variable has the most and the least impact on output. For instance, it identifies that among races, Malaysian has the most and Indian has the least satisfaction level on the privacy of online transactions.

X. SAMPLE FRAME AND DATA COLLECTION

In this research, a sample size of 500 students from different Malaysian universities including MMU, UPM, UM… was taken. (All students have bank account.)

Primary data are used as a collection method. It includes data through a questionnaire with customers of online banking and ATM services in Malaysia. This study attempts to collect data randomly. Therefore, the questionnaires distributed among students with different level of educations.

The special target for collecting data is students in different universities in Malaysia.

XI. DISCUSSION AND CONCLUSION

After summarizing all demographic, perception and expectation information, gaps of online banking and ATM services in Malaysia are found. 3 out of 11 dimensions of E-SERVQUAL model are found unable to respond customers' need. These dimensions are responsiveness, customization, and flexibility for E-SERVQUAL model which was applied for online banking system in Malaysia. Therefore, Malaysian anchor banks are required to improve their services related to these dimensions in order to fulfill the customers need. On the other hand, tangible and responsiveness dimensions out of 5 dimensions of SERVQUAL model are found unable to fulfill the respondents demand as well. So, ATM services related to these dimensions need for further enhancement to satisfy customers.

XII. SUMMARY OF SERVQUAL MODEL RESULTS

A sample size of 500 students in Malaysian university was targeted that results a respond rate of 97%. In other words, 486 questionnaires were returned. One of the sections of the questionnaire related to the demographic information of the respondents. It includes age, gender, race, education level, and marital status as well as online banking and ATM user background. 87 percent of the respondents are among the age group of 18 to 29 years followed by 9.9 percent for the age group of 30 to 39 years. 3.1 percent of the respondents are between 40 to 60 years old. Gender of the respondents is approximately same. 49.4 percent of the respondents are male whereas 50.6 of them are female. Race was another factor that was surveyed in questionnaires. 29.6 percent of the respondents are Chinese followed by 22.8 percent of Malaysian, 19.3 percent of Iranian and 9.3 percent of Indians. The largest proportion of the respondents is from races other than these three nations. Education level was another section of the questionnaires. 45.1 percent of the respondents are studying for degree whereas 25.3 percent of them are studying for Master's degree followed by 15.4 and 14.3 percent of the respondents who are studying for Diploma and PHD degree consecutively. 88.3 percent of the respondents are single whereas 11.7 of them are married. Respondent background is another section of demographic part where some information such as frequency of internet banking and ATM usage as well as duration of internet banking usage collected. 33.3 percent of the respondents claimed that they use online banking facilities monthly whereas 29 percent of them use online banking less often. 27.8 percent of the respondents use online banking weekly followed by 9.9 percent of the respondent with daily frequency of online banking usage. Respondents' usage is mostly for paying bills, checking balance and transferring money. Frequency of ATM service usage was another section in demographic part. 55.6 percent of the respondents claimed that they use ATM services on a weekly basis for withdrawal and cash deposit whereas 19.8 percent of them use it monthly. 14.8 percent of the respondents use ATM

services less often whereas 9.9 percent of them use it daily. Duration of online banking and ATM services was the last section of demographic part. 52.5 percent of the respondents claimed that they use online banking facilities less than a year whereas 24.7 percent of them use online banking services between 1 to 2 years. 13 percent of the respondents use online banking services between 2 to 3 years followed by 9.9 percent of the respondents who use online banking services between 3 to 5 years. For duration of ATM services, 22.8 percent of the respondents claimed that they use ATM services less than a year while 21.6 percent of them use ATM services between 1 to 2 years followed by 21 percent of the respondents with 2 to 3 years of using ATM services. The amount of respondents who use the service between 3 to 5 years and more than 5 years were the same which was 17.3.

The structure of questionnaires for online banking services was based on E-SERVQUAL model with 11 dimensions in order to discover any gap in online banking services in Malaysia. These dimensions consist of ease of navigation, trust or assurance, privacy, responsiveness, reliability, customization, aesthetic design, efficiency, access, flexibility, and price knowledge. For first dimension which was ease of navigation, three questions were asked and the overall difference of this dimension results a positive mean which is 0.8048. The customer satisfaction mean was 2.8007 and their expectation mean was 1.9959.

Second dimension for measuring the impacts of service quality on customer satisfaction for online banking services was trust or assurance. This dimension also indicates a positive difference of 0.7161. The customer satisfaction mean was 2.81485 while their expectation mean was 2.09875. Privacy was third dimension which asked from respondents. Customer satisfaction in this dimension exceeds their expectation indicating a positive difference. The customer satisfaction mean was 3.13 but their expectation was 2.3333. The fourth dimension among 11 dimensions that results a negative overall result was responsiveness. It indicates that customer expectation from this aspect exceeds their perception. In other words, their expectations were not fulfilled well. The overall difference was -0.7037 and their satisfaction and expectation means were 2.4012 and 3.1049 respectively. Fifth dimension in the questionnaires was reliability. Respondents answered to this dimension well implying that the overall difference mean for this dimension was 0.8138. Customer perception from this dimension was higher than what they expect. Customer satisfaction and expectation means were 3.0607 and 2.2469 respectively. Another dimension in E-SERVQUAL model for online banking services that results a negative result was customization. The overall difference mean was -0.5432 and customer satisfaction and expectation mean were 2.3889 and 2.9321 respectively. Aesthetic design was another dimension of the questionnaires. This dimension also fulfills the demand of respondents in term of delivering services. The customer satisfaction mean for this dimension was 2.9434 whereas their expectation was 2.3806. The overall difference was 0.5628. Eighth dimension of E-SERVQUAL model measures the efficiency of online banking systems in terms of delivering services. This dimension fulfills the

respondents demand as the overall difference mean was positive. The customer satisfaction mean was 2.9166 whereas the respondent expectation mean for this service was 2.2129. The overall difference was 0.7037. Access was the ninth dimension of E-SERVQUAL model. The overall difference for this dimension was 0.4527 indicating that respondent's expectations are completely fulfilled. The customer satisfaction mean was 2.7058 whereas their expectation was 2.2531. Flexibility was another dimension which did not satisfy the respondents. The overall mean difference was -0.6893 indicating that the respondents expectation was higher than perception. The respondent's satisfaction and expectation were 2.1543 and 2.8436 respectively. The last dimension of E-SERVQUAL model also results a negative difference implying that respondents are not satisfied in this area. Customer's satisfaction and expectation means were 2.2469 and 3.1132 respectively. The overall mean difference was -0.8663. After measuring the impact of service quality on customer satisfaction in online banking area, the study focused on ATM services in Malaysia. For this area, the study used SERVQUAL model to exploit the impact of service quality on customer satisfaction. This model consists of 5 dimension including reliability, assurance, tangible, empathy, and responsiveness. Reliability was the first dimension which was asked in questionnaires. The results indicated that respondents were satisfied in term of reliability of ATM services. Respondent's satisfaction and expectation means were 2.7462 and 2.12 respectively. The overall mean difference was 0.6262. Second SERVQUAL dimension the study used was assurance. This dimension also satisfied the ATM user's demand. The respondent's satisfaction and expectation means were 2.8237 and 2.1811 respectively indicating a positive mean difference of 0.6426.

First dimension among 5 SERVQUAL dimensions which was not able to satisfy the respondent's demand was tangible. The mean difference of this tangible that extracted from questionnaires was negative. The overall mean difference was -0.4039 and the respondent's satisfaction and expectation means were 2.3127 and 2.7166 respectively. Empathy was another dimension in questionnaires which fulfills the respondent's perception. The overall mean difference was 0.6368 whereas respondent's satisfaction and expectation means were 2.9228 and 2.286 respectively.

Responsiveness was the second dimension among 5 SERVQUAL dimensions which was not able to satisfy the respondent's demand. The overall mean difference was -0.7223 which was negative. It implies that the respondent's expectation exceeds their perception. The respondent's satisfaction and expectation means were 2.2345 and 2.9578 respectively.

XIII. SUMMARY OF TWO WAY ANOVA ANALYSIS RESULTS

Results of Two-Way ANOVA analysis are summarized in two tables. First table shows the relationship between dependent and independent variables which is based on the highest satisfaction level. Second table shows the

relationship between dependent and independent variables which is based on the lowest expectation level.

TABLE1. Highest Satisfaction of Outcomes for Different Demographic Factors

DV/IV	Race	Degree	Gender	Age	Marital Status
Ease of navigation	Indian	-	-	-	Single
Trust	-	-	-	-	-
Privacy	-	-	Male	30-39	-
Responsiveness	Other	-	-	40-60	-
Reliability	-	-	-	-	-
Customization	Indian	-	Male	-	-
Aesthetic Design	-	PhD	-	40-60	Married
Efficiency	-	Master	-	18-29	-
Access	Other	-	-	30-39	Single
Flexibility	-	-	-	-	-
Price Knowledge	Iranian	-	-	40-60	-
ATM Reliability	Other	-	-	-	-
ATM Assurance	Other	-	-	-	Single
ATM Tangible	-	-	-	40-60	-
ATM Empathy	Other	Master	-	-	-
ATM Responsiveness	-	PhD	Male	40-60	-

TABLE2. Lowest Expectation of Outcomes for Different Demographic Factors

DV/IV	Race	Degree	Gender	Age	Marital Status
Ease of navigation	-	-	-	18-29	Married
Trust	-	-	-	-	-
Privacy	-	Degree	-	-	-
Responsiveness	Indian	-	-	-	-
Reliability	Malaysian	Degree	-	18-29	Married
Customization	Indian	PhD	Female	18-29	-
Aesthetic Design	Malaysian	-	-	18-29	-
Efficiency	Malaysian	-	-	-	Single
Access	Malaysian	-	-	-	-
Flexibility	-	-	-	-	-
Price Knowledge	Indian	Diploma	-	-	Single
ATM Reliability	Malaysian	-	Female	30-39	-
ATM Assurance	Malaysian	Diploma	-	30-39	-
ATM Tangible	Malaysian	-	-	40-60	Married
ATM Empathy	-	Diploma	-	30-39	Single
ATM Responsiveness	-	Diploma	Female	-	-

After summarizing all demographic, perception and expectation information, gaps of online banking and ATM services in Malaysia are found. 3 out of 11 dimensions of E-SERVQUAL model are found unable to respond customers' need. These dimensions are responsiveness, customization, and flexibility for E-SERVQUAL model which was applied for online banking system in Malaysia. Therefore, Malaysian anchor banks are required to improve their services related to these dimensions in order to fulfill the customers need. On the other hand, tangible and responsiveness dimensions out of 5 dimensions of SERVQUAL model are found unable to fulfill the respondents demand as well. So, ATM services related to these dimensions need for further enhancement to satisfy customers.

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