An Empirical study on the Effect of E-Service Quality to Satisfaction

Gong Jing (1st author)
Commercial school, Linyi University, Associate Professor
The middle part of Shuangling Rd., Linyi city, Shandong Province, P.R. China.

Yoo, In Seon (corresponding author)
Department of Business Administration, Suwon University, Professor
17, Wauan-gil, Bongdam, Hwaseong, Gyeonggi-do, Korea.

Abstract:
With the development of e-commerce, e-banking becomes one of the most booming service industries since the reform and opening up in China. Many studies have been conducted to assess users’ satisfaction with e-banking, none has focused on the ways in which the three quality factors (system quality, information quality and service quality) associated with e-banking affect customer satisfaction in China. Our proposed research model, based on DeLone and McLean’s IS success model, assesses how these three external quality factors can impact customer’s satisfaction and trust. We collected 306 valid questionnaires from e-banking customers, then analyzed them using structural equation modeling. Our results show that system quality and service quality significantly influence customers’ satisfaction with e-banking in China, and that information quality does not. Also, satisfaction has significantly influence on loyalty with e-banking in China context.

Keywords: IS success model, e-banking, e-Service Quality, Customer satisfaction

1. Introduction
The Internet revolution and technology advancement fundamentally changed the banking and financial services sector in terms of the variety of financial services and how they are provided. Using telecommunication systems and technologies, a bank can reach out to customers and provide them with not only general information about its services but also the opportunity of performing interactive retail banking transactions (Shumaila et al., 2003), that’s so called electronic banking. Electronic banking (e-Banking) becomes efficient channels for delivering innovative financial services for each bank gradually (Liao & Wong, 2008) The biggest change is banks’ service channel, which has changed from branch offices in the past to incorporate CD/ATMs (cash dispensers/automated teller machines), phone banking, PC banking, Internet banking and mobile banking (Lee & Chung, 2009).

Banking service is one of the most booming service industries since the reform and opening up in China. In 1996, Bank of China expanded business from traditional banking to Internet firstly. From then on, almost all large-and-medium-sized commercial banks in China began their own e-service. With the rapid development of e-commerce, China’s e-banking entered into the phase of rapid development. In 2005, China e-banking’s annual online transactions are just 52.5 trillion. In 2012, the online transactions were 900 trillion Yuan (CFCA, 2012) which show a dramatic growth. During the period the 12th Five Year plan of China, e-banking in China will still keep growing steadily, as long as the international financial environment does not deteriorate drastically and there is no significant upheaval of the China’s economy. It is predicted that e-banking transaction size will rise up greatly.

Along with the rapid development, commercial banking faces more competition in China. Because of homogeneity trend of financial production and service, plus low switching cost, customer can easily transfer from one e-banking to another. Given the fact that banks invest billions in the internet infrastructure, customer satisfaction and customer retention are increasingly developing into key success factors in e-banking (Bauer et al., 2002). Although customer loyalty is crucial for sustaining business in banking organizations, lack of loyalty research in China has been noted in the online banking context. So it is necessary to research on customer satisfaction and loyalty with e-banking in China. The purpose of this survey study is to research the relationship between e-service quality with satisfaction and loyalty of e-retail banking in China. We employed survey data and structural equation model to measure e-banking service quality and consumer attitudes toward e-banking.

2. Literature Review
Transfer from traditional e-commerce to e-service is a paradigm shift (Rust, R.T. & Kannan P.K.2003) . And the nature of the Internet is e-service. The main distinct difference between e-service and offline service is the use of information system. So we try to overview literatures about the information system model and find the relationship between them and customer satisfaction loyalty.

2.1 IS Model and E-commerce success metrics
The main difference between online service and offline service is the use of information system and the most famous model was developed by DeLone and McLean which provides a robust indicator of the success of information systems (DeLone & McLean, 1992).

Shannon and Weaver (1949) used technical, semantic and effectiveness aspects to evaluate information systems. Later, Mason (1978) reformulated these concepts with a behavioral focus by emphasizing the impact of IS on changes in user behavior.


[Fig. 1: IS success model, e-banking, e-Service Quality, Customer satisfaction]
After the publication of the D&M success model, IS researchers began proposing modifications to this model. Pitt et al. (1995) evaluated the instrument from an IS perspective and suggested that the construct of service quality be added to the D&M model. DeLone & McLean (2003) decided to add service quality in their updated IS success model. Another important modification to the model was proposed by Seddon (1997). He claimed that the original model was confusing, because both process and variance models were combined within the same framework. And he furthered suggested that the concept of use is highly ambiguous and suggested that further clarification was needed to this construct. There were many other calls to revise or extend the model. Recognizing these proposed modifications to their model, D&M reviewed empirical studies that had been performed during the years since 1992 and revised the original model accordingly (DeLone & McLean, 2002, 2003).

The updated model is shown in Fig. 2.

DeLone and McLean (2003) supposed that the six dimensions of the updated D&M IS Success Model can be used as a parsimonious framework to organize the various success metrics identified in the IS and e-commerce literature. It is obviously to find that quality factors (system quality, information quality and service quality) are the important antecedents of IS success and e-commerce.

2.2 E-service quality dimensions

Most researchers have done lots of study focus on service quality both in offline context and online context. It is known that service quality has played an important role for decision making (M.L. Tseng, 2009), especially in the electronic commerce (Yang & Fang, 2004) And there are so many research study on service quality (Parasuraman, Zeithaml, and Berry, 1985; Parasuraman et al., 2005). Parasuraman, Zeithaml & Berry (1985, 1988) develop and refine SERVQUAL, a multi-item scale for measuring the quality of face-to-face services with five dimensions: tangibles, reliability, responsiveness, assurance, and empathy.

Electronic service quality is considered as one of the key determinants of successful electronic commerce these days. Zeithaml et al. (2002) first introduced the concept of electronic service quality (e-SQ), stating that service quality on the Internet is “the extent to which a website facilitates efficient and effective shopping, purchasing, and delivery of products and services.” E-services involve the use of information technologies (IT) via the Internet to enable, improve, enhance, transform or invent a business process or system to complete tasks, solve problems, conduct transactions or create value for current or potential customers (Sawhney and Zabin 2001, Wu et al. 2003).

Compared with the abundant research examining the quality of face-to-face services, investigations of electronic service quality remain in their infancy (Serkan et al., 2010). A majority of the studies measuring e-service quality provided empirical evidence that e-service quality is a multidimensional construct. Zeithaml, Parasuraman, and Malhotra (2000, 2002) developed the e-SERVQUAL instrument for measuring e-service quality with seven dimensions: efficiency, reliability, fulfillment, privacy, responsiveness, compensation, and contact. Among them, the dimensions of efficiency, reliability, fulfillment, and privacy form the core e-SERVQUAL scale, this scale can be used to measure customers’ perceptions of service quality as delivered by online service. Wolfinger and Gilly (2003) developed the e-TailQ to establish a general model of e-tail quality in four major e-quality dimensions determined including fulfillment/reliability, website design, privacy/security, and customer service. Different e-service quality scales such as SITEQUAL (Yoo & Donthu, 2001), PIRQUAL (Francis & White, 2002), and Ast (Chen & Wells, 1999) were developed suggesting various dimensions based on different perspectives.
Besides that, there are many other theories about e-quality dimensions in different countries. Such as website setting, access, web site Interface, trust, attention and credibility were dimensions of e-SQ in UK (Jayawardhena, C. 2004); credibility, efficiency, problem handling, security in Hong Kong (Noel Y. M. Siu, Jeremy C. W. 2005); credibility, efficiency, fulfillment, security, site aesthetics, system availability in Sweden (Kenova V. and Jonasson P. 2006); and efficiency, fulfillment, system availability, privacy, contact, compensation, site aesthetics, customization in Taiwan. These theories and instruments must undergo further validation through research in different contexts and cultures before they are accepted as universal (Boddeywn, Jean J., Iyer, G. R. 1999).

For e-banking’s case in china, we supposed that security, convenience, ease of use, aesthetics, and fulfillment are the most important factors of e-banking system quality, and personalization, completeness, accuracy, timeliness, ease of understanding, Relevance and Currency as key factors of information system, and assurance, empathy and responsiveness are key factors of service quality.

2.3 E-satisfaction

Since Oliver (1980) put forward a cognitive model for characterizing antecedents and consequences of satisfaction in 1980, customer satisfaction has been widely developed in both theory and applications. Gremler (1995) defined Satisfaction as a mindset stemming from disconfirmed expectation together with emotions resulting from previous experience of customer (Gremler, D.D., 1995). So satisfaction can be considered as a result of regular assessment of experience one having with a product or service in relation to purchase and consumption of it. Here e-satisfaction can be considered as favorable feeling of customer associated with an e-banking as a result of his/her dealings with it.  

2.5 E-Loyalty

Loyalty is defined as the repeated purchase behavior presented over a period of time driven by a favorable attitude toward the subject (Keller, 1993), including both attitudinal and behavioral aspects. The notion of loyalty has become a central construct within the e-business framework due to consumers’ easy switching behavior on the web (Tsai et al. 2006). Both academics and practitioners agree that building loyalty is not only a key strategy but also a necessity for companies operating on the Internet (Reichheld and Schefter 2000).

Contrast to online banking, convenient physical locations and general lack of information shielded offline banking from the penalties of providing anything less than the best products and service quality. As online banking can provide service at anytime and anywhere, district restrict disappear, customers can get information easily and compare service suppliers in real time, at any time. Building superior online customer loyalty (e-loyalty) is now the key to e-banking.

For this study, e-loyalty is defined as a customer’s favorable attitude and commitment towards the e-banking that results in repeat using behavior, based on the study of Srinivasan et al. (2002).

3. Model and hypotheses

3.1 E-service quality dimensions as antecedents of e-satisfaction

Most research insisted that superior e-service quality can improve customer satisfaction, customer acquisition, and customer retention (Boulding et al. 1993, Ranaweera and Neely 2003, Lee and Lin 2005). E-service quality has been suggested as a critical component in controlling customers attitude and market response outcomes. Since expectations towards online service have increased beyond the price issue, it is critical to better understand customer expectations concerning purchase experience and service quality (Yoo & Donthu, 2001). Especially in an online transaction context, where there is little person to person interaction that can affect the customer’s satisfaction and trust level, the quality of the service is even more critical to enhance customer response towards the online retailer. Previous studies have examined the impact of e-service quality on e-satisfaction and e-service quality was found to influence the level of e-satisfaction (Coughlan, Anderson, Stern & El-Ansary, 2001; Devaraj, Fan & Kohli, 2002; Montoya-Weiss, Voss & Grewal, 2003; Park & Kim, 2003; Shankar, Smith, & Rangaswamy, 2003; Szymanski & Hise, 2000). And previous studies (Stacie et al. 2006) have demonstrated the positive relationship between service quality, information quality and system quality and satisfaction.

System quality has been evaluated with respect to various concepts such as convenience, flexibility, integration, response time, language, etc. (Livari, J., 2005). Other concepts include ease of use, ease of learning, system features, sophistication, customization (Sedera & Chan, 2004). Thus:

H1: The system quality has a positive influence on e-satisfaction. Information quality has been evaluated in a variety of ways. Four conceptions are taken into account by Christy M K Cheung (2002) i/o evaluate of information quality: accuracy, content, format, timeliness. Livari (2005) studied information quality with respect to three concepts of currency, completeness, consistency. DeLone and McLean (2003) addressed concepts of personalization and relevance security; Thus:

H2: The information quality has a positive influence on e-satisfaction. According to a literature review by Christy M K Cheung (Jarvenpaa et al. (1997), Zeithaml, 2002) services quality significantly influences satisfaction; Thus:

H3: The service quality has a positive influence on e-satisfaction.

3.2 E-satisfaction as antecedents of e-loyalty

In the previous literature, customer satisfaction has historically been the critical concept in shaping loyalty (Anderson & Mittal, 2000; Eriksson & Vaghult, 2000; Oliver, 1997, 1999). It is commonly believed that satisfied customers are more likely to display loyalty behavior, i.e. repeat purchase and willingness to give positive word of mouth (Taylor, 1998; Bennett & Rundle -Thiele, 2004; Schultz, 2005). The importance of e-loyalty and e-satisfaction, and the close relationships among them have also been a critical issue in the study of online transaction (e.g., Park & Kim, 2003; Reichheld & Schefter, 2000; Yang & Peterson, 2004).

In previous studies, e-satisfaction has been determined to influence e-loyalty. Anderson & Srinivasan (2003) emphasized the impact of satisfaction on e-loyalty and noted that a satisfied customer is more likely to build a closer relationship with the online retailer. So, we
supposed that:

H4: The level of e-satisfaction positively related with e-loyalty.

4. Method

This study employed survey of online banking customers to gather data for hypothesis testing and to address research objectives. To ascertain whether e-service quality is influential in a user’s satisfaction with e-banking, structure equation modeling is used.

First section of the Questionnaire contained fourteen items. Respondents were asked to name the e-banking they had used from most often in the past year. Though this way can we ensure that respondents possessed sufficient experience and proper knowledge to answer related question. And other demographic questions are included. Second section composed of 35 items. Respondents were asked to evaluate the quality (system quality, information quality and service quality) of e-banking they had used with 24 items. Satisfaction toward e-banking was measured using 6 items, and e-loyalty was measured using 5 items.

A per-test was conducted before the formal survey. The developed questionnaire was distributed to 20 individuals from diverse demographic groups who had experiences in using e-banking and 20 middle and top managers of Industrial and Commercial Bank of China (ICBC). The pre-test results were reviewed by researchers for clarity and completeness, and modifications to refine and shorten the instrument were made.

A total of 17 items for e-quality, 6 items for satisfaction and 5 items for loyalty were finalized for the questionnaire (see Appendix A for the final items for the questionnaire). All items were measured by a seven-point Likert scale (1= Extremely disagree, 7= Extremely agree), except the items assessing demographic information.

Participants were 350 senior students in Lin Yi University who have experience of using e-banking. 350 questionnaires were distributed among them. Each questionnaire set was in an open envelope that also contained a letter from the researchers requesting participation and assuring anonymity to respondents. We excluded participants who did not respond to all questionnaires or for whom there was a suspicion of random response such as use of the identical answer throughout. A total of 306 respondents met these inclusion criteria.

Table 1 Convergent validity constructs

<table>
<thead>
<tr>
<th>Factor</th>
<th>items</th>
<th>loading</th>
<th>alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>System quality (SYS-Q)</td>
<td>Ø S1: my e-banking has adequate security features.</td>
<td>0.558</td>
<td>0.774</td>
</tr>
<tr>
<td></td>
<td>Ø S2: E-banking is convenient.</td>
<td>0.737</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ø S3: I can use the e-banking utilities of website without a lot of effort.</td>
<td>0.661</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ø S4: The e-banking website design is aesthetically attractive</td>
<td>0.566</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ø S5: It is quick and easy to complete a transaction in e-banking.</td>
<td>0.706</td>
<td></td>
</tr>
<tr>
<td>Information quality (INF-Q)</td>
<td>Ø I1: The e-banking website provides all the information I need.</td>
<td>0.616</td>
<td>0.838</td>
</tr>
<tr>
<td></td>
<td>Ø I2: The information about the financial products/services is adequate</td>
<td>0.744</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ø I3: The e-banking provides accurate financial information</td>
<td>0.664</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ø I4: My online banking updates information duly.</td>
<td>0.627</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ø I5: The website information is easy to understand.</td>
<td>0.606</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ø I6: The information is sufficient to make transaction decision.</td>
<td>0.629</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ø I7: The website produces the most current information.</td>
<td>0.684</td>
<td></td>
</tr>
<tr>
<td>Service quality (SER-Q)</td>
<td>Ø S1: My online banking always keeps its promises.</td>
<td>0.696</td>
<td>0.807</td>
</tr>
<tr>
<td></td>
<td>Ø S2: E-banking is concerned with present and future interests of users.</td>
<td>0.566</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ø S3: Customer services are easily accessible.</td>
<td>0.747</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ø S4: It can respond to customer request promptly.</td>
<td>0.651</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ø S5: It is ready and willing to respond to customer needs.</td>
<td>0.721</td>
<td></td>
</tr>
<tr>
<td>E-satisfaction (E-S)</td>
<td>Ø S1: I think that I made the correct decision to use e-banking.</td>
<td>0.736</td>
<td>0.895</td>
</tr>
<tr>
<td></td>
<td>Ø S2: I am satisfied with the service I have received from e-banking.</td>
<td>0.804</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ø S3: Using the e-banking is enjoyable.</td>
<td>0.795</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ø S4: The e-banking is well known and has good reputation.</td>
<td>0.738</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ø S5: I strongly recommend e-banking to others.</td>
<td>0.755</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ø S6: Overall, I was satisfied with the e-banking.</td>
<td>0.755</td>
<td></td>
</tr>
<tr>
<td>E-loyalty (E-L)</td>
<td>Ø L1: This e-banking is my first choice.</td>
<td>0.705</td>
<td>0.807</td>
</tr>
<tr>
<td></td>
<td>Ø L2: I will keep on using online banking in the future</td>
<td>0.756</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ø L3: I strongly recommend the e-banking to others.</td>
<td>0.592</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ø L4: I seldom consider switching to another online retailer.</td>
<td>0.682</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ø L5: I will encourage my friends and family use this e-banking.</td>
<td>0.63</td>
<td></td>
</tr>
</tbody>
</table>
5. Result
The questionnaire used was developed based on both research background and opinions of relevant experts, thus it has content validity. In order to verify reliability of questionnaire, Cronbach’s α coefficient was used.

Table 2: Cronbach’s α of factors

<table>
<thead>
<tr>
<th>Factors</th>
<th>SYS-Q</th>
<th>INF-Q</th>
<th>SER-Q</th>
<th>E-S</th>
<th>E-T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s α</td>
<td>0.938</td>
<td>0.919</td>
<td>0.935</td>
<td>0.894</td>
<td>0.807</td>
</tr>
</tbody>
</table>

The result showed in table 2. Each factor’s Cronbach α was estimated above 0.807 which demonstrated questionnaire reliability. Model fit index was listed in Table 3. Index showed that model fit was good enough.

Table 3: Model Fit index

<table>
<thead>
<tr>
<th>χ²</th>
<th>df</th>
<th>NFI</th>
<th>RFI</th>
<th>IFI</th>
<th>TLI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>218.729</td>
<td>70</td>
<td>0.903</td>
<td>0.873</td>
<td>0.932</td>
<td>0.91</td>
<td>0.931</td>
<td>0.078</td>
</tr>
</tbody>
</table>

Table 4 shows the result that three of four hypotheses (H1, H3, H4) depicted in the conceptual model are supported, and one hypotheses (H2) do not support.

Table 4: Result of hypothesis testing using Amos 18

<table>
<thead>
<tr>
<th>hypothesis</th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
<th>P</th>
<th>Hypothesis support</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>0.903</td>
<td>0.26</td>
<td>3.466</td>
<td>***</td>
<td>Significant</td>
</tr>
<tr>
<td>H2</td>
<td>-0.354</td>
<td>0.334</td>
<td>-1.06</td>
<td>0.289</td>
<td>Not examined</td>
</tr>
<tr>
<td>H3</td>
<td>0.457</td>
<td>0.149</td>
<td>3.079</td>
<td>0.002**</td>
<td>Significant</td>
</tr>
<tr>
<td>H4</td>
<td>0.875</td>
<td>0.087</td>
<td>10.09</td>
<td>***</td>
<td>Significant</td>
</tr>
</tbody>
</table>

Note: *P<0.05, ** P<0.01, *** P<0.001

According to the result, system quality has significant effect on customer satisfaction about e-banking in china (p<0.001). Customers’ satisfaction has significant effect on customers loyalty (p<0.001). And service quality has significant effect on customer satisfaction at level p<0.01.

See as figure 4:

The results of correlation analyses proved that there was positive correlation between system quality and satisfaction and for china e-banking customers. The R-square value of the multiple regression results shows that 69 percent of the variation in e-satisfaction can be explained by the variation in the independent variables of system quality. From the result, we confirm that Chinese e-banking user focus on the system quality and service quality. Information quality plays less important effect on customer attitude. For e-banking management, focus on increase the consumer service level and improve the system quality, such as security, ease of use could cause improving customer satisfaction and loyalty.

The following limitation were present in the collection of data: Firstly the survey assumes that the respondents are familiar with banks and banking transactions and have been exposed to or have knowledge of the existence of e-banking alternatives. The survey select university students as respondents, samples not include other age person.

Reference:
Marketing Constructs,” Journal of Marketing Research, 16 (February), 64-73.
51. http://www.cnnic.cn/research/