

# Survey and Expert Evaluation for e-Banking

Basil Soufi

Hamdan Bin Mohammed e-University,  
P.O. Box 71400, Dubai, UAE  
basil.soufi@gmail.com

**Abstract.** A variety of factors impact customer take-up of and satisfaction with e-commerce platforms. Aspects of functionality, usability, security and customer service are considered key determinants of perceived service quality. The study examines e-banking platforms in the United Arab Emirates using survey and expert evaluation. The evaluation has identified the platforms that were considered better overall and highlighted areas for improvement. The paper reflects on the usefulness of the methods employed in the evaluation and outlines issues for future work.

**Keywords:** Evaluating e-commerce, e-banking case study, survey and expert evaluations.

## 1 Introduction

Online banking or e-banking has seen rapid development and take-up recently. It offers customers potential benefits of convenience, cost savings, accessibility and flexibility. Yet barriers to take-up still exist and can be related to a variety of factors. Based on the technology acceptance model (Davis, 1989) and more recent research on trust in electronic commerce (e.g. Casalo et al, 2006; Schlosser et al, 2006), Soufi and Maguire (2010) have developed an evaluation framework for e-Banking platforms. According to this framework, there are 4 key determinants of trust and perceived service quality. These are:

- Functionality
- Usability
- Security and Privacy
- Customer Service

Functionality refers to the functions or capabilities provided on the online banking system. When evaluating an interactive system, the evaluation of functionality should be given high priority as it concerns the ability and success of the system in meeting the goals of the user. The e-banking platform should help the provider accomplish their business goals by helping users accomplish *their personal missions*.

The usability of an e-business platform can also have an appreciable impact on the ability of customers to achieve their goals and do business. Good usability leads to

improved customer satisfaction, higher conversion rates and returning customers (Rhodes, 2000; UsabilityNet, 2003). Conversely, bad usability leads to frustrated customers and loss of business.

Privacy and security controls form an important part of the recommendations of the Basel Committee's 'Risk Management Principles for Electronic Banking' (Basel Committee, 2001). Privacy refers to the protection of personal information. Security technologies ensure the integrity, confidentiality, authentication and non-recognition of relationships (Casalo et al, 2007). Privacy can therefore be described as a set of legal requirements and good practices with regards to the handling of personal information whereas security refers to the technical guarantees that ensure that these legal requirements and good practices will be met effectively. Perceived security refers to perception of security regarding the means of payment and the mechanism for storing and transmission of information.

Customer service is related to a number of factors including customer care, responsiveness and user support. In a very competitive environment, customer service is an important differentiator and contributes to the perception of service quality and trust. For a more detailed review of the theoretical foundations relating to the framework and an exploration of the relationships between the various factors see Liao and Cheung (2008); Yap (2010), Jayawardhena (2004) and Bauer et al (2004).

## **2 A Case Study Evaluation of e-Banking**

### **2.1 e-Banking in the UAE and Elsewhere**

The UAE is one of the countries that make up the Gulf Cooperation Council or 'GCC'. According to the World Bank, the UAE had an estimated population of 7.89 million and a per capita gross national income of 40,760 USD in 2011 (World Bank, 2011). The UAE is one of the fastest developing countries with a very high human development index ranking. The UAE was ranked 30 in the world according to the United Nations Human Development Report, 2011). The UAE is served by a number of local (e.g. Emirates National Bank of Dubai, First Gulf Bank, Union National Bank, Abu Dhabi Commercial Bank, RAK Bank etc.) and foreign banks (e.g. Citibank, HSBC, Standard Chartered). According to the UAE Central Bank's report of registered banking institutes, 23 locally incorporated banks and 28 foreign banks operate in the UAE as of 31<sup>st</sup> October 2010. This makes for a highly competitive market where banks strive to improve customer service and innovate in their product and service offering.

Although e-Banking has grown steadily, several factors have impeded the take-up of e-banking transactions. Lack of trust is an important factor that affects e-commerce as purchasing and transacting over the Internet requires consumer trust (Schlosser et al, 2006). Other usability problems that e-banking sites still suffer from are difficult navigation and the need to remember more codes to access an account such as a user code, password, or answering security questions (Nielsen, 2001).

These can affect users across different cultures. Another factor is the apparent reluctance to do banking online for certain cultures (Williams & Richardson, 2005; Guru et al, 1999).

e-Banking practices and customer satisfaction have been the subject of several research studies. Studies of e-Banking in China (Laforet and Li, 2005), Estonia (Eriksson et al., 2005), Iran (Sadeghi and Hanzae, 2010), Malaysia (Guru et al, 1999; Wei and Nair, 2006), Taiwan (Wang et al., 2003), Turkey (Sayar and Wolfe, 2007) and USA (Southard and Siau, 2004) are some examples. The technology acceptance model (Davis, 1989) and the quality dimension of Servqual (Parasuraman, 1985) are considered as conceptual foundations to many of these studies as they provide empirical evidence for the 'perceived usefulness' and 'perceived ease of use' attributes.

## 2.2 Study Methods and Findings

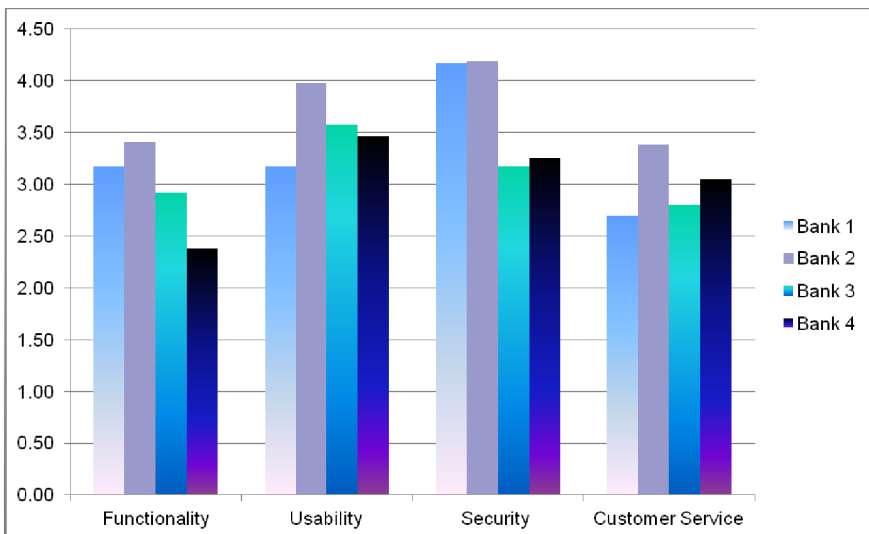
The evaluation methods to be used in this study must be capable of collecting data for the four key aspects described above. Where it comes to usability, two of the most popular usability evaluation techniques are user testing and heuristic evaluation. Studies that compare the efficiency and effectiveness of the 2 methods suggest that the two methods address different usability problems and are complementary (Tan et al., 2009; Batra & Bishu, 2007). Because the evaluations considered here are multi-faceted and involve 4 dimensions, the evaluation method needs to capture customer perceptions of e-banking functionality, usability, security and customer service. Both interviews and surveys can have the required breadth and flexibility. Surveys have the advantage of reaching a larger group and the capability of being administered online. Surveys were therefore selected as the core data collection method in this study. In order to provide a different perspective and the scope for the corroboration of findings, the study included expert evaluation of three of the key determinants; functionality, usability and security. The study focused on some of the largest and most recognized locally incorporated banks. Four banks were selected for this purpose and these are referred to as Banks 1 to 4.

**Survey Evaluation.** This method involves administering a set of questions to a large sample of users. Surveys can help determine information on customers, work practice and attitudes. Surveys are normally composed of a mix of 'closed' questions with fixed responses and 'open' questions, where the respondent is free to answer as they wish. Surveys are useful for obtaining qualitative data from users about existing tasks or the current system. If well designed, surveys have the main benefits of being quick and relatively inexpensive to administer. Results can be subjected to statistical analysis to provide quantitative data. This 'hard' data can supplement the more subjective, qualitative information such as unstructured opinions. However survey design is not straightforward and it may be hard to follow up on interesting comments as it requires maintaining contact with the respondents.

A web based survey containing 25 closed questions was created. These included four introductory questions about the respondent's age, profession, use of the Internet, and experience with e-banking. There were 21 questions relating to functionality, usability, security and privacy, and customer service i.e. the 4 key determinants of service quality. Respondents rated their e-banking service on a standard 1-5 scale. The survey also included 4 open questions at the end. Sixty two respondents took part in the survey.

The results of the survey are summarized in Figure 1. This shows the average of the responses of survey participants. Figure 1 shows that for functionality Bank 2 received the highest score whilst Bank 4 received the lowest. Bank 2 received the highest usability score and Bank 1 the lowest. Banks 1, 2 received a higher score for security than Banks 3, 4. Bank 2 received the highest customer service score whilst Bank 1 the lowest. Overall, the scores for usability and security are higher than those for functionality and customer service. This indicates that these factors have been given more attention by the banks considered and that there is more scope for improvement in aspects of functionality and customer service. There was more disparity in the scores for functionality and security indicating that customer perceptions of these factors varied considerably.

It is noted that Bank 2 received the highest score in every aspect of the survey evaluation and was the preferred bank overall. It may be that Bank 2 is superior in every aspect or it may simply be a reflection of customer preference. Bank 1 was ranked second. Banks 3 and 4 were ranked third and fourth in close succession.



**Fig. 1.** Survey evaluation summary findings

**Expert Evaluation.** This method involves analysts evaluating the system with reference to established guidelines or principles, noting down their observations and often ranking them in order of severity. The analysts are usually experts in human factors or HCI, but others, with less experience have also been shown to report valid problems. The method provides quick and relatively cheap feedback to designers and the results can generate good ideas for improving the user interface. If experts are available, carrying out a heuristic evaluation (categorizing the feedback according to design rules) is beneficial before actual users are brought in to help with further testing, as well as when an existing system is in use (Nielsen and Mack, 1994).

In this study, expert evaluation focused on three of the four determinants, namely functionality, usability, and security. Two experts performed a set of 10 tasks on all four e-banking platforms and recorded their observations. Each of the two experts is considered a 'double' expert. The first expert had extensive knowledge of e-banking functionality and security. The second expert had extensive knowledge of e-banking functionality and usability. The tasks used included a mix of informational, administrative and transactional tasks. The tasks are considered representative of what customers typically do through e-Banking. The evaluation utilized checklists and evaluator's expertise.

It has been found that all banks supported the first 5 tasks. These deal with everyday transactions such as check balance, validate payment, request statements, make a transfer etc. Task 6 involved making a bill payment to the national telecommunication company Etisalat. Although this was supported, the usability of this facility varied between the banks. This concerns the ability of the user to receive feedback and providing them with the opportunity to verify details which varied between the banks. Three tasks were either not supported or could only be carried out in a limited way. These are 'opening new bank accounts online', 'standing order facility', and 'Government fee payment'.

Usability was generally found to be quite good with 3 out of 4 platforms having clear layout and simple navigation. One of the banks had a cluttered interface and confusing navigation (Bank 3).

Where it comes to security and privacy, the banks evaluated varied considerably. Although all platforms use high security SSL encryption methods and provide confirmation of transactions through SMS and e-mail, the login protocol is one area that requires some attention both in terms of security and usability. Only one of the 4 banks features strong authentication of the user identity through the use of a security token generator. This provided a means of enhancing security while maintaining usability. The login protocol for Bank 3 is considered poor as it features minimal security. Bank 4 does not use strong authentication but requires multiple passwords that need activation by telephone contact. This has resulted in a cumbersome login process.

A summary of the key findings from the expert evaluation is given in Table 1. Overall, Banks 1, 2 were evaluated as better than Banks 3 and 4. As noted above, experts identified both usability and security issues to be addressed by Bank 3 which was considered most in need of improvement.

**Table 1.** Expert evaluation key findings

		<b>Bank 1</b>	<b>Bank 2</b>	<b>Bank 3</b>	<b>Bank 4</b>
<b>Functionality</b>	<b>Support for opening new bank account online</b>	Limited	No	Yes	No
	<b>Standing Order Facility</b>	No	No	Limited	No
	<b>Government Fee Payment</b>	No	No	Limited	No
<b>Usability</b>	<b>Layout and Navigation</b>	Clear layout easy navigation	Simple and intuitive	Cluttered I/F Confusing Navigation	Simple
	<b>Etisalat Bill Payment - Integration</b>	Good	Limited	Limited	Good
<b>Security</b>	<b>Login Protocol</b>	Adequate	Good	Poor	Cumbersome
	<b>Privacy Policy</b>	No	No	Yes	Yes

### 3 Discussion and Conclusions

The results from the evaluations were useful in obtaining ranking scores for the e-banking platforms and identifying areas of improvement. All platforms offered basic e-banking functions but differed for advanced features. Experts identified specific usability and security improvements for certain banks. Usability issues of layout and navigation as well as the usability and integration of certain types of bill payment were highlighted. Security and privacy, as evaluated by the survey, were different across the banks. Experts identified different practices in the areas of login protocol and privacy policy leading to recommended enhancements in these areas.

It can be seen that there was good agreement between the survey and expert evaluations in terms of overall findings. However, experts were more specific in their assessments of the different aspects of the platforms. For example, although Bank 2 received the highest survey score for each of the 4 aspects, the expert evaluation showed that it did not offer the best functionality.

Further work is required to extend expert evaluation to include the relationship between banks and their customers. This may be achieved by developing scenarios involving various types of problem resolution through multiple channels over a longer time frame. Customer service - the fourth determinant of trust and service quality – was excluded from expert evaluation in this study. By comparison, all four determinants were included in the survey evaluation.

A criticism that is often leveled at both survey and expert evaluations is that they are subjective and results are influenced by the opinions of survey participants and the expert reviewers. It is interesting to consider the interaction between the four determinants of service quality in survey evaluation. When survey participants preferred one of the e-banking platforms for one determinant e.g. security, there was a tendency for this preference to be exhibited for the other determinants. The two methods were different in that expert evaluation was less susceptible to such interaction. It can therefore be argued that of the two methods used in this study, expert evaluation showed less subjectivity and was more specific than survey evaluation.

The use of the two methods is considered a success as it has highlighted specific areas for the banks to attend to and the findings from the two methods were generally in agreement. Future work should focus on the issues that have been identified and enable security enhancements to be achieved without compromising usability.

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