Trust in Mobile Banking based on DeLone & McLean IS Success Model

Anitawati Mohd Lokman[a], Nur Rasyina Rosely[b], Azhar Abd Aziz[c] and Mudiana Mokhsin[d]

[a,d]RIG KAE, Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA (UiTM), Shah Alam, Selangor, Malaysia.
Email: [a]anita@tmsk.uitm.edu.my
[b]Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA (UiTM), Shah Alam, Selangor, Malaysia

Abstract: The technology has helped humankind to live a much better life compared to the past decade. Many activities can be done efficiently, saving energy, time and money. Banking system has also done a lot of improvements including implementing Internet banking and mobile banking. Mobile banking continues to gather momentum across developed countries, fuelled by the increasing use of smartphone and the steady supply of mobile banking from banks worldwide. This study was performed to identify the relationship between components in IS success model towards Trust and to identify the influence of user segments (Gender, Age, and Educational Level) towards the components. Trust in mobile banking was measured by four other variables in the study, i.e. Information Quality, System Quality, Perceived Usefulness, End-User Satisfaction. Convenience sampling were used to identify respondents, and 146 respondents have participated in this study. The findings showed that based on D&M IS Success Model, user segments do not play an important role in Trust in Mobile Banking. The result provides a guide to design Trust in Mobile Banking, and give insights of the components that lead to trust based on demographic background.

Keyword: DeLone and McLean IS Success Model (D&M IS Success Model), Mobile Banking, Trust.

1. INTRODUCTION

The technology that we are now having marks the beginning of a revolution in the ways of communication and transaction especially on mobile phone [1]. Today, it has redefined communication and has reshaped the way services are provided. The technology has undeniably brought a paradigm shift that affects both lives of people as well as business environment. According to [2], nowadays, mobile phones has become an indispensable device to many people. Mobile phones can perform activities such as communications, transactions and services. Over the last decade, the world has witnessed the extensive growth of the telecommunication industry which has resulted in the use of smartphones by almost people of all ranks. The use of mobile phones has become undeniably irresistible as its usage has integrated into all spheres of people's activities such as business transactions and personal entertainment.

It started with games and now mobile phones became a medium for entertainment because it has revolutionized its ability to store and play music, radio and access to the Internet. As the usage of mobile phone become wider in terms of functionality, the marketers started to find opportunities to reach their target prospect through mobile advertising. Banking industry can be labelled as one of the top sectors that uses and utilizes the Internet and mobile technology on consumer markets. As quoted by [3], the new development of electronic banking services and multiple electronic channels that we are having now has made it possible to create new kinds of value to add to the customer. According to a report done by [4], the adoption rate of mobile banking is highest in the developing countries reaching 60-70% in China and India, compared to developed nations, such as the US, Canada and the UK.

Although there are techniques being applied to make banking transactions secure, there are still threats and risks involving those transactions that are known (or ignored) by the general public. As revealed by [5], there are lots of risks and threats regarding security of online banking information which are increasing day by day. These threats are one of the reasons people reject mobile banking nowadays and emerged as the main barriers to the adoption of online banking. Based on a research conducted by [6], security is the main issue for mobile banking. [7] stated that knowledge deficiency, lack of technological skills and culture are also barriers in the development path of electronic m-Banking. This paper reports work to identify relationship between components of IS Success Model towards Trust in Mobile Banking and the influence of user segments (Gender, Age, and Educational Level) towards the relationship between the components of IS Model and Trust in Mobile Banking.

2.   THEORETICAL BACKGROUND

m-Banking has been welcomed in most countries as a new branch in e-Banking [8]. Scholars use many terms to refer to mobile banking that includes m-transfers, m-finance, branchless banking, m-payments or pocket banking [9]. Mobile phones enable the user to access their bank account to conduct conventional and more advanced financial transactions [10]. The use of m-Banking rises daily so as the security threats are also rising. Smartphones and computer operating systems do not differ much as they both allow countless security exploits to be adapted and deployed on mobile devices such as man-in-the-middle attacks, malware, trojan horses, phishing schemes, rootkits, denial of services and others [11].

Although mobile devices are typically with their users throughout the day, many people disregard or lack the knowledge of security risks using mobile devices. In addition, banking institutions should be more transparent regarding the type of security they offer to their customers because they are the ones who recommend mobile applications to their customers. According to [11], one of the major factors that are making consumers uncertain about m-Banking use is the of lack of understanding about potential security risks and the protection that is being offered. After all, m-Banking is a form of service convergence enabled by innovative technologies [10].

Trust in m-Banking means people will use mobile devices as a medium to make bank transactions such as online payment and other transactions such as bill payments, balance inquiries and transference, anywhere and anytime [12]. M-Banking services transcend the limitations of space and time that permits them to make any payments. Thus, m-banking becomes convenient to the consumers. However, according to [13], due to lack of control and everything is done virtually, m-Banking involves substantial uncertainties and risks. Customer trust is an important factor for the benefit of m-Banking. According to [14], as mobile commerce (m-Commerce) and electronic commerce (e-Commerce) become a trend, more studies have been administered on the concept of structure, the establishment of a mechanism of trust and the impacts of trust. In today's world, there are lots of doubts relating to online transactions due to the high level of risk. So, it is necessary to investigate trust in e-Business [15].

Similar to many parts of the world, the banking sector in Malaysia offering m-Banking to its customers. Currently there are thirteen banks in Malaysia that uses Mobile Banking services [16]. According to a recent survey done by the world's leading independent mobile advertising network [17], 57 per cent of 1,091 Malaysians access the web exclusively via mobile devices. Another study done by [8]13 revealed that Malaysians use the mobile web as well as Mobile Banking excessively. A study by [18]19, indicates that m-Banking can be recognized as an effort to give extra value by offering more convenient services to its client. Past studies indicated that convenience, efficiency and privacy are aspects that contribute to the use of m-Banking [19]20. Lack of security and privacy were found to be significant barriers to the acceptance of online banking.

The work as reported in this paper adopted D&M IS Success Model, as it is a useful framework to understand different attributes of information systems success. For instance, to assess why user satisfaction is not suitable and what problems does the usability of the system create to users and organization. It can be applied to individuals, groups, organizations, industries, and nations. The model was constructed based on Theory of Reasoned Action (TRA) [20],[18] and Theory of Planned Behaviour (TPB) [18]. It comprised of six distinct aspects of information systems success, i.e. System Quality, Information Quality, Use, User Satisfaction, Individual Impact, Organizational Impact, and Service Quality.

3. METHODOLOGY

The study adopted D&M IS Success Model to investigate relationships towards Trust in Mobile Banking. It measured four components that leads to Trust in Mobile Banking , namely Information Quality, System Quality, Perceived Usefulness and End-User Satisfaction. Figure 1 shows the research framework.
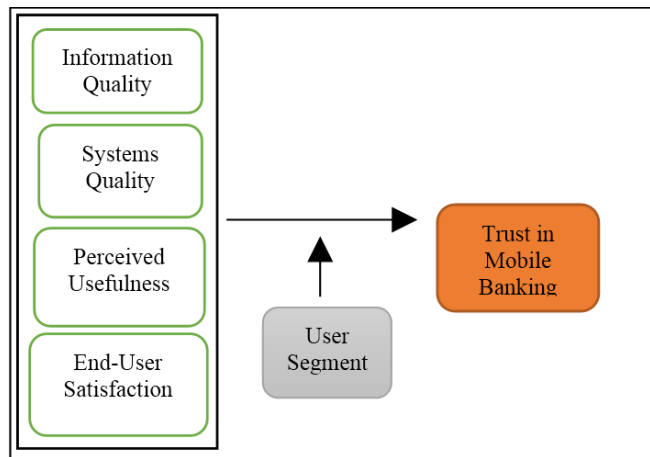

Figure 1: Research Framework

The research then developed and performed pilot study with 15 respondents to test the validity of the questionnaire. Actual study was then conducted with sample size of 150. The sample size was collected based on the number of variables. There were five main variables, which are Information Quality, Systems Quality, Perceived Usefulness, End-User Satisfaction and Trust. Using a method that was suggested by [14]23, each variable needs to have a maximum number of 30 respondents. Linear regression was calculated to address Research Question 1, 2, 3, 4, and Hierarchical regression was used for Research Objective 6 and 7.

In this study, the researcher used Linear regression to see the relationship for each of the independent variable and dependent variable. Hierarchical regression was used to determine the order of entry of the independent variables based on theoretical knowledge, to analyse the relationship between user segments (Gender, Age and Educational level) towards the relationship between the components of IS Success Model (Information quality, System Quality, Perceived Usefulness, End-user Satisfaction) and Trust in Mobile Banking.

4.   FINDINGS AND DISCUSSION

There are two methods of analysis used in this study to achieve its objectives. In this study, the researcher used Linear Regression and Hierarchical Regression as a method of analysis. The result is shown below, according to the research hypotheses.

H1: Information quality has significant relationship between components of IS Model towards Trust in Mobile Banking.

The result shows that Information Quality explains 86% of variance of Trust in Mobile Banking is significant since the Sig. of F value is .000. Furthermore, the Durbin-Watson result is in range 1.5 to 2.5 with 1.686. Besides that, the researcher found that Information Quality (β = .927, p < .05) significantly influences Trust in Mobile Banking. Therefore, "H1: Information quality has significant relationship between components of IS Model towards Trust in Mobile Banking" is accepted.

H2: Systems quality has significant relationship between components of IS Model towards Trust in Mobile Banking.

The result shows that Systems Quality explains 86% of variance of Trust in Mobile Banking is significant since the Sig. of F value is .000. Furthermore, the Durbin-Watson result is in range 1.5 to 2.5 with 1.859. Besides that, the researcher found that Systems Quality (β = .939, p < .05) significantly influences Trust in Mobile Banking. Therefore, "H2: Systems quality has significant relationship between components of IS Model towards Trust in Mobile Banking" is accepted.

H3: Perceived Usefulness has significant relationship between components of IS Model towards Trust in Mobile Banking.

The result shows that Perceived Usefulness explains 87% of the variance in Trust in mobile banking, which Sig. of F is at .000. Additionally, the value of Durbin-Watson for Perceived Usefulness and Trust in Mobile Banking is 1.997 which lies within the range of 1.5 to 2.5. Therefore, "H3: Perceived Usefulness has significant relationship between components of IS Model towards Trust in Mobile Banking" is accepted.

H4: End-User Satisfaction has significant relationship between components of IS Model towards Trust in Mobile Banking.

The result shows that End-User Satisfaction explains 83% of variance of Trust in mobile banking is significant since the Sig. of F value is .000. Furthermore, the Durbin-Watson result is in range 1.5 to 2.5 with 2.234. Besides that, the researcher found that End-User Satisfaction (β = .945, p < .05) significantly influences Trust in Mobile Banking. Therefore, "H4: End-User Satisfaction has significant relationship between components of IS Model towards Trust in Mobile Banking" is accepted.

H5: User segment of Gender has significant influence towards the relationship between the components of IS Model and Trust in Mobile Banking.

The result shows that 96% of the variance in the dependent variable (Trust in Mobile Banking) that is explained in the independent variables (Information Quality, Systems Quality, Perceived Usefulness and End-User Satisfaction). On the other hand, Model 2 and 3 also shows 96%, which is the same as Model 1. Next, the researcher found that the Durbin-Watson result of 1.863 lies within the range 1.5 and 2.5. Besides that, based on the table, it can be seen that the interaction between components of IS Success Model and Users Segment of Gender is (β = −.089, p >.05). Therefore, it shows that Gender does not moderate the relationship between components of IS Success Model and Trust. In relation to this finding, "H5: User segment of Gender has significant influence towards the relationship between the components of IS Model and Trust in Mobile Banking" is rejected.

H6: User segment of Age has significant influence towards the relationship between the components of IS Model and Trust in Mobile Banking.

The result shows that 96% of the variance in the dependent variable (Trust in Mobile Banking) that is explained in the independent variables (Information Quality, Systems Quality, Perceived Usefulness and End-User Satisfaction). On the other hand, Model 2 and 3 also shows 96%, which is same as Model 1. Next, the researcher found that the Durbin-Watson result of 1.862 lies within the range 1.5 and 2.5. Besides that, based on the table, it can be seen that the interaction between components of IS Success Model and Users Segment of Age is (β = .094, p >.05). Therefore, it shows that Age does not moderate the relationship between components of IS Success Model and Trust in Mobile Banking. In relation to this finding, "H6: User segment of Age has significant influence towards the relationship between the components of IS Model and Trust in Mobile Banking" is rejected.

H7: User segment of Educational Level has significant influence towards the relationship between the components of IS Model and Trust in Mobile Banking.

The result shows that 96% of the variance in the dependent variable (Trust in Mobile Banking) that is explained in the independent variables (Information Quality, Systems Quality, Perceived Usefulness and End-User Satisfaction). On the other hand, Model 2 and 3 also shows 96%, which is same as Model 1. Next, the researcher found that the Durbin-Watson result of 1.862 lies within the range 1.5 and 2.5. Besides that, based on the table, it can be seen that the interaction between components of IS Success Model and Users Segment of Educational Level is (β = .094, p >.05). Therefore, it shows that Education Level does not moderate the relationship between components of IS Success Model and Trust in Mobile Banking. In relation to this finding, "H7: User segment of Educational Level has significant influence towards the relationship between the components of IS Model and Trust in Mobile Banking" is rejected.

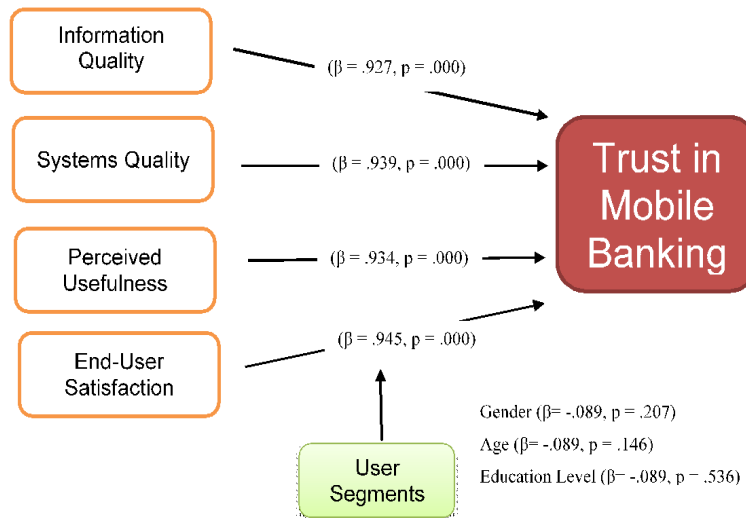Result from the analysis enable the research to show relationship as illustrate in Figure 2.

Figure 2: User Segments and Trust in Mobile Banking

Based on Figure 2, the study concludes that there is significant relationship between components of IS Model towards Trust in Mobile Banking using Linear Regression analysis because all the values of the components of IS which are Information Quality, Systems Quality, Perceived Usefulness and End-User Satisfaction is (p < .05). However, in past studies by [21], found that Trust in Mobile Banking is significantly associated only with perceived web site quality that is Information Quality and System Quality. In this study, the result shows differently which

all the IS components (Information Quality, Systems Quality, Perceived Usefulness and End-User Satisfaction) are significantly associated with Trust in Mobile Banking. As supported by [22] variables that affect the level of Trust in mobile use includes Information Quality, Systems Quality and Perceived Usefulness. Thus, it can be concluded that these components have significant effect towards Trust in Mobile Banking. Besides that, in a recent study done by [23], a study in China also stated that ease of use (Perceived Usefulness) was found to have significant impact on Trust.

Also, from the result as shown in Figure 2, the research can conclude that Gender, Age and Educational Level does not moderate the relationship between components of IS Success Model and Trust in Mobile Banking as all the values ($p > .05$). As mentioned by [24], demographics could be an added impact of the acceptance of new technology. As supported by [25], demographic factors play a significant role in adoption decisions. The level of education, age, gender and the living situation could give an impact on the consumer's intention of accepting technological innovation [24]. [7] stated that the lack of understanding of the concept of mobile banking is due to the demographics. In other words, demographics can create a barrier of accepting the technology [7]. However, in this study, it shows that Gender, Age and Educational Level does not give an impact on the Trust in Mobile Banking because the values show that ($p > .05$) for all the user segments of this study. In other words, the user segments have No. significant influence towards the relationship between the components of IS Model and Trust in Mobile Banking. In another research, an author [26] also mentioned in their study that educational levels of respondents did not affect the use of telephone or online banking.

5. CONCLUSION AND RECOMMENDATIONS

Findings from this study provides insights that bank institutions should consider doing a thorough research on how and why the consumer adopt or reject the use of Mobile Banking services. From there, the banks can identify why people are reluctant to use mobile banking, or what are the factors that makes people prefer to use mobile banking. The banks can strategize their services and focus on what matters most, in terms of security, tuser interface design, ease of use, and etc. Further study similar to this research should be extended to wider population and user segments, such as to people with special needs, to enable wider generalization of the research findings.

Result from this research can be useful for banking institutions to know what is lacking in the current mobile banking implementation. It can be used to understand the components that affect or influence Trust in Mobile Banking, and thus help the banking industry to design Trust in Mobile Banking. It also provides insights to the components that lead to trust based on demographic background, and thus help in strategizing Trust in Mobile Banking.

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