



# Exploring Customers' Opinion on Improving the Security of Mobile Banking in Sri Lanka

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## ABSTRACT

Mobile banking is usually carried out using mobile phones. The applications are installed in the phones based on the bank's requirements. They allow customers to carry out banking transactions on their mobile phones with much ease. Such transactions include transfer of money from account owner to any other account, checking of account balances and so on. Because of the convenience involved, customers need to secure much confidence in the apps to encourage them use it appropriately. A paper published by Wijenanda and Sellappan (2018) presented an architecture that described the security checks process for improving the authentication of mobile applications for mobile banking in a bank in Sri Lanka. Another paper was later published by Wijenanda and Sellappan (2018) presents actual system model that features the security patterns in authentication of mobile applications. It captures face and voice recognition in the authentication requirements.

Corresponding Author: **Wijenanda D. A. K.** This paper explores the opinion of banks' customers in Sri Lanka. Their experiences with the app and opinion on the need to improve the strength of authentication in mobile banking.

**KEYWORDS:** Mobile Application, Mobile Banking, Face Recognition, Voice Recognition, banks' customers.

## Introduction

Change in customers' behaviour has had a significant impact on how customers perceive and use banking services (Sunari, 2014). In mobile banking schemes; financial services are availed and banking services are provided using mobile devices (Baraka et al, 2013). To develop and execute a mobile banking strategy that creates value for customers and encourages them to switch to the mobile channel from the costlier channels such as branch, so that it would make a difference to the cost/income ratio of the banks is required (Sunari, 2014).

## Literature Review

In pursuit of such objectives, financial institutions globally have placed heavy emphasis on cost effectiveness, efficiency and seamless service and the optimal mobilization of existing resources and infrastructure (Delrene, 2016). The adoption of mobile technology has emerged to be a winning formula as a cost effective and efficient distribution channel of financial products and services. Experiences of several developing countries have shown that the poor majority are in need of a wide range of financial services that could potentially be delivered via mobile phones or mobile phone operators. In their operations, these mobile apps send data in plaintext. Financial service providers tend to rely on the security services provided by the mobile applications, which

has been proved to be susceptible to cyber-attacks. The used algorithms for crypto mechanisms are flawed leaving data carried through the network vulnerable upon interception.

Access to banking services is widely acknowledged to be high and Financial access in Sri Lanka being estimated between 68.5% of population (WB) to 82.5% of households (GTZ), 58% of adults of bottom 40% income group having bank accounts (WB) is a call for security improvement (Peter, 2013). The banks in Sri Lanka, however, are trying to popularize the concept of Internet banking among their customers, to meet up with the ever-increasing traffic in physical bank premises (Kariyawasam, 2016). Mobile phones have created a platform to expand commercial transactions in a very easy manner and have created a wide array of business opportunities through the expansion of wireless communication (Kumari and Janaka, 2014). The basic idea of mobile services is to improve the access of information services when travelling or anywhere (Drennan and Mort, 2007).

In a case were a banking area is poor in terms of internet connectivity, there will be need for proposing a topology for improving the connectivity (Datukun et al, 2016a; Datukun et al, 2016b). Improving network performance is necessary in any organization (Datukun et al, 2017). This could minimize the complains in accessing the mobile application for mobile banking. An expectation of "better" internet

performance demands that networks are diagnosed for possible measures to be taken to improve it (Onwudebelu et al, 2014). This will help in browser-based management information system provided for administrative users in mobile banking.

**Methodology**

A questionnaire was designed and administered to the customers of banks in Sri Lanka. The customers responded to the survey and pass the questionnaires to the researcher. The responses were analyzed using SPSS software. A one-sampled binomial test and descriptive analysis were carried out. Their results are presented in this paper. The one-sampled test presents the significance of the data and the descriptive analysis presents the experience of the customers with the existing mobile application and their opinions on improving the security in the authentication of the application.

**Data Analysis**

Figure 1 describe the one-sampled binomial test of all the questions in the appendix based on the variable labels. comparing the appendix and Figure 1, A1 corresponds to a1, A2 to a2 ...C7 to c7. The sig. values of 0.000 shows significance at 0.05 level. Hence accompanied by the decision of rejecting the null hypothesis. This justifies that the data is significant for all the given variables.

Hypothesis Test Summary				
	Null Hypothesis	Test	Sig.	Decision
1	The categories defined by a1 = 2.000 and 1.000 occur with probabilities 0.5 and 0.5.	One-Sample Binomial Test	.000	Reject the null hypothesis.
2	The categories of a2 occur with equal probabilities.	One-Sample Chi-Square Test	.000	Reject the null hypothesis.
3	The categories of a3 occur with equal probabilities.	One-Sample Chi-Square Test	.000	Reject the null hypothesis.
4	The categories of a4 occur with equal probabilities.	One-Sample Chi-Square Test	.000	Reject the null hypothesis.
5	The categories of b1 occur with equal probabilities.	One-Sample Chi-Square Test	.000	Reject the null hypothesis.
6	The categories of b2 occur with equal probabilities.	One-Sample Chi-Square Test	.000	Reject the null hypothesis.
7	The categories of c1 occur with equal probabilities.	One-Sample Chi-Square Test	.000	Reject the null hypothesis.
8	The categories of c2 occur with equal probabilities.	One-Sample Chi-Square Test	.000	Reject the null hypothesis.
9	The categories of c3 occur with equal probabilities.	One-Sample Chi-Square Test	.000	Reject the null hypothesis.
10	The categories of c4 occur with equal probabilities.	One-Sample Chi-Square Test	.000	Reject the null hypothesis.
11	The categories of c5 occur with equal probabilities.	One-Sample Chi-Square Test	.000	Reject the null hypothesis.
12	The categories of c6 occur with equal probabilities.	One-Sample Chi-Square Test	.000	Reject the null hypothesis.
13	The categories of c7 occur with equal probabilities.	One-Sample Chi-Square Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

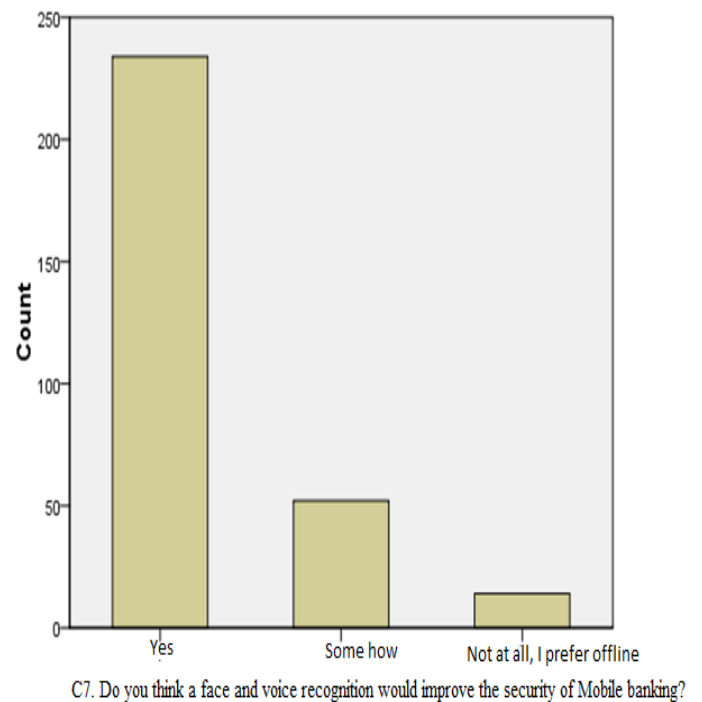
**Figure 1:** One-Sampled Binomial Test

Table 1 indicates that the respondents experience security issues in terms of logins (authentication) of the mobile banking system. This is indicated by 61.3 percent with the highest responses in this regard.

**Table 1:** What are some issues you experience during mobile banking?

	Frequency	Percent	Cumulative Percent
Valid Login issues	184	61.3	61.3
Poor internet	89	29.7	91.0
I don't use it	27	9.0	100.0
Total	300	100.0	

Figure 2 describes the responses to question C7 in the questionnaire in the Appendix. Clearly, those that say “Yes”, face and voice recognitions could improve the security of the mobile banking constitutes the majority responses. This indicates that over 200 respondents out of 300 suggest the fact that face and voice recognition is required in improving the security of accessing mobile banking system.



**Figure 2:** Responses to Question C7

**Conclusion**

Since this analysis shows that the null hypothesis is being rejected on ground of significance at 0.05 level, the data remains valid and relevant for a necessary decision in this research. Having about 61 % of the banks’ customers, being the potential respondents of this research indicates in Table 1 that they do have authentication issues with accessing mobile banking system, one could conclude that improving the authentication process is required. For the fact that the respondents in Figure 2 indicates that over 200 participants

are of the opinion that face and voice recognition would improve the security system in mobile banking, one could conclude that a security model that captures them needs to be proposed. Hence, to respond to this results, a mobile application that includes face and voice recognition will be developed and presented. The prototype will be published in the next paper.

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**APPENDIX**

**QUESTIONNAIRE FOR MOBILE BANKING IN SRI LANKA**

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Security issues in mobile banking has been a concern worldwide. Sri Lanka on its own has not been excepted from this menace. As the result, customers of banks develop fear in using the provided mobile app to be banking by use of their mobile phones (mobile banking). This research focuses on improving the security status of mobile banking for customers in Sri Lankan banks to gain confidence in using the application made available to them. As a bank customer in Sri Lanka, kindly fill this questionnaire in participation for this research to gain more insight into this research problem and solution specification(s). Your participation will not include information that reveals your identity and will not be used against you in any way. All data will be used EXCLUSIVELY for the needs of the present research. Thank you for your participation in anticipation.

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A1 What is your gender?

1. Male 2. Female

A2 What is your age group?

1. 18-24 years 2. 25-50 years 3. Above 50 years

A3 What is your highest level of education?

1. Diploma/NCE and below 2. Bachelor’s degree and above 3. Others

A4 What is your occupation?

1. Student/Farming 2. Civil Servant 3. Business owner 4. Others

B1 Do you access the Internet

1. Most times 2. Sometimes 3. Not at all

B2 How do you access the Internet?

1. Through my mobile phone/tablet 2. Through my computer 3. Others

C1 Do you have bank account?

1. Yes 2. No 3. I do not know what it is

C2 What type of banking do you do?

1. Internet banking 2. Manual (offline) banking 3. All of the above

C3 Does your bank provide mobile banking services?

1. Yes 2. No 3. I do not know

C4 Do you use the mobile banking facility to perform transactions?

1. Always 2. Sometimes 3. Not at all

C5 Do you experience any issue(s) when using mobile banking?

1. Most times 2. Sometimes 3. I don’t use it

C6 What are some issues you experience during mobile banking?

1. Login issues 2. Poor internet connectivity 3. I don’t use it

C7 Do you think a face and voice recognition would improve the security of Mobile banking?

1. Yes 2. Somehow 3. Not at all, I prefer offline.