# Customer Attitude Towards Mobile Banking Services in Sri Lanka

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***Abstract*—Internet banking plays a significant role in banking sector in recent times. This paper expects to recognize and examine client appropriation and perspectives towards versatile financial services based on the mobile banking. Electronic banking is the place where clients communicate with the bank through personal computer or smart phones and banks give them the administrations like short message administrations, reserve moves, account subtleties, issue of checkbook, and so forth. The fundamental reason for this audit is to comprehend the elements which add to the client's aim to utilize electronic financial administrations and issues identified with actualizing electronic banking by the banks. Most of the current studies were concentrated on factors related with customer adoption of reliable banking services, but studies emphasizing on issues on the side of the banks or the implementation process is yet to be explored. Future studies must concentrate on these aspects. The research methodology is based on the factors which mainly include customer demographic information, registered bank information, attitude, subjective norms, perceived behavioral aspect, a questionnaire survey was conducted to gather the data and 151 complete responses were gathered from banking customers who were internet users from Sri Lanka.The survey results revealed the importance of the mobile banking application usage factors of the consumers. Two main hypothesis tests were carried out for identify the relationship between customer mobile banking services usage and identifying the customer attitude towards the banking services.With the hypothesis testing analysis revealed that there is a considerable amount of motivation and potential interest towards consumer mobile banking service usage in Sri Lanka.**

***Index Terms*—E-banking, Electronic Banking, Mobile Banking, Customer Adoption, Customer Attitude**

## I. Introduction

The banking sector in Sri Lanka is a dynamic contributor to the Sri Lankan economy and has helped the country to grow as well as support many families to build their future.At the point when Sri Lanka or then known as Ceylon was under the rule of the Sinhalese Kings and even the Portuguese (1505-1656) and Dutch (1656-1796), banks and banking were as yet strange to the Sri Lankan culture. It was distinctly during the British settlement (1802-1948) that Banking was acquainted with Sri Lanka with basically parts of unfamiliar banks being set up. The CBSL was set up in 1950 under the MLA No.58 of 1949 which was a significant achievement in Sri Lanka's monetary history. Today, the Central Bank is the overseeing group of business banks. Banks which go under the administration area in Sri Lanka assume a vital function in its economy adding to about 60% of the GDP and utilizing about 40% of the absolute labor force. The financial area likewise holds about 55% of monetary area resources while the others are held by Insurance and Real Estate organizations[1]. The financial area assumes a significant function in the Sri Lankan economy as in different nations on the planet. Impressive development and improvement can be seen in the new past regarding the number of banks, the number of instruments on offer, the scope of administrations gave. There are 25 authorized business banks working in the nation directed by the Central Bank of Sri Lanka. Ten of these banks are shaped locally and the rest are unfamiliar banks working as branch elements. Two of the neighborhood business banks are state-claimed. The Sri Lankan government and the national bank of Sri Lanka have acquainted a few changes with improving the proficiency and security of the monetary area. The financial area of Sri Lanka is contributing an extensive sum to the monetary development of Sri Lanka. Business firms and people are recognizably utilizing the check- in their business exchanges because of that business banks are truly necessary for the current climate. The financial area has received new advances to a significant level to improve its proficiency and execution to accomplish its drawn-out objectives. The objective of this study is to analyze the factors influencing mobile banking usage and adaptation in the recent times.The initial mobile banking services were powered by SMS communication, which was known as 'SMS Banking'. Then gradually, Mobile Web was introduced and mobile banking was offered through WAP (Wireless Application Protocol). As WAP was restricted to a specific set of hand-sets, USSD (Unstructured Supplementary Service Data) came into practice which permitted a real-time interactive access to bank accounts on many basic handsets[2]. In recent times, with the spread of smart- phones, mobile banking has established to the use of special client programs, called Mobile Apps, downloaded to the mobile device used for mobile banking.In this research the survey information can be used in the mobile banking services improvement decisions for the banking sector. The hypothesis tests and to the customer relations team should be able to facilitate or new customers to provide better online banking services. So the Employee Relations team can take necessary steps to avoid the risk. The result in the analysis may provide the recommendation to the customer relations team in the banking sector who are focusing on improving the online banking related services and customer experiences.

## II. Data Collection and Processing

In this study, the researcher concerns the factors influencing the customer adoption and uses of E-Banking system in Sri Lankan public commercial banks' perspective especially covering most of the parts in Sri Lanka. The research methodology is based on the factors which mainly include customer attitude, subjective norms, perceived behavioral control, A Questionnaire survey was conducted to gather the data and 151 complete responses were gathered from banking customers who were internet users. The initial level of the survey is categorized into three parts such as gathering demographic information, banking information, mobile banking application usage. For the demographic information consumer age, living district, occupation, education level, marital status, and monthly income information has been gathered. For the banking information currently registered banks, registered service, and offline services usage information has been gathered. For the third section current mobile banking application usage and services information has been gathered. Overall, 155 data points collected from November 2020 to December 2020 is used in this analysis. Among them, 4 observations had incomplete data and hence were omitted from the analysis. The completed data points 151 consists of 103 mobile banking users and 48 responses of non-mobile banking application users. To achieve the objectives initially the survey is conducted via Sinhala language medium, for information extraction survey results need to be converted into the English language. After that data pre-processing techniques were conducted to further clean up the data set.All the survey questionnaire set, extracted data set and spread sheet and source code is available in the github repository[3].

## III. Methodology

To understand the factors influencing mobile banking services usage in Sri Lanka, a detailed study on the data collected was undertaken. Initially, a descriptive analysis was conducted through the data set gained. The data set has been critically analyzed via the various aspects of consumer information. Two main hypothesis testing were conducted to understand the relationship between customer attitude towards the current mobile data application services usage.

## IV. Analysis and Results

Identifying the factors influencing to the mobile banking application usage with Descriptive Analysis

From the initial data set, there were main 21 attributes, and with the help of data, extractions the researcher was able to extend the data set into 59 attributes, which provide information on demographic details, banking details, and current engagement details of mobile banking application services usage. Most of the initial data analysis is done by using the Microsoft Excel application. Further analysis of the data is done using well-known python libraries[4], [5], [6], [7].

According to the figure 1, the most of the mobile banking application users based on age range between 30 and 39 and 19 and 29. This means that more than half of the mobile banking

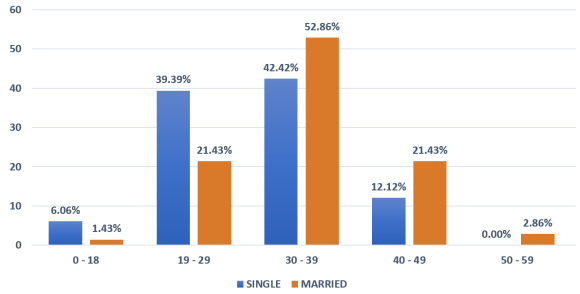


Fig. 1. Survey participants vs age range distribution.

users between age range 0 and 39. So according to the sample statistics young generation of the Sri Lanka moving forward to the mobile banking application.

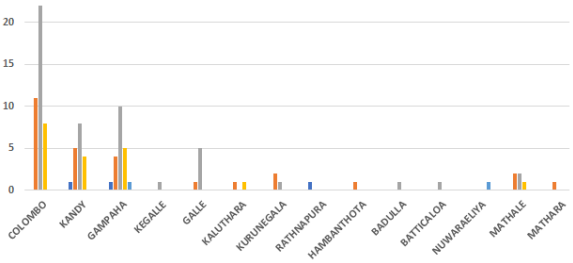


Fig. 2. Survey participants distribution in district level.

Figure 2, elaborates on the survey participant with district distribution. According to the statistics most of the survey participants are coming from Colombo district and Gampaha, Kandy, Kegalle and Galle also having considerable amount of mobile banking application users.

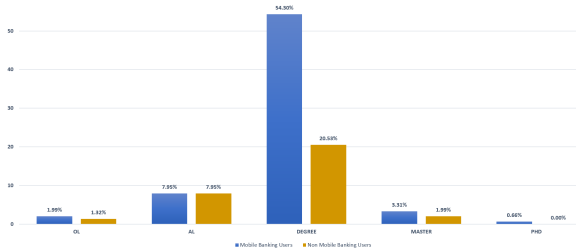


Fig. 3. Education level of participants mobile banking usage based on the survey.

Figure 3, shows the distribution of education level in mobile banking users and non mobile banking users. Based on the statistics there is a huge variation of degree holders based on the mobile banking preference.How ever the based on the sample gained most of the high educational level people are tend to use more mobile banking services.Based on the statistics non degree holders have less use of mobile banking services.

Figure 4, represent that the mobile banking users occupational sector and monthly income distribution. Based on the sample statistics more monthly income users are tend to

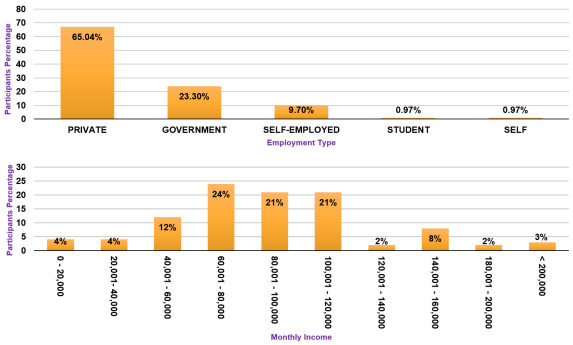


Fig. 4. Mobile banking users' occupational sector and the monthly income distribution.

use more mobile bank services. In fact the if the consumers' monthly income is greater than 40,000 rupees have more tendency to move in to the mobile banking services. Also that figure 4, represents the most of the private sector employees are tend to use more mobile banking services.

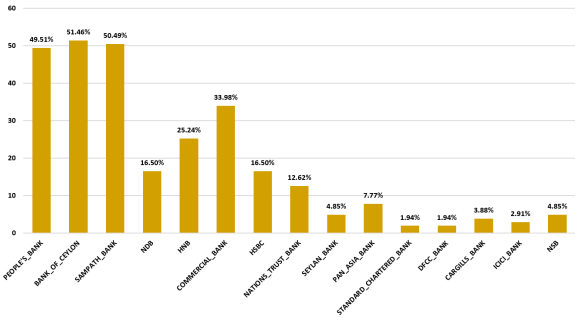


Fig. 5. Bank preferences based on the survey participants.

Figure 5, shows the current bank registration distribution. Based on sampling statistics government banks such as Bank of Ceylon and People's Bank has most of the consumer preferences despite of government banks are recently moved in to the mobile banking services.Also noted that Sampath Bank gained most preferences out of other private banks due to Sampath Bank is dominant on the internet banking industry and providing internet banking based services for a long time compared with other banks.

According to figure 6, most of the mobile banking application users based on android phone.Less than 10% of the participants are based on Apple Iphone usage, that represent that for the mobile application based banking services are not effected with user's mobile type. However application wise android phone user's needs to more priority than Apple Iphone users.

With related with figure 7, most of the mobile banking application users are self motivated for mobile banking services usage, also there is a significant amount of motivation given by the banks itself to consumers to move into the mobile based banking services.

Figure 8 and 9 shows, the distribution of account types registered in the banks. Overall all of the survey representa-

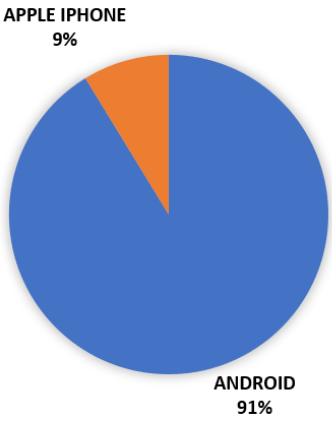


Fig. 6. Mobile banking application usage mobile type distribution.

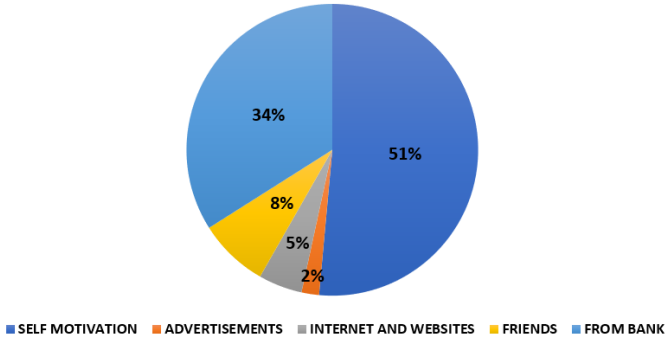


Fig. 7. Source of mobile banking application registration.

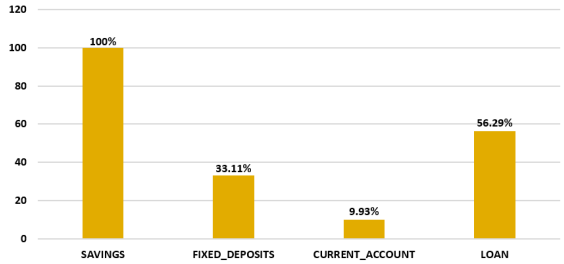


Fig. 8. Representation of survey participants account types registration.

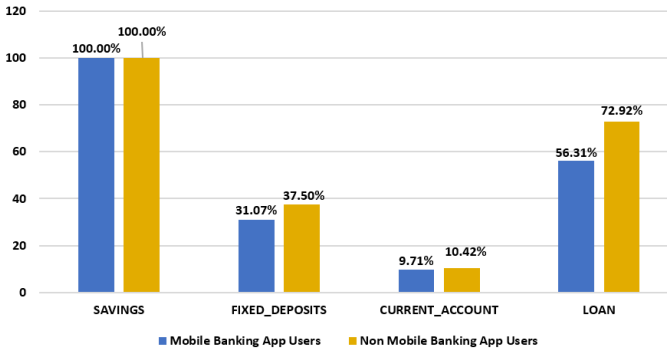


Fig. 9. Representation of survey participants account types based on mobile banking and non mobile banking user registration.

tives have saving accounts. There is a considerable amount of loans are gained (56.29%) among the survey bank consumers. However with comparison of mobile bank users and non mobile bank users non mobile bank users primarily have loans and fixed deposits with compared with the mobile banking users.So most of the mobile bank users are registered for particular bank for specific reason (to become either for fixed deposit holder or load account holder).

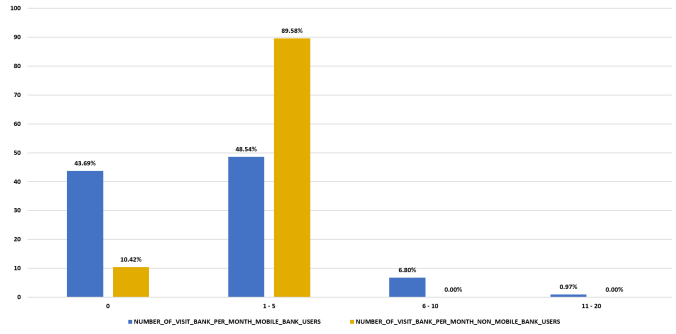


Fig. 10. Representation of the mobile bank user vs non mobile bank average user bank visits per month.

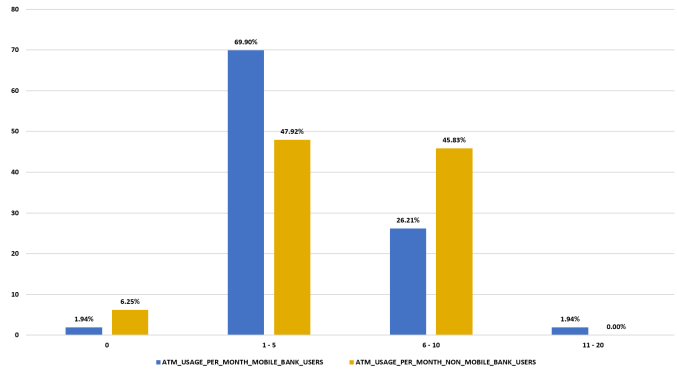


Fig. 11. Representation of the mobile bank user vs non mobile bank average ATM usage per month.

Figure 10, 11, shows the distribution of offline banking services usage compared with mobile banking users. There is a significant difference when considering the number of bank visits per month. According to the figure reffigure9, it is clearly observed that around 89% of the non mobile bank application consumers frequently visit banks.

When considering the bank ATM usage Figure 11 shows the distribution of offline banking services usage compared with mobile banking users. With ATM usage per month mobile bank application users are less frequent when compared with non mobile bank application users.According to the figure reffigure9, it can be clearly seen that with summation of 1-6 time user group and 6 -10 times user group , non mobile application users have higher frequency of ATM usage.

So with the increase of mobile application users bank can reduce the offline bank operation and manual money transactions, which involves to reduce time for each and every operations in the banks and increase the consumer bank service operations and experiences.

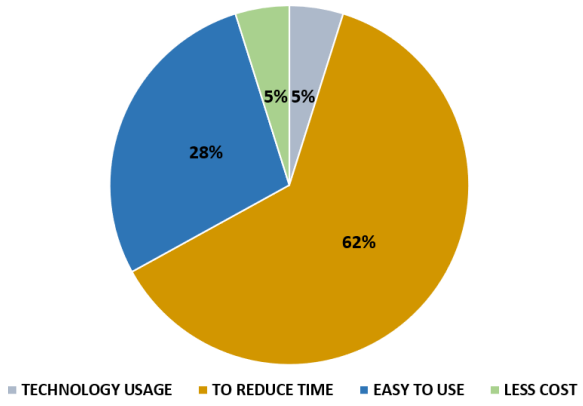


Fig. 12. Consumer intention to use the mobile based bank services.

Based on the figure 12, most of the mobile banking application users intention is to reduce time and ease of use of the mobile application. All the operations performed through the mobile application, most of the users find quit simple and more efficient than gain services while visiting the bank.According to the 62% of significant ratio of users finds mobile banking services takes less time and avoid waiting in huge queues in the banks.

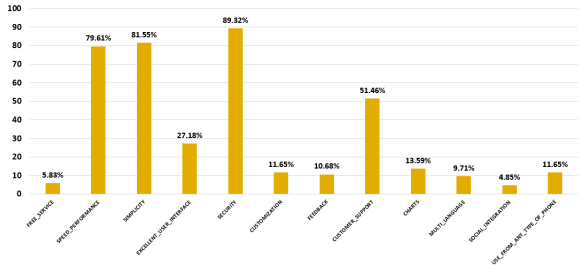


Fig. 13. Consumer preferences for mobile banking application services usage.

According to the figure 13, it can be seen that banking mobile application users preferred security (89.32%), simplicity (81.55%) and speed and performance (79.61%) respectively. Also most of the banking mobile application users preferred (51.46%) customer support features as well.

The banking area of Sri Lanka keeps on playing out its part of monetary inter-mediation while the scope of items and administrations offered just as its effort went through additional development. Before the finish of 2014, 23 banks involving homegrown banks and 12 parts of unfamiliar banks proceeded with tasks while growing the financial organization and acquainting new assorted financial arrangements withdraw in new clients.Adoption of mobile banking has become fundamental in the banking industry in Sri Lanka. Most commercial banks in the country are offering mobile banking within the last few years. However, the maturity level of mobile banking remains at a primary stage in the country.

Fig. 14. *Mobile banking application feature analysis.*

| Informational | Transaction | Interactive | Orchestrate |
|---|---|---|---|
| View balance, transaction history | Remote deposit capture | Actionable alerts - OTP | Opt-in preference management, marketing alerts |
| SMS alert | Balance transfer | Financial Management | Offers and POS coupons Location and |
| All modalities | Bill pay | Mass marketing | context aware services |
| ATM finder , maps etc. | Stock payments | Transaction verification | Lifestyle management |

Based on the figure 14, most of mobile banking application features are never been used frequently.Based on sample statistics balance inquiry, fund transfers between own and third-party accounts,information on account history, credit card and utility bill payments, cheque status inquiry, cheque book request,cheque book request, change PIN/password, alerts on account activity, mobile recharging are the most frequently used features in the mobile banking application.

## V. HYPOTHESES OF THE RESEARCH

Based on the survey statistics for perceived mobile banking services usage information, the following hypotheses are constructed.For further analysis of the constructed hypotheses statistical analysis techniques have been used[8], [9].

- Proposition of the private sector people are preferred to use the mobile banking application and the proposition of the government and other sector people are preferred to use mobile banking applications are the same.
- Proposition of the mobile banking application safety feature preference is the same as the proposition of the preferences for speed and performance feature in the mobile banking applications.

### *A. Hypothesis - Proposition of the private sector people are preferred to use the mobile banking application and the proposition of the government and other sector people are preferred to use mobile banking applications are the same*

For the initial hypothesis, with the survey information the representatives have been categorized according to the occupation sector of the participants. According to the survey results, the majority of the people are based in the private sector.(Reference Figure 5)

Fig. 15. *Proportions of user preferences based on mobile banking application users vs occupational sector.*

| | Mobile Application In Use Participants | Total Participants |
|---|---|---|
| PRIVATE | 67 | 83 |
| GOVERNMENT AND OTHER | 36 | 68 |
| **TOTAL PARTICIPANTS** | 103 | 151 |

According to the Figure 15, null hypothesis and alternate hypothesis defined as follows.

P1: Proportion of the private sector people preferred to use mobile banking apps.
P2: Proportion of the government sector people preferred to use mobile banking apps.
So, null hypothesis can be consider as H0 : P1 = P2 and alternate hypothesis can be defined as Ha : P1 $>$ P2.

With the use of statistical calculations Z value gained for the hypothesis is 3.6443 and the value of p is 0.00014.
The result is significant at $p < 0.05$, therefore considering the p value gained it can be involved with rejecting the null hypothesis. So according to the statistics there is 95% of confidence that the proportion of the private sector people preferred to use mobile banking apps is greater than the proportion of the government sector people preferred to use mobile banking apps.

### *B. Proposition of the mobile banking application safety feature preference is the same as the proposition of the preferences for speed and performance feature in the mobile banking applications*

For the hypothesis, with the survey information the representatives defined the preferences for currently used mobile banking application features. According to the survey results, the majority mobile banking application users preferred for security, easy to use and speed and performance features.(Reference Figure 13) However with compared with security and easy to use preferences are most of the time users given equal preferences, speed and performance also given similar amount of ratio according to the survey statistics.So for this hypothesis, checking whether the users are given equals preferences for the security feature as well as speed and performance feature.

Fig. 16. *Proportions of user preferences based on mobile application features.*

| | Number Participants said Preferred | Total Participants |
|---|---|---|
| SAFETY | 92 | 103 |
| SPEED | 82 | 103 |
| **TOTAL RESPONSES** | 174 | 206 |

With the use of statistical calculations Z value gained for the hypothesis is 1.7782 and the value of p is 0.03754.
The result is slightly significant at $p < 0.05$, therefore considering the p value gained it can be involved with rejecting the null hypothesis. So according to the statistics there is 95% of confidence that the confidence that of the mobile application users preferred safety mobile banking apps is greater than proportion of the mobile application users preferred speed in mobile banking apps.

## VI. SURVEY QUESTIONNAIRE SUMMARY

Initially the survey was conducted with 21 questions in the Sinhala language.After the survey the results has been translated to the English language and performed cleaning techniques such as get rid of extra spaces, select and treat all blank cells, convert numbers stored as text into numbers, remove duplicates, highlight errors, change text to lower/upper/proper case, spell check,delete all formatting for final data set. For the survey initially demographic specific information such as age, living district, job status, education level, marital status,

monthly income gathered (6 questions). For the second section of the survey user bank related information has been gathered (4 questions).For the third section mobile banking application users information has been gathered (11 questions).

## VII. CONCLUSION

The results of this study show that there is a potential movement in the mobile banking industry in Sri Lanka. In recent years most of the young generation of Sri Lanka more and more move into the mobile banking industry due to various benefits gained through the mobile banking services.From the statistics gained through the survey and the initially defined hypothesis related statistical analysis revealed that private sector employees are more tend to use mobile banking application related services rather than government and other sector employees. According to the second hypothesis related statistical analysis revealed that most of the current mobile banking users are more considerate about the security of the mobile applications when considering other features such as easy to use and speed and reliability. In Sri Lankan context of view self motivation is the most potential reason that may influence the intention of mobile banking services. Also enforcement from banks itself can make consumers move to more and more mobile bank related services.

## VIII. ACKNOWLEDGMENT

I would like to express my gratitude to Dr. Uthayasanker Thayasivam for their support and guidance to carry out this analytic study. Further, gratitude goes to the survey participants to providing me the relevant data for further analysis of mobile banking application usage in Sri Lanka.

## IX. GIT REPOSITORY

https://github.com/sampathsl/UOM_2020_CS5651_Statistical_Inference

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