A Survey on Mobile Banking App Usage in Sri Lanka

Thilina S. Jayathilaka
Department of Computer Science & Engineering, University of Moratuwa, Sri Lanka

***Abstract*—In an era of smartphones, mobile banking apps plays an important role in seamless financial connectivity all around the world. However, most people are skeptical about using mobile banking apps in spite of their education level and age. Therefore, this research survey is done to derive both a general understanding and a statistical analysis on mobile banking app usage in a sample of banking app users. The process included a preparation of a survey questionnaire to collect data and conducting an initial analysis and then statistical calculations on the responses received with the help of google form response facility and also R Studio. It could be statistically inferred on the sample that majority of the users tend to use mobile banking apps several times a month and they are averagely satisfied with the ease of use and security. However, it cannot be ignored the fact that some users hardly use these apps even they have already installed them in their phones. Discussions on these aspects are conducted on this research survey and given the situation, it has been concluded that the survey was fairly successful.**

***Index Terms*—statistical inference, bootstrap sampling, mobile banking, mobile banking apps, banking services, social media usage, age distribution, education level**

I. Introduction

Ever since the invention of the mobile telephone, world started to become smaller in a way that started connecting more and more people together no matter where they live or move as long as there is signal coverage. Over the years, facilities like text messaging, camera, and connectivity to internet arrived to the mobile telephone; in fact, this is when the term *smartphone* came into being; and later more advanced functionalities like photo editing, online conferencing, online shopping and reservations with payment gateways became increasingly popular as mobile applications; in short, *apps*; all over the world.

However, most of the people are still skeptical about the usage of mobile banking apps on. It may probably due to factors like skeptic about security of mobile banking apps and also about themselves that they might make mistakes while costing their own bank accounts. It may also be the fact that most people are used to traditional banking procedures and no doubt quite happy because they do not need struggle with a mobile banking app which sometimes might be hard to use due to bad design or it keeps lagging a lot. Even in 2020, according to general experience, one does not easily meet a hard core mobile banking app user everyday although he or she may have installed one or two mobile banking apps in his or her smartphone.

II. Objective

In this background, it is important to find out why most people do not use mobile banking apps and for those who do use them, why do they use them rarely and use only basic features even most apps provide extensive tools to handle users accounts and banking services. From the above two main categories, this research survey is specifically targeted to gather feedback from people who already use mobile banking apps and try to analyse them. Since the context has been narrowed down, this report will refer mobile banking app users simply as *users*, and those who do not as *non-users*.

III. Methodology

Following systematic approach was taken to conduct this research survey and each step will be described as needed in subsections and upcoming sections.

A. Preparing the Questionnaire

To collect feedback from users, a strategic questionnaire needed to be prepared. It had to be not too long not to make the users discourage to fill it and pass on to someone, and not too short in order to collect sufficient amount of information to conduct proper analysis. So the questionnaire was limited to short answer, multiple choice and rating scale questions.

The questionnaire begins with basic ground level questions such as the smartphone type the users use, the actual banking services they engage with, the number of mobile banking apps installed in their phones, and how long have they been using them.

After that, questionnaire focuses on questioning the diversity and extent of engaging in common banking services such as *savings accounts*, *fixed deposits* and *credit cards*.

Then, the questionnaire focuses on user ratings on several aspects of mobile banking apps such as their ease of use, feeling of security and also the user's rate of motivation to recommend others to use mobile banking apps.

Final section of the questionnaire intents to gather some demographics of users to analyse any effect on mobile banking app usage from aspects such as their age, gender, occupation, education level and also their usage of social media.

This questionnaire was prepared as a result of consistent discussion among colleagues and instructions of the supervisor which in turn lead to a more normalized and qualified questionnaire. It was prepared in both *English* and *Sinhala* language and they can be found in the GitHub repository [1].

B. Data collection

Since the PDF and printed versions of the questionnaire was not quite helpful to distribute among many users and get them filled within a short period of time allocated for this project, a google form was prepared and distributed to users around the country via emails, test messages and social media. With that, feedback of 112 users were collected successfully.

C. Analysis

After gathering the data, an initial analysis was done by examining how each question was responded. The charts provided by the google form was helpful in demonstrating and identifying important aspects of the mobile banking app usage among the sample. As the next step, a popular statistical technique called *Bootstrap Sampling* was used to make further analysis on gathered sample data make confident inferences on the collected sample. More details on the analysis are included in the next section.

IV. Results

This section describes the important aspects of collected data from a total of 112 users, with both initial and statistical analysis with bootstrap sampling and statistical inference.

A. Initial Analysis of Results

The attention was first focused on what type of banking services do the users generally engage with in their lives by the response chart for the corresponding question as shown in Figure 1. According to this, the most common type of banking service which the users engage with is savings accounts (99.1%) and the least common type is current accounts (15.2%). Other than savings accounts, credit card services stands out with a percentage of 39.3%.

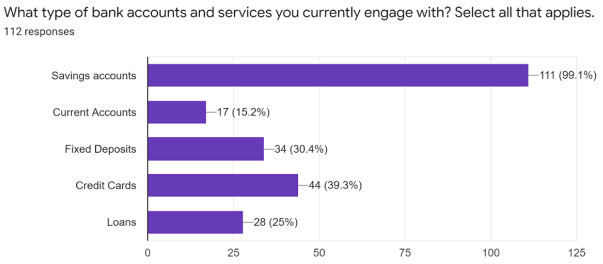

Fig. 1. Types of banking services engaged by users

Next, the number of mobile banking apps installed in users' smartphones were analysed by the responses as shown in Figure 2. From the sample, 41 users only have 1 app and 37 users have 2 apps installed in their smartphones. Other counts are fairly low. There is one user in the sample who has 7 apps in his or her phone. Also, 2 users have said that they have no apps currently in their smartphones either because they have deleted them recently or they have switched to a new phone and they have not yet re-setup their mobile banking apps yet. However, the fact that this was a erroneous response from their part cannot be ignored because the questionnaire allowed to enter a value from 0 or above.

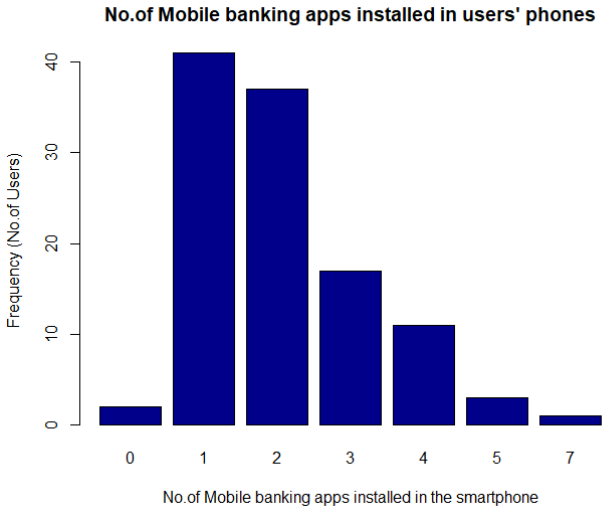

Fig. 2. Mobile banking app count in users' smartphones

Then the rate of how often the users engage with mobile banking apps in their smartphones are analysed by the response chart for the corresponding question as shown in Figure 3. According to this, 33% of the users use mobile banking apps several times a month and percentages of users who use them on both daily (26.8%) and weekly (25%) bases are almost similar.

Although there is 5.4% of users who use mobile banking apps once a month, which suggests they may use them to check their monthly salaries of to pay monthly bills, there is 9.8% of users who hardly use the apps even though they have installed them in their smartphones. The reasons for this might be that they may have installed them due to a sudden motivation from advertisements or by recommendation from their colleagues and later they forget to use it. Or they may have tried to use them but stopped due to reasons like lagging or complexity of usage.

After that, users were asked to respond about the tasks they engage with mobile banking apps. They are shown in figure 4. According the responses to the corresponding question, the most common tasks users engage with is *checking savings account balance*. Second and third most common tasks are *Transferring money* and *Paying bills* respectively. The least common task is *Managing fixed deposits* and it might be the reason that users are reluctant to engage in investment level tasks using their mobile phones more often and also it might be the cause that the sample is biased in such a way that most of users are not active money investors in their general lives.

Next, the users were questioned specifically on each task they engage using mobile banking apps. First one being the *Bill payments*, Figure 5 shows the different types of bills users pay via banking apps. Here, 25.9% of users are not paying any bills via banking apps and from those who do, most common types are *Mobile/Telephone bills* and *Internet bills* with percentages of 68.8% and 59.8% respectively. However, 36.6% and 27.7% users pay *Electricity bills* and *Water bills*

via banking apps which of course is a good trend than few years back.

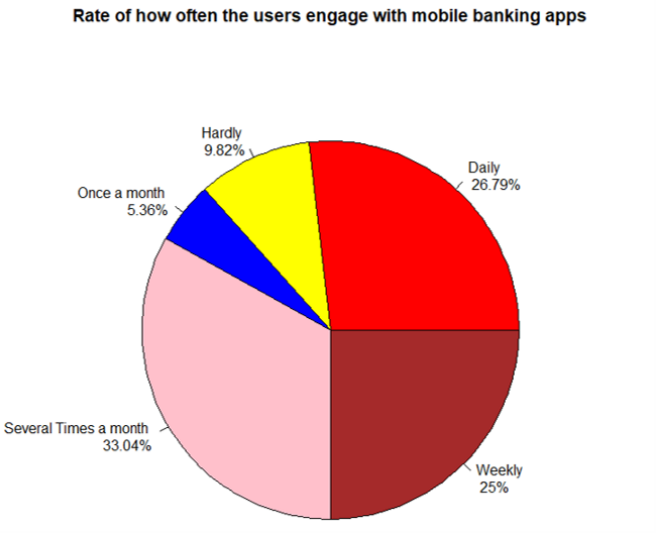

Fig. 3. Rate of how often the users engage with mobile banking apps

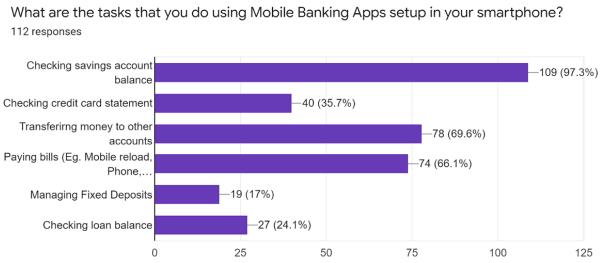

Fig. 4. Tasks done by users with mobile banking apps

Users were also asked to respond to credit card related tasks they engage using mobile banking apps and the responses to the corresponding question are shown in Figure 6. Comparatively to paying bills, there are abundance users who do not engage with credit card related tasks via banking apps and from those who do engage, mostly checks the credit card balance. It is important to note that 18 users are using mobile banking app to check for credit card promotion which is a good trend instead of visiting the banking website to do the task.

Then users were asked to respond to fixed deposit related tasks they engage using mobile banking apps and the responses are shown in Figure 7. According to this, 90 users in the sample do not engage with fixed deposit related tasks via banking apps which is important to be focused by the banks because almost all banking apps provide smooth fixed deposit related facilities in their apps.

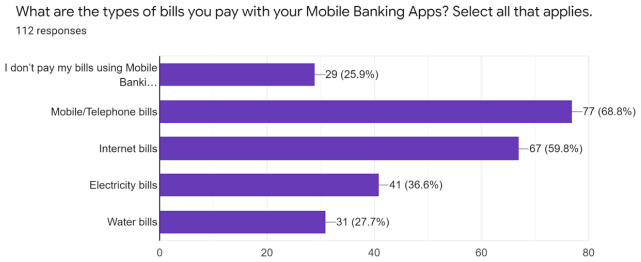

Fig. 5. Credit card related tasks done by users via mobile banking apps

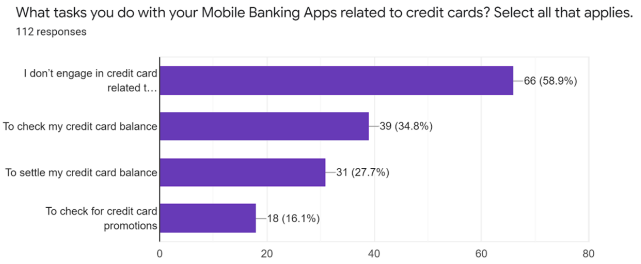

Fig. 6. Credit card related tasks done by users via mobile banking apps

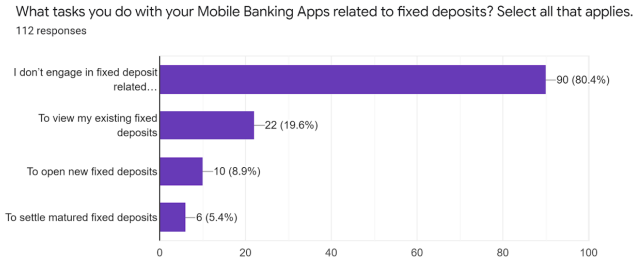

Fig. 7. Fixed deposit related tasks done by users via mobile banking apps

In the next part of the questionnaire, users were asked to rate certain aspects regarding the usage of mobile banking apps and the responses to the corresponding questions are shown in Figures 8, 9 and 10.

These responses suggests that most users in the sample feels that it is easy to use mobile banking apps and they also feel secure about using them for basic tasks like checking saving accounts balance, transferring money and bill payments. Important point to note is that majority of users tend to recommend usage of mobile banking apps to their colleagues according to Figure 10.

However, there are few users who feels very hard to use the apps and quite skeptical about the security features of the apps. Bankers must approach these types of users first and inquire what are the problems they have because they will reveal existing problems in their apps first hand.

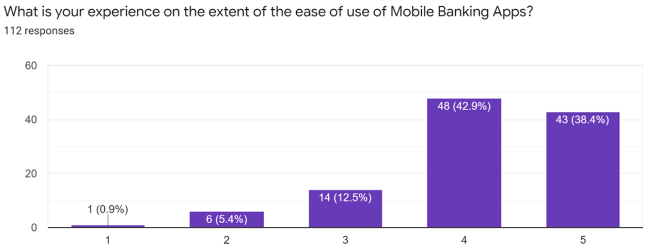

Fig. 8. Scales of ease of using mobile banking apps

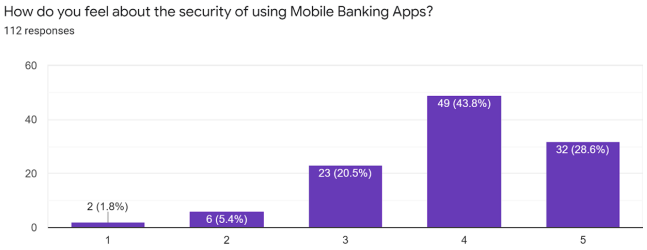

Fig. 9. Scales of sense of security related to mobile banking apps

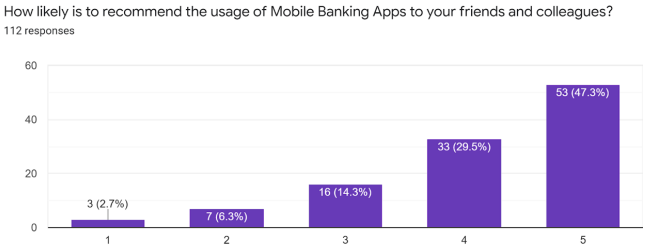

Fig. 10. Scales of mobile banking apps being recommended

B. *Analysis of Demographics*

In the final part of the questionnaire, users were asked to provide some demographic information analyse the general overview of the sample users. All the demographics aspects can be found in the survey but only few of them are used for the analysis of demographics here. They are *age*, *education level*, *social media sites that users visit* and *its frequency*.

According to the age distribution of the sample shown in Figure 11, most of the users are around 28. However, this user sample has a high probability of being biased towards specific age group because the questionnaire was distributed firstly among most of the users of the same age while also trying to distribute it to more younger and older users too.

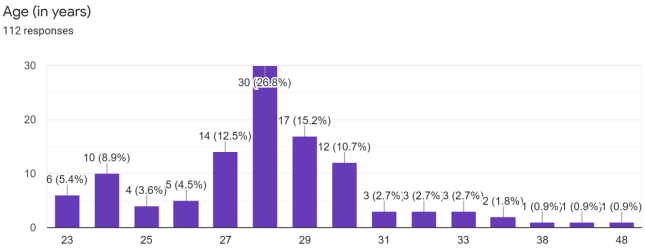

Fig. 11. Age distribution of users

Highest education level achieved by each user was also recorded and shown in Figure 12. According to this, most of the users are first degree holders and this data may also show some bias of the sample same as it has shown in the age distribution. Almost all the users have at least an *After O/L Diploma* and few of them have masters and doctors degrees.

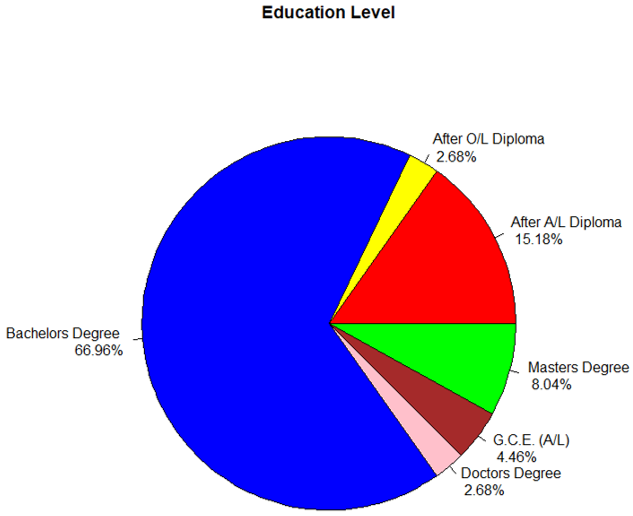

Fig. 12. Highest education level of users

The questionnaire was also included two multiple choice questions at the end with the intention of understanding their general social media usage, basically, the social media sites they visit most, as shown in Figure 13 and how often they generally use social media, as shown in Figure 14.

According to the responses, most users visit *Facebook*, *Whatsapp* and *YouTube* and the hardly visit sites like *Twitter* or *Viber*. Hence this is an important point to the bankers if they were to promote mobile banking app usage through these types of popular social media platforms.

According to Figure 14, only 16.1% of users engage in social media less than 1 hour per day. All others engage more than that. In fact, 28.6% of users spend roughly 2 hours on social media and another 20.5% of users spend more than 4 hours per day. This is also important for bankers if they were to promote mobile banking apps.

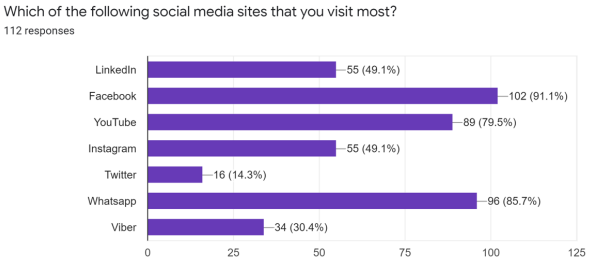

Fig. 13. Social media sites visited by users

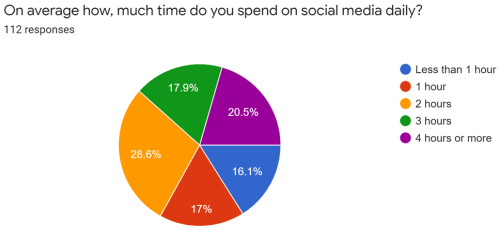

Fig. 14. Frequency of social media usage by users

C. *Bootstrap Sampling and Statistical Inference on the sample*

After doing the above basic analysis on various aspects, a statistical approach namely *Bootstrap sampling* was taken to assert formal statements regarding mobile banking usage on the collected sample.

As the first aspect, the frequency of mobile banking app usage by the users in the sample was taken into account, shown in Figure 3. Bootstrap sampling was done for this aspect of data based on 9,999 bootstrap replicates using *R Studio*. Each categorical frequency value was bootstrap sampled and 95% confidence intervals were calculated. Those intervals are given in Table I and the histogram of t and the quality of standard normal for the highest frequency category, that is *Several times a month*, is depicted in Figure 15.

According to the sampling and calculations using *R Studio*, it can be said with 95% confidence that 24.11% to 41.07% of users in the sample use mobile banking apps several times a month and 4.46% to 15.18% of users hardly use them even though they have installed them in their smartphones. 95% confidence intervals of other frequency categories are mentioned in Table I.

With 95% Bootstrap Confidence (based on 9999 bootstrap replicates)	
Several times a month usage	24.11% - 41.07%
Daily usage	18.75% - 34.82%
Weekly usage	16.96% - 33.04%
Hardly usage	4.46% - 15.18%
Monthly usage	1.79% - 9.82%

TABLE I
CONFIDENCE INTERVALS OF APP USAGE FREQUENCY

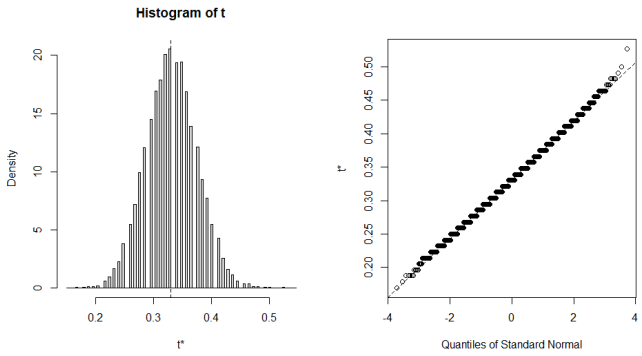

Fig. 15. Analysis of Mobile Banking App Usage Frequency

A Bootstrap sampling and a statistical inference was also done for the demographic aspect of the highest education level possessed by the users in the sample. This was also done based on 9,999 bootstrap replicates using *R Studio* and 95% confidence intervals were calculated for the 4 most common education levels of users in the sample, see Figure 12 and Table II.

According to the sampling and calculations, it can be said with 95% confidence that 56.25% to 74.11% of users in the sample are first degree holders and 0.89% to 8.93% of users in the sample have G.C.E. (A/L) as their highest educational level. 95% confidence intervals of other educational levels are mentioned in Table II.

With 95% Bootstrap Confidence (based on 9999 bootstrap replicates)	
First Degree	56.25% - 74.11%
After A/L Diploma	8.93% - 22.32%
Masters Degree	3.57% - 13.39%
G.C.E. (A/L)	0.89% - 8.93%

TABLE II
CONFIDENCE INTERVALS OF COMMON EDUCATIONAL LEVELS IN THE SAMPLE

The histogram of t and the quality of standard normal for the most common education level in the sample, that is *First Degree*, is depicted in Figure 16. The calculation script done using *R Studio* are publicly available in the GitHub repository [1].

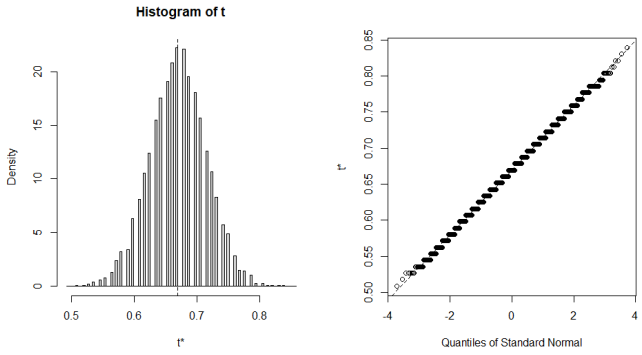

Fig. 16. Analysis of First Degree Holder Users

V. Discussion

Mobile phones, especially smartphones, have become a tool for everyday use, which creates an opportunity for the evolution of banking services to reach the previously unbanked population through mobile banking apps. The use of mobile banking apps can make basic financial services more accessible to most people while minimizing time and distance to the nearest branches of their banks [2]. However, people are still skeptical and reluctant about using mobile banking apps or the ones that do does only simpler tasks like checking savings account balance instead of managing further tasks like settling their credit cards, opening fixed deposits and transferring money to other accounts.

This research survey was targeted on mobile banking app users with the intention of collecting their feedback and doing statistical inferences on the collected sample of users. Data was collected using a systematically prepared questionnaire which resulted in a sample of 112 users. Then, initial analysis was done based on the responses to selected questions and then statistical inference was done on the sample based on two aspects.

According to the Figure 11, most of the users in the sample are around 28 and therefore, this sample is biased on that age area. Not only that, this sample may be biased towards first degree holders because most of the users who have filled this survey were first degree graduates in any arbitrary field, see Figure 12.

According the statistical inference done for the sample with bootstrap sampling technique, 24.11% to 41.07% of users in the sample tend to use mobile banking apps several times a month and 4.46% to 15.18% of users in the sample hardly use the mobile banking apps installed in their phones. Bankers can use these two informational statements and prepare strategies to improve the frequency of mobile banking app usage within the actual population. Bankers also can try to identify any hindrances faced by the actual population who hardly use those apps even though they have installed them in their smartphones which may be because of a technical complexity that users do not understand how to overcome during operation and it has discouraged them not use it anymore.

There might be instances like some users may have sent money to the wrong bank account during money transfers and they were frustrated by that and they may have decided not to use such risky apps even though they already know that its their own fault. It may also be the fact that they have installed mobile banking apps due to sudden motivation by a colleague or a catching advertisement and later they have lost the interest of using it.

According to the Figures 13 and 14, most common types of social media platforms used by the sample are *Facebook*, *YouTube* and *WhatsApp* in decreasing order or popularity and also, more than 80% of users in the sample engage with social media more than 1 hour on a daily basis. Bankers can use this information to target customers on these common social media platforms to advertise and promote usually neglected by important features in their mobile banking apps. If the survey included a question that inquires users to specify the time of day they engage in social media the most, bankers would be able prepare the best advertising time and strategy as well.

Initial charts for the responses were obtained by the google form responses facility itself and others were generated by *R Studio* in which all the calculations were also done.

VI. Conclusion

Finally, according to this research survey, one could get a general understanding and also a confident statistical inference about the mobile banking app usage in an educated population roughly around the age of 30. If the sample could have been collected by distributing the survey within a wider range of ages and education levels, then the analysis and the inference could have been much more generalized to the actual population. However, given the conditions, it can be concluded that this research survey was a success.

Acknowledgment

This research survey was done as the project for the module of *Statistical Inference* included in computer science masters' program conducted by the University of Moratuwa. Special thanks goes to the module supervisor, Dr. Uthayasanker Thayasivam, and all the colleagues participated in active discussions and all users who helped in distributing and filling the survey to make this project a success.

References

[1] Jayathilaka, T. "CS5651-Statistical_Inference-Survey_Project: This Is a Project to Assess Mobile Banking App Usage in Sri Lanka for the Module of Statistical Inference in MSc in Computer Science, UOM-SL." GitHub, GitHub, 5 Dec. 2020, https://github.com/tsj1992/CS5651-Statistical_Inference-Survey_Project.

[2] Kabir, Mohammad Rokibul. "Factors influencing the usage of mobile banking: Incident from a developing country." World Review of Business Research 3.3 (2013): 96-114.