Statistical Analysis of Mobile Banking Usage in Sri Lanka

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Abstract - Mobile banking facility offered by various government and non-government financial institutions is becoming popular among Sri Lankan community these days. This paper aims at statistically analyzing the survey results obtained about the usage of mobile banking applications.

Index Terms - Mobile Banking Application, Descriptive Analysis, Statistical Analysis, Chi-square test

INTRODUCTION

Mobile banking is a service provided by banking and financial institutions for their customers to conduct the financial transactions remotely by using a mobile device. Unlike traditional banking, mobile banking facility is available for the customers on a 24x7 basis. There's a rapid growth in the mobile banking sector in Sri Lanka. This paper aims at finding out the usage of mobile banking applications within Sri Lankan community.

METHODOLOGY

A survey was conducted over a period of three weeks inquiring certain details about mobile banking usage.

Please refer the appendix for the questionnaire.

The data obtained out of the 96 responses was subjected to descriptive and statistical analysis for testing few basic hypotheses derived at the end of the survey.

DESCRIPTIVE ANALYSIS

Descriptive analysis in statistics involves getting the measures of central tendency (measure of variability) or measures of dispersion of data. This helps users to get an understanding about the dispersion of data by using tables, graphs (bar chart, pie chart), box plot diagrams.

I. Distribution of Age and Gender

The survey data consisted of 66.67% of male responses and 33.33% of female responses. Accordingly the highest percentage 46.87% of responses about mobile banking app usage was received from the age group 21-30 years and the least percentage of 2.08% was reported from the category of age above 55 years.

Please refer the graph fig 1.1

II. Distribution of responses based on district

When analyzed the results the highest percentage of mobile banking app usage 25% was reported from Colombo district while the least percentage of usage 2.08% was reported from Anuradhapura district. It is difficult to arrive at a specific conclusion based on this data about mobile banking app usage of the entire population of Sri Lanka due to the

limitation of not having enough data about other districts.

Please refer the graph fig. 1.2

III. Distribution of responses based on level of education

On analysis of survey results based on the level of education it was found out that 69% of mobile banking app users fall into the category of having a level of education degree or above.

Please refer the graph fig. 1.3

IV. Distribution of responses based on employment status

The highest percentage of 60% of responses had been reported for the respondents employed in the private sector and second highest of 27% from the respondents employed in government sector. So it is clear that employment status matter the use of mobile banking application.

Please refer the graph fig 1.4

V. Distribution of responses based on level of income

According to the survey results the highest percentage 37% of mobile banking app users fall into the category of having a monthly income of Rs. 100000- 200000.

Please refer the graph fig 1.5

VI. Distribution of frequently used banking operations

In the survey respondents were given the option to select (one or more) the most frequently used mobile banking operations using the app. Accordingly the mostly used operation is checking account balance, 2nd highest is utility bill payment and the 3rd highest is to transfer the funds.

Please refer the graph fig. 1.6

VII. Distribution of responses based on level of satisfaction and no. of years of usage

According to the analysis 33.33% of respondents have been using the mobile banking application for 1-3 years and they are moderately satisfied with the currently using banking application.

Please refer the graph fig 1.7

VIII. Distribution of responses based on frequency of monthly usage and level of satisfaction

The highest percentage of 32.19% was reported from respondents who use the mobile banking application 5-10 times a month and they are moderately satisfied with the currently using mobile banking application.

Please refer the graph fig 1.8

IX. Distribution of data based on user opinion

On further analyzing the results it was found out that 43.75% of respondents strongly agree with the fact that mobile banking applications are efficient and time savvy. 34.38% of respondents strongly agree with the fact that mobile banking apps are risky in terms of security aspects when compared to traditional banking. 12.5% of respondents strongly believe that English language skill and technical skills are required to operate a mobile banking app and also same percentage (12.5%) strongly agree that use of mobile banking apps is costly and has additional charges when compared to traditional banking. Moreover 43.75% respondents strongly agree to the fact that the performance issues and technical issues of

mobile banking applications cause frustration among users.

Please refer the graph fig. 1.9

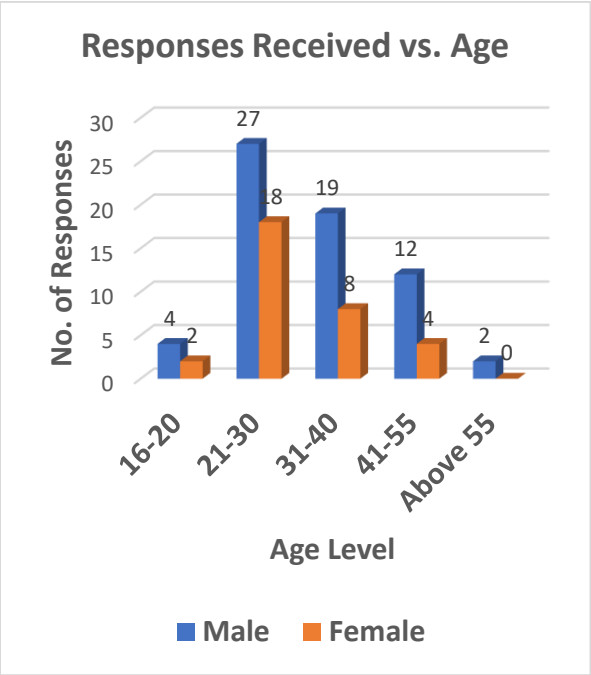

Fig 1.1 – Distribution of Age and Gender

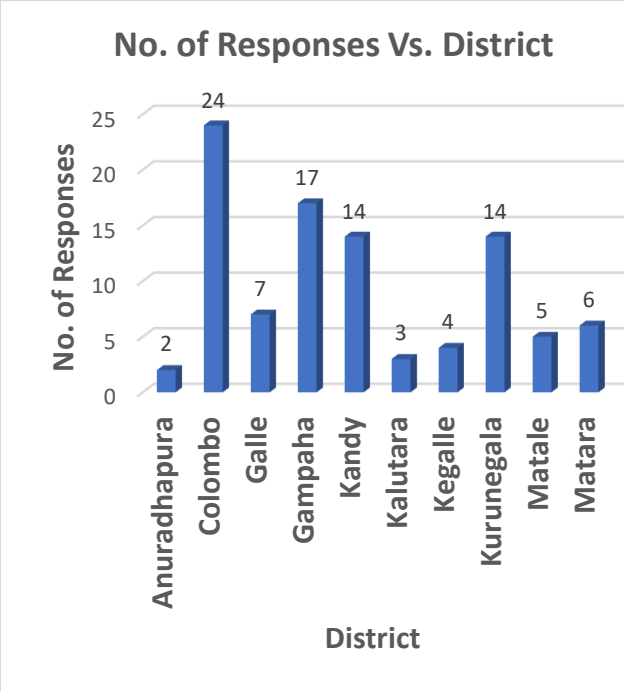

Fig. 1.2 – Distribution of responses based on district

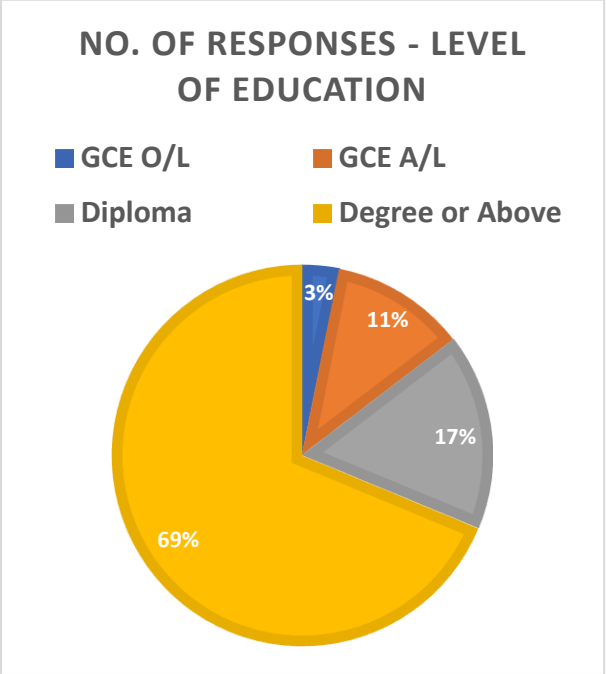

Fig. 1.3 – Distribution of responses based on the level of education

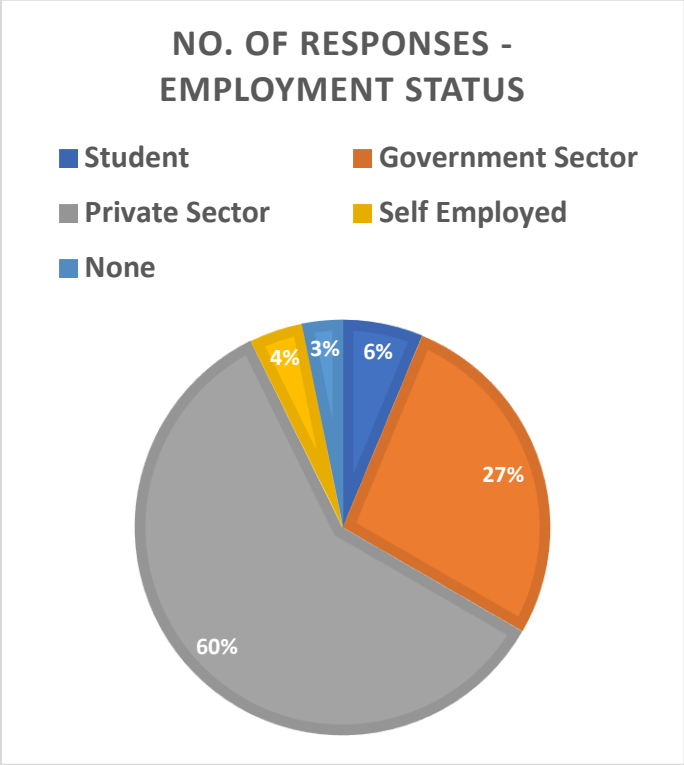

Fig. 1.4 – Distribution of responses based on the employment status

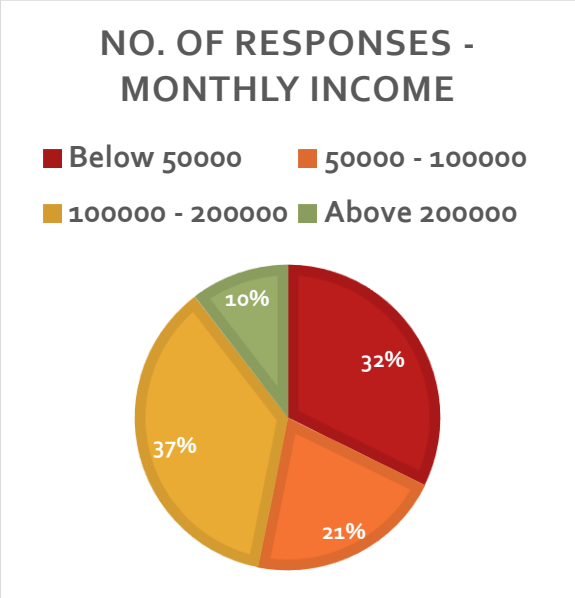

Fig. 1.5 – Distribution of responses based on the monthly income.

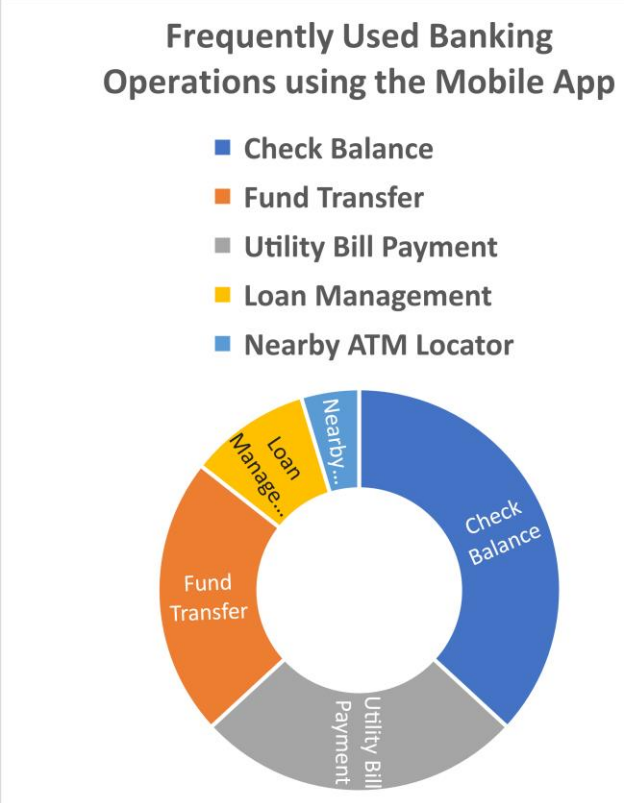

Fig. 1.6 – Distribution frequently used banking operations using the Mobile banking app

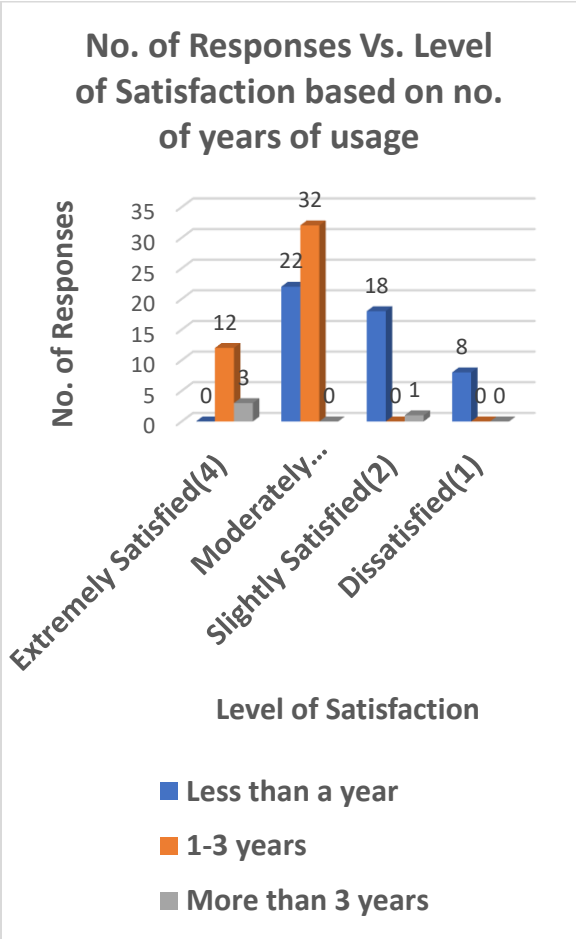

Fig. 1.7 – Distribution of responses based on the level of satisfaction and the no. of years of usage

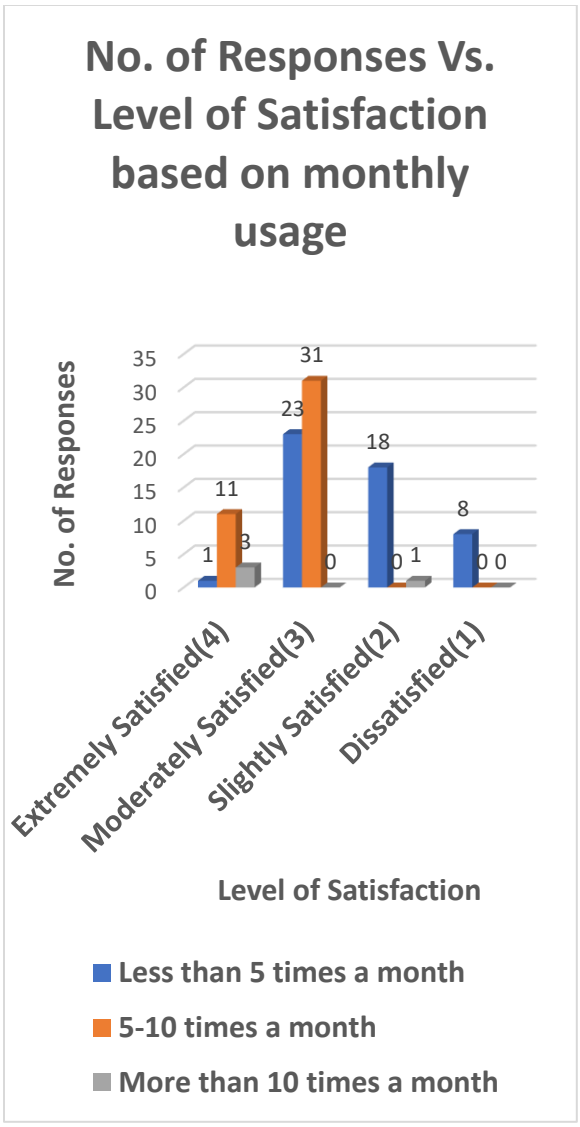

Fig. 1.8 – Distribution of responses based on the level of satisfaction and frequency of monthly usage.

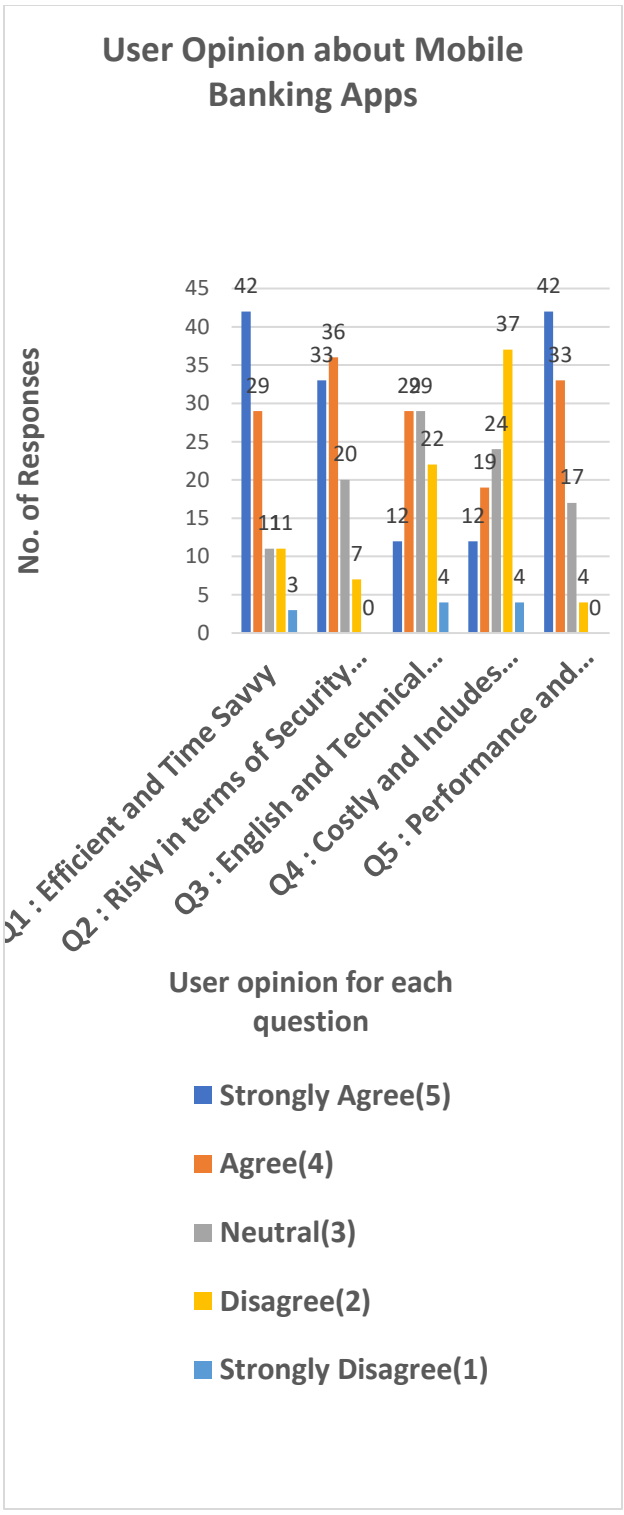

Fig. 1.9 – Distribution of user opinion

STATISTICAL ANALYSIS

Statistical Data Analysis is a procedure of performing various statistical operations on univariate and multivariate data. This helps to derive statistical inference during quantitative research. Univariate statistical data analysis includes t test for significance, z test, f test, ANOVA one way etc.

Chi Square statistic and P value Test (Method of Statistical Significance) are used in this project for hypothesis testing.

I. Is there any relation between employment status and frequency of monthly usage?

Null Hypothesis Ho : Employment status and frequency of usage are independent.

Alternative Hypothesis Ha : Employment status and frequency of usage are dependent/associated.

Accordingly the chi-square value 24.02 is greater than the critical value 15.51 null Hypothesis (Ho : Employment status and frequency of usage are independent) can be rejected.

Also the p-value 0.0023 is less than the alpha value/level of significance 0.05. Therefore we can reject the null hypothesis.

Therefore employment status and monthly usage are dependent/associated.

Observed (fo)	Less than 5 times a month	5-10 times a month	More than 10 times a month
None	3	0	0
Student	6	0	0
Government Sector	17	9	0
Private Sector	18	35	4
Self Employed	4	0	0

Chi-square statistic	24.02
Probability (level of significance/alpha)	0.05
Degree of freedom(r-1)(c-1)	8
Critical Value	15.51
x2 >CV : Reject null	
p	0.0023
p<alpha : Reject null	

II. Is there any relation between no. of years of usage and level of satisfaction?

Null Hypothesis Ho : No. of years of usage and level of satisfaction are independent.

Alternative Hypothesis Ha : No. of years of usage and level of satisfaction are dependent/associated.

Since the chi-square value 50.01 is greater than the critical value 12.59 null Hypothesis (Ho : No. of years of usage and level of satisfaction are independent) can be rejected.

Also the p-value 4.67E-09 is less than the alpha value/level of significance 0.05. Therefore we can reject the null hypothesis.

Therefore no. of years of usage and level of satisfaction are dependent/associated.

Observed (fo)	Dissatisfied(1)	Slightly Satisfied(2)	Moderately Satisfied(3)	Extremely Satisfied(4)
Less than a year	8	18	22	0
1-3 years	0	0	32	12
More than 3 years	0	1	0	3

Chi-square statistic	50.01
Probability(level of significance/alpha)	0.05
Degree of freedom(r-1)(c-1)	6
Critical Value	12.59158724
x2 >CV : Reject null	
p	4.67178E-09
p<alpha : Reject null	

III. Is there any relation between level of education and frequency of monthly usage?

Null Hypothesis Ho : Level of education and frequency of monthly usage are independent.

Alternative Hypothesis Ha : Level of education and frequency of monthly usage are dependent.

Since the chi-square value 28.18 is greater than the critical value 12.59 null Hypothesis (Ho : level of education and frequency of monthly usage are independent) can be rejected.

Also the p-value 8.7E-05 is less than the level of significance/alpha value 0.05. Therefore the null hypothesis can be rejected.

Therefore level of education and frequency of monthly usage are dependent/associated.

Observed (fo)	Less Than 5 times a month	5-10 times a month	More than 5 times a month
GCE O/L	3	0	0
GCE A/L	10	1	0
Diploma	14	2	0
Degree or Above	21	41	4

Chi-square statistic	28.18
Probability(level of significance/alpha)	0.05
Degree of freedom(r-1)(c-1)	6
Critical Value	12.59158724
x2 >CV : Reject null	
p	8.69918E-05
p<alpha : Reject null	

IV. Is there any relation between gender and frequency of monthly usage?

Null Hypothesis Ho : Gender and frequency of monthly usage are independent.

Alternative Hypothesis Ha : Gender and frequency of monthly usage are dependent.

Since the chi-square value 0.54 is less than the critical value 5.99 null Hypothesis (Ho : Gender and frequency of monthly usage are independent) cannot be rejected.

Also the p-value 0.76 is greater than the level of significance/alpha value. Therefore the null hypothesis cannot be rejected.

Therefore gender and frequency of monthly usage are independent.

Observed (fo)	Less Than 5 times a month	5-10 times a month	More than 10 times a month
Female	16	14	2
Male	32	30	2

Chi-square statistic	0.54
Probability(level of significance/alpha)	0.05
Degree of freedom(r-1)(c-1)	2

Critical Value	5.991464547
x2 <CV : Fail to Reject null	
p	0.761300387
p>alpha : Fail to Reject null	

V. Is there any relation between level of monthly income and frequency of monthly usage?

Null Hypothesis Ho : Level of monthly income and frequency of monthly usage are independent.

Alternative Hypothesis Ha : Level of monthly income and frequency of monthly usage are dependent.

Since the chi-square value 21.22 is greater than the critical value 12.59 null Hypothesis (Ho : Level of monthly income and frequency of monthly usage are independent) can be rejected.

Also the p-value 0.0017 is less than the level of significance/alpha value. Therefore we can reject the null hypothesis.

Therefore level of monthly income and frequency of monthly usage are related/associated.

Observed (fo)	Less than 5 times a month	5-10 times a month	More than 10 times a month
Below 50000	25	6	0
50000-100000	10	9	1
100000-200000	9	24	2
Above 200000	4	5	1

Chi-square statistic	21.22
Probability(level of significance/alpha)	0.05
Degree of freedom(r-1)(c-1)	6
Critical Value	12.59158724
x2 >CV : Reject null	
p	0.001671304
p<alpha : Reject null	

CONCLUSION

By using the Chi-square test and p-value test it was evident that following hypothesis are tested as valid.

- Employment status and monthly usage are dependent/associated.
- No. of years of usage and level of satisfaction are dependent/associated.
- Level of education and frequency of monthly usage are dependent/associated.
- Gender and frequency of monthly usage are independent.
- Level of monthly income and frequency of monthly usage are dependent/ associated.

According to the survey the factors such as level of education, employment status, level of monthly income has a significance influence towards usage of mobile banking usage irrespective of the gender of the user.

Also it was noted that the factor no. of years of usage has a significant contribution when determining the user's level of satisfaction.

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GITHUB Repository

https://github.com/PRISLK/SI_Assignment.git

APPENDIX – Questionnaire used in the survey

1. Gender (Male/Female)

2. Age

    16-20

    21-30

    31-40

    41-55

    Above 55

3. District (respondent could select the district where he/she is living but responses were received only from following districts)

    Anuradhapura

    Colombo

    Galle

    Gampaha

    Kandy

    Kalutara

    Kegalle

    Kurunegala

    Matale

    Matara

4. Occupation

    Student

    Government Sector

    Private Sector

    Self Employed

    None

5. Level of Education

    GCE O/L

    GCE A/L

    Diploma

    Degree or Above

6. Monthly Income

    Below 50000

    50000 - 100000

100000 - 200000

Above 200000

7. What are the frequently used operations in the banking application?

Check Balance

Fund Transfer

Utility Bill Payment

Loan Management

Nearby ATM Locator

8. How long have you been using the mobile banking application?

Less than a year

1-3 years

More than 3 years

9. How frequently do you use the mobile banking application for transactions?

Less than 5 times a month

5-10 times a month

More than 10 times a month

10. How satisfied are you with the features of the currently using mobile banking application? (Extremely Satisfied - 4, Moderately Satisfied - 3, Slightly Satisfied - 2, Dissatisfied - 1)

11. Use of a mobile banking application is highly efficient and time savvy. How well you agree?(Strongly Agree-5, Agree-4, Neutral-3, Disagree-2, Strongly Disagree -1)

12. Use of mobile banking application for transactions is highly risky in terms of security aspects. How well you agree? (Strongly Agree-5, Agree-4, Neutral-3, Disagree-2, Strongly Disagree -1)

13. English and technical skills can be considered as mandatory skill requirements when engaging with a mobile banking application. How well you agree? (Strongly Agree-5, Agree-4, Neutral-3, Disagree-2, Strongly Disagree -1)

14. Use of a mobile banking application costs additional charges when compared to traditional banking. How well you agree?(Strongly Agree-5, Agree-4, Neutral-3, Disagree-2, Strongly Disagree -1)

15. Frequent performance issues and technical malfunctioning of the mobile banking application causes frustration among application users. (Strongly Agree-5, Agree-4, Neutral-3, Disagree-2, Strongly Disagree -1)