Analysis of Survey Results

USAGE OF MOBILE BANKING APPLICATIONS

CS5651 - STATISTICAL INFERENCE

MSc in Computer Science 2020 University of Moratuwa

209381P – T.P.N. Silva

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

Introduction

- **The survey was conducted over a period of 3 weeks and had received 96 responses.**
- **Questionnaire consisted of following basic questions.**

1. Gender (Male/Female)
2. Age
    - 16-20
    - 21-30
    - 31-40
    - 41-55
    - Above 55

3. District
    - Anuradhapura
    - Colombo
    - Galle
    - Gampaha
    - Kandy
    - Kalutara
    - Kegalle
    - Kurunegala
    - Matale
    - Matara

Introduction

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

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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 savy. How well you agree?(Strongly Agree-5, Agree-4, Neutral-3, Disagree-2, Strongly Disagree -1)

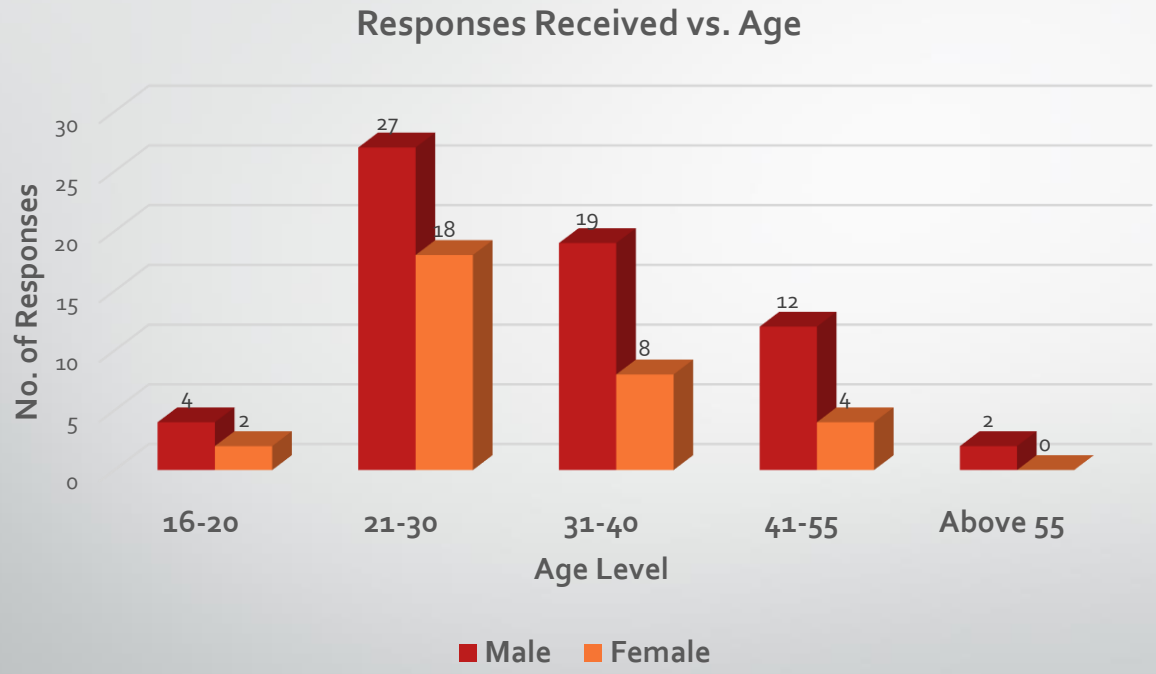
12. Use of mobile banking application for transactions is highly risky in terms of security aspects. How well you agree? (Strongly Agree-5, Agree-4, Neutral-3, Disagree-2, Strongly Disagree -1)

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)

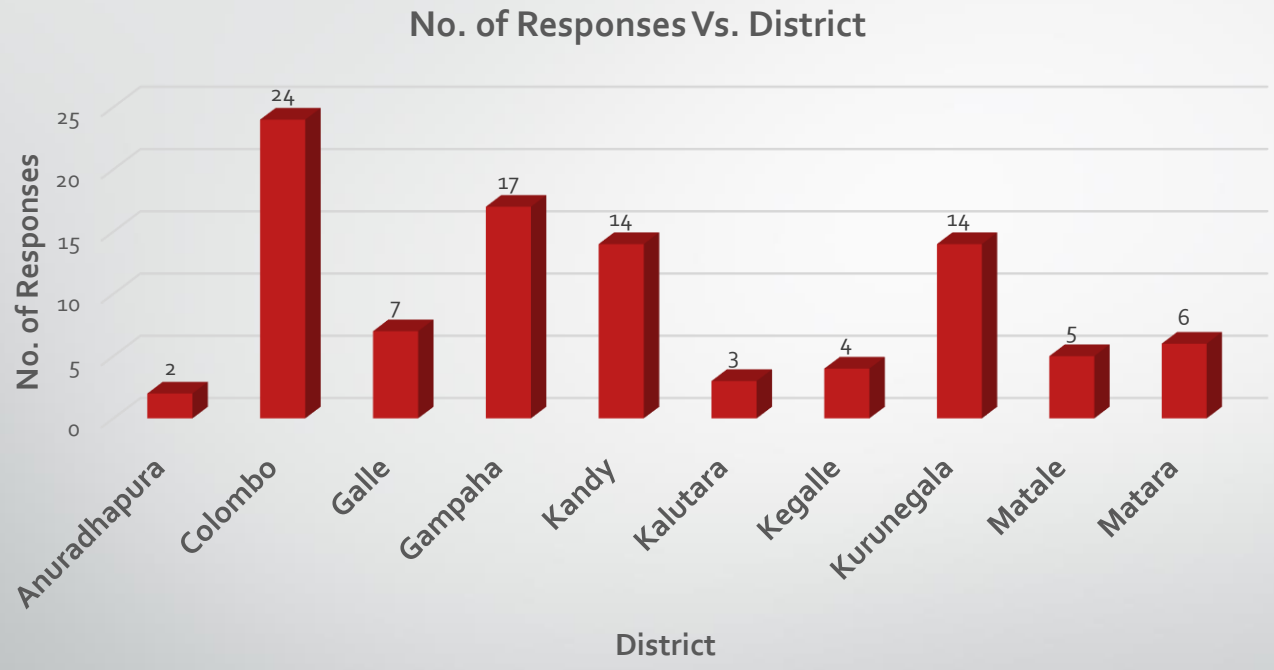
15. Frequent performance issues and technical malfunctioning of the mobile banking application causes frustration among application users. (Strongly Agree-5, Agree-4, Neutral-3, Disagree-2, Strongly Disagree -1)

Descriptive Analysis – Distribution of Age and Gender



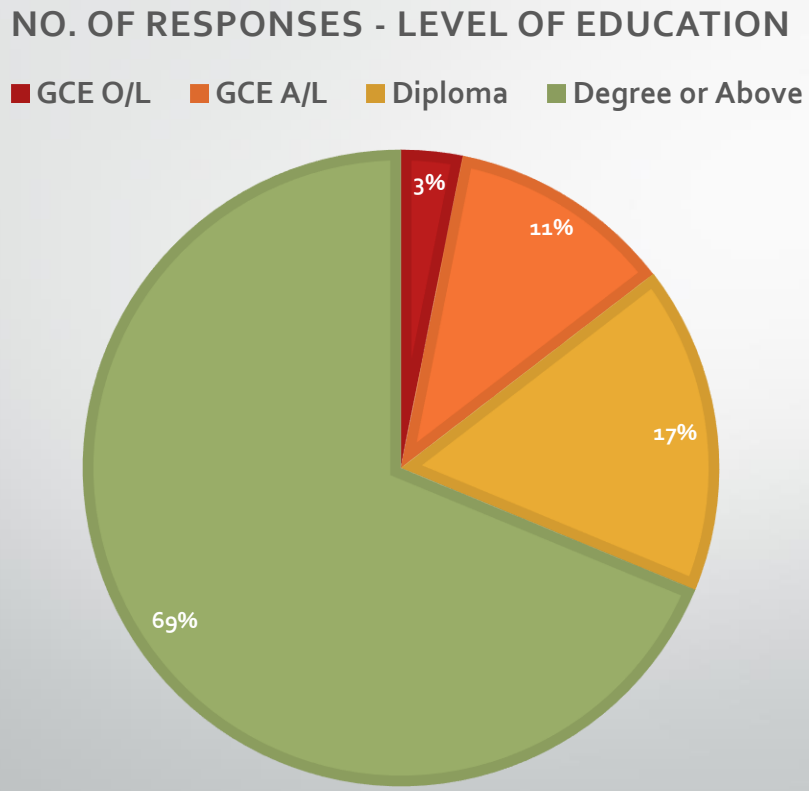
Age	Male	Female
16-20	4	2
21-30	27	18
31-40	19	8
41-55	12	4
Above 55	2	0

Descriptive Analysis – Distribution of District



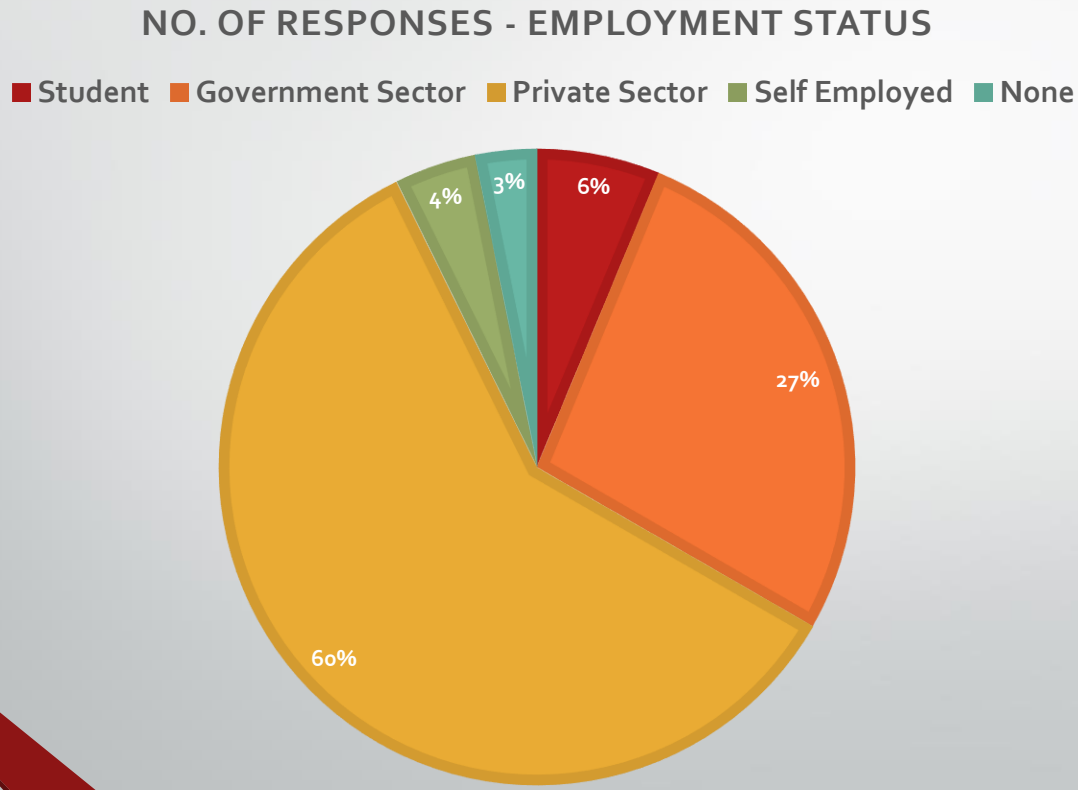
District	No. of Responses
Anuradhapura	2
Colombo	24
Galle	7
Gampaha	17
Kandy	14
Kalutara	3
Kegalle	4
Kurunegala	14
Matale	5
Matara	6

Descriptive Analysis – Distribution of Level of Education



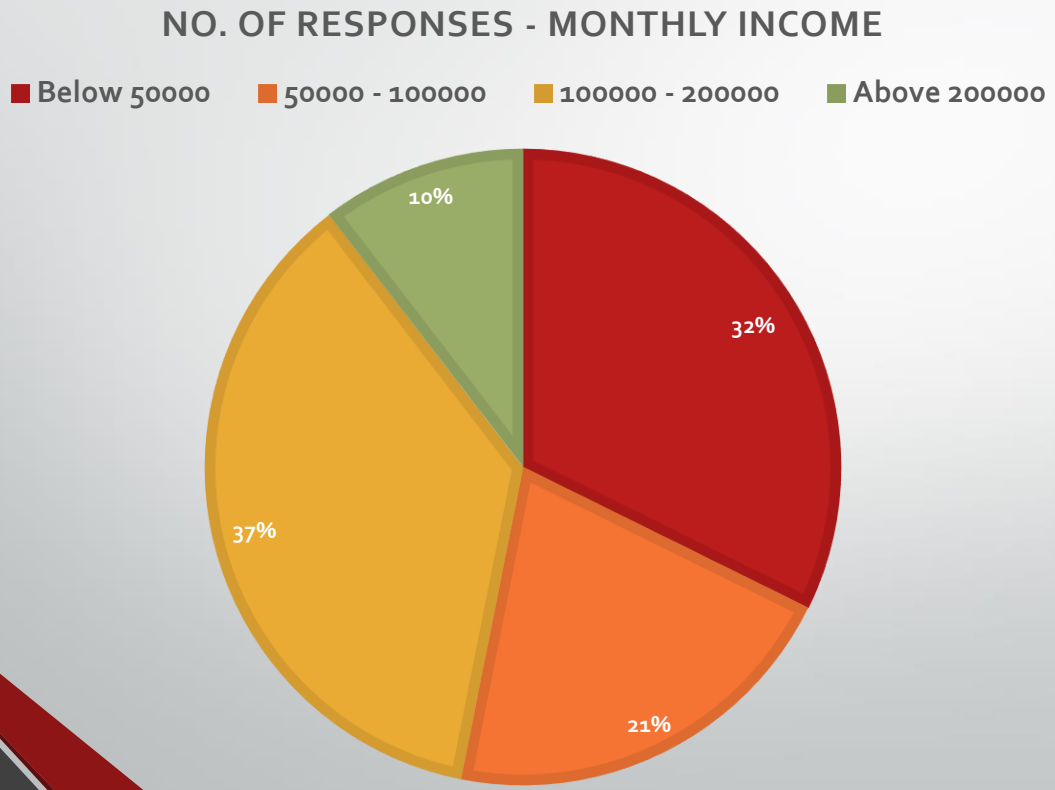
Level of Education	No. of Responses
GCE O/L	3
GCE A/L	11
Diploma	16
Degree or Above	66

Descriptive Analysis – Distribution Employment Status



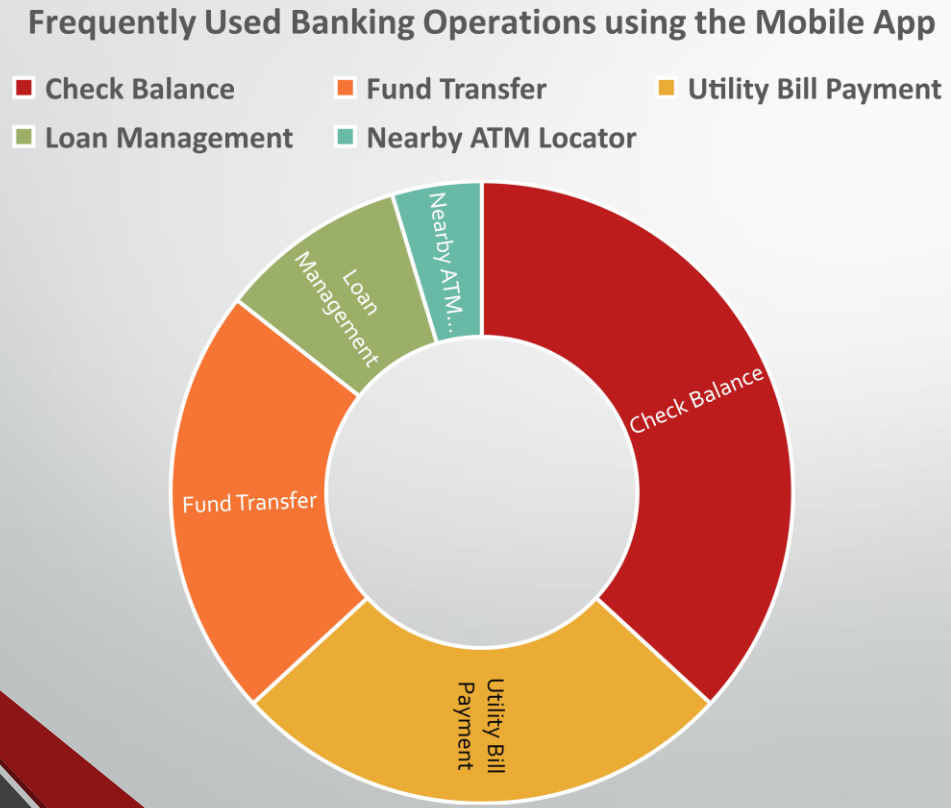
Occupation	No. of Responses
Student	6
Government Sector	26
Private Sector	57
Self Employed	4
None	3

Descriptive Analysis – Distribution of Level of Income



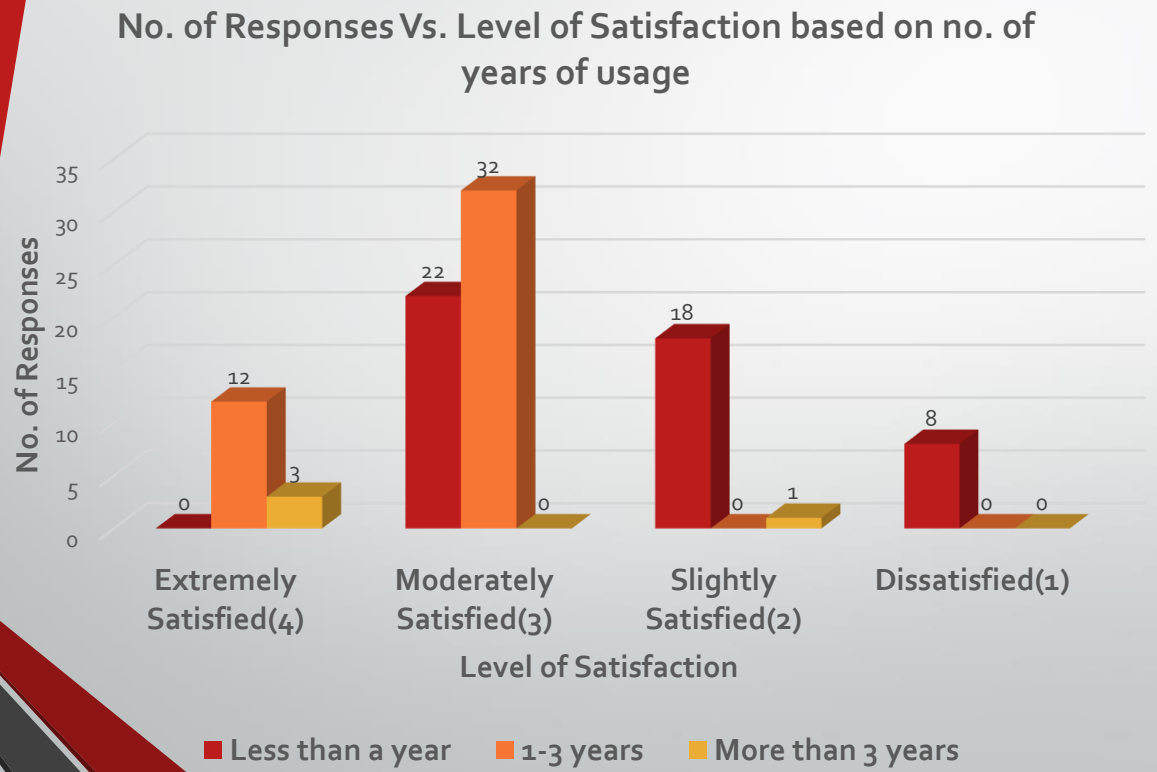
Monthly Income	No. of responses
Below 50000	31
50000 - 100000	20
100000 - 200000	35
Above 200000	10

Descriptive Analysis – Distribution of Frequently used banking operations



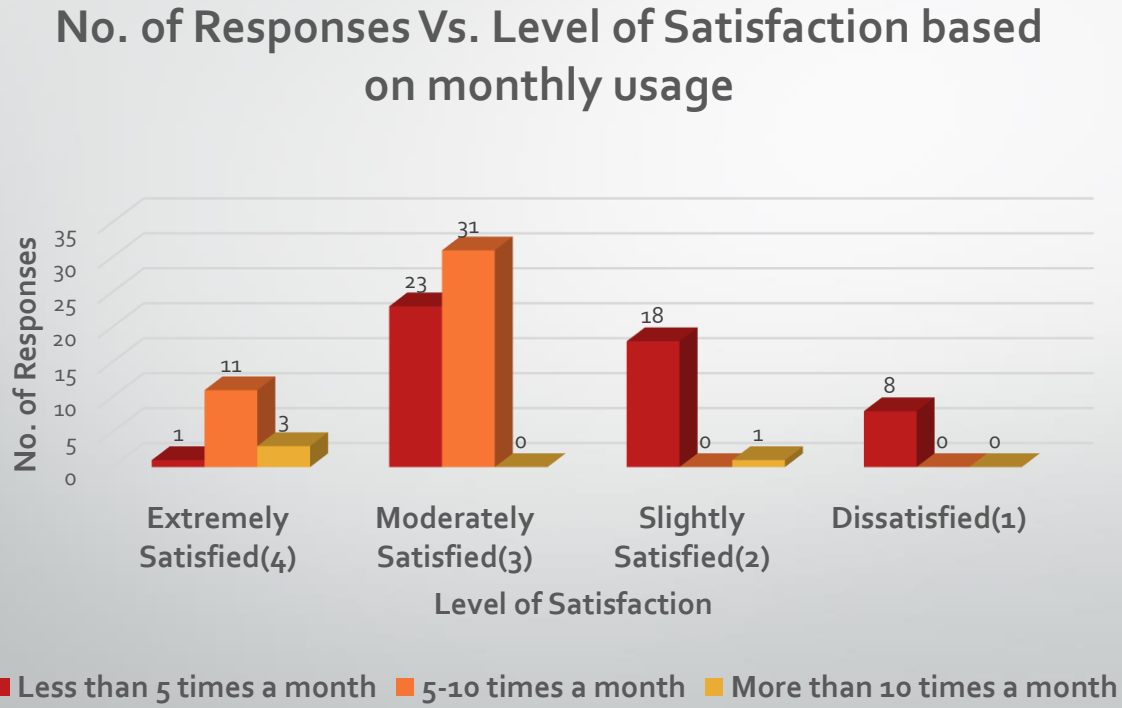
Usage	No. of responses
Check Balance	87
Fund Transfer	53
Utility Bill Payment	62
Loan Management	23
Nearby ATM Locator	11

Descriptive Analysis – Distribution of Level of satisfaction and no. of years of usage



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

Descriptive Analysis – Distribution of Level of satisfaction and monthly usage



	Extremely Satisfied (4)	Moderately Satisfied(3)	Slightly Satisfied(2)	Dissatisfied(1)
Less than 5 times a month	1	23	18	8
5-10 times a month	11	31	0	0
More than 10 times a month	3	0	1	0

Descriptive Analysis – Distribution of User Opinion

Questions

Q1. 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)

Q2. 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)

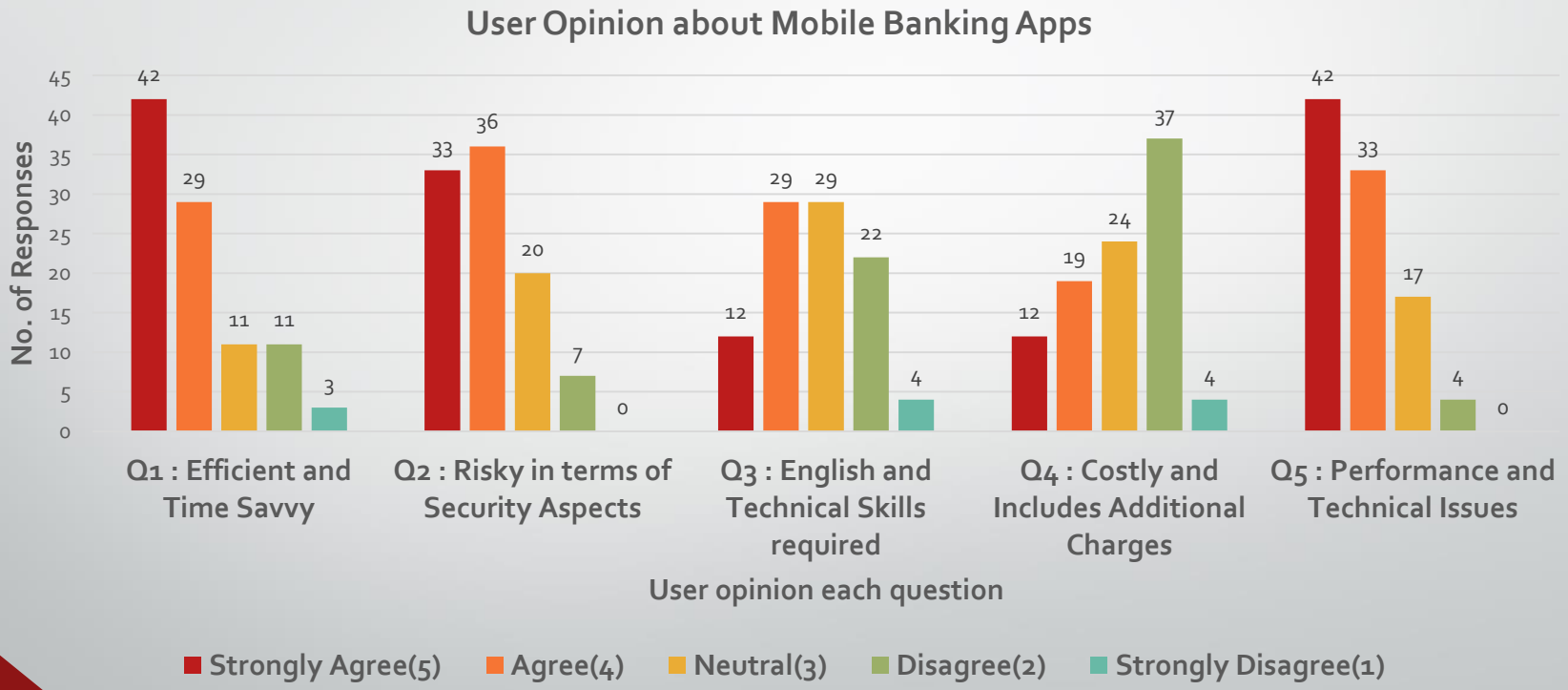
Q3. English and technical skills can be considered as mandatory skill requirements when engaging with a mobile banking application. How well you agree? (Strongly Agree-5, Agree-4, Neutral-3, Disagree-2, Strongly Disagree -1)

Q4. 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)

Q5. 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)

	Q1 : Efficient and Time Savvy	Q2 : Risky in terms of Security Aspects	Q3 : English and Technical Skills required	Q4 : Costly and Includes Additional Charges	Q5 : Performance and Technical Issues
Strongly Agree(5)	42	33	12	12	42
Agree(4)	29	36	29	19	33
Neutral(3)	11	20	29	24	17
Disagree(2)	11	7	22	37	4
Strongly Disagree(1)	3	0	4	4	0

Descriptive Analysis – Distribution of User Opinion



Statistical Analysis – 1) 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

Observed (fo)	Less than 5 times a month	5-10 times a month	More than 10 times a month	Grand Total
None	3	0	0	3
Student	6	0	0	6
Government Sector	17	9	0	26
Private Sector	18	35	4	57
Self Employed	4	0	0	4
Grand Total	48	44	4	96

Expected (fe)	Less than 5 times a month	5-10 times a month	More than 10 times a month	Grand Total
None	1.5	1.375	0.125	3
Student	3	2.75	0.25	6
Government Sector	13	11.91666667	1.083333333	26
Private Sector	28.5	26.125	2.375	57
Self Employed	2	1.833333333	0.166666667	4
Grand Total	48	44	4	96

Statistical Analysis – 1) Is there any relation between employment status and frequency of monthly usage?

Since 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.
Therefore employment status and monthly usage are dependent/associated.

Chi-sqaure	Less than 5 times a month	5-10 times a month	More than 10 times a month	Grand Total
None	1.5	1.375	0.125	3
Student	3	2.75	0.25	6
Government Sector	1.230769231	0.713869464	1.083333333	3.02797203
Private Sector	3.868421053	3.014952153	1.111842105	7.99521531
Self Employed	2	1.833333333	0.166666667	4
Grand Total				24.0231873

Probability(level of significance)	0.05
k value (Degree of Freedom)	8
(r-1)(c-1)	
Critical Value	15.50731306
chi-square	24.02
critical value	15.51
p-value	0.002271365

Statistical Analysis – 2) 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

Observed (fo)	Dissatisfied(1)	Slightly Satisfied(2)	Moderately Satisfied(3)	Extremely Satisfied(4)	Grand Total
Less than a year	8	18	22	0	48
1-3 years	0	0	32	12	44
More than 3 years	0	1	0	3	4
Grand Total	8	19	54	15	96

Expected (fe)	Dissatisfied(1)	Slightly Satisfied(2)	Moderately Satisfied(3)	Extremely Satisfied(4)	Grand Total
Less than a year	4	9.5	27	7.5	48
1-3 years	3.666666667	8.708333333	24.75	6.875	44
More than 3 years	0.333333333	0.791666667	2.25	0.625	4
Grand Total	8	19	54	15	96

Statistical Analysis – 2) Is there any relation between no. of years of usage and level of satisfaction?

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

Chi-square	Dissatisfied(1)	Slightly Satisfied(2)	Moderately Satisfied(3)	Extremely Satisfied(4)	Grand Total
Less than a year	4	7.605263158	0.92592593	7.5	20.0311891
1-3 years	3.666666667	8.708333333	2.12373737	3.820454545	18.3191919
More than 3 years	0.333333333	0.054824561	2.25	9.025	11.6631579
Grand Total					50.0135389
Chi-square stat	50.01				
Probability(level of significance)	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					

Statistical Analysis – 3) 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.

Observed (fo)	Less Than 5 times a month	5-10 times a month	More than 5 times a month	Grand Total
GCE O/L	3	0	0	3
GCE A/L	10	1	0	11
Diploma	14	2	0	16
Degree or Above	21	41	4	66
Grand Total	48	44	4	96

Expected (fe)	Less Than 5 times a month	5-10 times a month	More than 5 times a month	Grand Total
GCE O/L	1.5	1.375	0.125	3
GCE A/L	5.5	5.041666667	0.458333333	11
Diploma	8	7.333333333	0.666666667	16
Degree or Above	33	30.25	2.75	66
Grand Total	48	44	4	96

Statistical Analysis – 3) Is there any relation between level of education and frequency of monthly usage?

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

Chi-square-x2	Less Than 5 times a month	5-10 times a month	More than 5 times a month	Grand Total
GCE O/L	1.5	1.375	0.125	3
GCE A/L	3.681818182	3.240013774	0.458333333	7.38016529
Diploma	4.5	3.878787879	0.666666667	9.04545455
Degree or Above	4.363636364	3.820247934	0.568181818	8.75206612
Grand Total				28.177686
Chi-square stat	28.18			
Probability(level of significance)	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				

Statistical Analysis – 4) 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.

Observed (fo)	Less Than 5 times a month	5-10 times a month	More than 10 times a month	Grand Total
Female	16	14	2	32
Male	32	30	2	64
Grand Total	48	44	4	96

Expected (fe)	Less Than 5 times a month	5-10 times a month	More than 10 times a month	Grand Total
Female	16	14.66666667	1.333333333	32
Male	32	29.33333333	2.666666667	64
Grand Total	48	44	4	96

Statistical Analysis – 4) Is there any relation between gender and frequency of monthly usage?

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.
Therefore gender and frequency of monthly usage are independent.

Chi Square	Less Than 5 times a month	5-10 times a month	More than 10 times a month	Grand Total
Female	0	0.03030303	0.333333333	0.363636364
Male	0	0.015151515	0.166666667	0.181818182
Grand Total				0.545454545
Chi-square stat	0.54			
Probability(level of significance)	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				

Statistical Analysis – 5) 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.

Observed (fo)	Less than 5 times a month	5-10 times a month	More than 10 times a month	Grand Total
Below 50000	25	6	0	31
50000-100000	10	9	1	20
100000-200000	9	24	2	35
Above 200000	4	5	1	10
Grand Total	48	44	4	96

Expected (fe)	Less than 5 times a month	5-10 times a month	More than 10 times a month	Grand Total
Below 50000	15.5	14.20833333	1.291666667	31
50000-100000	10	9.166666667	0.833333333	20
100000-200000	17.5	16.04166667	1.458333333	35
Above 200000	5	4.583333333	0.416666667	10
Grand Total	48	44	4	96

Statistical Analysis – 5) Is there any relation between level of monthly income and frequency of monthly usage?

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

Chisquare	Less than 5 times a month	5-10 times a month	More than 10 times a month	Grand Total
Below 50000	5.822580645	4.742057674	1.291666667	11.856305
50000-100000	0	0.003030303	0.033333333	0.03636364
100000-200000	4.128571429	3.948160173	0.201190476	8.27792208
Above 200000	0.2	0.037878788	0.816666667	1.05454545
Grand Total				21.2251362
Chi-square stat	21.22			
Probability(level of significance)	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

- 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.

- 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.