SHIKSHANA PRASARAKA MANDALI'S

SIR PARASHURAMBHAU COLLEGE

(ESTABLISHED IN 1916)

AUTONOMOUS SINCE JUNE 2019-2020

ARTS | SCIENCE | COMMERCE

ACCREDITED WITH A+ GRADE (3.70 CGPA) BY NAAC

DEPARTMENT OF STATISTICS

SUBMITTED TO DEPARTMENT OF STATISTICS

SAVITRIBAI PHULE PUNE UNIVERSITY

TITLE OF PROJECT

USE OF CASHLESS SERVICES

Submitted by :-

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2) Anjali madhukar kadre (9729)

3)Shital gorakh satpute (9767)

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5)Vivek vilas kondhare (9736)

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CERTIFICATE

This is to certify that the project report titled

"Usage of cashless services ".

Is to submitted by Hrushikesh chavan, Shital satpute ,Anjali kadre ,Pratik narwade ,Vivek kondhare as a partial fulfillment for T.Y.Bsc(Statistics) practices. It is bonafide work out by these students under my supervision and guidance .

Place :- Pune

Date:- / /2021

Prof.Taai turkunde

Examiner

Head Of Department Of Statistics

PREFACE

We have great pleasure to present our project regarding “Usage of cashless services ”.

This project has been undertaken to know which factor affects the usage of cashless services in Pune.

This project is presented in simple and lucid language.

We would fill amply rewarded if the project would prove to be beneficial to anyone who studies it.

INDEX

ACKNOWLEDGEMENT

The success and final outcome of this project required a lot of guidance and assistance from various people and we are extremely privileged to have got this along the completion of our project.

We sincerely thank , Prof.Taai Turkunde Head, Department of statistics, S.P college, Pune for providing all necessary facilities and for his persistent encouragement.

We owe our deep gratitude to our project guide Prof. Taai Turkunde, who took keen interest in our project and guided us all along, by providing us with all the necessary information and unconditional support and for developing a good project.

Lastly, we would like to thanks the teaching as well as the non-teaching staff members for their help and co-operation.

MOTIVATION

One of the main reasons for selecting this topic “Use of cashless services ” is that it is the most trending topic. Given the fact that most of the foreign countries are widely cashless but India is yet not half way through even after the declaration of demonetization. Hence we wanted to search for the factors that affect the growth of cashless economy in Pune and the suburbs around it.

India spends 312 crores rupees for just printing of currency notes, don’t you think if we become cashless this money can be saved? Cashless service can bring down the cost associated with printing, storing and transporting the cash.

We also wanted to create awareness among the people regarding various cashless services and how India can turn out to be a more cashless economy.

INTRODUCTION

Cashless economy is a system where no physical cash is in circulation .The major modes of cashless transaction are cards (debit/credit), e-wallet, net-banking etc.

Digital India, the flagship programmer of the Government of India. It was launch on 1st July 2015, with a vision of transform India into a digitally empowered society and knowledge economy. “Faceless, paperless, cashless” is one of the professed role of digital India. Faceless, since there is no actual need to meet the person you want to transfer your money. Paperless because with help of cashless transactions there won’t be any need for printing the currency notes and cashless because financial transaction are not being done in the terms of currency notes, coins or physical cash money.

Indian government has taken a decision of demonetization (2016) by discontinuation of all 500 and 1000 bank notes, as it would no longer be recognized as legal tender. This move has been executed with the aim to curb the circulation of “black money” in the country and the problems associated with it. India is slowly going towards cashless economy but it may be a long process for years to become a completely cashless economy.

COLLECTION OF DATA

For our project analysis we preferred primary data and we therefore designed questionnaires. One was for common people and other one was for retailer or Goods and Services providers. The 1st questionnaire was distributed among students, businessmen, Government employees, private employees, labourers, house-wives , senior citizens etc. the 2nd questionnaire was distributed among all good and service providers.

The data was collected from the following places of Pune city(Urban Area) and suburbs around it, Wakad, Sangvi, Gokhalenagar, Shivajinagar, Swargate, Moshi and some rural area of maharastra.

OBJECTIVES:

Main objective:

- To check the various factors those affect the usage of cashless services.

Sub objectives:

- To check if factors like gender, age groups, occupations and leaving area have impact on the usage of cashless services.
- To find what are the reasons for not using cashless services.
- To show graphically usage of different modes for cashless transactions, frequency of usage of cashless services.

KEYWORDS:

- Chi-square test for independence of attributes. (χ^2)
- Proportionality test.
- Multiple Logistic Regression.
- P-value. • Level of significance.
- Yule's correlation coefficient (QAB)

TECHNICAL STATEMENTS:

- To check whether proportion of usage of cashless services in males is greater than females.
- To check whether proportion of usage of cashless services in different age groups, occupations and annual income groups is equal or not.
- To check whether usage of cashless services is dependent with gender, age groups, occupation, leaving area of a person.
- Whether gender, age groups, occupations and leaving area are affecting the usage of cashless services.

STATISTICAL STATEMENTS:

- H0: Proportion of males using cashless services is equal to proportion of females using cashless services

VS

H1: Proportion of males using cashless services is greater than proportion of females using cashless services.

- H0: Proportion of usage of cashless services among different age groups is equal

VS

H1: Proportion of usage of cashless services among different age groups is not equal.

- H0: Proportion of usage of cashless services among different occupations is equal

VS

H1: Proportion of usage of cashless services among different occupations is not equal.

- H0: Proportion of usage of cashless services among different leaving area groups is equal

VS

H1: Proportion of usage of cashless services among different leaving area groups is not equal.

- H0: Gender and usage of cashless services is independent

VS

H1: Gender and usage of cashless services is dependent.

- H0: Age groups and usage of cashless services is independent

VS

H1: Age groups and usage of cashless services is dependent.

- H0: Occupations and usage of cashless services is independent

VS

H1: Occupations and usage of cashless services is dependent.

- H0: leaving area and usage of cashless services is independent

VS

H1: leaving area and usage of cashless services is dependent.

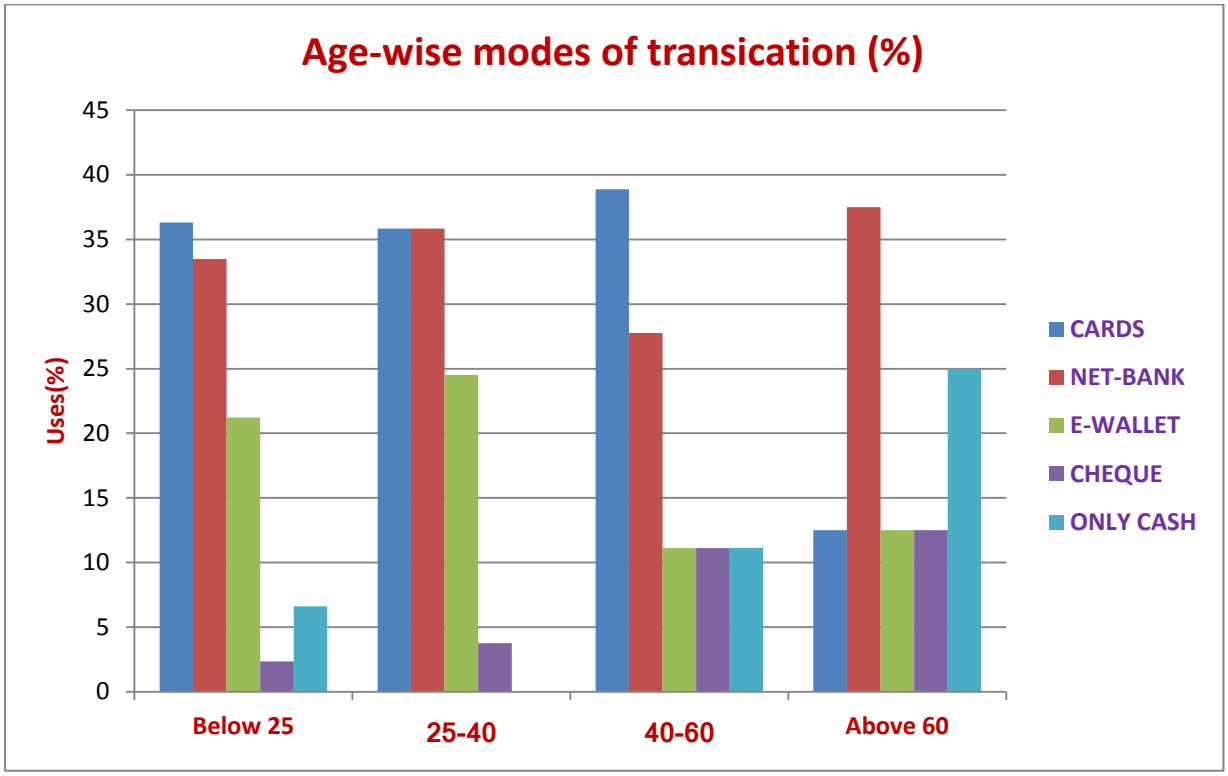
- Fitting of multiple logistic regression (with response variable: usage of cashless services and regressors: gender, age groups, occupations, annual income)

EXPLORATORY ANALYSIS

GRAPHICAL REPRESENTATION OF DATA:

- **Classification of modes of transaction according to age (%) :**

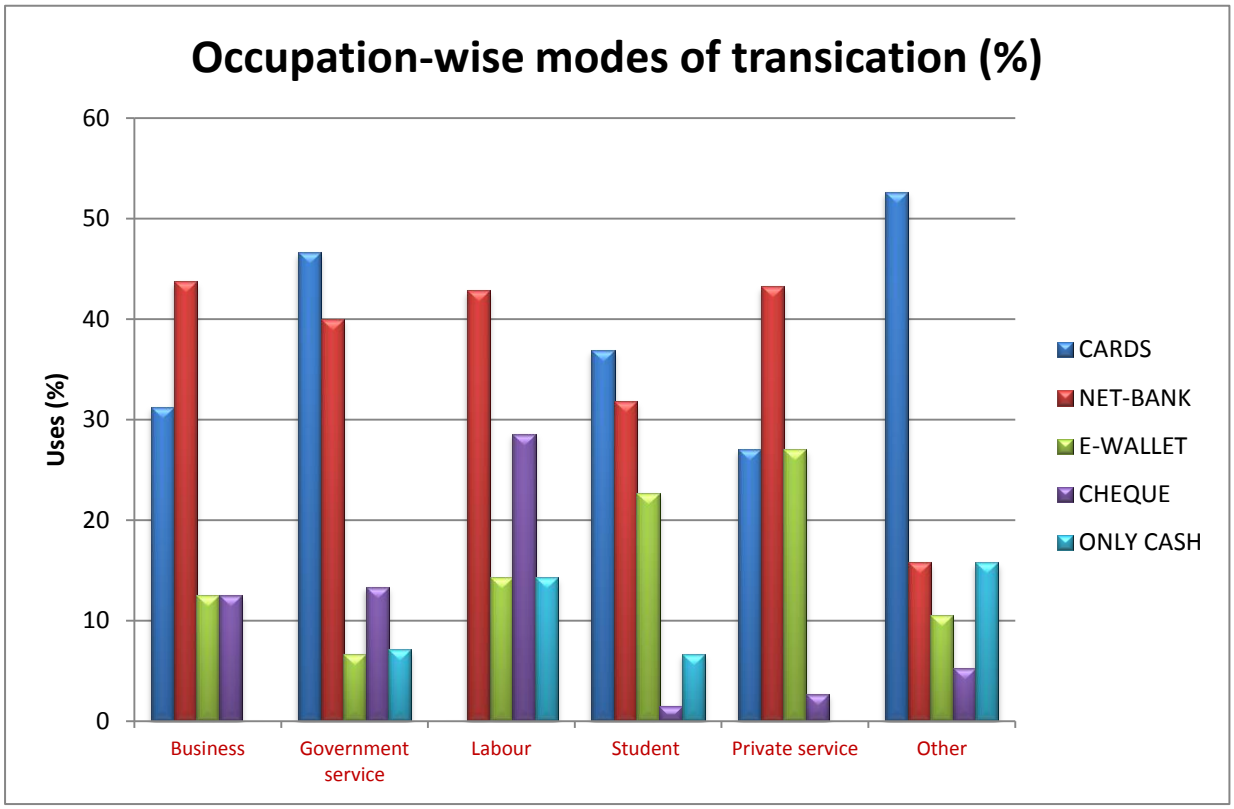
Age group	CARDS	NET-BANK	E-WALLET	CHEQUE	ONLY CASH
Below 25	36.32	33.49	21.22	2.35	6.62
25-40	35.84	35.84	24.52	3.77	0
40-60	38.88	27.77	11.11	11.11	11.13
Above 60	12.5	37.5	12.5	12.5	25



CONCLUSION: Usage of all the modes of transaction is almost moderate and maximum in the age group between 25-40.

• CLASSIFICATION OF MODES OF TRANSACTION ACCORDING TO OCCUPATION (%) :

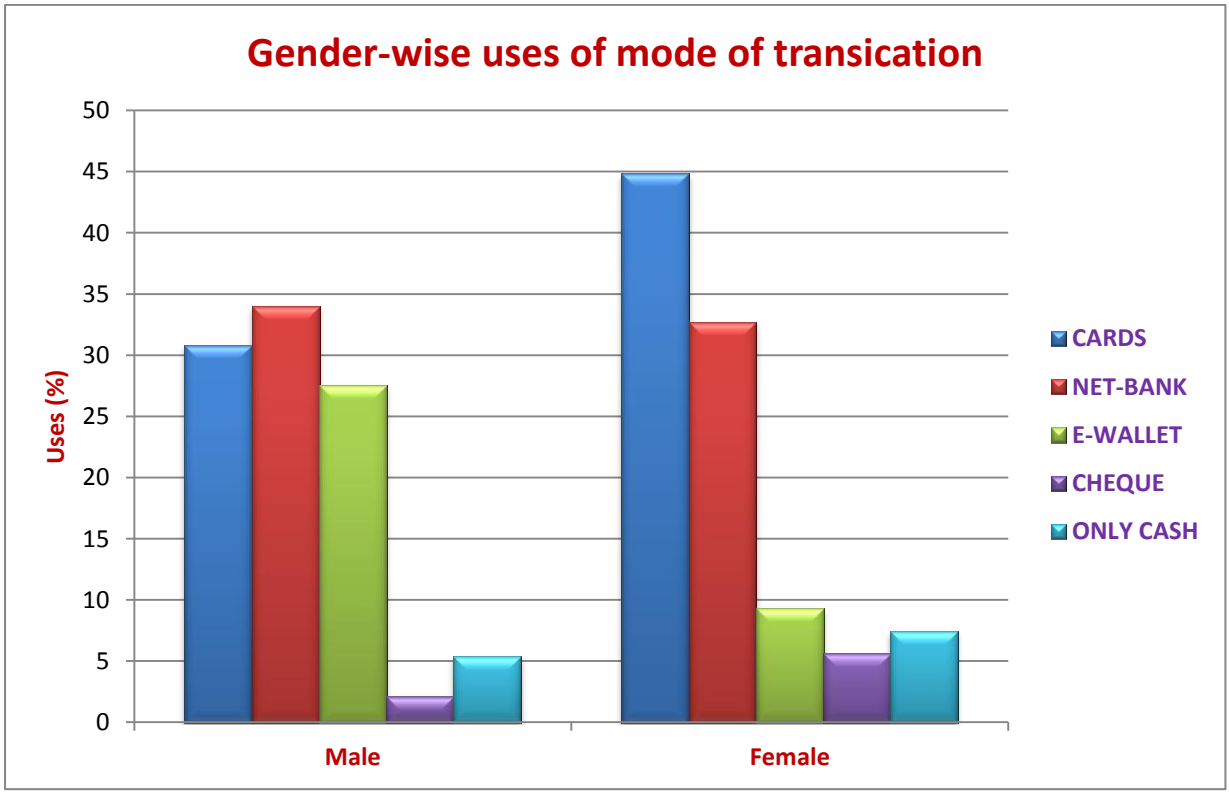
Occupation	CARDS	NET-BANK	E-WALLET	CHEQUE	ONLY CASH
Business	31.25	43.75	12.5	12.5	0
Government service	46.66	40	6.66	13.33	7.11
Labour	0	42.85	14.28	28.57	14.28
Student	36.86	31.81	22.72	1.51	6.66
Private service	27.02	43.24	27.02	2.7	0
Other	52.63	15.78	10.52	5.26	15.78



CONCLUSION: Usage of all the modes of transaction is almost moderate in government servants, businessmen and private sector whereas it is least in labor and other

• CLASSIFICATION OF MODES OF TRANSACTION ACCORDING TO GENDER (%) :-

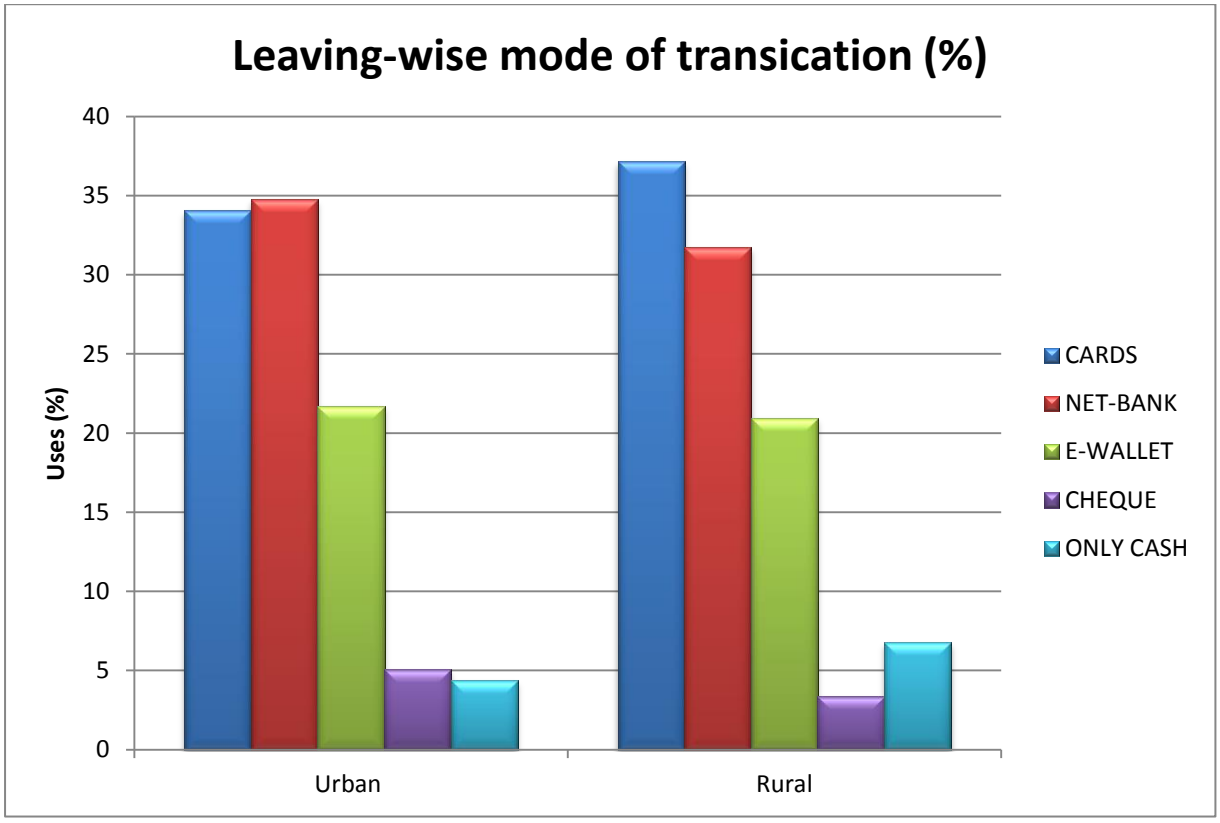
Gender	CARDS	NET-BANK	E-WALLET	CHEQUE	ONLY CASH
Male	30.81	34.05	27.56	2.16	5.4
Female	44.85	32.71	9.34	5.6	7.47



CONCLUSION: All the modes of transaction are more used by males than females

• CLASSIFICATION OF MODES OF TRANSACTION ACCORDING TO LEAVING AREA (%) :-

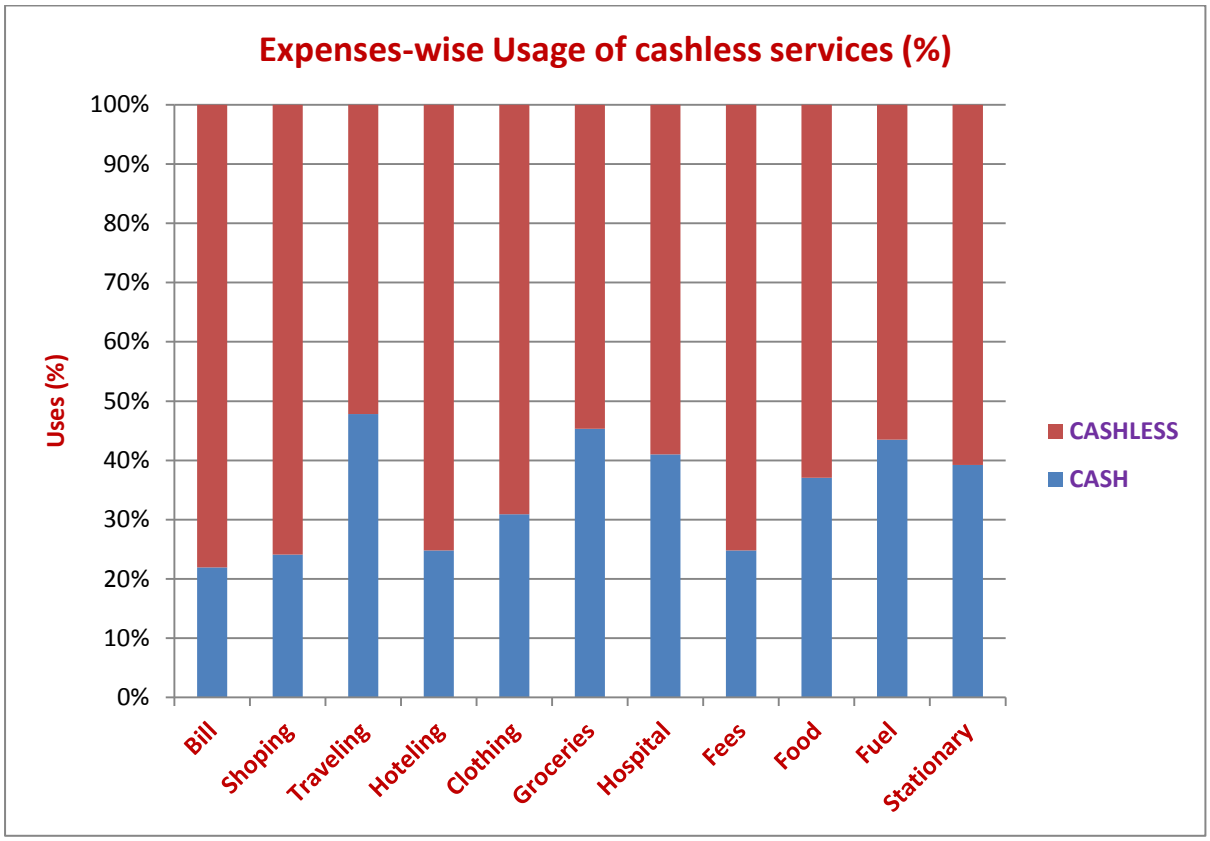
Living area	CARDS	NET-BANK	E-WALLET	CHEQUE	ONLY CASH
Urban	34.05	34.78	21.73	5.07	4.37
Rural	37.16	31.75	20.94	3.37	6.75



Conclusion:- All the modes of transaction are more used by urban people than rural people

• GRAPHICAL REPRESENTATION OF EXPENSES (%) :

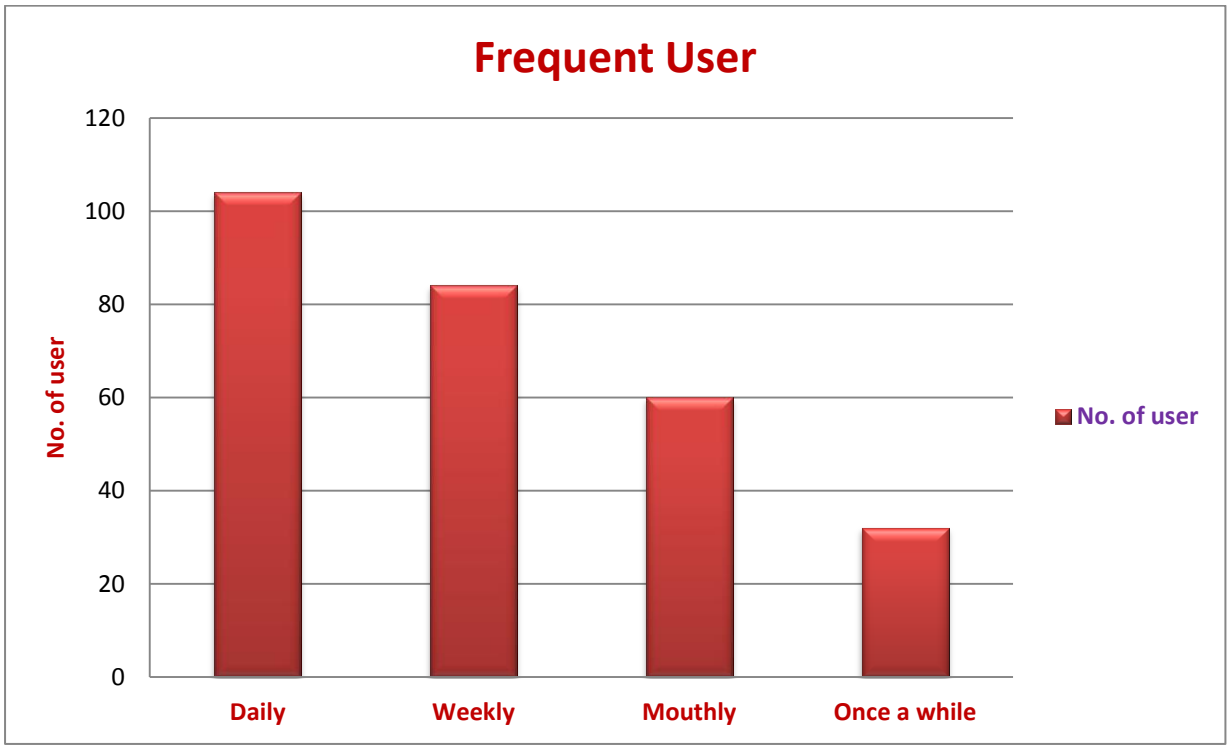
Services	CASH	CASHLESS	TOTAL
Bill	61	217	278
Shoping	67	211	278
Traveling	133	145	278
Hoteling	69	209	278
Clothing	86	192	278
Groceries	126	152	278
Hospital	114	164	278
Fees	69	209	278
Food	103	175	278
Fuel	121	157	278
Stationary	109	169	278



Conclusion: Usage of cashless transactions is maximum in shopping, bills and hotels and minimum in groceries, food and stationary expenses.

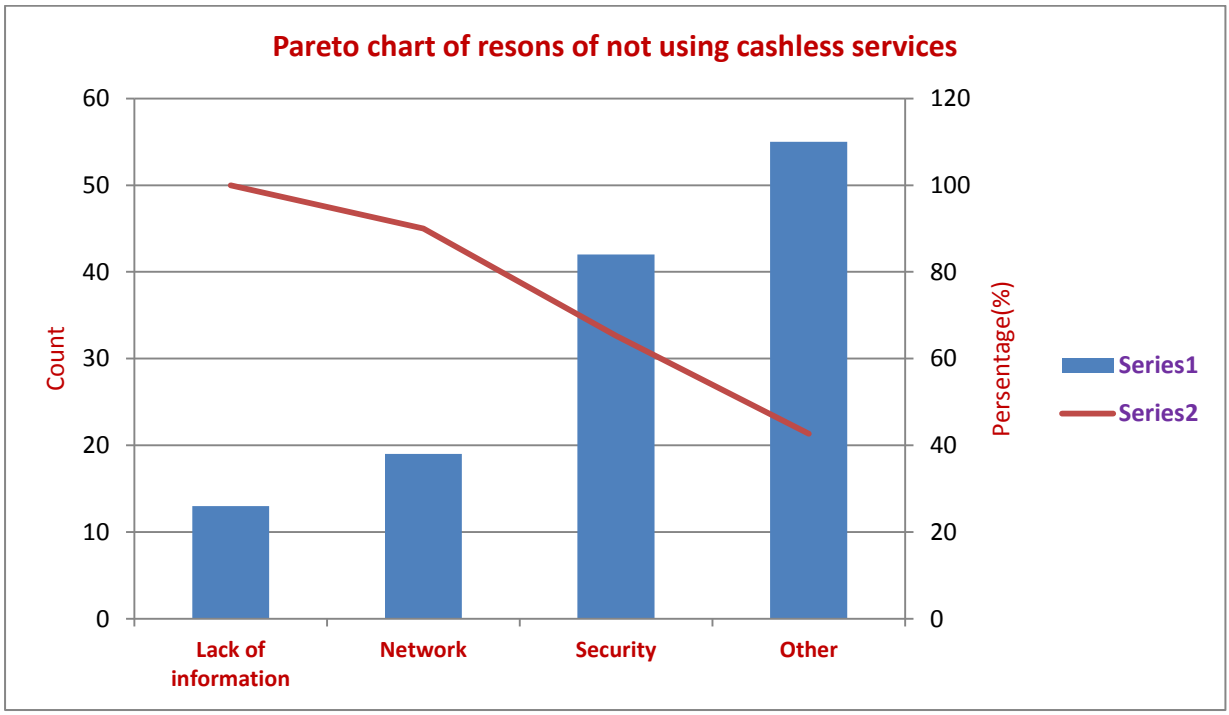
• CLASSIFICATION OF FREQUENT USAGE OF CASHLESS SERVICES:

Frequency	Daily	Weekly	Mouthly	Once a while
No. of user	104	84	60	32



CONCLUSION: Most of the people use cashless services Daily whereas the least usage is once in a while.

• PARETO DIAGRAM OF REASONS OF NOT USING CASHLESS SERVICES:

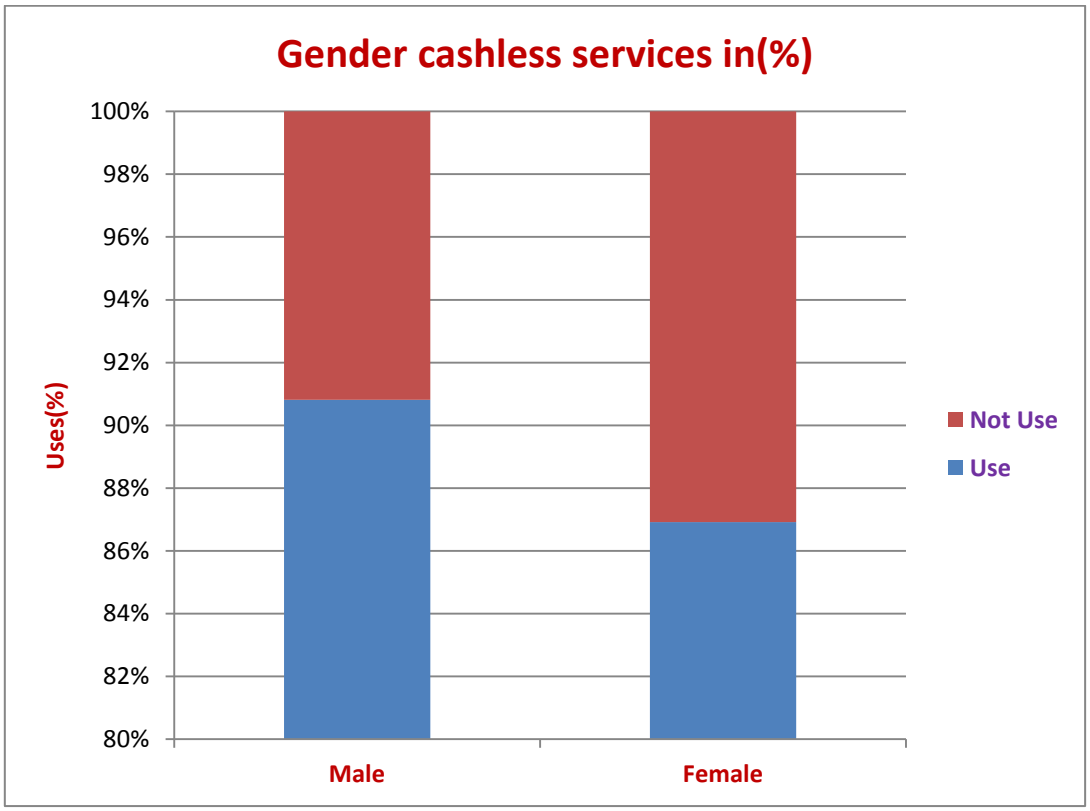


CONCLUSION: The most important reason for not using cashless services among people is lack of information whereas the least important reason is network.

DATA ANALYSIS

ANALYSIS OF GENDER:

Gender	Use	Not Use	Total
Male	168	17	185
Female	93	14	107
Total	261	31	292



INTERPRETATION: Usage of cashless services is 87% in females and 91% in males.

Proportionality Test: Proportion of usage of cashless services between two genders.

P1: Proportion of males using cashless services.

P2: Proportion of females using cashless services.

Ho: P1=P2 VS H1:P1>P2

R-command:

```
n=c(185,107)
 x=c(168,93)
prop.test(x,n,alt="g")
```

Anser:

```
        2-sample test for equality of proportions with continuity correction


data:  x out of n
X-squared = 0.71217, df = 1, p-value = 0.1994
alternative hypothesis: greater
95 percent confidence interval:
 -0.03242553  1.00000000
sample estimates:
   prop 1    prop 2
0.9081081 0.8691589
```

Decision: Here P-value >0.05, therefore we accept H0 at 5% level of significance.

Conclusion: We may say that proportion of males using cashless services is same as proportion of females using cashless services.

● **TEST :** Chi-square test for testing dependency between gender and usage of cashless services.

H0: Gender and Usage of Cashless Service are independent.

H1: Gender and Usage of Cashless Services are dependent. Observed Frequency:

Observed frequency:-

		B	ß	
	Gender	**Use**	**Not Use**	**Total**
A	**Male**	168	17	185
α	**Female**	93	14	107
	Total	261	31	292

Excepted frequency :

Gender	**Use**	**Not use**
Male	165.35	19.64
Female	95.64	11.35

P-value :0.3987

Decision: Here P-value >0.05, therefore we accept H0 at 5% level of significance.

Conclusion : Hence, Gender and usage of cashless services are independent.

QAB = (AB)(αβ)-(Aβ)(αB) / (AB)(αβ)+(Aβ)(αB)

QAB = 0.196033

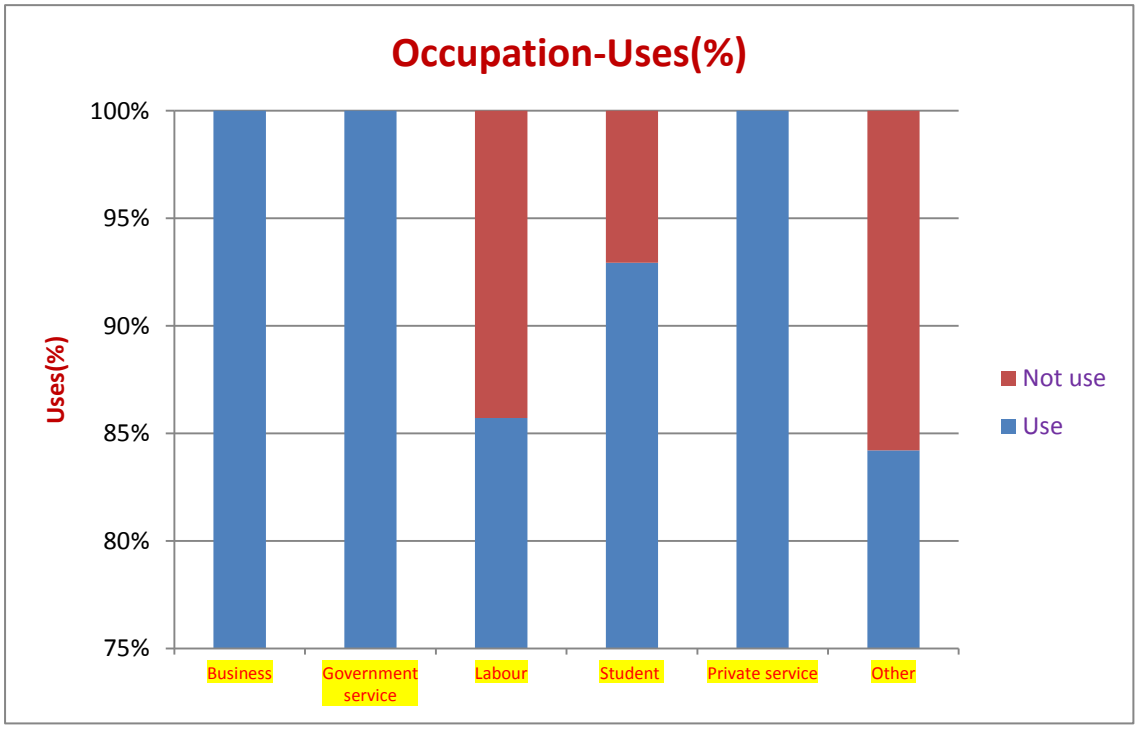
INTERPRETATION: There is positive association between usage of cashless services and male but it so minior association because value of QAB is so small.

ANALYSIS OF OCCUPATION

Data :-

Occupation	Use	Not use	Total
Business	16	00	16
Government service	15	00	15
Labour	6	1	7
Student	184	14	198
Private service	37	00	37
Other	16	3	19

Chart:



INTERPRETATION: Usage of cashless services in private employees,Government services ,business is approx 100%.

Proportionality Test: Proportion of usage of cashless services between occupations.

- P1 : Proportion of Student using cashless services.
- P2 : Proportion of Businessmen using cashless services.
- P3 : Proportion of Government servant using cashless services.
- P4 : Proportion of Private employees using cashless services.
- P5 : Proportion of Labour using cashless services.
- P6 : Proportion of Others using cashless services.

Hypothesis- H01 : P1=P2=P3 VS H11 : P1≠P2≠P3

R-commandn=

```
n=c(16,15,7)

x=c(198,37,19)

prop.test(x,n)
```

Anser:-

```
3-sample test for equality of proportions without continuity c
orrection

data:  x out of n
X-squared = 33.546, df = 2, p-value = 5.194e-08
alternative hypothesis: two.sided
sample estimates:
    prop 1     prop 2     prop 3
0.08080808 0.40540541 0.36842105
```

Decision: Here P-value > 0.05, therefore we accept H0 at 5% level of significance.

Proportionality Test: Proportion of usage of cashless services between occupations

- P3 : Proportion of Labour using cashless services.
- P4 : Proportion of Student using cashless services

Hypothesis:- H02:P2=P4 VS H12: P2>P4

R Command:-

```
prop.test(7,198)
```

Answer :- 1-sample proportions test with continuity correction

```
data:  x out of n, null probability 0.5
X-squared = 169.14, df = 1, p-value < 2.2e-16
alternative hypothesis: true p is not equal to 0.5
95 percent confidence interval:
 0.01557888 0.07444004
sample estimates:
         p = 0.03535354
```

Decision: Here P-value <0.05, therefore we reject H0 at 5% level of significance.

Conclusion:

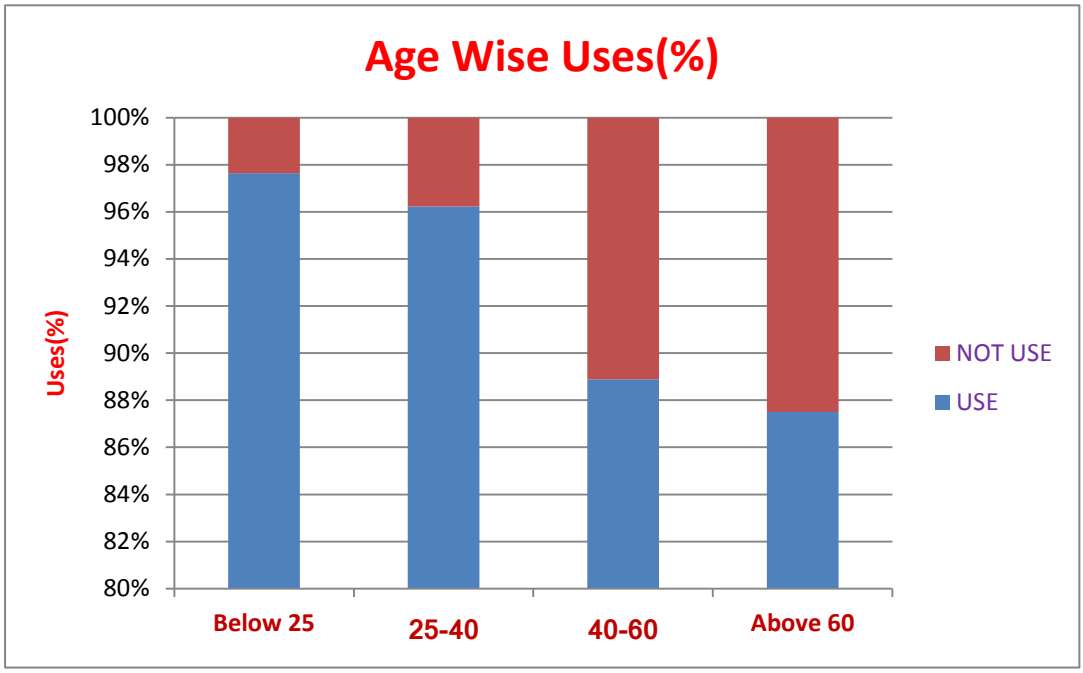
1. The proportion of student, businessmen, and government servant using cashless services may be equal.

2. The proportion of lebour using cashless services may be less than proportion of student using cashless services.

ANALYSIS OF AGE GROUP

Age group	USE	NOT USE	TOTAL
Below 25	207	5	212
25-40	51	2	23
40-60	16	2	18
Above 60	7	1	8

chart:-



INTERPRETATION : Usage of cashless services is least in the age group above 60 whereas it is maximum in the age group below 40.

TEST: For testing proportionality of usage of cashless services among different age groups .

P1: Proportion of people below 25 age using cashless services.

P4: Proportion of people between above 60 age using cashless services

Hypothesis:- H02:P1=P4 VS H12: P1>P4

R-Command:-

```
x<-c(8)

n<-c(212)

prop.test(x,n)
```

Answer:-

```
1-sample proportions test with continuity correction

data:  8 out of 212, null probability 0.5
X-squared = 179.36, df = 1, p-value < 2.2e-16
alternative hypothesis: true p is not equal to 0.5
95 percent confidence interval:
 0.01765160 0.07570162
sample estimates:
     p = 0.03773585
```

Decision: Here P-value <0.05, therefore we reject H0 at 5% level of significance.

CONCLUSION: Proportion of people below 25 age group , between 25-40 age group and 40-60 using cashless services may be equal, whereas proportion of people using cashless services below 25 age group is greater than proportion of people using cashless services between above 60 age group

TEST: Chi-square test for testing dependency between age groups and usage of cashless services

H0: Age group and usage of cashless services is independent.

H1: Age group and usage of cashless services is dependent.

Observed Frequency:

		B	ß	
	Age group	**USE**	**NOT USE**	**TOTAL**
A	**Below 40**	258	7	265
α	**Above 40**	23	4	27
Total		281	11	292

Expected Frequency:

Age group	**USE**	**NOT USE**	**TOTAL**
Below 40	238	28	266
Above 40	24	2	26
	262	30	292

p-value = 0.02196

Decision : Here p-value < 0.05, therefore we reject H0 at 5% level of significans.

Conclusion: Age group and usage of cashless services may be dependent.

YULES CORRELATION COEFFICIENT:

QAB = (AB)(αβ)-(Aβ)(αB)/ (AB)(αβ)+(Aβ)(αB)

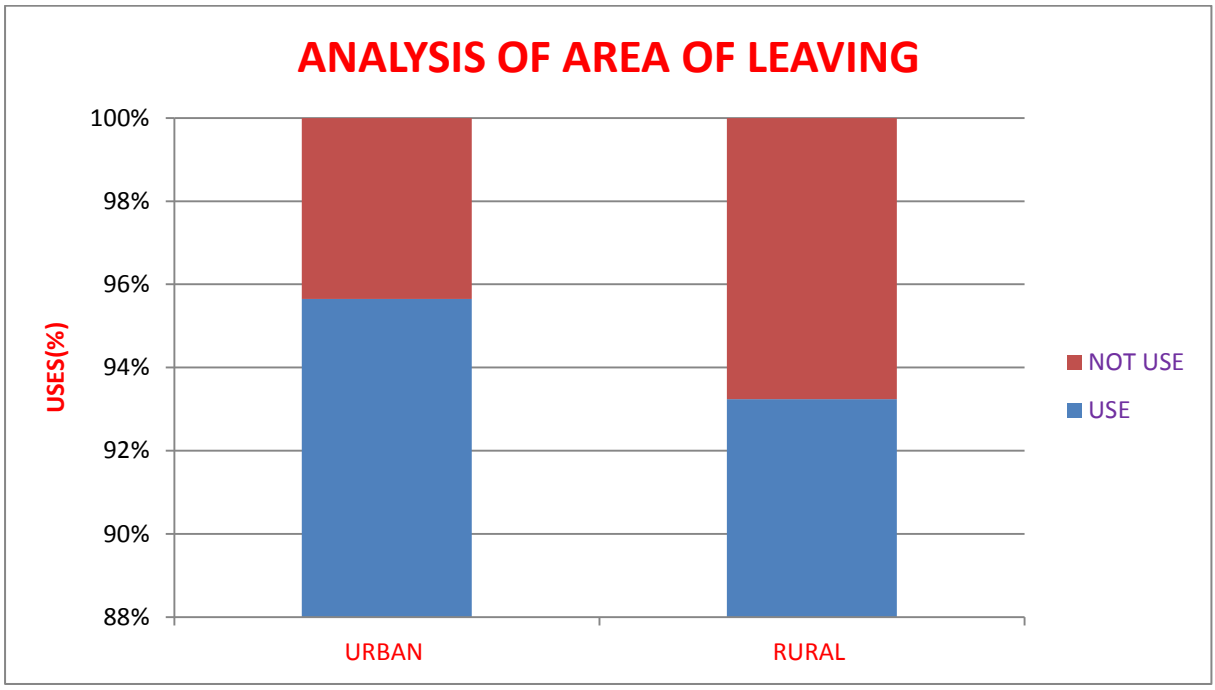
QAB = 0.7300

INTERPRETATION: There is positive association between usage of cashless service and age group below 40.

ANALYSIS OF LEAVING AREA

DATA:

AREA	USE	NOT USE	TOTAL
URBAN	132	6	138
RURAL	138	10	148
TOTAL	270	16	286



I**NTERPRETATION**: Usage of cashless services is 93% in rural and 72% in urban.

Proportionality Test: Proportion of usage of cashless services between two genders.

P1: Proportion of urban people using cashless services.

P2: Proportion of rural people using cashless services

Ho: P1=P2 **VS** **H1**:P1>P2

R-command

```
n= c(138,148)
x=c(270,16)
prop.test(x,n,alt="g")
```

Answer:-

```
2-sample test for equality of proportions with continuity
correction
data: x out of n
X-squared = 10.905, df = 1, p-value = 0.0004794
alternative hypothesis: greater
95 percent confidence interval:
 0.07287799 1.00000000
sample estimates:
 prop 1    prop 2
0.7207547 0.5714286
```

Decision: Here P-value < 0.05, therefore we reject H0 at 5% level of significance.

Conclusion: We may say that proportion of males using cashless services is more than proportion of females using cashless services.

● **TEST** : Chi-square test for testing dependency between gender and usage of cashless services.

H0: Area of leaving and Usage of Cashless Service are independent.

H1: Area of leaving and Usage of Cashless Services are dependent.

Observed Frequency:

		B	**ß**	
	AREA	USE	NOT USE	TOTAL
A	URBAN	132	6	138
α	RURAL	138	10	148
	TOTAL	270	16	286

Expected Frequency:

Area	USE	NOT-USE
RURAL	133	16
URBAN	123	14

P-value : 0.2049

Decision: Here P-value > 0.05, therefore we accept H0 at 5% level of significance.

Conclusion : Hence, area of leaving and usage of cashless services are independent.

Yule's Correlation Coefficient :

QAB = (AB)(αβ)-(Aβ)(αB) / (AB)(αβ)+(Aβ)(αB)

QAB = 0.229050

INTERPRETATION: There is positive association between usage of cashless services and urban.

• Binary Logistic Regression: USE VS. GENDER, AGE GROUP, OCCUPATION,LEAVING :

Regression Equation:

Y=2.11015+0.04740(gender_male)-0.16337(age_group 40-60)-0.20815(age group 60 above)+0.04482(age_group <25)-0.00514(occupation_gov.ser)-0.11951(occupation_lebour)-0.28172(occupation_other)-0.04705(occupation_priv.ser)-0.21806(occupation_student)-0.11210(rural)-0.05913(uban)

Y=use

TEST: ANOVA for testing significance of regression .

H0:β1=β2=β3=β4=β5=β6=0

VS

H1: At least one of the βj not be equal to zero

Deviance Table

Source	DF	Adj Dev	Adj Mean	Chi-Square	P-Value
Regression	12	179.355	14.9463	179.36	0
GENDER	1	6.094	6.094	6.09	0.013594909
AGE GROUP	3	24.570	8.1901	24.57	0.012795765
OCCUPATION	5	67.891	13.5782	67.89	0.000006364
LEAVING	3	8.051	2.6837	8.05	0.04498958
Error	462	431.597	0.9342		
Total	474	610.953			

DECISION: Here p-value of all the factors is less than 5% level of significance. Therefore we reject H0

CONCLUSION : From the above ANOVA table we can conclude that gender, age group and income significantly affect the usage of cashless services whereas occupation highly significant since it's p value is too far away from 0.05.

- **Goodness-of-Fit Tests :**

H0: Fit is good vs H1: Fit is not good

Test	DF	Chi-Square	P-Value
Deviance	462	431.60	0.842
Pearson	462	443.90	0.719

DECISION : Here all P-values are greater than 5% level of significance. Therefore we Accept H0.

CONCLUSION : Fit may be good**.**

CONCLUSION:

- Use of cards is maximum among all factors like gender, age group, occupation and leaving area hence it is important mode of cashless services.
- Usage of cashless services is extremely low in the daily food and beverages, groceries and fuel ,travling expenses which has proven to be a major drawback.
- Usage of cards and e-wallet is almost negligible in the age groups above 60.
- The main reason for not using cashless services has been found to be lack of information.
- The factors like gender, age, groups, occupation and annual leaving area have major impact on usage of cashless services.
- mostly labourers where they get their income on a daily wage basis that is why they are heavily cash dependent.
- Bank along with NGO's should provide literacy programs across India to promote the cashless economy this might sound time consuming process but will surely have a greater impact.
- useage of cashless is high in below 25 age group .
- compare to female male ration of using cashless services is high .
- fees,shopping or bills payment mode maximum cashless.
- frquency of use of cashless service is high in daily basis.
- maximum of female using cards in cashless service.
- maximum of rural people using cards in cashless services .
- use of net-banking is high in buisness occupation .

LIMITATIONS AND SCOPE :

- Our data is restricted to mostly student population only.
- In our project we have focused on Pune city and some rural area of maharastra , but it can also be used all over India as well.
- We have not actually measured the risk involved in cashless mode of transaction.
- One can also include factor such as education which might affect the usage of cashless services

TOOLS USED:

For analysis of data in our project we have used the following statistical softwares:

- MS-Excel.
- R software.
- Microsoft word
- Github
- R Community

REFERENCES:

- Introduction to Linear Regression Analysis by Douglas Montgomery, Elizabeth A. Peck.
- Fundamental of Statistics by S.C. Gupta and V.K. Kapoor.
- Regression Analysis (Nirali Prakashan) by Dr. Manisha Sane.
- News paper-Loksatta 20th December 2018.

Questionnaire for Cashless services Appeal:

This questionnaire is designed for research purpose only.

Data collected will be highly confidential.

1: Gender:

a) Male b) Female

2: Age group:

a) Below 25 b) 25 – 40 c) 40 – 60 d) 60 above

3: Occupation:

a) Student b) Business c) Government Service d) Private Service e) Labor f) Other

4: Area of Leaving :

a) Urban b) rural

5: Do you have bank account?

a) Yes b) No

6: Type of bank account:

a) Nationalized bank b) Co-operative bank

7: Are you literate regarding cashless modes of transaction?

a) Yes b) No 8: Do you use cashless modes of transaction?

a) Yes b) No

8A: If yes, which modes of transaction do you use?

a) Cards b) Net-banking c) E-wallet d) Cheque

8B: If no, why?

a) Security b) Lack of information c) Network d) Other

9: How frequently do you use the above mode of transaction?

a) Daily b) Weekly c) Monthly d) Once a while

10: Which is your preferred mode of transaction?

a) Cards b) E-wallet

11: At which amount you choose cashless mode instead of cash?

12: Do you agree or disagree with the statement:

“I would consider making payments using my mobile phone / smartphone in future.”

a) Strongly disagree b) Disagree c) Neither agree nor disagree d) Agree e) Strongly agree

13: Do you support “cashless India”?

a) Yes b) No

14: What is the primary objective of cashless transaction according to you?

a) Curbing black money b) Stopping terrorism c) Making India a cashless economy d) Other

15: Are you ready for “cashless India”?

a) Yes b) No

16: Is there any risk involved in cashless mode of transaction?

a) Yes b) No

17: According to you how much % risk is involved in it?

18: Specify the risk if any:

19:Tick your preferred mode of transaction:

Expense	**cash**	**cashless**	**Expense**	**cash**	**cashless**
Bill			**Hospital**		
Shopping			**Fees**		
Traveling			**Food**		
Hoteling			**Fuel**		
Clothing			**Stationary**		
Groceries					

“ INDIA SPENDS 312 CRORES RS. FOR JUST PRINTING OF CURRENCY NOTES, DON’T YOU THINKIF YOU BECOME CASHLESS THIS MONEY CAN BE SAVED?”