

Real -Time Payments: an Empirical Study Between Urban and Rural Population with Regard to Usage of UPI System

Dr. Anupama Jonnalagadda¹

¹Associate Professor, Badruka PG College, Hyderabad

ABSTRACT

Digital payments have emerged as powerful economic boosters in the digitalization era, driving financial inclusion, enhancing transaction efficiency, and fostering innovation across sectors." Ministry of Electronics and Information Technology (MeitY). (2022). Though the evolution of digitalization dates back to 90s, the Aadhaar Revolution, digital identity system, took place between 2009-2014. It enabled digital KYC, e-signature, and biometric authentication, which is instrumental for financial inclusion and e-governance. and the era continued from demonetization and digital payments, saw the rise of UPI and Fin tech Ecosystem, which is still on. In this study, the author tries to compare the impact of Digitalization between two groups, sample of people in formal services and sample of people involved in informal services. Chi-square test is adopted in order to test the hypothesis: 1- (Variable: Uses digital payments (Yes/No) vs Group (Informal/Formal). Hypothesis :2 is based on platform preference, Hypothesis :3 is based on transaction purpose. Exploratory research is done using two different questionnaire. They have been administered, to group of people, one is formal services and the other is informal services. The responses and suggestions are analysed and the findings presented.

Keywords: Digital payments, UPI System

INTRODUCTION

Digital transformation is the process of using digital technology to alter or develop new organisational culture, customer experiences, and business processes, in reaction to shifts in the market, consumer insights, and business requirements.

(Ahmed, M. & Kareem, et.all., 2025). The roots of **digitalization in India** can indeed be traced back to the **early 1990s**, especially with the **economic liberalization of 1991** and the introduction of **information technology (IT) reforms**. A key milestone was the establishment of software technology parks and the adoption of computerization in government and banking. (Bhatnagar, 2000). The early 1990s economic liberalisation, which opened the door for technology breakthroughs, is when India's digital transformation began. Significant economic reforms that opened the Indian market to international competitors and created a competitive atmosphere that encouraged technological innovation began during this time. The first steps towards a nation empowered by technology were taken during this age with the advent of the internet and the subsequent growth in IT services. (Alexander Stasiak, 2024). A number of important pillars are influencing India's digital landscape and are essential to the effective execution of digital transformation plans. First, a fundamental component is the growth of digital infrastructure, such as the extensive deployment of high-speed internet connectivity. In order to connect even the most remote regions of India, projects like BharatNet seek to bring high-speed broadband to rural communities. Accessing digital services, facilitating e-governance, and promoting economic growth all depend on this pervasive connectivity. (Kupčs, Raimonds, 20).

Factors driving adoption of Digitalization: convenience and adoptability, Accessibility, increased smart phone penetration, E-commerce growth, contactless payment trends are some factors which increased rapid digitalization (Ali Rasul Mohammed, 2024). Aadhaar (2009) and UPI (2016) are two significant turning moments that solidified India's digital economy. While digitalization in India formally increased with the launch of the Digital India program in 2015, its roots are in earlier policies and technologies. (Aleksandrova, "et.,all", 2022). Although India's transition to a digital economy has been gradual, there have been a number of significant turning points: **Early Foundations (1990s–2000s)** 1991: Economic liberalization laid the groundwork for IT and telecom growth, **1995:** Internet services launched for the public by VSNL, **2004–2009:** National e-Governance Plan (NeGP) initiated to digitize public services.

Need for the study:

With the ever increasing users of UPI and steady fast increase in technology, it becomes necessary to understand the contribution of UPI in economic booster with more and more population both urban and rural usage. In recent years, digital payments have revolutionized financial transactions in India, offering speed, convenience, and inclusion. While the overall adoption of digital payments has surged,

its reach and effectiveness among lower-income, less-educated, and informal sector workers remain under-explored. A significant portion of India's workforce comprises informal daily wage earners such as maids, milkmen, auto-rickshaw drivers, and security guards – individuals often excluded from formal banking and financial systems. Although government initiatives like **Digital India** and the **Unified Payments Interface (UPI)** have aimed to bridge this gap, the extent to which such tools are being adopted by informal service providers (often engaged in "rural-type" occupations) as compared to more formally employed urban service providers is unclear. Additionally, the nature and purpose of digital transactions (e.g., bill payments, peer transfers, retail shopping) may vary significantly across these groups.

The majority of current study tends to concentrate on how urban(Formal services) customers or literate users with smart phone access use online payment methods. However, there is a pressing need to assess how **occupation type** – especially within the context of low educational attainment – influences digital payment behavior, platform preferences, and transaction purposes.

Understanding their adoption patterns is essential for creating inclusive digital finance policies, raising financial literacy, and improving service delivery in industries that rely significantly on cash. This is because both formal and informal service providers are important facilitators of economic activity, more so after COVID-19.

Objectives of the study:

- 1.** To evaluate the frequency and adoption of digital payments between formal service providers and informal service providers, daily wage workers.
- 2.** To investigate which digital payment methods certain occupational groups prefer
- 3.** To examine how both official and informal service workers use digital money for transactions.

Hypothesis:1

H₀₁: There is no significant difference in the adoption of digital payments between informal and formal service providers.

H₁₁: There is a significant difference in the adoption of digital payments between informal and formal service providers. Tool: **Chi-square test** (Variable: Uses digital payments (Yes/No) Vs Group (Informal/Formal))

Hypothesis 2: Platform Preference

H₀₂: There is no association between the type of occupation (informal/formal) and the preferred digital payment platform.

H₁₂: There is a significant association between the occupation type and the platform used (e.g., UPI, Paytm, Google Pay, etc.). Tool: **Chi-square test** for each platform

Hypothesis 3: Transaction Purpose

H₀₃: There is no significant difference in transaction types (e.g., bill payment, groceries, peer transfer) between informal and formal service workers.

H₁₃: There is a significant difference in transaction types between the two occupation Tool: **Chi-square test** (for each transaction category)

METHODOLOGY

Exploratory survey is used by making survey using two different questionnaires to two sets of sample in formal services ,named as Urban population and other is informal services , named as rural population. Tools used for data visualization are pie charts and explained , in order to present in a easily understandable manner. **By using chi –square test, this study provides acomprehensive understanding of the impact of digi payments on both types of samples.**

Factors which influence digital payment adoption

Technology:

Technology has a big impact on how digital payments are developed. The following are some significant domains where technology impacts digital payments: Mobile payment methods like Google Pay, Apple Pay, and Samsung Pay have become commonplace for customers due to the extensive use of smart phones. These apps leverage near-field communication (NFC) technology to enable quick, secure transactions. (Zhao, X., & Xu, Y,2022).

a) **Block chain and Crypto currencies:** With Bit coin, Ethereum, and other crypto currencies becoming more popular as alternate payment methods, block chain technology guarantees transparency, security, and quicker cross-border transactions. (Narayan, S., & Lin, J.,2021). The rise of digital transactions has

increased the demand for secure, transparent, and decentralized payment systems. Block chain technology presents an innovative solution by eliminating intermediaries, ensuring immutability, and enabling real-time settlements. Unlike traditional financial systems that rely on centralized authorities, block chain leverages distributed ledger technology (DLT) to enhance security and minimize fraud. Smart contracts automate transactions, reducing processing time and costs while ensuring trust among participants. (Parmar, Aditya, 2025).

b) AI and ML technologies help detect fraud in digital transactions in real-time by analyzing patterns and anomalies in payment behavior. They also power personalized payment experiences, like recommending payment methods based on user preferences.

The digitalization of the banking sector, especially Web 2.0 banking, represents a significant transformation in the relationship between banks and their customers. This shift highlights the significance of online social platforms and digital company operations while integrating digital aspects into customers' daily lives. The Process automation, customer experience, online banking, credit risk management, stock market trend forecasting, marketing management, and auditing are all areas where artificial intelligence is becoming more and more popular. By advising ethical AI use, stakeholder engagement, confidence in data handling, and strong internal control systems, it finds that AI has a beneficial impact on banks operational efficiency and customer service. By advocating for ethical AI use, stakeholder participation, confidence in data handling, and strong internal control systems, it encapsulates AI's beneficial effects on banking operational efficiency and customer service. It also recommends investigating the relationship between leadership, organizational culture, and AI integration in developing nations. The study advances the theoretical and empirical frameworks that describe the best ways to incorporate AI into banking operations, assisting practitioners and policymakers in utilizing AI to promote economic growth and financial inclusion (Abdulsalam, et.al., 2024).

c) Cloud Computing: Scalability for payment providers has been made possible by cloud-based payment solutions, which have decreased the requirement for physical infrastructure. As a result, digital payment systems are being adopted more quickly worldwide. In recent years, the idea of cloud computing has emerged as one of the most significant computer paradigms. Cloud computing has grown to be a fantastic invention with significant implications for the entire information technology (IT) business, not just for online services themselves (Patel, P., & Sharma, M., 2023). **Cloud technology enhancing scalability and security of digital wallets.**(Rasul Mohammed, Ali & Ainhoa, Fernanda. (2024).

d) Biometrics: Biometric verification, such as facial recognition, fingerprint scanning, and voice recognition, has added a layer of security to digital payments, improving both safety and user convenience. The arrival of digital payment technologies has brought unprecedented convenience to businesses and consumers. However, the rapid adoption of digital payments relies on both parties trusting the technology to handle their transactions securely and accurately. The introduction of biometric data-driven payment security enhances the current security systems, reducing system overheads, and increasing customer confidence in the technology. (Anil Kumar Komarraju1 | Mondeti Ramprasad2 | Malleneni Bhasker Rao, 2024)

e) Open Banking & APIs: Open banking systems allow third-party developers to create financial services using banks' APIs. This has facilitated integration between payment systems, improving interoperability and user experience.

f) 5G Technology: With faster speeds, reduced latency, and more bandwidth, 5G technology has the potential to drastically change the banking industry and bring about new service offerings and improved digital experiences. Banks have been investigating and deploying 5G between 2021 and 2025 in an effort to enhance back-end operations, digital engagement, and mobile banking. This includes improved security and fraud detection, more streamlined client experiences across many touchpoints, and cloud-based services that are quicker and more dependable. The rollout of 5G networks is expected to reduce transaction times and improve the performance of digital payment services, especially for mobile payments that rely on high-speed internet. (Khan, Azhar & Arfeen, 2025). These technologies are not just enhancing the speed and convenience of digital payments but also ensuring higher levels of security, trust, and scalabilities.

ABSTRACT

The concept of Cloud Computing has been distinguished as one of the major computing models in recent

years. Cloud computing has become a great innovation that has important consequences not just for services on the internet but also for the entire Information echnology (IT) market. Its emergence aims to optimize on-demand technology, hardware and information provisioning as a service, reaching the economy of scale in the distribution and operation of IT strategies. A great deal of cloud computing research has been concerned over some obstacles and challenges that rely upon behind the lure of cloud computing. Security has been always raised as one of the most critical issues of cloud computing where resolving such an issue would result in constant growth in the use and popularity of the cloud. Security requirements represent a major issue that has to be met in order of easing some of these obst

Advantages of Disruptive Technologies: Emerging disruptive technology makes the life of consumers easier. It makes daily tasks faster, efficient and reduces the effort required. For example, online banking enables people to transfer and receive money anytime. Another way in which Fin tech is disrupting traditional banking models is through peer-to-peer lending. Fin tech companies have created platforms that match borrowers with investors directly, bypassing traditional banks.

The factors affecting digital payments: Perceived Usefulness, Perceived Trust, Personal Innovativeness, Perceived Ease of Use, and Perceived Risk.

Table:1 Most prominent UPI systems in India

1.Phone pe	<ul style="list-style-type: none"> ❖ Largest UPI app by transaction volume and value (as of 2024–2025) ❖ Offers payments, mutual funds, insurance, gold, and bill payments ❖ Backed by Walmart ❖ UPI Market Share: ~ 47%+ (NPCI data, 2024)
2.Google pay (gpay)	<ul style="list-style-type: none"> ❖ Developed by Google; popular among youth and urban users ❖ Simple UI; supports payments, recharges, and banking services ❖ Integrated with loyalty and cash back offers ❖ UPI Market Share: ~ 30%+
3.Paytm	<ul style="list-style-type: none"> ❖ Paytm ❖ Started as a wallet, now a full-stack financial service provider ❖ Offers banking (Paytm Payments Bank), wealth management, and credit ❖ Strong merchant base, QR code penetration ❖ UPI Market Share: ~ 10% (declining slightly due to regulatory)
4. Amazon Pay	<ul style="list-style-type: none"> ❖ Linked with Amazon accounts for seamless checkout ❖ Also supports bill payments and peer-to-peer UPI transfers ❖ Integrates cash back offers and voice-enabled payments (via Alexa)
5.BHIM(Bharat Interface for Money)	<ul style="list-style-type: none"> ❖ Developed by NPCI to promote UPI adoption ❖ Minimal interface, used especially in rural or semi-urban areas ❖ Supported in many Indian languages ❖ Lower market share, but widely respected as a government initiative
6. Banks' Own UPI Apps	<p>Examples:</p> <ul style="list-style-type: none"> ❖ SBI YONO – from State Bank of India ❖ ICICI I Mobile ❖ HDFC Pay Zapp ❖ Kotak 811 ❖ These apps often integrate UPI along with full-service mobile banking

Other UPI-Based Systems & Innovations UPI Lite
 Launched by NPCI for small-value offline transactions (up to ₹500)
 Fast, requires no real-time internet or bank server hits
 Used in low-connectivity areas

UPI 123PAY
 UPI for feature phones (non-smartphones)
 Voice-based IVR system for rural inclusion

RuPay Credit on UPI
 Allows linking of RuPay credit cards to UPI
 Expands UPI utility beyond just debit accounts

UPI in Numbers (as of 2025), in India.
Monthly Transactions: Over 13 billion+
Transaction Value: ₹18–20 lakh crore monthly
Active Banks on UPI: Over 400+
Adoption: Supported in 100+ foreign apps (for NRIs and international tourists)

Combined Impact on Financial Services	
Area	Disruption Brought by Open Banking & Payments Tech
Consumer Banking	Personalized offers, multi-bank account integration
Consumer Banking	Real-time credit risk assessment using transaction data
Wealth Tech	Robo-advisors with access to aggregated financial data
SMEs	Faster invoice payments, cash flow prediction tools
Cross-border	Cheaper, faster transfers using block chain or fin tech rails

UPI Limitations and Challenges: Addressing Common Concerns: i) Security and Fraud Prevention, ii) Transaction Limits iii) . Awareness and Education iv) Customer Support and Grievance Redressal. Challenges from regulations point of view: Rapid Technology Advancements, cross-border transactions, consumer protection issues. There exist security and privacy concerns, as well Fraud and Data breaches, user authentic challenges.

Set-I

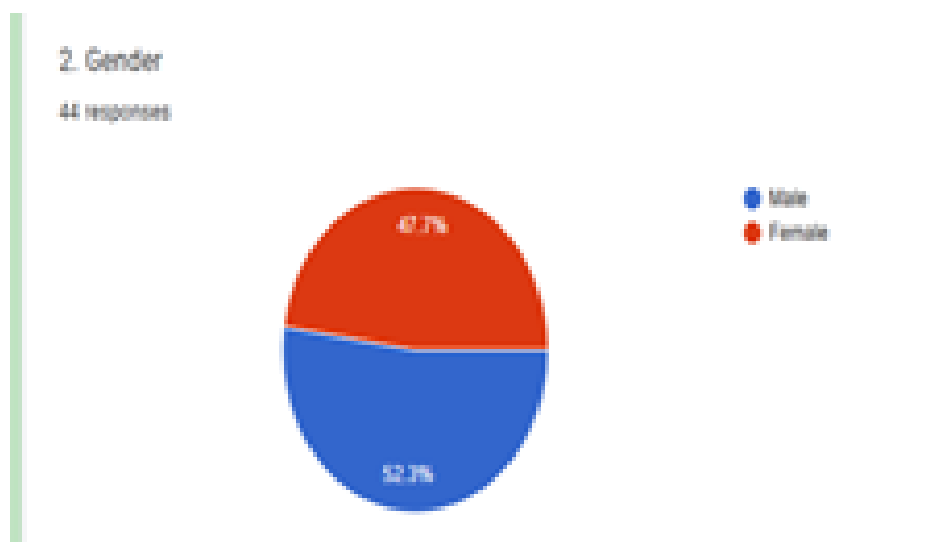
This Research is focused on knowing varius variables both in urban(Formal servies) population and rural(Informal services) population. It uses a variety of samples from different academic levels to investigate the specifics of UPI usage within a geographic area. This study will provide new insights and aid in the development of well-informed policies and strategies for stakeholders by concentrating on current issues like the impact of digital literacy, the influence of socioeconomic factors, and the implications of emerging technologies .The following table presents the data collected by administering the questionnaire to urban population , formal services and their responses .

Table 2: UPI-FinTech -Responses from Urban(Formal servies) population

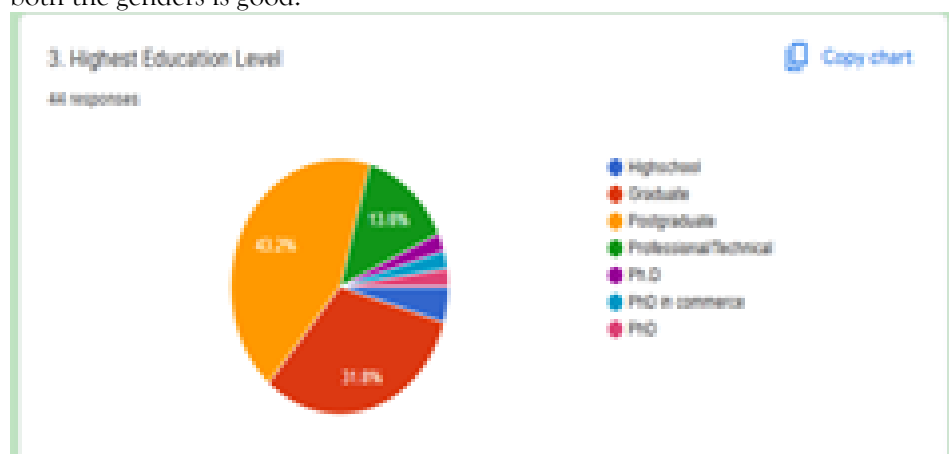
1. Age Group
 41 responses



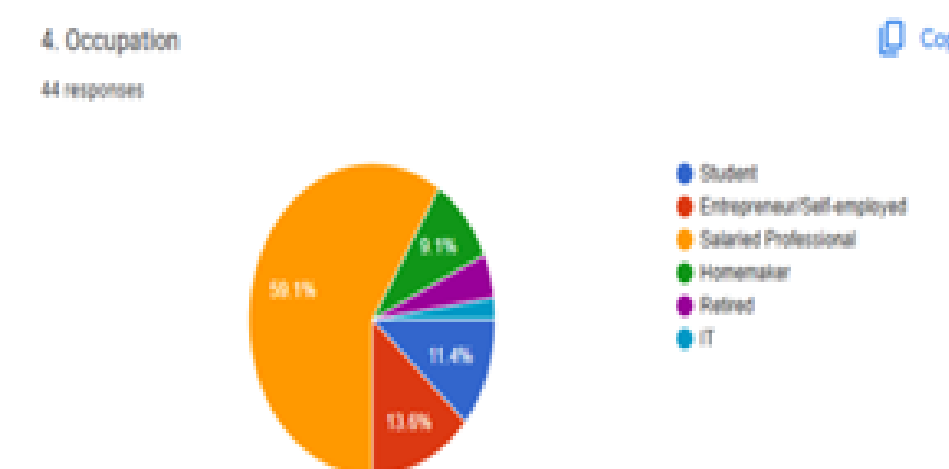
1. The sample includes 18.2% , between 18-25 years , 26% ,between 26-35 years, 27.3%, between 36-50 years, and 29.5% are above 50 years of age.It can be infered that the usage of UPI is prevalent among consumers of all ages , more or less the same



2. The percentage of users of UPI is very close, from the survey, it can be understood that there is not much difference between male and females regarding use of technology. We can see the awareness in both the genders is good.



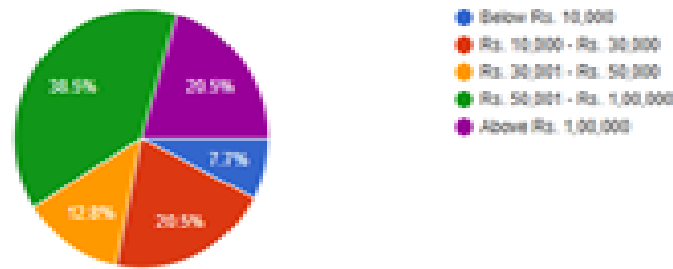
3. The responses regarding the academic qualifications show, a noticeable amount of Doctorates, 43.2% are post graduates, 31.8% are graduates, 13.6% are professional/ technically qualified, and considerable amount of sample are high school educated. It can be expected that potential amount of members are likely to have awareness about UPI Payments.



4. The next parameter which is occupation of the consumer is occupation. The spending pattern can be estimated sometimes on the basis of occupation we can infer from the survey that 59.1% are salaries professionals in the sample. 13.6% are entrepreneurs or self employed. 9.1% are home makers, 11.4% are students and not so significant percentage consists of homemakers and retired personnel

5. Monthly Personal Income (Optional)

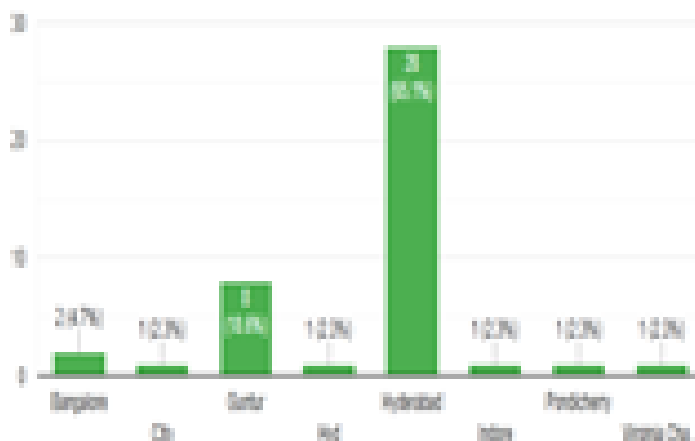
39 responses



5. This pie chart reveals the monthly income of respondents. 38.5% have monthly income of above 50,000/- , upto 1,00,000/-. 20.5% above 1,00,000 and equal amount of sample between 10,000/- to 30,000/-.we also see there is 7.7% consumers who are below 10,000/- per month income group

6. City/Town

41 responses



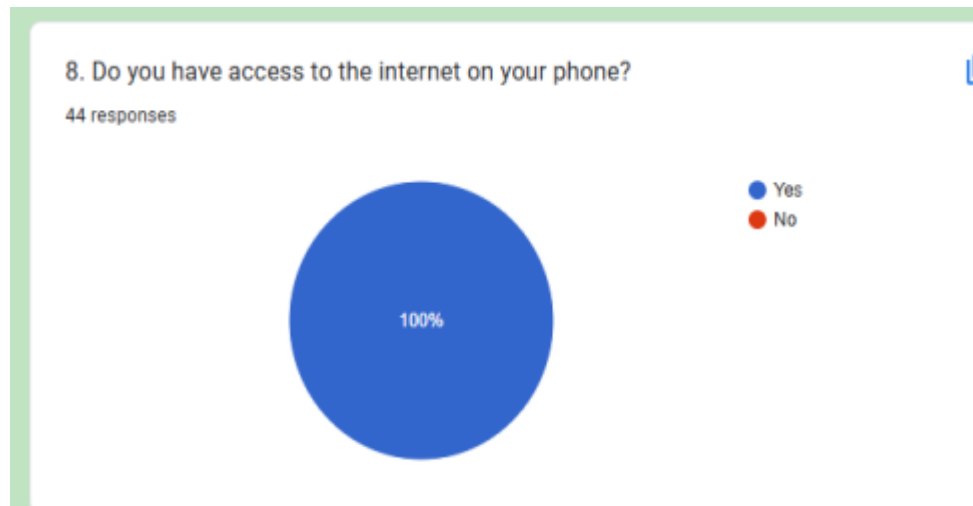
6. Major percentage of the sample is from Hyderabad , which is 65.1%, the other from various other geographical locations. We can observe the usage of UPI by people residing in Hyderabad , from this pie chart.

7. Do you own a smartphone?

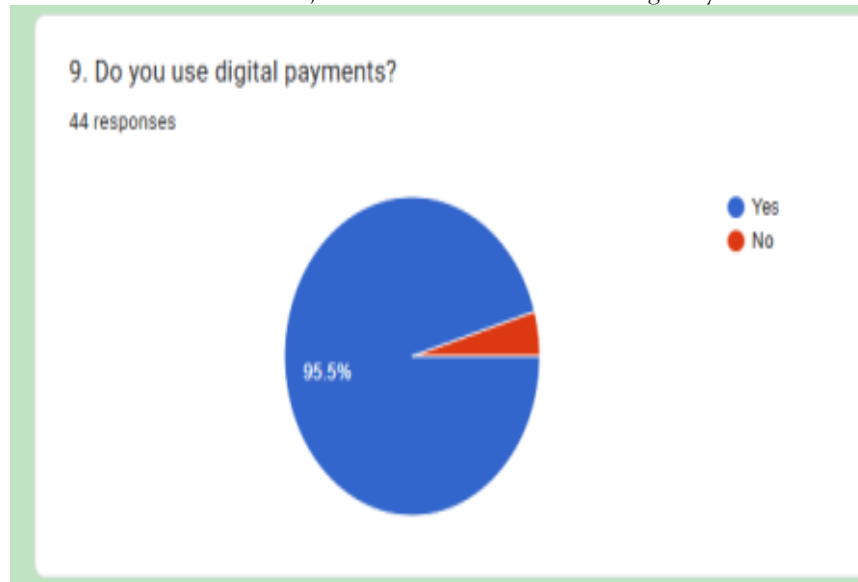
44 responses



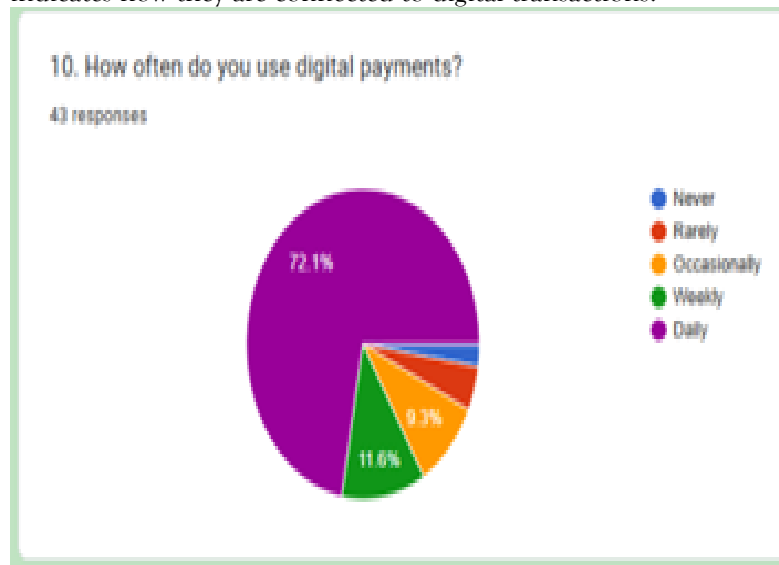
7. We can infer from the following pie chart that almost all the consumers possess smart phone, which enables them to activate UPI payments



8. It can be observed from the chart that all the sample consumers are digitally connected and equipped with internet connections, which enables them to be digitally connected



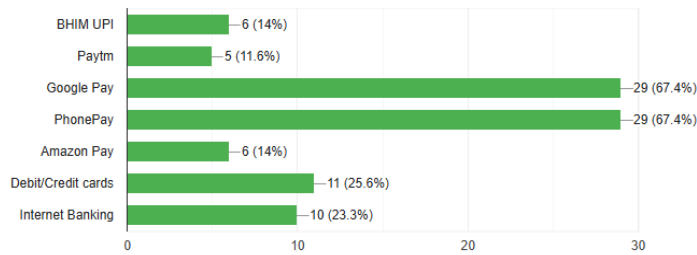
9. From the sample of 44 respondents, 95.5% have mentioned that they do make digital payments, which indicates how they are connected to digital transactions.



10. The pie chart depicts that 72.1% use digital payments, which shows how prevalent digital payments are among the consumers.

11. Which digital payment platforms do you use regularly? (select all that apply) [Copy chart](#)

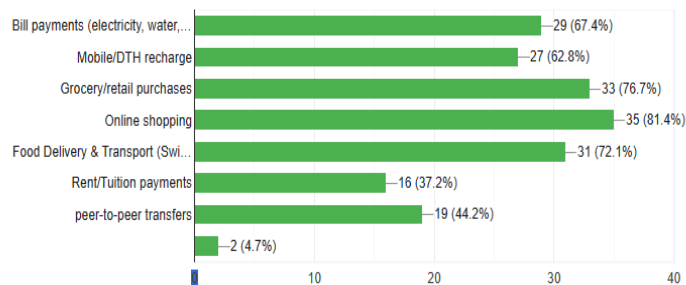
43 responses



11. The major digital payment platforms as BHIMUPI, Paytm, Google pay, Phone pe, Amazon pay, Debit/credit cards, and through internet banking. We see that equal amount of consumers use google pay and phone pay.

12. For which types of transactions do you use digital payments? [Copy chart](#)

43 responses

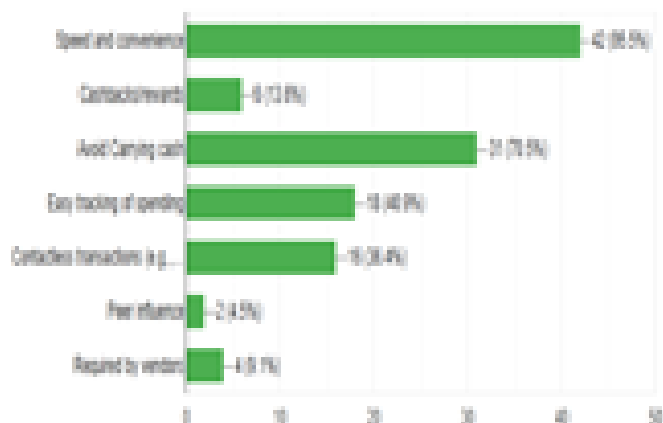


12. Digital payments are used for various of transactions like bill payments, Mobile DTH recharge, grocery purchases, online shopping, food delivery, rent, tuition fee payments, peer-to-peer transfers and many more. Here, in this study we can infer 67.4% is used for bill payments, 62.8% for mobile recharge, 76.7% is used for grocery shopping, and maximum digital payments recorded are regarding online shopping accounting for 81.4%. with advent of food delivery apps, digital payments regarding food delivery have also occupied significant stake of 72.1%. payments regarding rent and tuition fee payments accounted to 37.2%, and peer-to-peer amounted to 44.2%.

Attitude & Experience

13. What motivates you to use digital payments? (choose top 3) [Copy](#)

44 responses

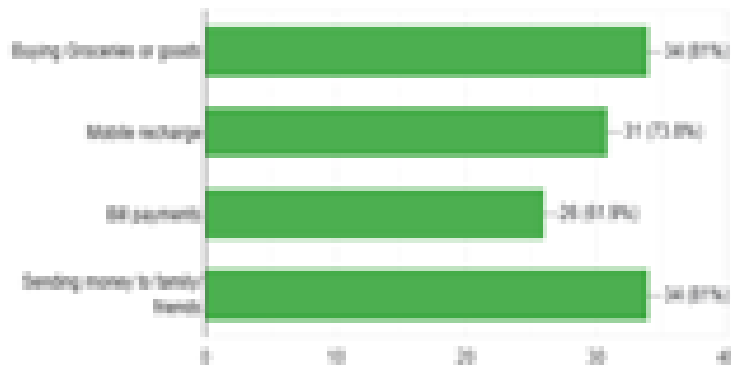


13. For knowing the reasons motivating usage of digital payments, the responses have been many and 2683

interesting.95.5% of the sample expressed it is due to speed and convenience , 70.5% opined can avoid carrying cash, 40.9% expressed it is easy to keep track of spending where are 36.4% felt it is contactless transaction and is safe. Some also opined they adopted due to peer influenc and later part had to adopt as their vendores required it for transacting with their vendors.

14. What Kind of transactions do you use digital payments for? (Tick all that apply)

46 responses

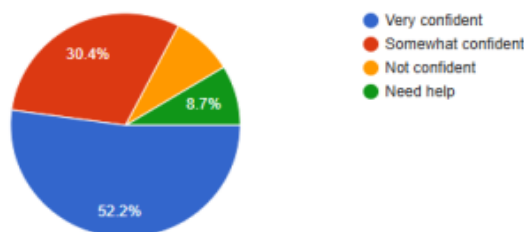


14. In response to the usage of digital payments, the first and foremost has been sending money to family and friends and buying grocery or goods(81%), which are significant in money transfers.

Trust, Challenges & Perceptions

15. How confident are you in using digital payment apps on your own?

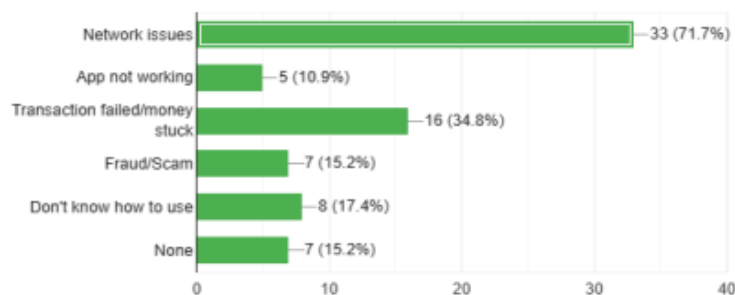
46 responses



15. The next aspect regarding digital payments has been, trust, challenges and perceptions regarding digital payments. 52.5% expressed very confident while using UPI payments, 30.4% say they are somewhat confident and 8.7% said they need help while operating digital transactions.

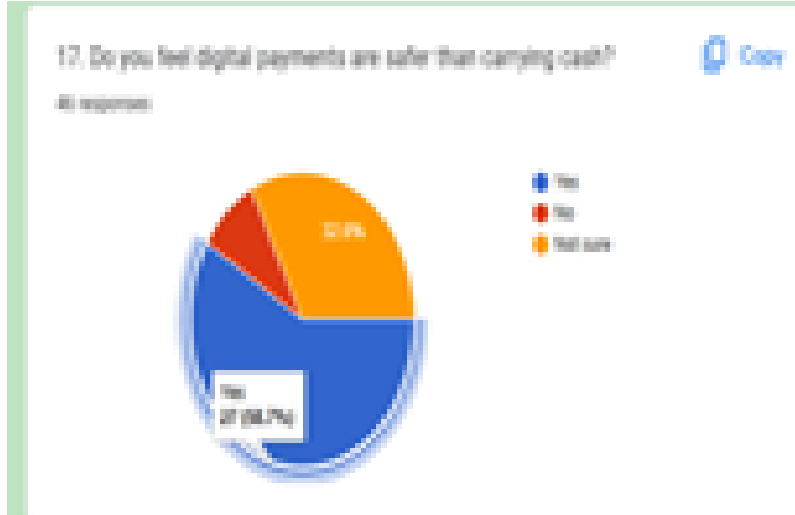
16. What problems have you faced (if any) while using digital payments? (Tick all that apply)

46 responses

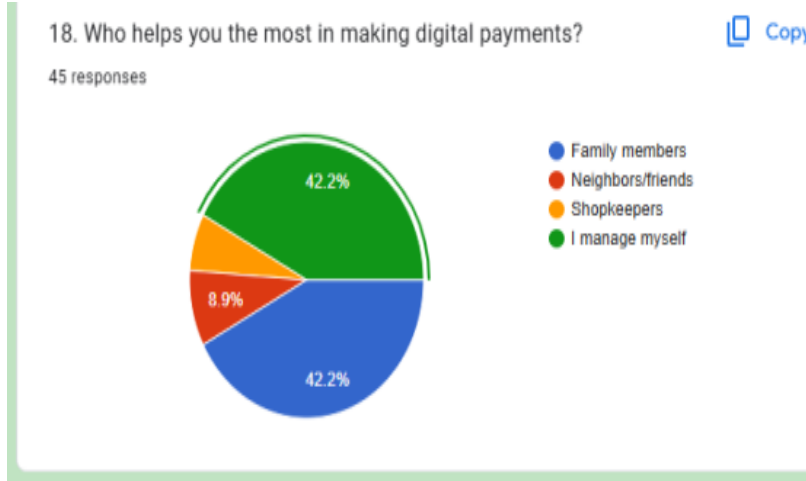


16. When surveyed about the problems faced while using digital payments, the customers have come up with problems like network issues(71.1%),failure of transactions(34.8%),lack of knowledge to use(17.4%),encountered with scam or fraud(15.2%),problem with app(10.9%). 15.2% have expressed

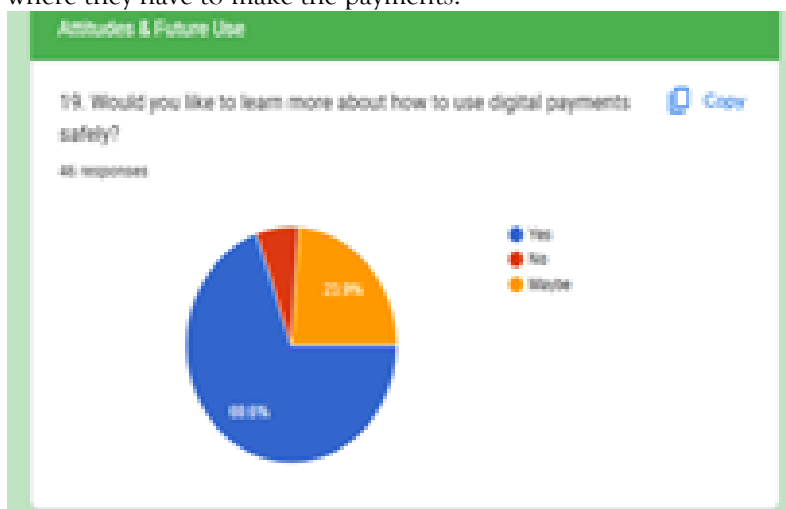
they have no problem while using digital payments



17. The response regarding safety while using digital payments is yes(58.7%), and not sure(32.6%).It reveals the confidence level



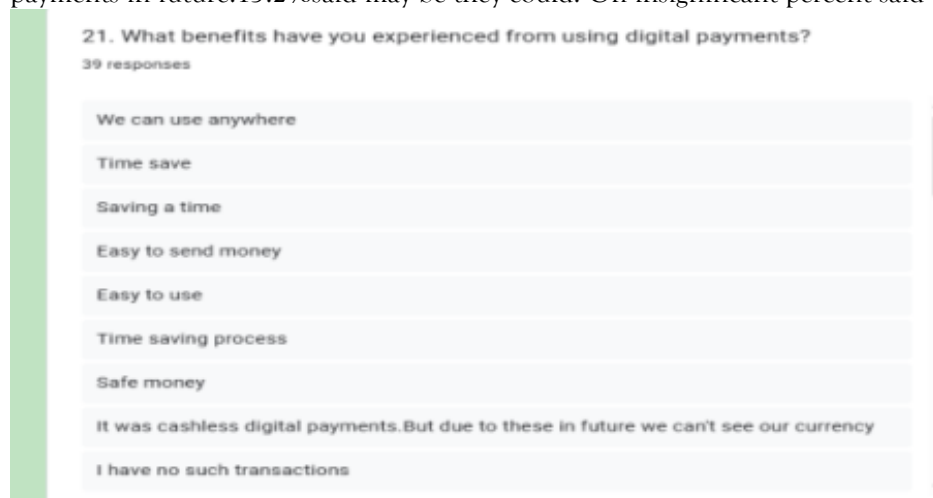
18. For the consumers unable to operate on their own, may need anyones help to do the same, the response is as above 42.2% take help from their family, equal amount try to manage on their own and 8.9% say they take help of neighbours and friends and very little customers take help of shop keepers where they have to make the payments.



19. When asked , if people were interested in learning using digital payments the response is highly encouraging .69.6% are open to learn as to how to use digital payments and adopt. Where as 23.9% expressed they were not sure. While rest of them were not interested in learning and adopting to the same.



20. The response to using digital payments in future has been tremendous. 80.4% want to use digital payments in future. 15.2% said maybe they could. An insignificant percent said they may not.



21. The survey tried to find out the benefits experienced by the users of digital payments, the following responses have been arrived at. It can be used anywhere, saves time, ease of use, safety in transfer of money, mostly, to summarise it is convenience and ease of using which makes customers to adopt to digital payments.

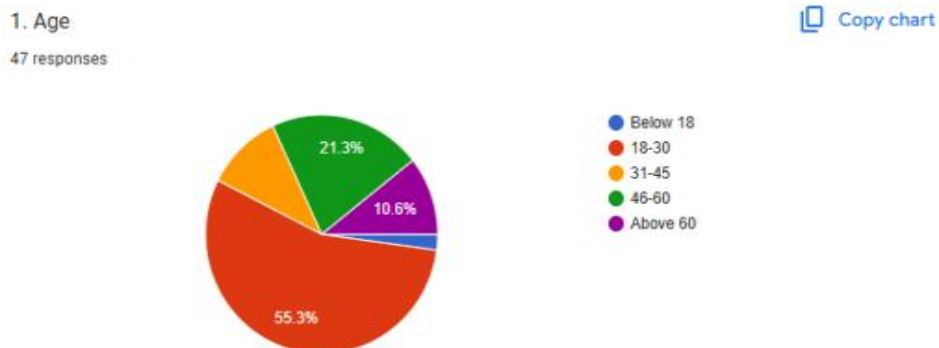


22. When asked for suggestions regarding usage of digital payments, ease of carrying digital wallets than carry cash, for the ease of transportation, ease of tracking transactions, peer influence for urban population. Regarding rural people, the suggestions have been need more awareness. To make them use more of it to find ease of it, hassle free transactions like network, failed transactions and protection from frauds and so on.

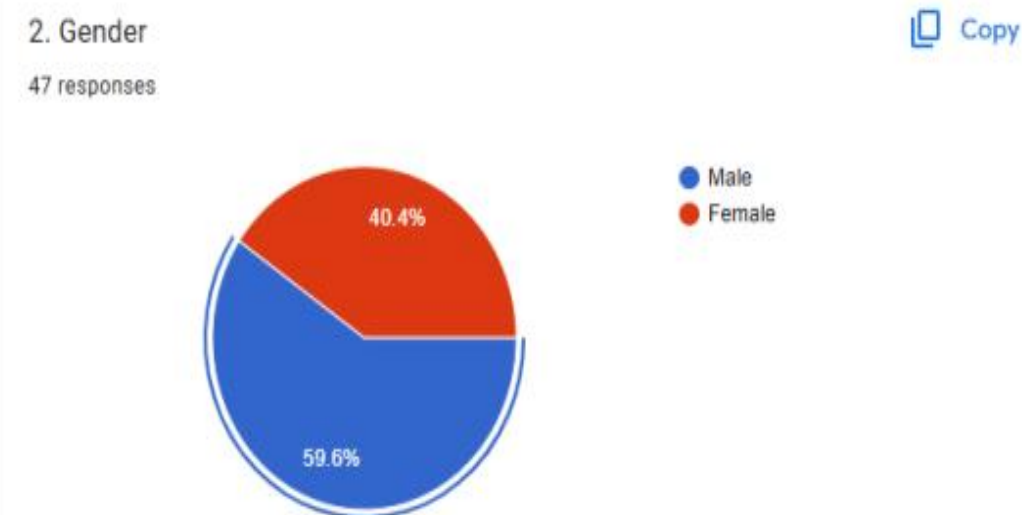
The following are the responses from the questionnaire administered to the rural (informal services) population. 47 responses have been collected for various variables.

Set-II

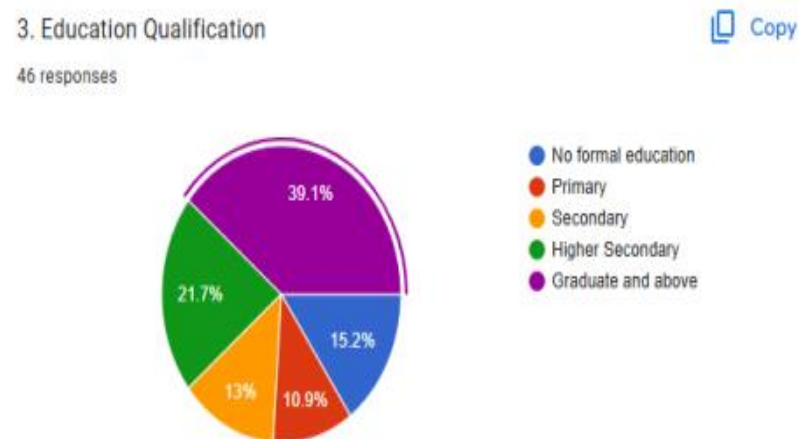
Table-3: UPL-FinTech -Responses from Rural (Informal services) population



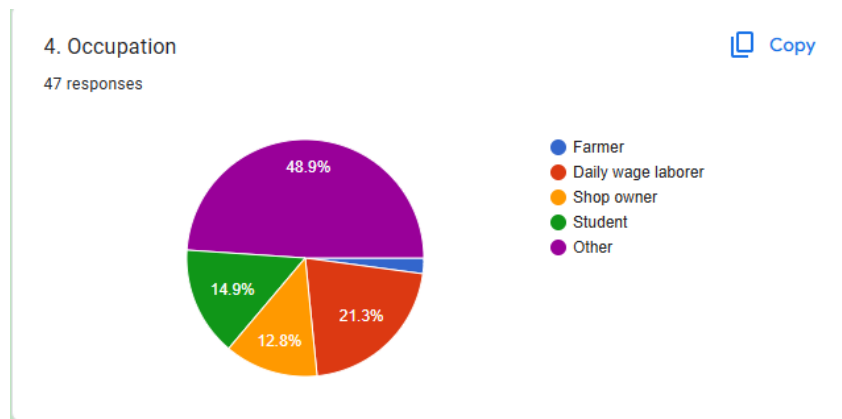
1. From the responses of rural (informal services) sample, the respondents aged between 18-30 are 55.3%, 31-45 are 12.8% approximately, 21.3% are between 46-60, and 10.6% are above 60 years of age.



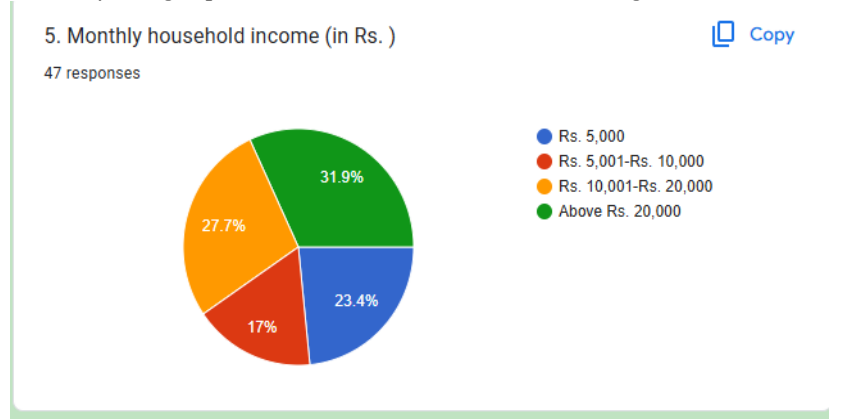
2. From the pie chart, it can be inferred that from the total respondents, 59.6% are males and 40.4% are females.



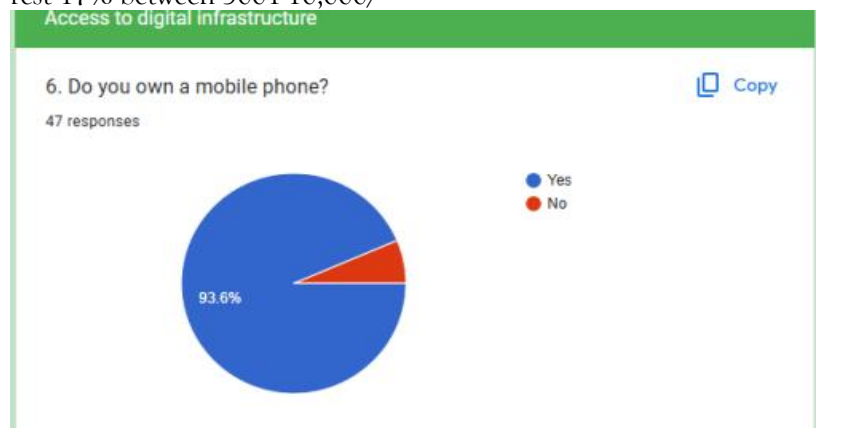
3. The educational qualification of the respondents is as follows, 39.1% are graduates and above, 21.7% have education up to higher secondary standard and 13% have secondary education, 10.9% have primary education and 15.2% have no formal education background.



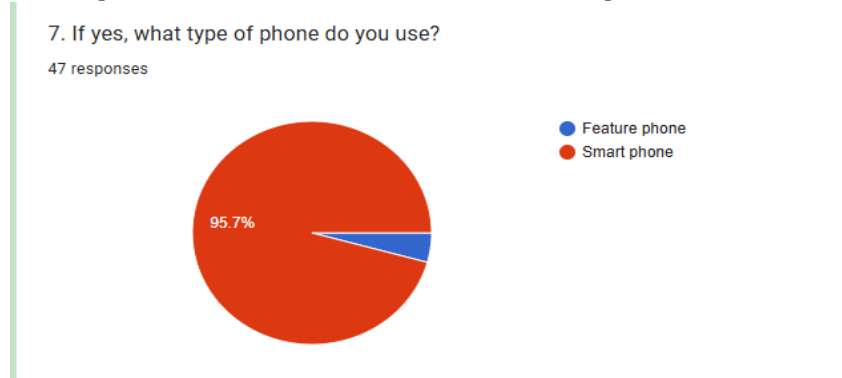
4. With regard to occupation, 21.3% are daily wage earners, 12.8% are shop owners, 14.9% are students and very meagre percent of farmers and 48.9% coming under the others category.



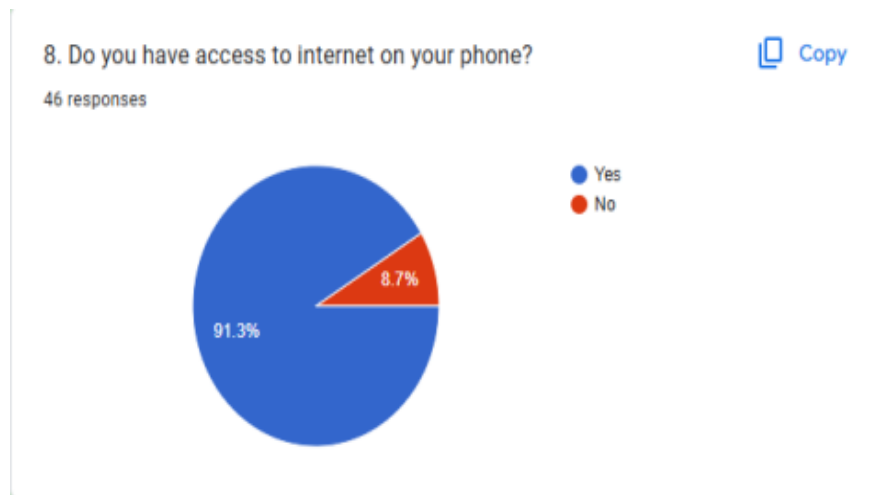
5. The next aspect of the survey has been the monthly income of the respondents. 31.9% reported above 20,000/- per month, 27.7% recorded 10,001-20,000/- per month, 23.4% recorded above 5,000/-, and rest 17% between 5001-10,000/-



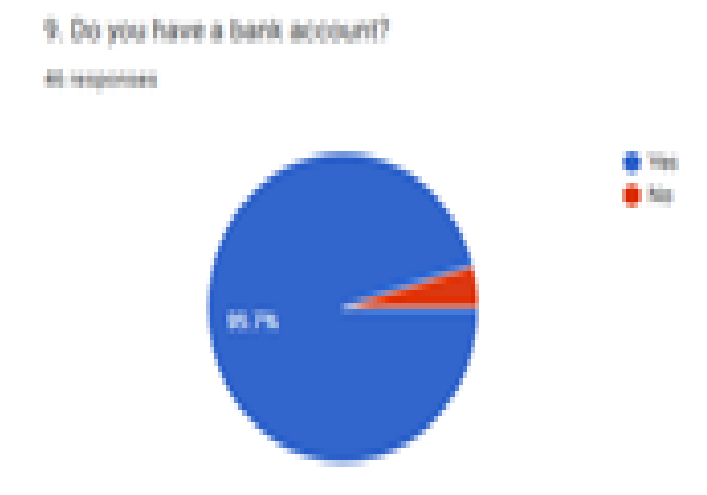
6. To know about digital payments , it is necessary to have a mobile, as we understand, 93.6%, do have mobile phones and rest of them don't have mobile phones.



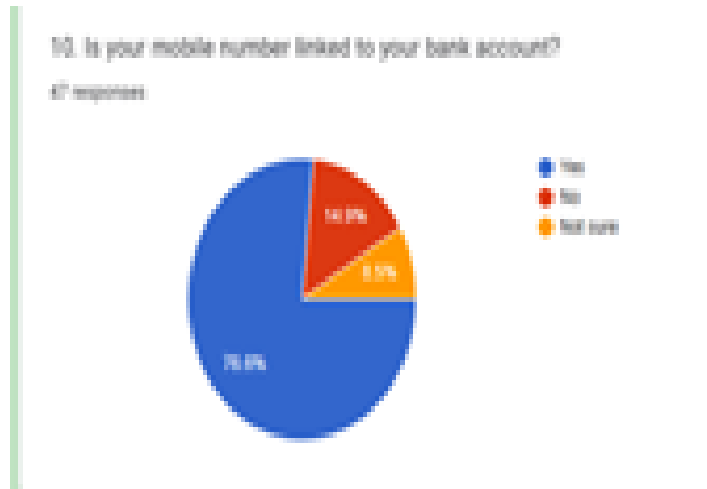
7. As smart phone enables operating digital transactions, the study response has been 95.7% having smart phones and the rest having feature phones only.



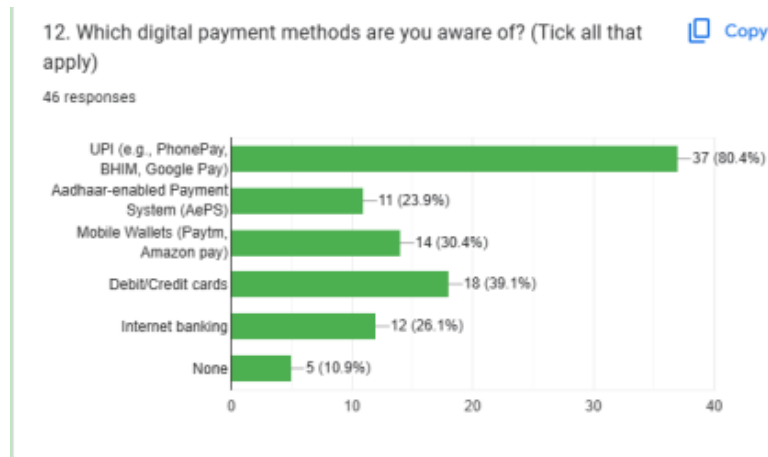
8. For the availability of internet on phone, the response is 91.3% having it and the rest 8.7% not having internet on phone



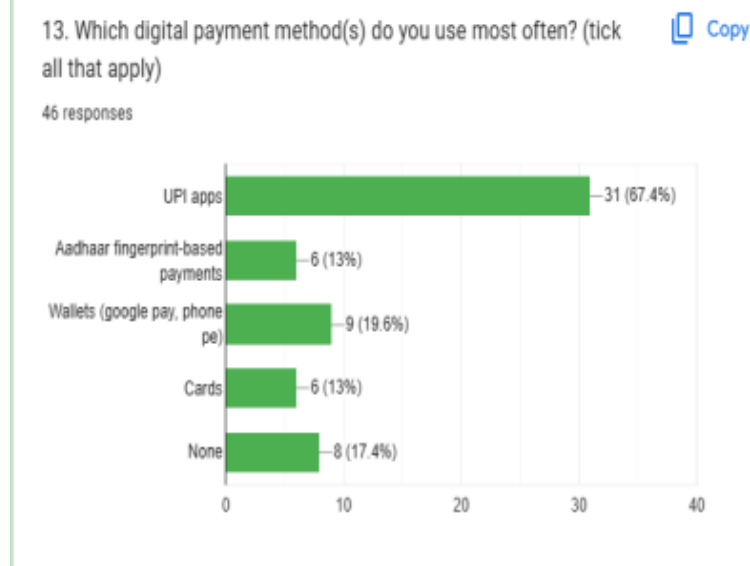
9. In the recent past, banks have introduced KYC ,where mobile phones are linked to bank accounts, the response for that question has been encouraging.95.7% are having bank accounts and rest of them are not .



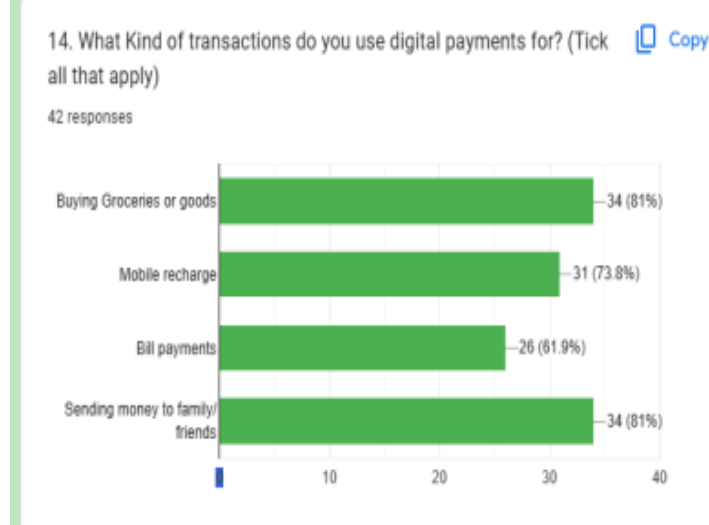
10. Our survey had to know if the mobile numbers are being linked to banks to know what is their financial literacy, it is understood that 76.6% of the respondents phones are linked to banks. 14.9% say no they are not linked to bank account. And 8.5% of the respondents are not sure ,if they are linked or not.



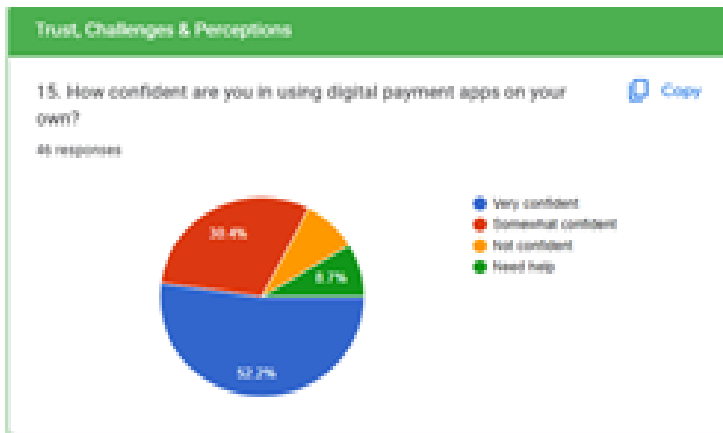
12. To know which digital platform they are aware of, the following is the response recorded. 80.4% are aware of phone pe, 23.9% are aware of aadhaar-enabled payments, 30.4% are used to paytm and amazon pay, 26.1% use internet banking, and 10.9% are not using any kind of digital payment methods.



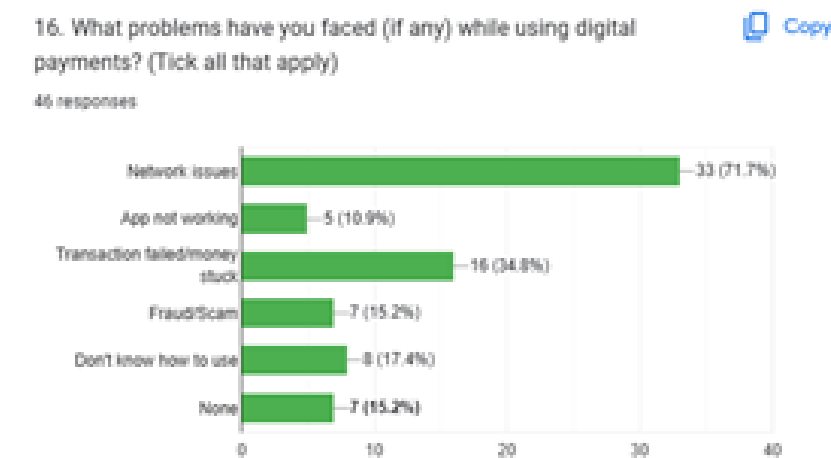
13. For the mode of digital payment method mostly used, 67.4% are using UPI apps, 13% bio-metric based, 19.5% are using googlepay, phonepe, 13% are using cards and 17.4% are not using any method.



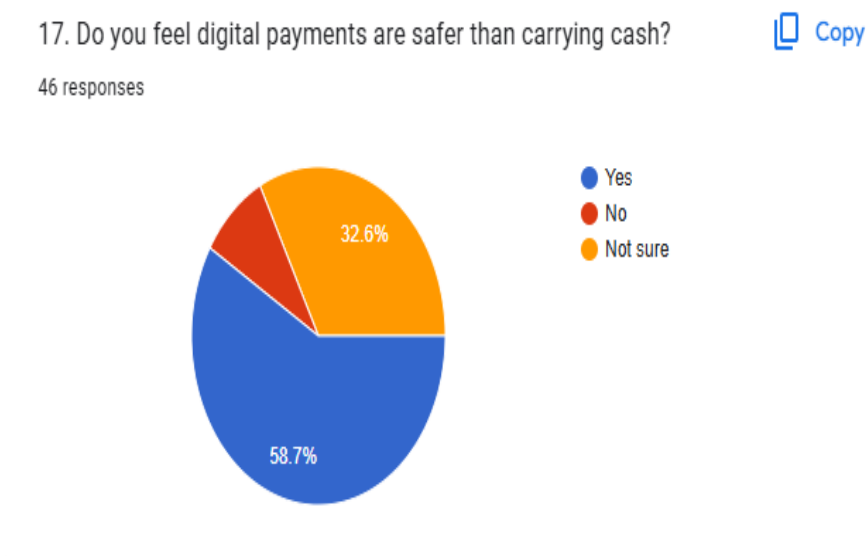
14. For the kind of transactions being used, 81% responded as grocery, 73.8% said mobile recharge, 61.9% are using for bill payments, and for money transfers to family and friends 81% are using digital payments.



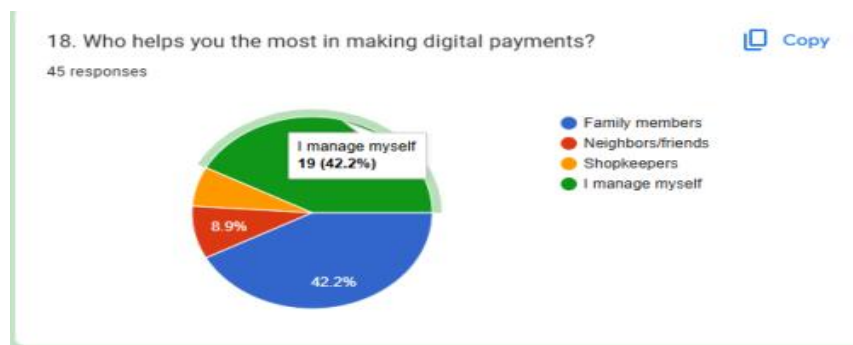
15. Regarding the ease of using digital payments the respondents opined 52.2% said are very confident in using, 30.4% said somewhat confident, 8.7% said they are not confident using digital payments, and the rest have responded not confident in using the digital payments.



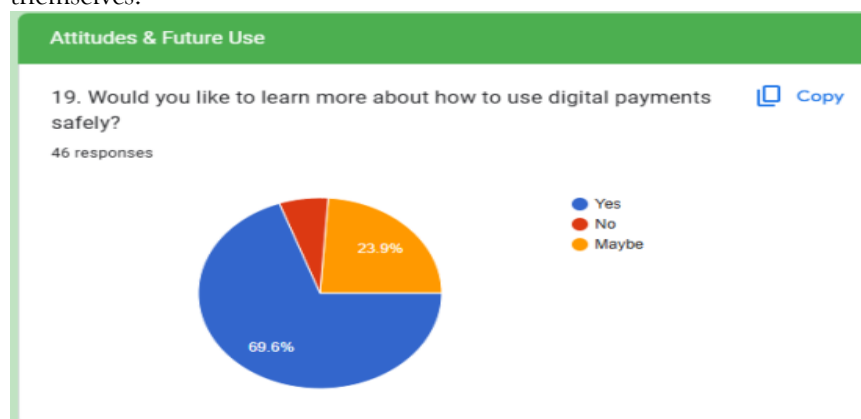
16. Regarding the problems faced while using digital payments, the responses are 71.7% regarding network issues, 34.8% transaction failed, and money got stuck, 10.9% app not working.



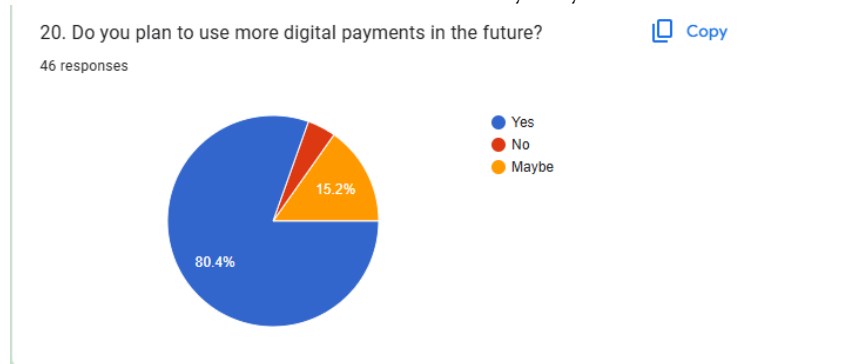
17. Regarding the safety aspect of digital payments, 58.7% responded they feel safe about using it. 32.6% are not sure about UPI payments. And 8.7% said no, they don't feel safe using UPI.



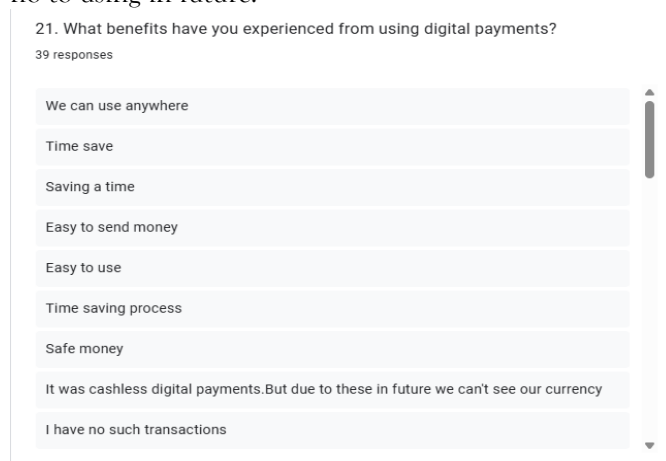
18. Response to seeking help for digital payments 42.2% responded that family members help them, 8.9% mentioned neighbors help them in operating UPI, yet another 42.2% mentioned they manage by themselves.



19. The respondents say yes to learning more about digi payments , to the extent of 69.6% and may be to the extent of 23.9% and the rest 6.5% say they don't want to learn more about it.



20. In order to know if they want to continue using digi payments in future, question has been posed to them, for which large part of sample are willing to learn(80.4%) and 15.2% said may be and 4.4% said no to using in future.



21. On the benefits of using digi payments, the responses are ease of use anywhere, saving in time, safe regarding money, quick transfer and the like.

22. What suggestions do you have to make digital payments easier for rural people like you?
 36 responses

- No
- Like chesthunnaru
- Awareness
- Educate people
- Cash payment better, as small amounts of buying
- Like signal availability in villages
- Without failed transactions
- It was very beneficiary to use digital payments.because excess of cash we can't carry anywhere. By using digital payments it was easy to make transaction
- Not sure

22. Because of the benefits derived , people in informal services are tending to use digital payments more , in the instances of carrying excess money ,it facilitates safe portability. And it has been opined that more awareness has to be created to include this section of society to use digital payments.

The following is the result of hypothesis testing , for hypothesis and the result are presented.

RESULT OF HYPOTHESIS TESTING

Hypothesis Testing: Digital Payment Adoption

Hypothesis Statement

- **Null Hypothesis (H₀₁):** There is no significant difference in the adoption of digital payments between informal and formal service providers.
- **Alternative Hypothesis (H₁₁):** There is a significant difference in the adoption of digital payments between informal and formal service providers.

METHOD

A Chi-square test of independence was conducted to determine whether there is a statistically significant association between the type of occupation (formal vs. informal) and the use of digital payments (Yes/No).

Table 4: Contingency Table

Occupation Type	Uses Digital Payments: Yes	No	Total
Formal	35	0	35
Informal	7	2	9
Total	42	2	44

Chi-square Test Results

- **Calculated χ^2 value:** 8.13
- **Degrees of freedom (df):** 1
- **Significance level (α):** 0.05
- **Critical χ^2 value:** 3.84

Conclusion

Since the calculated Chi-square value (8.13) exceeds the critical value (3.84), the null hypothesis is rejected.

There is a statistically significant difference in the adoption of digital payments between formal and informal service providers.

This suggests that the likelihood of using digital payments is influenced by the type of occupation, with formal service providers demonstrating higher adoption rates.

Hypothesis 2: Platform Preference

Hypothesis Testing: Digital Payment Platform Preference

Hypothesis Statement

- **Null Hypothesis (H₀₂):** There is no association between the type of occupation (formal/informal) and the preferred digital payment platform.
- **Alternative Hypothesis (H₁₂):** There is a significant association between the type of occupation and the preferred digital payment platform.

Method

A series of **Chi-square tests of independence** were conducted to determine whether the choice of specific digital payment platforms (e.g., Google Pay, PhonePe, Paytm, etc.) was associated with the occupation type of the user (formal or informal).

Respondents were categorized into:

- **Formal:** Salaried Professionals, Entrepreneurs/Self-employed, IT, Retired
- **Informal:** Students, Homemakers

Platforms considered included:

- Google Pay
- PhonePe
- Paytm
- Amazon Pay
- BHIM UPI
- Debit/Credit Cards
- Internet Banking

A 2x2 contingency table was constructed for each platform to compare the number of users and non-users across the two occupational categories.

Table 5: Sample Contingency Table: Google Pay

Occupation Type	Used	Not Used	Total
Formal	28	9	37
Informal	6	1	7
Total	34	10	44

Chi-square Test Results

Platform	χ^2 Value	Significance ($\alpha = 0.05$)
Google Pay	0.34	Not Significant
PhonePe	~0.21	Not Significant
Paytm	~0.05	Not Significant
Amazon Pay	~0.05	Not Significant
BHIM UPI	~0.78	Not Significant
Debit/Credit Cards	~0.37	Not Significant
Internet Banking	~1.22	Not Significant

(All values approximate; df = 1 for each test)

CONCLUSION

Since none of the Chi-square values exceeded the critical value of 3.84 at $\alpha = 0.05$, the null hypothesis is **not rejected** for any of the platforms tested.

There is no statistically significant association between the type of occupation and the choice of digital payment platform. Preferences for platforms such as Google Pay, PhonePe, or Paytm appear consistent across both formal and informal worker groups.

Hypothesis 3: Transaction Purpose

Hypothesis Testing: Digital Payment Usage by Transaction Type

Hypothesis Statement

- **Null Hypothesis (H₀₃):** There is no significant difference in transaction types (e.g., bill payments, groceries, peer transfers) between informal and formal service workers.
- **Alternative Hypothesis (H₁₃):** There is a significant difference in transaction types between the two occupation groups.

Method

A series of **Chi-square tests of independence** were conducted to determine whether the type of occupation (formal vs. informal) is associated with the usage of digital payments for specific transaction categories.

Occupation Groups:

- **Formal:** Salaried Professionals, Entrepreneurs/Self-employed, Retired individuals, IT professionals
- **Informal:** Homemakers, Students

Transaction Categories Tested:

1. Bill Payments (e.g., electricity, water)
2. Mobile/DTH Recharge

3. Groceries/Retail Purchases
4. Online Shopping
5. Food Delivery & Transport (e.g., Swiggy, Uber)
6. Rent/Tuition Payments
7. Peer-to-peer Transfers

Each category was analyzed using a 2x2 contingency table comparing users and non-users in both occupational groups.

Table 6: Sample Analysis: Peer-to-Peer Transfers

Occupation Type	Uses P2P Transfers	Doesn't Use	Total
Formal	24	8	32
Informal	4	4	8
Total	28	12	40

- Calculated χ^2 value ≈ 1.91
- Degrees of freedom = 1
- Critical χ^2 value at $\alpha = 0.05 = 3.84$

Since $1.91 < 3.84$, the null hypothesis is not rejected for this category.

Table 7: Summary of Results

Transaction Type	χ^2 Value (approx)	Significance ($\alpha = 0.05$)
Bill Payments	~ 0.00	Not Significant
Mobile/DTH Recharge	~ 0.00	Not Significant
Groceries/Retail	~ 0.00	Not Significant
Online Shopping	~ 0.00	Not Significant
Food Delivery & Transport	~ 0.00	Not Significant
Rent/Tuition Payments	~ 0.28	Not Significant
Peer-to-peer Transfers	~ 1.91	Not Significant

FINDINGS AND CONCLUSION:

The survey tried to find out the benefits experienced by the users of digital payments, the following responses have been arrived at. It can be used anywhere, saves time, ease of use, safety in transfer of money, mostly, to summaries it is convenience and ease of using which makes customers to adopt to digital payments.

1. Objective 1 and Hypothesis 1, the chi-square results indicate that, there is a statistically significant difference in the adoption of digital payments between formal and informal service providers.

This suggests that the likelihood of using digital payments is influenced by the type of occupation, with formal service providers demonstrating higher adoption rates.

2. Objective 2 and Hypothesis 2, the chi-square results indicate that, There is no statistically significant association between the type of occupation and the choice of digital payment platform. Preferences for platforms such as Google Pay, PhonePe, or Paytm appear consistent across both formal and informal worker groups

3. Objective 3 and Hypothesis 3, the chi-square results indicate that, the digital payment usage patterns across transaction types are similar between formal and informal occupational groups. This suggests a broad-based adoption of digital payment use cases regardless of employment type.

CONCLUSION

None of the transaction categories showed statistically significant differences between formal and informal service workers.

The results indicate that digital payment usage patterns. UPI has revolutionized the way we make digital payments in India, but it is not without its limitations and challenges. By acknowledging and addressing concerns such as network connectivity, security, transaction limits, interoperability, awareness, and customer support, we can foster a more inclusive and efficient UPI ecosystem. Continuous innovation, collaboration between stakeholders, and proactive measures to enhance security and user experience will be key in overcoming these challenges and realizing the full potential of UPI as a transformative digital payment platform.

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