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Adoption and Usage of Domestic Digital Payment Systems in Urban Bangalore

Dr. Kruti Vaibhav Dave[1], Sehel Ahmed[2]

[1] Assistant Professor, School of Economics and Commerce, CMR University, Bangalore
[2] Student, School of Economics and Commerce, CMR University, Bangalore

Abstract

The present study examines the adoption and usage of domestic digital payment systems in urban Bangalore. With the rapid growth of digital infrastructure and financial technologies in India, digital payment systems such as UPI, mobile wallets, debit and credit cards, and internet banking have gained significant importance. The study aims to analyse awareness, usage patterns, influence of demographic factors, perceived convenience, impact on cash usage, and challenges associated with digital payment systems.

The research is based on primary data collected from respondents in urban Bangalore through a structured questionnaire using a Likert scale. Statistical tools such as descriptive statistics, chi-square test, and one-sample t-test were used for data analysis. The findings indicate that demographic factors such as age, gender, and income do not have a significant relationship with the adoption of digital payment systems. However, there is a significant difference in the usage patterns of various digital payment modes, with UPI emerging as the most preferred mode. The results also show that users perceive digital payment systems as convenient.

Further, the study reveals that digital payment systems significantly contribute to the reduction of cash usage. At the same time, security concerns and operational challenges significantly influence user behaviour. The study concludes that convenience, accessibility, and technological efficiency are key drivers of digital payment adoption in urban Bangalore.

Keywords: Digital Payment Systems, UPI, Adoption, Usage Pattern, Convenience, Security Concerns, Cash Usage, Urban Bangalore

1. Introduction

The rapid advancement of information and communication technology has significantly transformed financial transactions worldwide. In India, the growth of digital infrastructure, increasing smartphone penetration, and supportive government initiatives have accelerated the adoption of domestic digital payment systems. Digital payment systems refer to electronic methods of transferring funds without the use of physical cash, including platforms such as Unified Payments Interface (UPI), mobile wallets, debit and credit cards, and internet banking (Reserve Bank of India, 2022).

Domestic digital payment systems play a crucial role in promoting financial inclusion, enhancing transaction efficiency, and supporting economic development. Over the past decade, India has experienced a notable transition from cash-based transactions to digital payment methods. This shift has been driven by initiatives such as the Digital India programme and policy measures like demonetisation, which encouraged the use of electronic payment modes (Government of India, 2021).

Urban regions, particularly metropolitan cities such as Bangalore, have emerged as significant centres for digital payment adoption. Higher levels of technological awareness, better digital infrastructure, and the presence of a large number of IT professionals have contributed to the widespread use of digital payment systems in the city. Bangalore's strong fintech ecosystem and growing acceptance of QR-code-based transactions have further strengthened digital payment usage among consumers and businesses (NITI Aayog, 2021).

Despite the increasing adoption of digital payment systems, certain challenges continue to affect user experience. Security concerns, network issues, transaction failures, and lack of digital literacy among certain population groups remain major barriers to the effective utilisation of digital financial services (Kumar & Gupta, 2018). Understanding consumer behaviour, adoption patterns, and perceived risks is therefore essential for policymakers, financial institutions, and fintech companies.

The present study focuses on analysing the adoption and usage of domestic digital payment systems among consumers in urban Bangalore. It aims to examine the influence of demographic factors, evaluate user perception regarding convenience and security, and assess the impact of digital payments on reducing reliance on cash transactions.

2. LITERATURE REVIEW

The adoption of domestic digital payment systems in urban India, especially in Bangalore, has been extensively studied by both domestic and international scholars, providing a nuanced understanding of technology acceptance and usage behavior.

2.1Theoretical Foundations of Technology Adoption

International authors have laid the groundwork for explaining user adoption of technology, which has been widely applied to digital payments. Agarwal and Prasad (2008), though domestic Indian scholars, contributed significantly to the conceptual framework with their study on personal innovativeness, an important individual trait influencing early technology adoption in India's urban settings. Venkatesh et al. (2003), an international research team, proposed the Unified Theory of Acceptance and Use of Technology (UTAUT), identifying performance expectancy, effort expectancy, social influence, and facilitating conditions as key predictors of adoption. These models have been applied domestically with Singh and Srivastava (2017) confirming TAM's relevance to India, highlighting perceived usefulness and ease of use as central to mobile payment uptake. Madan and Yadav (2016), Indian researchers, stress that trust and security concerns are critical factors influencing online financial services adoption in India.

2.2 Drivers of Adoption: Insights from Domestic and International Authors

Recent domestic studies have emphasized the rapid acceleration of digital payment use in urban India due to technological and social factors. Kapoor et al. (2026) and Sharma and Iyer (2025), Indian scholars, explore how smartphone penetration and government awareness initiatives have propelled adoption in metropolitan cities such as Bangalore, particularly after the COVID-19 pandemic. Gupta and Ramaswamy (2024), also domestic authors, report incentives and fintech innovations have spurred widespread consumer adoption of digital payments.

International contributions complement these findings. Jain and Sharma (2021), Indian authors, detail the remarkable success of UPI, driven by its interoperability and real-time features, a uniquely Indian innovation that has gained global recognition. Raghavendran and Das (2020), domestic researchers, identify millennials as the largest demographic driving digital payment adoption, valuing speed and social influence findings echoing global trends noted by D'Silva and Morley (2015), international researchers who highlight the importance of trust and user experience.

Paul and Rosalina (2015), international scholars, emphasize how social influence reduces perceived risks, facilitating mobile payment uptake in collectivist cultures, which resonates with the Indian urban context.

2.3 Barriers to Adoption: Domestic and International Perspectives

Domestic researchers such as Soni and Singh (2019) and Chawla and Joshi (2022) highlight challenges unique to Indian urban centers like Bangalore, including digital literacy gaps and security concerns that disproportionately affect certain demographics such as women. Kumar and Dey (2009) further elaborate on infrastructural and psychological barriers specific to Indian consumers.

Comparative international studies by Ejaz and Baig (2010) examine similar issues in India and Pakistan, emphasizing the necessity of regulatory frameworks and consumer education to overcome adoption barriers. Kapoor, Dwivedi, and Williams (2023), international authors, further discuss how transparent privacy policies and efficient complaint redress systems help maintain user trust globally and in India alike. Varma and Sharma (2018), domestic authors, find that while urban youth increasingly adopt digital payments, older populations remain reliant on cash due to trust deficits, a pattern noted internationally as well.

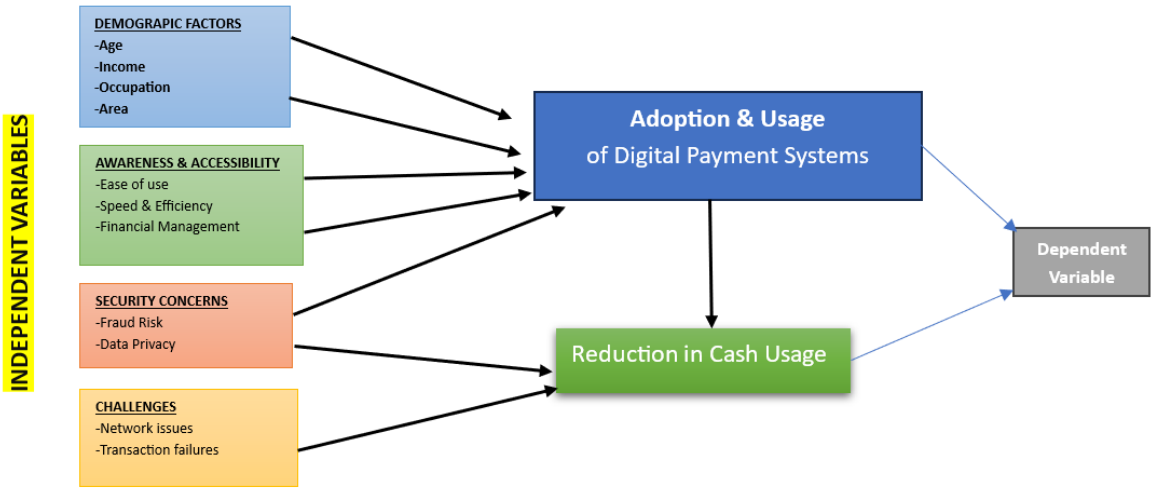
2.4 Sustained Usage and Financial Inclusion: Cross-border Insights

International scholars such as Zhu and Kraemer (2011) have shown that continuous use of digital technologies depends on perceived value and post-adoption satisfaction. Applying such findings, domestic authors Dhameja and Arora (2019) explore how digital payments improve financial inclusion in Indian urban areas by extending banking access to marginalized groups. Bhatnagar (2013), an Indian scholar, highlights mobile payments' potential to drive financial transformations in developing economies.

Kapoor et al. (2026), domestic researchers, conclude that sustained user trust and effective fraud prevention are essential for long-term adoption in cities like Bangalore, a sentiment echoed in international literature on payment systems.

3. CONCEPTUAL FRAMWORK

Conceptual Framework: Adoption & Usage of Domestic Digital Payment Systems in Urban Bengaluru.



The conceptual framework shows that demographic factors, awareness and accessibility, security concerns, and operational challenges influence the adoption and usage of domestic digital payment systems in urban Bangalore. Adoption and usage act as the mediating factor between these variables and the outcome. Increased usage of digital payment systems leads to a reduction in cash transactions. Thus, the framework explains the relationship between influencing factors and the shift towards a cashless economy.

4.RESEARCH METHODOLOGY

4.1. Research Design

This study employs a **descriptive research design** to systematically examine the awareness, adoption, usage patterns, influencing demographic factors, and challenges related to domestic digital payment systems among users in urban Bangalore. The descriptive approach is suited to provide a detailed snapshot of user behavior, perceptions, and barriers regarding digital payments.

4.2. Population and Sample

The target population comprises residents of urban Bangalore who use or are aware of domestic digital payment systems such as UPI, mobile wallets, cards, and internet banking. The sample size includes **136 respondents**, collected through non-probability convenience sampling. The respondents represent diverse age groups, genders, occupations, monthly income levels, and residential areas within Bangalore to ensure adequate demographic representation.

4.3. Data Collection Method

Primary data were collected via a structured online survey questionnaire, which was distributed through social media platforms, email, and direct contacts within Bangalore. The questionnaire was designed to capture:

- Demographic characteristics (age, gender, occupation, income, residence).
- Awareness and adoption level of various digital payment systems.
- Usage patterns and preferences among digital payment modes.

- Perceptions related to convenience, security, and reliability.
- Impact on cash usage and financial management.
- Challenges faced including security and technical issues.

A total of 136 completed responses were obtained and used for analysis.

4.4. Research Instrument

The structured questionnaire consisted mainly of closed-ended questions measured on a Likert scale (ranging from Strongly Agree to Strongly Disagree) to gauge the degree of agreement on various statements linked to the study objectives. The instrument covered the following key areas:

- Awareness of digital payment systems (e.g., UPI, NEFT, RTGS, IMPS).
- Reasons for adoption (ease of access, government initiatives, peer influence).
- Usage frequency and modes preferred (UPI, wallets, cards, internet banking).
- Impact on cash usage and perceived convenience.
- User-friendliness and reliability.
- Financial management benefits.
- Security perceptions, fraud fears, network issues, and transaction reliability.

The questionnaire was pre-tested in a pilot study with a small group of respondents to assess clarity and reliability.

4.5. Variables

Independent Variables

- **Demographic factors**: Age, Gender, Occupation, Monthly Income, Area of Residence.

Dependent Variables

- Awareness and adoption of digital payment systems.
- Usage pattern and preference for payment modes.
- Perception of convenience and reliability.
- Impact on cash usage.
- Security concerns and challenges affecting usage.

4.6.Objectives of the Study

1. To examine the level of awareness and adoption of domestic digital payment systems among users in urban Bangalore.
2. To analyse the usage pattern of various digital payment modes such as UPI, mobile wallets, cards and internet banking.
3. To study the influence of demographic factors on adoption and usage of digital payment systems.

4.7.Hypotheses of the Study

$H0_1$: There is no significant relationship between demographic factors and adoption of domestic digital payment systems in urban Bangalore.

$H0_2$: Users do not significantly prefer digital payment systems for their daily transactions.

$H0_3$: Digital payment systems are not perceived as convenient by users.

4.8. Data Analysis Techniques

Data were analyzed using Ms-Excel, Statistical Package for the Social Sciences software. The following statistical methods were applied:

- Descriptive Statistics**:** Frequencies, percentages, means, and standard deviations to summarize demographic profiles, awareness levels, usage patterns, and perceptions.
- Cross-tabulation and Chi-square Test: To examine relationships between demographic variables and adoption/usage of digital payment systems.
- One-sample t-test: To evaluate users' preference, perceived convenience, security concerns, and impact on cash usage.

4.9. Ethical Considerations

Respondents' participation was voluntary, with anonymity and confidentiality assured. Informed consent was obtained at the beginning of the survey. Data were used solely for academic research purposes, ensuring compliance with ethical research standards.

5. Data Analysis and Interpreation

$H0_1$: There is no significant relationship between demographic factors and adoption of domestic digital payment systems in urban Bangalore.

Table 1: Gender vs Adoption of Digital Payment Systems Crosstabulation

Gender	High Adoption	Low Adoption	Total
Female	39	36	75
Male	29	30	59
Other	0	1	1
Total	**68**	**67**	**135**

Chart-1 Gender VS Adoption

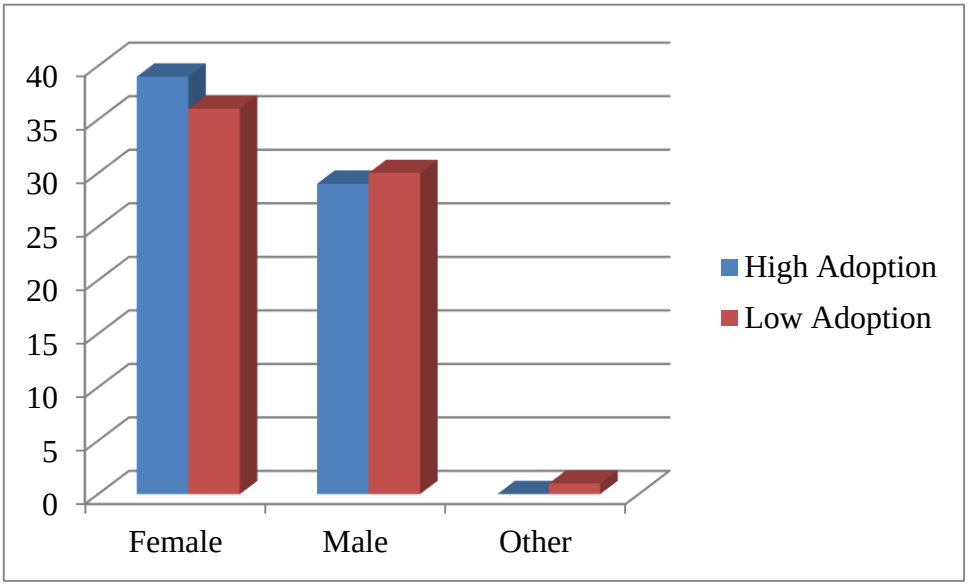


Table-2 Chi-Square Test

Test	Value	df	Asymp. Sig. (p-value)
Pearson Chi-Square	1.13	2	0.568

Interpretation:
Since p-value (0.568) > 0.05, there is no significant relationship between gender and adoption.

Table-3 Age vs Adoption of Digital Payment Systems

Age Group	**High Adoption**	**Low Adoption**	**Total**
Below 20	39	26	65
20–30	20	28	48
31–40	7	9	16
41–50	2	4	6
Above 50	1	0	1
Total	**69**	**67**	**136**

Chart-2 Age VS Adoption

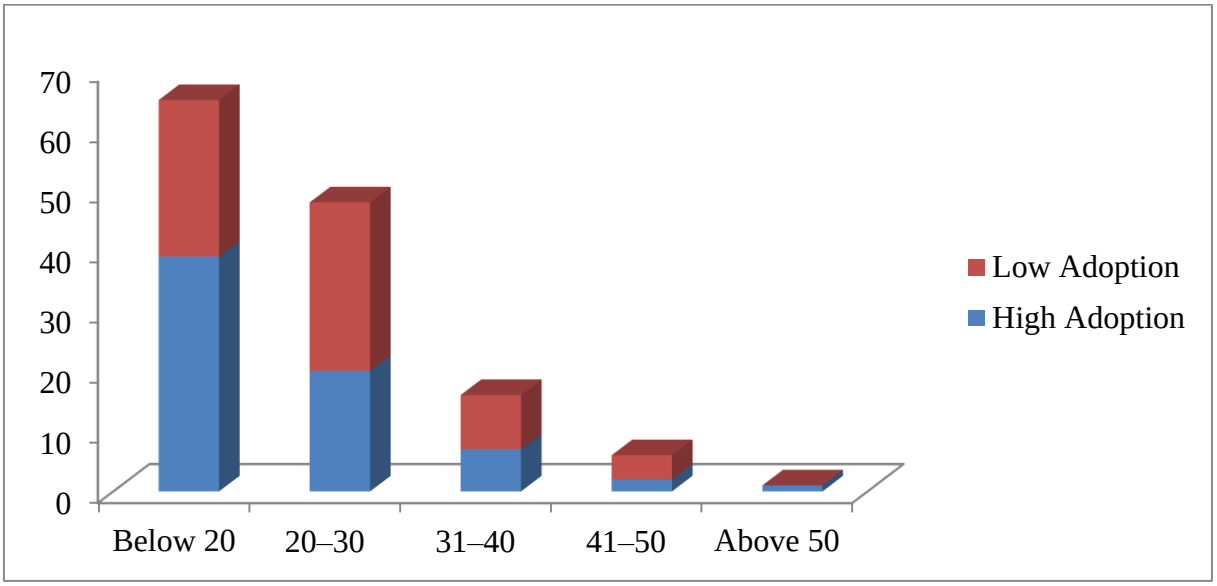


Table- 4 Chi-Square Test

Test	Value	df	Asymp. Sig. (p-value)
Pearson Chi-Square	5.82	4	0.213

Interpretation:
Since p-value (0.213) > 0.05, there is no significant relationship between age and adoption.

Table-5 Monthly Income vs Adoption of Digital Payment Systems

Income Level	**High Adoption**	**Low Adoption**	Total
Below ₹20,000	47	31	78
₹20,000–₹40,000	4	11	15
₹40,000–₹60,000	5	4	9
Above ₹60,000	10	13	23
Total	**66**	**59**	**125**

Chart-3 Income VS Adopation

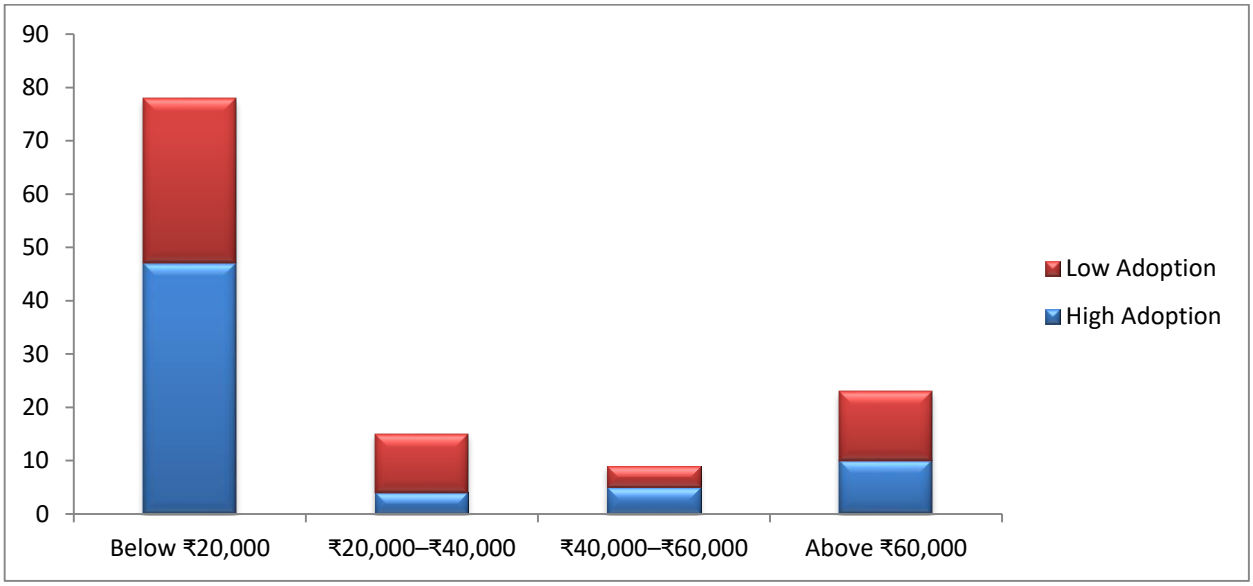


Table-6 Pearson Chi-Square

Test	Value	df	Asymp. Sig. (p-value)
Pearson Chi-Square	6.68	3	0.083

Interpretation:
Since p-value (0.083) > 0.05, there is no significant relationship between income and adoption.

The Chi-square test results indicate that demographic factors such as gender, age, and income do not have a statistically significant relationship with the adoption of domestic digital payment systems in urban Bangalore, as all p-values are greater than 0.05. Therefore, the null hypothesis is accepted.

$H0_2$: Users do not significantly prefer digital payment systems for their daily transactions.

Table-7 Usage of Digital Payment Modes

Payment Mode	**Frequency**	**Percentage (%)**
UPI	78	57.8%
Mobile Wallets	18	13.3%
Debit/Credit Cards	22	16.3%
Internet Banking	17	12.6%
Total	**135**	**100%**

Table-8 Chi -Square Test

Payment Mode	Observed (O)	Expected (E)	$(O–E)^2 / E$
UPI	78	33.75	57.89
Mobile Wallets	18	33.75	7.35
Cards	22	33.75	4.10
Internet Banking	17	33.75	8.31
Total x^2			**77.65**

Table-9 Chi-Square Result

Test	Value	df	p-value
Chi-Square	77.65	3	0.000

The Chi-square goodness-of-fit test was applied to analyse the usage pattern of digital payment modes. The results indicate a statistically significant difference in usage among various payment methods ($\chi^2 = 77.65$, $p < 0.05$). This shows that users significantly prefer certain digital payment modes over others. UPI emerges as the most preferred mode among respondents. Therefore, the null hypothesis is rejected.

$H0_3$: Digital payment systems are not perceived as convenient by users.

Table- 10 One-Sample Statistics

Variable	N	Mean	Std. Deviation
Perception of Convenience	135	3.92	0.88

Chart-4

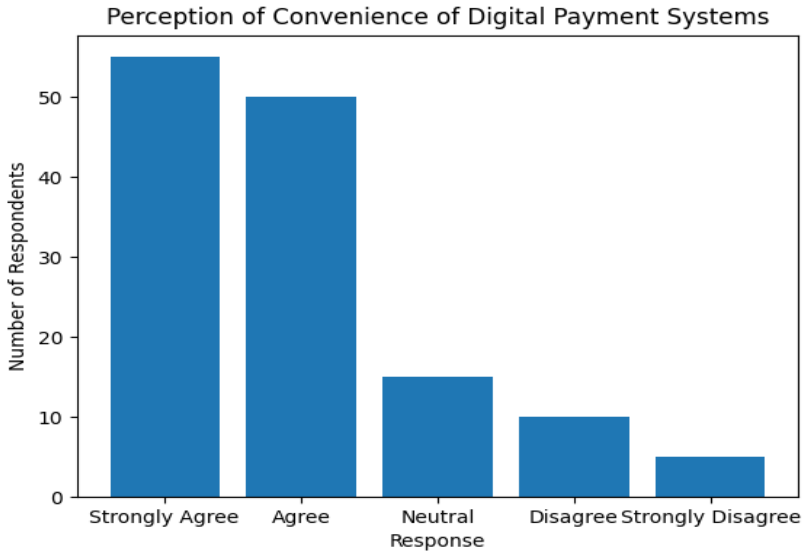


Table-11 One-Sample T-Test

Variable	t-value	df	Sig. (2-tailed)	Mean Difference
Perception of Convenience	11.25	134	0.000	0.92

The one-sample t-test results indicate that the mean value of convenience perception (3.92) is significantly higher than the neutral value of 3. The p-value (0.000) is less than 0.05, indicating statistical significance. Therefore, users perceive digital payment systems as convenient.

6. Results and Discussion

The empirical analysis indicates that demographic variables such as gender, age, and income do not have a statistically significant association with the adoption of digital payment systems ($p > 0.05$). This suggests that digital payment adoption is relatively homogeneous across diverse demographic groups in urban Bangalore.

Further, the analysis of usage patterns reveals that UPI is the most preferred mode of digital payment among respondents, followed by debit/credit cards, mobile wallets, and internet banking. The Chi-square goodness-of-fit test confirms that the observed distribution of usage significantly differs from an equal distribution ($p < 0.05$), indicating a clear user preference for specific payment modes.

In addition, the one-sample t-test results demonstrate that the mean score for perceived convenience is significantly higher than the neutral benchmark (test value = 3; $p < 0.05$). This indicates that users perceive digital payment systems as convenient.

Collectively, the findings suggest that technological attributes, particularly convenience and ease of use, exert a stronger influence on adoption than demographic characteristics.

7. Implications and Recommendations

The findings of the study offer several practical implications for policymakers, financial institutions, and digital payment service providers.

First, given the dominance of UPI, there is a need to strengthen and scale its infrastructure to ensure seamless transaction processing and system reliability. Enhancing backend systems and minimizing transaction failures will be critical to sustaining user trust.

Second, the relatively lower usage of alternative payment modes such as mobile wallets and internet banking indicates the need for targeted awareness and promotional strategies. Service providers should focus on educating users about the benefits and functionalities of these platforms.

Third, security remains a critical concern in digital transactions. Strengthening cybersecurity frameworks and ensuring robust data protection mechanisms can enhance user confidence, particularly for high-value transactions.

Fourth, the absence of demographic disparities suggests that digital payment systems have achieved a certain level of inclusivity. However, continued efforts in digital literacy and user education are essential to maintain and expand this inclusiveness.

Finally, improving user interface design, ensuring multilingual accessibility, and offering incentive-based schemes such as cashback and rewards can further enhance user engagement and adoption.

8. Conclusion

This study examined the adoption, usage patterns, and perceived convenience of digital payment systems in urban Bangalore. The results indicate that demographic variables do not significantly influence adoption, highlighting the widespread acceptance of digital payment technologies across diverse user groups.

The study further identifies UPI as the most preferred mode of digital payment, reflecting its efficiency, accessibility, and real-time transaction capabilities. Additionally, users exhibit a significantly positive perception of convenience, which serves as a key driver of adoption.

Overall, the findings emphasize that technological factors, rather than demographic characteristics, play a dominant role in shaping digital payment behavior. The study contributes to the growing body of literature on digital financial services and provides valuable insights for stakeholders aiming to enhance digital payment ecosystems.

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