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ADOPTION LEVELS OF E-PAYMENT SYSTEMS AMONG E-COMMERCE USERS: A STUDY IN THE INDIAN CONTEXT

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ABSTRACT

This research paper investigates the adoption levels of electronic payment (e-payment) systems among e-commerce users in India. The term 'E-Commerce Users' here refers to 'E-Commerce Consumers' or in simple terms they are the ' Online Shoppers' . Because e-commerce has advanced so quickly, the manner consumers do transactions for their purchases has changed. The widespread use of electronic payment systems, which give customers the ability to conduct safe and effective online transactions, is the main driver of this development. The adoption rates of electronic payment systems among e-commerce customers are examined in this study, along with the variables that affect their choices. The study is based on secondary data, examining trends, barriers, and factors influencing the acceptance and use of digital payment methods. Using a combination of qualitative and quantitative methodologies, the study examines the adoption rates of different e-payment mechanisms and considers factors including security, convenience, trust, and societal value. This study shows that although e-commerce customers are increasingly adopting electronic payment systems, their reluctance to do so is still caused by issues with security and trust. The findings suggest that while e-commerce in India is rapidly expanding, the adoption of e-payment systems varies due to factors such as user demographics, infrastructure limitations, security concerns, and regional differences. The study ends with suggestions for e-commerce companies and the government looking to increase the uptake of e-payments and encourage more participation.

*Keyword***:** E-Payment Systems, E-Commerce Users, Adoption Levels.

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1. INTRODUCTION

Electronic payment systems (e-payment systems) refer to digital platforms and methods that enable users to conduct financial transactions electronically without relying on physical cash or cheques. Due to reasons like the increasing number of smartphones, the extensive internet access, and programs like Digital India that promote a cashless economy, the use of e-payment systems has accelerated significantly in India. Digital wallets (like Paytm and Google Pay), the Unified Payments Interface (UPI), online banking, and credit/debit cards are all examples of e-payment mechanisms. The relevance of e-payment systems in Indian e-commerce is particularly notable. Since India's e-commerce business is one of the fastest-growing in the world, digital payment platforms are now essential for facilitating smooth transactions.

This research paper focuses on understanding the adoption level of electronic payment system by e-commerce users. The users here are basically the e-commerce consumers who purchase goods from e-commerce platforms. Indian customers exhibit a variety of preferences based on demographic factors, economic conditions, and technological access. While urban users, particularly younger demographics, are more inclined toward UPI and digital wallets, rural and older users often remain hesitant, they favor cash-on-delivery (COD) as a payment method. This contradiction draws attention to the difficulties in guaranteeing the fair implementation of digital payment systems.

1.1 E-Payment Systems in the Indian Context

India's e-payment ecosystem has undergone a transformation in recent years, marked by the introduction of Unified Payments Interface (UPI), mobile wallets (e.g., Paytm, PhonePe, Google Pay), and seamless integration with e-commerce platforms. The introduction of UPI by the National Payments Corporation of India (NPCI) in 2016 has revolutionized the digital payment landscape, enabling real-time transactions with minimal user effort.

Cash-on-delivery (COD) is still the most popular payment option for Indian e-commerce customers in spite of these developments. The Reserve Bank of India (RBI) has recently reported that although UPI transactions have increased, a sizable portion of consumers still steer clear of prepaid digital payment methods in favor of the alleged security and ease of paying upon delivery. These trends reflect the hypothesis that while digital payment adoption is growing, offline payment modes still dominate, especially in rural and semi-urban areas.

1.2 Problem Statement

A sizable percentage of Indian consumers still favor offline payment methods like cash-on-delivery, even in spite of the digital payment infrastructure's quick expansion and incorporation into e-commerce platforms. This reluctance to adopt prepaid digital payment methods poses barriers to achieving a truly cashless ecosystem and raises questions about the factors influencing this behavior .Understanding these dynamics is critical to addressing the gap between availability and adoption of e-payment systems in Indian e-commerce.

1.3 Objectives

The following goals are intended to be accomplished by the study:

- To examine the level of adoption of e-payment systems among Indian e-commerce users.
- To analyze demographic and geographic factors (e.g., age, rural vs. urban) influencing customers' payment preferences.
- To assess the extent to which consumers favor cash-on-delivery and other offline payment methods over prepaid digital payment options.

1.4 Significance

This study contributes to the academic discourse on digital payment systems by providing a nuanced understanding of the adoption patterns and preferences of Indian e-commerce users. It is particularly relevant for policymakers who aim to design strategies for enhancing financial inclusion and fostering a cashless economy. E-commerce companies can use the information to lessen their dependency on cash transactions, enhance consumer satisfaction, and optimize payment methods. Furthermore, digital payment providers can use the findings to address user concerns, enhance the usability of their platforms, and tailor their offerings to cater to diverse demographic segments. By bridging the gap in existing literature, this research offers practical recommendations for fostering greater adoption of e-payment systems in India’s rapidly evolving digital economy.

2. LITERATURE REVIEW

2.1 Conceptual Framework

The acceptance of technical advancements, like electronic payment systems, can be better understood by using well-established models such as the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Technology Acceptance Model (TAM).

Technology Acceptance Model (TAM): Proposed by Davis (1989), TAM identifies two primary factors influencing technology adoption: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). In the context of e-payment systems, PEOU concentrates on the ease of use and functionality of the platform, whereas PU refers to the speed, efficiency, and convenience of digital payments.

Unified Theory of Acceptance and Use of Technology (UTAUT): Developed by Venkatesh et al. (2003), UTAUT incorporates additional dimensions such as Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions. This model is particularly relevant in the Indian e-payment landscape, where factors like peer influence, government initiatives, and infrastructure availability significantly affect adoption rates.

These theories offer a starting point for investigating the adoption of electronic payment systems, enabling us to use organized frameworks to examine consumer preferences and behavior.

2.2 Review of Related Studies

- Singh et al. (2019): The impact of demonetization and the significance of government programs like Digital India were highlighted in this study, which examined the factors driving the uptake of digital payments in India. The study revealed that while awareness of e-payment systems increased post-demonetization, trust and ease of access were key barriers to adoption.
- Kumar & Gupta (2021): Examining e-payment usage in urban and rural regions, this study found that younger urban populations are more likely to adopt digital payment methods, while rural users rely heavily on COD due to limited digital literacy and infrastructure.
- Sharma & Sharma (2020): A global perspective on e-payment adoption revealed that while convenience and rewards incentivize usage, concerns about cyber security and transaction failure deter customers. The study also noted that e-commerce firms globally are integrating multiple payment options to cater to diverse preferences.
- Reserve Bank of India (2022): Recent RBI reports indicate a steady rise in digital payment volumes, with UPI accounting for a significant share of transactions. The study's theory is supported by the report's emphasis on COD's continued dominance in rural and semi-urban areas.
- PwC India (2023): According to a PwC India survey, more than 60% of e-commerce users still prefer COD since they don't trust digital payment methods and think that refunds or disputes for prepaid goods are complicated.

3. METHODOLOGY

This study adopts a descriptive research design to analyze the adoption levels of e-payment systems among Indian e-commerce consumers. Descriptive research is particularly suited for studies aimed at understanding and explaining trends, patterns, and behaviors. By using just secondary data, the study aims to extract knowledge from reliable sources that already exist without gathering primary data. This method makes it possible to understand consumer preferences and obstacles regarding e-payment systems in Indian e-commerce on a larger scale.

3.1 Data Collection Sources:

This study relies on secondary data from credible sources, including government reports (e.g., Reserve Bank of India and NITI Aayog), market research studies (e.g., Statista, Gartner, and KPMG India), and industry white papers from organizations like NPCI, PwC India, and e-commerce companies such as Flipkart and Amazon. Insights from these sources on payment preferences, transaction patterns, and usage patterns are essential for examining the adoption of e-payments and customer behavior in Indian e-commerce.

3.2 Data Analysis Sources:

Both statistical and qualitative methodologies are used in the data analysis. To summarize demographic patterns, monitor adoption trends over time, and investigate variations between geographic and demographic groups, statistical approaches like descriptive statistics, trend analysis, and comparative analysis are employed. This research paper employs qualitative methods, including content analysis to examine policy documents, industry reports, and white papers. Thematic analysis is also used to identify patterns in customer behavior, trust issues, and preferences between cash-on-delivery (COD) and prepaid digital payment methods. This approach of mixed-method ensures a comprehensive understanding of e-payment adoption level in the Indian e-commerce landscape.

4. DATA ANALYSIS AND DISCUSSION

4.1 Adoption Trends of E-Payment Systems in India

Over the past ten years, e-commerce and the use of digital payment methods have expanded quickly in India. Although other digital payment methods, such credit/debit card payments and mobile wallets, have also grown significantly, it is concerning that a sizable portion of the population still does not utilize e-payments at all. As a result, many Indians still choose

to pay by COD because they believe it to be a more secure method, and some are even unaware of how to use online payment methods.

- Share of E-Payments and COD on Indian E-commerce Platforms - A significant portion of COD is revealed by a transaction preferences analysis, even if the use of e-payments is growing:

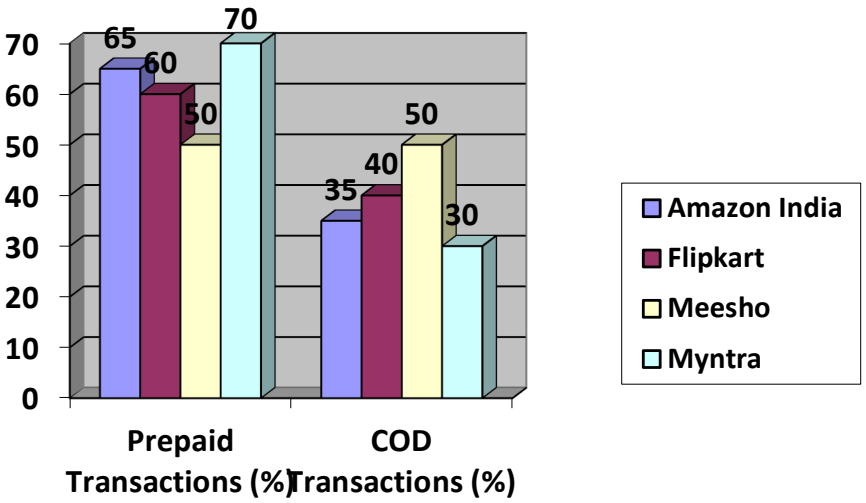

FIGURE 1: SHARE OF E-PAYMENTS AND COD
SOURCE: COMPILED BY THE AUTHOR USING DATA FROM THE ECONOMIC TIMES, KPMG, MYNTRA, TOI (2024)

- Preferred Mode of E-Payments by Indian Consumers - UPI dominates as the most preferred e-payment mode, followed by digital wallets and credit/debit cards.

Mode of Payment	Preference Share (%)
UPI (PhonePe, Google Pay, Paytm)	**45**

Digital Wallets	**25**
Debit/Credit Cards	**20**
Net Banking	**10**

TABLE 1: PREFERRED MODE OF E-PAYMENTS
SOURCE: NPCI (2023)

- Regional Variations-Adoption rates of e-payment systems vary significantly across regions in India. Urban areas, with better internet connectivity, digital literacy, and infrastructure, have higher adoption rates compared to rural areas. This regional divide remains a key challenge for achieving comprehensive digital payment adoption.

Region	**Adoption Rate (%)**	**Factors Influencing Adoption**
Urban Areas	75%	Higher internet access, better digital literacy, availability of smartphones
Rural Areas	40%	Limited internet access, lower digital literacy, low smartphone penetration
Tier 1 Cities	85%	High income, tech-savvy population, access to all types of e-payment systems
Tier 2 Cities	55%	Moderate access to internet, increasing smartphone usage

TABLE 2: REGIONAL ADOPTION LEVELS OF E-PAYMENTS IN INDIA
SOURCE: STATISTA.COM (2023) & PWC INDIA

- Demographic Factors- Demographic factors such as age, income, and education level influence the adoption of e-payment systems. Millennial (25–43 years) are more likely to adopt digital payments due to their comfort with technology. Adoption rates are also greater among better-income groups since they are more likely to have smartphones and internet access.

This table illustrates the adoption rate of e-payment systems across different age groups, with younger consumers being the most active adopters.

AGE GROUP	ADOPTION LEVEL	KEY OBSERVATIONS
GEN Z (<25 YEARS)	**MODERATE TO HIGH**	Early adopters of digital tools; driven by tech familiarity, usage limited by disposable income.
MILLENNIALS(25-43 YEARS)	**VERY HIGH**	Most active segment in digital payment usage; highly adaptable to fintech platforms.
GEN X (44-59 YEARS)	**HIGH**	Rapidly increasing adoption due to convenience and digital literacy.
BOOMERS (60+ YEARS)	**MODERATE**	Cautious adopters but growing user base; highest average transaction values observed

TABLE 3: E-PAYMENT ADOPTION ACROSS AGE GROUPS IN INDIA FOR E-COMMERCE TRANSACTIONS
SOURCE: RESEARCHER COMPILATION USING DATA FROM PWC INDIA, GLOBALDATA INC42 AND STATISTA.

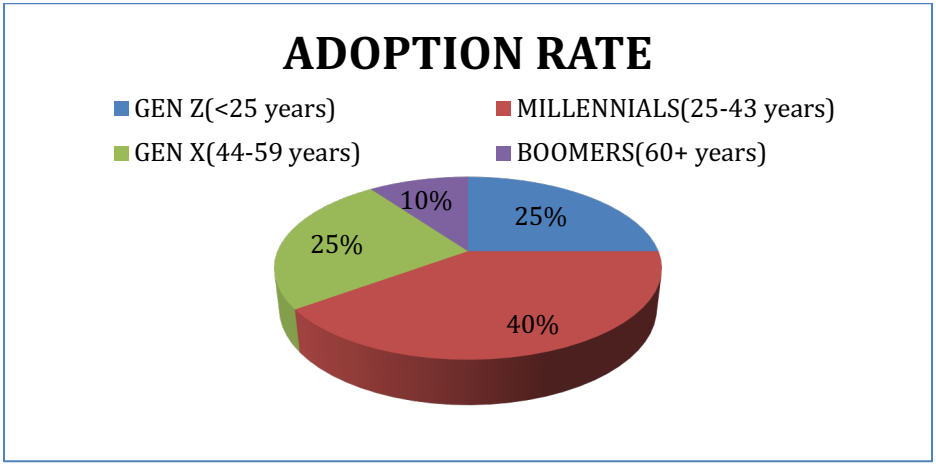

FIGURE 2: ADOPTION OF E-PAYMENT SYSTEMS BY AGE GROUP IN INDIA (2024)
SOURCE: COMPILED AND VISUALIZED BY THE AUTHORS BASED ON DATA FROM PWC INDIA (2024), GLOBAL DATA VIA INC 42 (2023) AND STATISTA (2023)

- Security and Trust Issues- Despite the growth in digital payments, concerns over security remains a significant barrier, particularly among older consumers and those in rural areas. A 2023 survey conducted by PwC revealed that 30% of respondents cited concerns over online fraud and lack of trust in digital transactions as their main reason for not adopting e-payment systems.

4.2 Comparison with Existing Literature

The findings align with studies by Singh et al. (2019) and Sharma & Sharma (2020), which observed growing adoption of prepaid methods but persistent reliance on COD. Even while UPI is still the most popular, the overwhelming preference for COD on sites like Flipkart and Meesho emphasizes the disconnect between e-payment systems' accessibility and reliability, particularly in rural areas.

4.3 Trends and Patterns

- Age-wise Analysis: Young urban consumers (18–35 years) predominantly use UPI and wallets due to their convenience and cashback offers. Older demographics (above 45 years) show resistance, preferring COD for its perceived safety and control.
- Platform-wise Variations: Meesho and other platforms that serve budget-conscious and semi-urban/rural consumers see a larger volume of COD transactions. Conversely, Myntra and Amazon India, targeting urban users, see a higher share of prepaid transactions.
- Mode Preferences: Due to its smooth integration and ease of use, UPI is the most popular option across all demographics. However, as UPI increases its market share, preference for digital wallets is diminishing.

4.4. Rural vs. Urban Disparities

- Urban Adoption: Better infrastructure, accessibility, and literacy all contribute to the strong uptake of prepaid electronic payment systems in urban areas.
- Rural Hesitancy: In rural regions, COD remains dominant due to limited digital literacy, network issues, and trust deficits in e-payment systems. These trends resonate with findings by Kumar & Gupta (2021).

4.5 Implications for E-commerce and Digital Payments in India

- For E-commerce Firms: Platforms must optimize payment options to cater to varying customer needs. Offering incentives like discounts for prepaid transactions could encourage adoption.

- For Providers of Electronic Payments: Measures that foster trust, such strong customer service, fraud prevention systems, and user-friendly interfaces, help allay user worries.
- Policy Implications: To close the rural-urban divide, policymakers should prioritize building infrastructure and improving internet literacy in rural regions. Programs like Digital India should continue to target these issues effectively.

The results underscore the complex interplay of demographic, technological, and behavioral factors in shaping e-payment adoption in Indian e-commerce. This analysis offers actionable insights for stakeholders, furthering the goal of a more inclusive digital economy.

5. FINDINGS

From the analysis of secondary data, the following key findings emerge:

1. *Rapid Growth in E-Payments*: UPI and mobile wallets have played a major role in the notable expansion of e-payment systems in India. But adoption varies, with younger and urban groups leading the way.
2. *Regional Disparities*: India's urban and rural areas still have a significant digital gap, despite the fact that adoption rates are higher in big cities and metropolitan areas. This disparity might be closed by initiatives to enhance digital literacy and internet infrastructure in rural areas.
3. *Demographic Variations*: E-payment systems are more likely to be adopted by younger, wealthier, and tech-savvy consumers. Adoption rates could be raised via targeted initiatives that target elderly and rural communities.
4. *Security Concerns*: Trust issues related to online fraud and security continue to be the biggest barrier to adoption. Building confidence requires more robust security protocols and awareness-raising initiatives about safe online transactions.

6. CONCLUSION

This study reveals significant growth in e-payment adoption in India, driven by UPI and digital wallets, yet highlights persistent disparities across demographics and regions. The use of digital payments is dominated by urban, younger, and tech-savvy people, whereas older and rural consumers prefer cash-on-delivery because of concerns with trust, infrastructure, and digital literacy. Security concerns, particularly fears of fraud and transaction failures, further hinder widespread adoption. Targeted efforts including strengthening digital literacy, putting strong security measures in place, and upgrading rural internet infrastructure are crucial to closing these disparities. In order to accelerate India's shift to a cashless economy, boost its e-commerce ecosystem, and improve its standing in the global digital economy, stakeholders may promote greater confidence and inclusivity by removing these obstacles. This research offers valuable insights for

policymakers, e- commerce platforms, and payment providers to optimize strategies for wider e-payment adoption.

7. RECOMMENDATIONS

1. Encourage Digital Literacy: Government and corporate sectors should fund digital literacy initiatives to inform people about the advantages and security of electronic payments in order to increase usage in rural areas.
2. Improve Security Features: To lower fraud worries, payment systems should place a high priority on improving security procedures and informing customers about safe transaction practices.
3. Targeted Campaigns for Older Consumers: Special campaigns targeting older consumers and those less familiar with technology can help increase adoption rates.
4. Build Rural Infrastructure: Improving mobile and internet access in rural regions would facilitate the process of bridging the adoption gap between India's rural and urban communities.

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