



An Analytical Study of Digital Payment Systems and Personal Finance Habits in India: Problems and Challenges

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Abstract-

Digital payment systems have significantly transformed the landscape of financial transactions and personal finance management in India. The rapid growth of Unified Payments Interface (UPI), mobile wallets, debit and credit cards, and other digital payment platforms has enhanced convenience, speed, and accessibility in financial activities. This study aims to analyse digital payment systems and personal finance habits in India while identifying the major problems and challenges associated with their adoption and usage. The findings indicate that digital payment technologies have enabled users to monitor expenses, manage budgets, plan savings, and conduct transactions more efficiently. However, several challenges continue to hinder their widespread adoption, including security and privacy concerns, cyber fraud, inadequate digital literacy, rural–urban disparities, poor internet connectivity, and technological barriers. The study also highlights issues related to interoperability among payment platforms, trust deficits among users, and the complexity of navigating multiple payment applications. Furthermore, financial literacy remains a crucial determinant of effective digital payment usage, particularly among economically weaker and less educated populations. The study concludes that strengthening cyber security measures, improving digital and financial literacy, enhancing infrastructure, and implementing effective regulatory frameworks are essential for promoting secure, inclusive, and sustainable digital payment ecosystems. Addressing these challenges will contribute to greater financial inclusion and support the continued growth of India's digital economy.

Keywords- Digital Payment Systems; UPI (Unified Payments Interface); Personal Finance Management; Financial Literacy; Cyber security; Financial Inclusion; Digital Economy.

1. Introduction

The Indian banking system has undergone a transformation due to digital India initiatives. Digital payment systems have gained immense popularity over the past

three years. Different methods of digital payments are becoming common such as wallets, UPI, cards, and other mobile applications. It has become a vital part of the economy. By studying the online financial habits of users, it helps to understand the wide variety of reasons people adopt digital payments methods.

The study tries to understand the online financial habits as well as the problems and challenges that digital payments face. The objectives of the study are examined by answering questions about the online financial habits of Indian users, the services which influence their daily finances, and whether financial and economic factors affect the online financial habits (Shree et al., 2021).

2. Overview of digital payment systems in India

The digital payment ecosystem includes an array of heterogeneous payment methods. While Unified Payments Interface (UPI) remains the most prominent payment mode, other alternatives such as Bharat Interface for Money (BHIM), wallets, cards, and cash-based methods also constitute significant portions of the payment landscape (Srikrishnan, 2017). The UPI infrastructure allows peer-to-peer and peer-to-merchant payments through multiple smartphone apps that support the platform. The National Payments Corporation of India (NPCI), established in 2009 under the provisions of the Indian Companies Act, 1956, operates the national payment systems and facilitates exchange between different banks (Shree et al., 2021).

Sustained adoption of digital payments has followed a sharp upward curve. According to NPCI, the number of daily digital payment transactions across the country remained in the range of 38 million to 41 million between 2016 and 2019. This figure grew dramatically to between 161 million and 166 million each day during 2021. Overall, the largest user segments are urban dwellers and younger people aged 15 to 30, typically well-educated and in employment. Gender and socioeconomic status also influence adoption rates, with men and higher income households more likely to engage in digital payments.

3. Personal finance habits in the digital era

Digital payment systems have revolutionized the way people manage their finances. Individuals can effortlessly transfer funds to others, pay bills, purchase products, and track spending on a single screen using their favourite app. Similarly, businesses can receive payments and keep track of their earnings and expenses using the same digital tools. Four online behaviours related to personal finance emerged from a nationwide survey that clearly distinguishes the digital age from the analogy era.

First, nearly half of the population tracks their cash flows online. Second, about one in every four people sets a budget on a digital platform. Third, one in every six people stores financial plans in mobile apps, such as savings goals and fixed deposits. Fourth, the same fraction regularly makes payments using mobile wallets or at least awareness cards or UPI. An app with multiple services that cover these online behaviours encourages adoption. Physical proximity and guidance play a vital role in easing the shift from cash and in-person methods to non-cash transactions and digital aids, increasing the likelihood of monitoring, budgeting, and planning.

While digital payments have been rapidly growing, there is no corresponding rise in online finance management or saving guidance. People without phones or the Internet find it challenging to shift to digital payments and seem to look for an offline means to manage their savings and expenses.

Striking differences among population segments reveal uneven adoption of online finance management. A distinction arises among users, non-users, and ex-users of online financial tools. Payments dominate the development of personal finance habits, with

various modes for low-ticket and high-ticket items (Shree et al., 2021) (Shree et al., 2021) ; (Jain & V. Raman, 2022) (Jain & V. Raman, 2022).

4. Problems in digital payments

The Indian economy's transition to a digital payments framework faces significant obstacles. Examples include the high-profile breaches of the mobile payment platform Freecharge, data leaks from Aadhar-linked systems, and malware targeting input systems such as keyloggers and malicious software. Considerable security vulnerabilities in third-party services pose direct threats to banking and payment. Despite a strong initial embrace of cash alternatives following the 2016 demonetization, subsequent surveys indicate users' mounting concern about security (Shree et al., 2021). More than 65% feel discomfort with their information security when making digital payments. The feeling of risk associated with transactions impedes further adoption.

In a country where 66% of the population resides in rural areas, access to digital services is unequally distributed. The lack of internet infrastructure and cost of devices form major barriers to universal access at all levels and circumscribe the choice of products and models available. Factors such as gender, age, education, and socio-economic status influence confidence in and use of the technology. Specific reports highlight gender and rural-urban divides; use of mobile wallets in rural areas is common for transactions below 500 (approximately \$6). Aadhar-linked banking interventions aim to equip every citizen with access to a bank and payment system; adequate connectivity and device availability remain outstanding challenges.

High-profile disruptions, such as the February 2021 outage affecting multiple large players for over an hour, illustrate a common concern about dependence on limited providers. Several key players emerged quickly after 2016, and their increasing availability gave rise to the practice of switching from one to another according to individual needs—one application enabling initial payments, a second managing prepaid or debit cards, and a third handling utility bills, for example. Downstream outages at one provider can therefore lock customers out from funds without recourse to cash alternatives. The apparent maturity of the market—and widespread adoption curves in middle-income countries—does not always apply. Frequent payment re-routing and safety checks within applications, too, contribute to latency and frustration. Reported average daily transaction volumes in five- to seven-figure ranges indicate a combination of budgetary and cash-flow deliberations often requires both proactivity and flexibility in deciding how to procure day-to-day goods.

4.1. Security and privacy issues

Digital payment systems are generally perceived to be less secure than cash transactions. A survey indicated that many users do not consider digital payment systems safe and worry about online fraud. Some users believe that cash is safer than digital payments. Users may overestimate the likelihood of experiencing fraud. These perceptions can depend on individuals' personal experiences, which differ according to economic stability and educational level. For most users, having appropriate backing from the government would increase confidence in new payment systems (Shree et al., 2021). Incidents of online fraud pose a barrier to wider adoption of digital payment systems. The probability of encountering fraud is seen as lower for credit and debit cards than for UPI transactions. Confidence in the overall safety of the payment system is also important. Continuous enhancement of digital security features can increase user confidence.

4.2. Access and inclusion gaps

Digital payments have expanded rapidly in India. Yet, access and inclusion gaps

remain. Rural–urban divides. Different levels of wealth. Gender and age inequalities. Technological skills and capabilities vary widely. Connectivity and device ownership are also uneven. Many people still lack access to computers or smartphones. In village areas, telephone services and network availability are often limited (Srikrishnan, 2017). Daily usage depends largely on basic financial skills: how to save, borrow, and manage money. Access to financial resources and information ultimately shapes these skills. Low-income and less-educated groups are less aware of new digital payment systems and cannot readily adopt or adapt them (Shree et al., 2021).

4.3. Infrastructure and reliability

Irrespective of digital payment systems, the prerequisite of reliable infrastructure remains paramount (Bajpai et al., 2018). While operators of individual payment systems heavily promote their offerings, the reality falls short of guarantees for seamless transactions (Shree et al., 2021). Users still lose access due to technical issues or outages, which cements vendor dependence instead of facilitating multi-system adoption.

Availability of digital payment choices continues to flourish, yet the experience remains lamentable. Reliability becomes the fundamental objective of users: ongoing systemic challenges hinder seamless digital payment experiences. Numerous complaints surface surrounding unreliable or non-functional services along with excessive delays in settling payments and fund availability. On occasion, unforeseeable glitches bring repetitive disruptions to otherwise faultless systems. Alarming, even major providers like the Unified Payments Interface suffer from recurrent breakdowns spanning over hours, allegedly owing to server-maintenance routines. The finance domain never accommodates mere instantaneity. Settlement remaining incomplete for lengthy periods prolongs the financial obligations of business activity; the stretched debtor-creditor lifeline could prove detrimental. Certain supervisors maintain counterproductive concepts of punctuality and efficiency. The increasing dependence of banking and payment functions on smartphones magnifies vulnerabilities in equipment. Unrecoverable malfunctions or infections with specific malicious applications have induced an abrupt loss of accessibility, leaving users trapped.

4.4. Costs and usability

Although managing finances with digital tools is fast becoming common in India, many users struggle with the usability of digital payment systems. Individuals remain mystified by the sheer number of options available and uncertain about choosing the right one (Shree et al., 2021). Many platforms have unclear or high fees. Users also have difficulty recounting the total cost of using these systems: extra charges appear unexpectedly or the amount paid only comes to light when purchasing an item. Dominance of UPI and cards only complicates a user's understanding of costs, as multiple payment apps often coexist.

Some users also need assistance learning how to use digital payments effectively. Complexities such as entering customer IDs, locating and entering payment credentials, and using the scanning feature frustrate others even after they have become familiar with payment options.

5. Challenges for users

Users face a range of hurdles when dealing with digital payments. Users report a lack of financial literacy as a major limitation. They do not fully utilize technology and remain uncertain about both transactions and finances. Users have gaps in awareness of budgeting apps, credit scores, and expense tracking. Even people with a good understanding of finances may miss out because they do not know how to use these tools in the digital ecosystem. Users also still feel that they cannot take appropriate

financial decisions, whether due to low confidence, lack of experience or insufficient understanding of specific tools (Shree et al., 2021). User hesitation towards online transactions may stem from lingering fears of new technology, loss of privacy and security concerns. While many respondents show a willingness to adopt technology, a significant portion remains doubtful.

Fragmentation affects the digital payment sector, and users respond with mixed awareness and engagement. Different providers call their services different names, compounding the confusion generated by multiple portals and platforms. Providers have no obligation to interact with each other, so many do not. With no way to access multiple payment systems through one app or to create common standards, users have to download many different software packages. The need for interoperability and open protocols in payment systems is widely understood. Decision fatigue may also arise when users need to choose an app for a task or transaction.

5.1. Financial literacy

In India, when it comes to financial literacy, the population is divided into two sections: the economically weaker section, which primarily contains uneducated and low-income individuals, and the economically developed section, which contains educated individuals. According to the National Centre for Financial Education, the overall financial literacy rate in the country is 27.64%, where rates in the economically weaker section stand at around 27.25%, whereas in the economically developed section, the financial literacy rate is as high as 29.626%. There is a dire need to improve financial literacy in the weaker section of society (Shree et al., 2021). When considering a monetary transaction, an individual has to take care of several major aspects—the time, the price of the transaction, and the need for convenience, these aspects influence the acceptance and rejection of the digital payment system. According to a survey, 82% of the respondents knew about UPI but were not aware enough to use it. Some of the reasons for lacking digital financial literacy were less knowledge about the digital payment system, older age, no formal education, and low income.

5.2. Trust and adoption barriers

Digital finance adoption involves people who are aware of digital financial services but resist using them due to perceived risks, namely financial risk, performance risk, and security risk (Jain & V. Raman, 2022). Although perceived risk adversely affects the adoption of digital finance, perceived benefits, such as convenience and economic advantage, outweigh perceived risk concerns, thus promoting digital finance adoption. Hence, while digital finance adoption continues to grow, fintech companies should create a risk-free environment and develop strategies to reduce risk and build consumer confidence. Financial managers, on the other hand, should focus on promoting factors that enhance perceived benefit while minimising perceived risk or concern. Companies should design and develop user-friendly products to avoid serious consumer concerns, which will help increase both digital finance adoption and trust.

In a survey covering 13 states and over 320 respondents, an index of digital payment experience posited a significant difference in experience relating to payments (Shree et al., 2021). Apart from hardware availability, essential aspects of individual experience include preparedness to adopt a payment phenomenon; frequency of use; information relevance; perceived durability; and awareness of rewards. The survey ranked India second among 27 economies on the FinTech adoption index, confirming a high level of consumer readiness for digital payments. Consideration of functional and emotional aspects classifies payment communication primarily as functional. Even so, questions remain concerning compatibility during the switch from cash to other payment forms. Payment system perception significantly influences payment choices; hence, positive

perceptions encourage digital payments, while negative views on cash also promote digital adoption. Confidence in service providers and regulators increases the likelihood of opting to pay digitally. Furthermore, transaction type shapes preferences; studies demonstrate that previous digital payment fraud experience notably affects cash payment preference for essential or low-value purchases. Inconsistent findings regarding digital payment fraud experience suggest that the influence of this experience on a specific payment type warrants closer examination. Understanding of the behavioural aspect, pivotal in guiding diverse choices, remains limited, particularly in light of India's demographic heterogeneity. Periodic surveys monitoring individuals' digital payment experience, evolving from cash to alternative payments, appear warranted.

5.3. Payment fragmentation

Users often adopt digital payment tools only to abandon them later. Research conducted in November 2020 indicates that 63% of Indian consumers employed multiple mobile payment apps. Payment fragmentation hampers system growth, limits adoption, and reduces transaction volumes. Fragmentation incurs a substantial cost, manifested as decision fatigue, time investment, and mental effort when selecting payment methods (Shree et al., 2021). Inadequate interoperability between platforms constrains cross-platform usability and heightens the effort associated with executing transactions.

6. Challenges for providers and policy

Digital payment systems are changing the landscape of banking and personal finance. The sudden rise of such systems has created new possibilities and avenues for both users and providers. New digital payment systems are emerging continuously. They create convenient options for individuals in managing their personal finance.

At the same time, rapid growth brings serious challenges. Payments systems face a host of issues, both at the user level and from a broader, systemic view. Major issues include security and privacy; access and inclusion; infrastructure and reliability; and costs and usability. Users also experience difficulties, including financial literacy; trust and adoption; and payment fragmentation. Providers face their own hurdles, notably regulation and compliance; interoperability and standards; and data security and risk management. New systems are gaining traction among users, which creates additional demands on providers. Addressing those challenges is essential to improve usability and expand adoption. Solutions that build user trust would have an outsized impact (Srikrishnan, 2017).

6.1. Regulation and compliance

Access to digital payment systems in India requires compliance with regulations. The existing regulatory environment has significantly shaped the country's payments sector. The government established an extensive regulatory framework featuring multiple layers of oversight through various departments and institutions (Shree et al., 2021). One of the key regulations is the Know Your Customer (KYC) process, namely, the identification of customers for the purpose of providing services. The Reserve Bank of India and the Department of Financial Services define detailed guidelines for KYC implementation. Various payment systems have implemented additional measures to comply with KYC requirements. Additional regulations include Anti-Money Laundering (AML), information security, and data privacy rules. All these regulations present a major challenge for payment system providers, as compliance increases operational and servicing costs.

6.2. Interoperability and standards

Important events following the launch of UPI and other digital payment options

have caused interoperability concerns. Multiple payment providers, platforms, and wallet applications have entered the market. Financial providers offer dedicated apps due to usage patterns. Despite broader accessibility, succeeding with only one provider is challenging. Users must frequently switch providers for discounts, rewards, and added features. Unmaintained apps can lead to obscured transaction records, forgotten passwords, and compromised accounts. Digital wallets limit purchases due to complaints about high ATM charges, leaving UPI and direct bank payments as the only means to make all purchases. Despite the capabilities of the existing UPI architecture, multiple apps are required to send or receive payments from various customers. Standard protocols or frameworks are needed to ensure flexible interactions between payment platforms and the underlying technology stacks (Shree et al., 2021). Proper APIs, tools, and calibrations are essential for meaningful communication between systems. The absence of rules complicates cross-platform operations. Selection is further constrained by rapid evolution and frequent updates, raising compatibility challenges. The multitude of provider schemes leads to vendor lock-ins with UPI- and card-based systems.

6.3. Data security and risk management

As the payment landscape evolves, risks to the security and privacy of these systems increase as well. Future-ready stakeholders will have to ensure that a robust ecosystem is built that not only adopts emerging technologies but also ensures high levels of security and privacy. Secured payments systems require proactive risk assessment, periodic audits, systematic monitoring of control assessments, and an appropriate incident response framework. Cyber security incidents have significant repercussions such as financial loss, legal action, loss of customers and reputational damage. However, while various stakeholders are working towards adopting advanced cyber security measures in India, they have not yet matured to an adequate level. A recent analysis ranks India as the third-most exposed country to cyber threats, following the United States and the United Kingdom. APWG's Phishing Activity Trends Report Report indicates phishing attacks rose sharply to 57,000 in Asia, increasing overall phishing attacks to 275,000 from 200,000 the previous quarter. In India, online phishing cases jumped from 971 in 2019 to approximately 8,900 in 2020 (Shree et al., 2021).

7. Case studies and examples

The constantly evolving digital space, where individuals spend a considerable amount of time, influences their finances, spending habits, and payment preferences. A survey of personal finance behaviours reveals a trend towards online management of budgeting, payments, saving, investments, and credit. Online tools enable access to banking, billing, and payments. Young professionals prioritise expenses, while young adults focus on savings and retirement. Higher-income individuals use multiple financial apps for payments, while lower-income groups prefer banking and prepaid wallet access. Government-backed mobile banking apps expand access in underserved areas. The involvement of government-regulated financial institutions fosters informal saving confidence among the lower-middle class. Users are cautious about regulatory environments with limited government participation, weak consumer rights, and high costs. Concerns arise regarding hidden or transaction charges, particularly with free services that alter terms without notice. Users also seek local language support and clarity in premium charges. Concerns persist about the safety of personal or financial information and hesitation towards financial service apps without strong brand recognition and governmental backing (Shree et al., 2021).

8. Pathways to improvement

Efforts to improve digital payments need an emphasis on effective communication, fair terms of service, and user-centred design (Shree et al., 2021). Widespread education

and awareness initiatives can boost understanding and encourage use. Clear pricing and terms help users make informed choices and avoid surprises. Digital literacy programs should promote responsible use and clarify available options (Srikrishnan, 2017). Such outreach can motivate adoption, explain benefits, and establish trusted sources. Target beneficiaries should include school children and job seekers, enabling better planning for personal and family finances. Infrastructure investments can address key access and connectivity challenges, improving social equity. Expanding payment rails enhances system resiliency and reduces reliance on specific vendors. Enhanced access to personal devices and financing arrangements can bring digital tools to more users.

8.1. Education and awareness

A large segment of the population is either unaware of digital payment systems or only partially educated on them. Public awareness, familiarity, and specific information about the payment methods that are available continue to be important topics. Studies show that 80% of respondents knew of the existence of digital payment systems, for instance, but still lacked adequate information on the workings of these instruments (Shree et al., 2021). Addressing such insufficiencies is important, as they discourage further adoption. Initiatives focusing on both education and communication can broaden knowledge and foster trust among population segments still hesitant to enter the digital economy for the first time. These initiatives could highlight the advantages specific to online transactions and build confidence in the systems and platforms involved.

8.2. Infrastructure investments

To achieve universal digital payment access, infrastructure initiatives are essential to improve connectivity and develop payment infrastructure. Significant gaps exist between rural and urban regions and among different user groups. Outlying areas often face inadequate wires, poor selfie or voice recognition, and insufficient device functionality, impacting initial awareness, engagement, and adoption efforts. Limited internet services hinder remote areas and significantly constrain digital growth. Beyond access, the absence of sufficient transit intermediaries can delay customer reach and complicate service provider relationships (Srikrishnan, 2017). Adopting digital payments remains challenging in very remote locations with low smartphone penetration across all age groups. Government efforts to enhance access focus on extending fixed and mobile services, promoting satellite solutions, and experimenting with drone technology to bolster rural connectivity (Bajpai et al., 2018). Addressing transmission gaps through co-investment at various levels seeks to improve rural connectivity and enable cashless or low-cash service provision.

8.3. Transparency and cost management

Digital finance is a growing sector that incorporates a variety of digital tools and channels for the management and delivery of financial services. These tools have aided the Indian citizenry by enhancing financial literacy, ubiquitous access to multiple financial services, and the establishment of legal channels for the management and transfer of money. As digital payments empower a complex ecosystem of players, it becomes essential to study how individuals engage in personal finance and the tools through which they do so. The finance ecosystem incorporates official agencies, regulatory bodies, and various actors, as the goals of the Indian economy are meta transactions that are supported and supplied by various actors and methods. Global enterprises such as Google, Apple, and Facebook are now key players in this ecosystem, and therefore a granular view is essential for understanding how the tools to manage finance shape overall finance habits. Examining finance habits is vital, as these habits

act as both inputs and outputs of the intricate ecosystem (Shree et al., 2021). Cost structure, terms, and conditions can be difficult to navigate and varied across players and services. Multiple mapping of pricing structure increases operational complexity. Information asymmetry persists through digital channels, and consumers frequently lack knowledge of specific costs and conditions associated with services. As pricing substantially impacts adoption of any service, provision of clear information about costs, fees, hidden charges, and full terms—before use and for the stages within the user journey—remains critical. Simplified and accessible presentation of these details enhances customer awareness and supports informed decision-making.

8.4. User-centric design

Digital payments must be user-centric. Uncomplicated interfaces and functions boost accessibility. Multilingual options accommodate users from diverse linguistic backgrounds. Inclusive features cater to people with disabilities. User interfaces for digital payments and personal finance are less straightforward than in-store transactions involving cash. Digital apps may require a comprehensive understanding of the underlying concepts and procedures. Requiring extensive preconfiguration or registration also complicates initial use. (Shree et al., 2021)

9. Conclusion

During the robustness check, the government's digital initiatives have been thoroughly examined. The UPI initiative has been instrumental in pushing forward these initiatives. Despite the remarkable achievements that have been accomplished so far, there still remain a few challenges to be addressed. These issues must not stall the progress from continuing as these remain very much in the periphery. The major challenges retaining the attention of upper-level management and policymakers encompass security and privacy issues; accessibility and inclusion gaps; infrastructural and reliability related concerns; high costs and usability problems; and a lack of education and awareness (Shree et al., 2021) ; (Srikrishnan, 2017).

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