

# The Role of Digital Payment Systems in Advancing Financial Inclusion in India

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## Abstract

The emergence of digital payment systems has been a powerful tool in the advancement of financial inclusion in India, enabling millions of individuals who were previously outside the banking system to access formal financial services. People in underserved areas are capable of participating in the digital economy owing to these systems, which enable secure, efficient, and readily accessible transactions. However, obstacles like negative attitude, lack of self-efficacy, and trust issues still prevent widespread adoption, especially among underserved groups. Addressing these barriers is crucial to ensure that the benefits of digital financial services are equitably distributed, thereby fostering inclusive economic growth. This study examines the drivers of digital payment adoption using the Theory of Planned Behavior (TPB), a well-established framework for understanding technology adoption along with individual decision-making. TPB is particularly suitable for this research as it elucidates how attitudes, subjective norms, and perceived behavioral control (PBC) shape individual's intentions to adopt new technologies. By exploring these factors, the study aims to understand how such intentions contribute to greater financial inclusion among underserved populations. Furthermore, the study provides deeper insights into how these behavioral intentions support financial inclusion among marginalized groups by expanding the model to incorporate trust as a mediator, as it is a key determinant of people's willingness to use digital financial services, particularly in situations where concerns about security, dependability, and institutional credibility persist. A structured survey was conducted with 436 respondents in Uttar Pradesh, exceeding the intended sample size of 384. Respondents were people aged 21 and above who had access to mobile phones or digital payment systems. Uttar Pradesh was chosen because of its large population, regional differences in banking access, and strategic importance to national financial inclusion efforts. Structural Equation Modeling was used to evaluate the hypotheses established. The major findings indicate that the attitude toward digital payment systems and PBC have significant impacts on the intention to use these systems, while subjective norms play an insignificant role. Moreover, behavioral intention strongly predicts financial inclusion, and the mediating role of trust further strengthens this relationship. The findings imply that increasing trust in digital financial services is critical for promoting financial inclusion in India. These findings are especially significant to policymakers, financial service providers, and technology developers looking to create more effective ways to increase digital payment acceptance and close financial access gaps in India's underprivileged regions. The study has wider implications for emerging economies confronting issues in digital infrastructure, trust, and financial inclusion, despite its focus on India. The behavioral drivers highlighted, particularly the significance of trust, can help shape digital finance strategies in nations with similar socioeconomic and technological characteristics.

**Categories:** Banking and financial services, Social Innovation, Fintech and Cryptocurrencies

**Keywords:** digital payment, financial inclusion, attitude, trust, intention

## Introduction

India is undergoing a dramatic digital change, particularly in its financial sector, which is fueled by rapid technological adoption and strong government support. This transition accelerated dramatically following the 2016 demonetization, which caused many individuals and organizations to switch to digital ways of payment due to a lack of physical currency ([Reserve Bank of India, 2017](#)). Since then, the country has witnessed a significant increase in the development and adoption of digital financial services. Launching the Unified Payments Interface (UPI) by the National Payments Corporation of India, which enables users to link numerous bank accounts and make instantaneous peer-to-peer payments, was one of the most significant milestones. As of October 2024, UPI alone processed over ₹23.49 lakh crore in transactions across more than 16.5 billion payments in a single month, showcasing its massive adoption ([Ministry of Finance, 2024](#)). In addition to UPI, digital interactions with financial and government services have become more accessible, especially in underserved and rural areas, with the help of platforms like BHIM (Bharat Interface for Money), Aadhaar-enabled Payment Systems (AePS), and apps like DigiLocker and UMANG (Unified Mobile Application for New-age Governance). These developments are consistent with the wider goals of the Digital India program, which emphasizes improving digital literacy, digital infrastructure, and inclusive access ([Ministry of Electronics and IT, 2022](#)). In this context, India's initiative

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towards a cashless economy-characterized by financial transactions predominantly executed via digital platforms such as mobile wallets, cards, and online banking-is pivotal for enhancing transparency, broadening financial inclusion, and mitigating the shadow economy, which includes unreported or informal economic activities that bypass taxation and regulation (Ali, 2024) (Medina and Schneider, 2018).

From peer-to-peer transfers to e-commerce transactions, digital payment systems have become an essential part of modern economies, contributing to financial inclusion, reducing cash usage and promoting economic growth. These systems facilitate payments made electronically or through digital channels, as opposed to physical cash transactions. Electronic payment (both the payer and payee using a digital device, such as a computer or smartphone, debit or credit cards, and others) transfer of funds between payment accounts. Digital payments are fast and easy to complete, with a tap, click, or swipe. Also, there should be an account for both the payer and payee with a bank, online banking method, electronic device (e.g. computer, internet-enabled mobile) from where they can make the transaction as well, as mode of transmission for the electronic transaction to take place (Khaitan, 2024). Digital payments provide various advantages, such as faster transaction speeds, higher security, lower operational expenses, and greater convenience for both customers and enterprises. As a result, there is an increasing expectation that digital payment methods will be available, particularly for facilitating faster, safer, and more cost-effective transactions (Joshi, 2017).

Improving financial inclusion is critical to achieving larger socioeconomic goals, spurring economic growth, and reducing poverty. Access to formal financial services enables people to make investments reliably, obtain credit, invest, and manage financial risks-all of which are critical components in breaking the cycle of poverty. For example, access to mobile banking and digital payment platforms has allowed small-scale farmers and micro-entrepreneurs in rural India to become more involved in the economy (Demirguc-Kunt et al., 2018). Furthermore, the Reserve Bank of India emphasizes that digital financial services have greatly aided the inclusion of women and low-income households, allowing them to access government subsidies and formal savings mechanisms (Reserve Bank of India, 2021). As a result, financial inclusion serves as both a development goal and a catalyst for achieving broader economic and social goals. The World Bank defines it as follows: "Financial inclusion is the availability of practical and affordable financial services and products that meet the needs of individuals and businesses (including credit, insurance, savings, payments and transactions), and is provided in a fair and sustainable way." Financial inclusion has been acknowledged to make it possible for 7 of the 17 Sustainable Development Goals (Financial Inclusion, 2025). According to the 2023 assessment from the Global Financial Inclusion Index, there has been marginal improvement in global financial inclusion across the 42 markets studied when compared to the previous year. The evaluation identifies three main supports for financial inclusion: the financial system, employers, and the government. The second support highlights how financial providers boost global financial inclusion. It examines the accessibility and usability of various financial products and services essential for achieving this goal. The evaluation shows that countries with digital financial systems are making the quickest progress in financial inclusion (World Bank et al., 2023). So, to improve fair financial access worldwide, companies in this field-including those that offer digital payments-should focus on areas that lack digital services in their global growth plans (Huszárik, 2024).

## Literature review

### *Digital Payment System and Financial Inclusion*

The rise of digital payments in India has seen a major boost from innovations like the UPI and the e-Rupee. These new tools back the government's "Digital India" plan to cut down on cash use and get more people into the banking system (Govind et al., 2024). India's digital payment scene has grown fast, with all digital payments jumping from 2,071 crore in FY 2017-18 to 18,737 crores in FY 2023-24 growing at 44% each year on average and in just the first five months of FY 2024-25, transactions hit 8,659 crores (Ministry of Finance, 2024). Indian payment products are gaining popularity due to their security, seamless integration with online markets, and increasing adoption by banks, financial institutions, and technology companies (Gandhi, 2024).

Digitalization has significantly enhanced the accessibility of financial services. In India, the rise of digital payment technologies has simplified access to fundamental financial services, enabling increased participation in the formal financial sector (Sille et al., 2024). The transition from cash-based to cashless transactions is crucial in promoting financial inclusion. This transition enables the delivery of more efficient and user-friendly financial services, which can help to reduce poverty and boost economic growth (Goldfinch, 2024). Digital payment methods help eliminate several barriers to accessing financial services. These include the absence of nearby banking facilities, geographic isolation, and the high transaction costs associated with traditional financial systems (Garg et al., 2024). Particularly in areas with limited infrastructure, digital technologies have offered competitive alternatives to traditional banking by utilizing mobile networks, biometric identification, and real-time processing. Although many people are aware of the advantages of digital financial services, acceptance of these services is still unequal, particularly in rural areas. An array of socio-technical obstacles still prevents widespread adoption of digital platforms, despite their availability. Low levels of digital literacy, inadequate

infrastructure, insufficient internet access, and language hurdles are some of these difficulties (Sharma and Dixit, 2024).

#### *Theory of Planned Behavior*

Originally developed in 1980 as the Theory of Reasoned Action, the Theory of Planned Behavior (TPB) aims to predict a person's intention to perform a specific behavior at a given time and place (Ajzen, 1985). The goal was to provide an explanation for all actions that individuals can control using this theory. Central to this model is the concept of behavioral intent, which is influenced by attitudes regarding the likelihood that a behavior will lead to a desired outcome, as well as personal evaluations of the pros and cons of that result. This psychological framework is designed to forecast and explain how people are likely to act in certain situations. The theory has garnered significant support from research across various fields. Studies indicate that intentions can be effectively predicted by attitudes, subjective norms, and perceived behavioral control (PBC). Collectively, these factors account for a substantial portion of the variability in actual behavior (Ajzen, 1991).

Attitude is an individual's judgment of a behavior, which can be both favorable and unfavorable. Beliefs about the behavior's outcomes and their attractiveness influence this evaluation (Ajzen, 1991). Consumer attitude significantly impacts their intention to adopt digital payment services. According to a survey, consumer attitudes and subjective norms account for around 60% of the intention to use digital payment services (Ashour et al., 2023). Positive attitudes toward digital payments significantly boost the intention to use these services. For instance, perceived usefulness and convenience are critical in shaping favorable attitudes (Firdaus and Doloksaribu, 2022). Subjective norms explore how social factors affect individual choices to use digital payments. (Putri et al., 2022). It significantly influences the intention to use mobile payment systems, especially when users have access to the service and receive adequate information. Positive social influences can encourage adoption, highlighting the importance of communication in promoting mobile payment usage (De Luna et al., 2023). PBC plays a critical role in the early adoption and continued use of digital payment systems. It influences users' confidence in their ability to navigate these technologies, which is essential for fostering innovative behaviors and enhancing user engagement. PBC significantly influences the adoption of digital payment methods. Consumers who believe they have the ability to use these technologies efficiently are more inclined to adopt them. This includes factors such as familiarity with technology and confidence in using digital platforms (Tribhan, 2024).

### Research gap

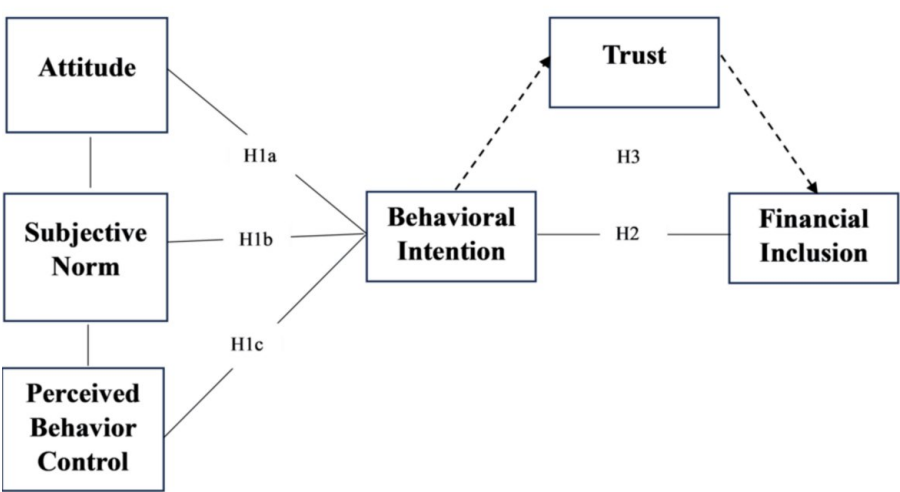
Despite a growing body of research on digital payment systems and their role in promoting financial inclusion in India, several critical gaps remain. While infrastructure-related barriers such as access to the internet, device availability, and banking reach have been thoroughly investigated, there is not enough comprehension of the behavioral factors that influence the decision of individuals to use digital payments, particularly when examined through the lens of established theoretical models such as TPB. Although TPB has been used in technology adoption research, its basic constructs-attitude, subjective norms, and PBC-have not been fully explored in the context of financial inclusion. Furthermore, although trust is acknowledged as a key factor in digital technology adoption, its role as a mediator between behavioral intention and financial inclusion remains underexplored. This study addresses this gap by integrating trust into the TPB framework, offering a more nuanced understanding of how intention translates into actual inclusion. Furthermore, existing research tends to overlook contextual problems such as language barriers, cultural views, and socioeconomic restrictions, all of which have a particular impact on Indian financial behavior. Moreover, while TPB has a strong theoretical foundation, only a few studies in this field use rigorous empirical methodologies such as Structural Equation Modeling (SEM), which is ideal for models including latent variables. This study intends to fill this methodological gap by testing the hypothesized relationships using SEM.

### Conceptual framework and hypothesis formulation

This study employs the TPB to investigate the behavioral factors influencing digital payment adoption in India. It provides a more direct analysis of individual behavioral intentions, even though other frameworks such as the Diffusion of Innovation Theory (DOI) and the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) can be used in similar scenarios. Hedonic motivation and price value are additional constructs that UTAUT2 includes, however they might not be as relevant in the Indian context, where the main focus is financial inclusion. On the other hand, DOI concentrates on how innovations spread among populations, which might ignore the psychological aspects of adoption that are unique to each person. TPB is particularly suited for this research as it focuses on individual decision-making processes, emphasizing how attitudes, subjective norms, and PBC shape behavioral intentions, which in turn predict actual behavior. Attitude refers to a person's feelings toward the use of digital payment systems, such as whether or not they believe that such platforms are beneficial. Social pressures from friends, family, or society to adopt these systems are known as subjective norms. PBC considers factors including a person's level of tech proficiency and their available resources when determining how confident they are in their ability to use digital payments. These elements come together to create

behavioral intention, which hints at whether someone will start using digital payments. Furthermore, the role of trust as a mediator in the adoption process is critical. As digital environments are often perceived as high-risk due to concerns about privacy, data security, and technological reliability, trust helps reduce uncertainty and encourages adoption (Shaw, 2014). It has been shown to mediate the relationship between intention and behavior, especially in digital transactions where users lack face-to-face interaction with service providers (Pennington et al., 2003). Therefore, incorporating trust into the TPB model provides a more robust and contextually relevant framework for understanding user behavior in digital finance.

This model as shown in Figure 1 of digital payments highlights the mental and social factors that drive adoption. It puts trust front and center as a way to reach wider social and economic goals.



**FIGURE 1: Conceptual and Theoretical Model**

Adapting pre-established TPB relationships and incorporating trust as a mediator, the following hypotheses are proposed in the context of the current study:

- H1a: Attitude toward digital payment systems positively influences behavioral intention to use them.
- H1b: Subjective norms positively influence behavioral intention to use digital payment systems.
- H1c: PBC positively influences behavioral intention to use digital payment systems.
- H2: Behavioral intention positively impacts financial inclusion.
- H3: Trust mediates the relationship between behavioral intention and financial inclusion.

## Research Method

### Data collection and sample

The study's target group was Indian digital payment platform users aged 21 to 45. This age group was chosen because they are more likely to use mobile technologies and digital banking services. Participants who lived in India, fell within the defined age range, and had used any type of digital payment (e.g., UPI, mobile wallets, online banking) in the previous six months were eligible. Individuals with no prior experience with digital payment systems, as well as those who were not in the specified age bracket, were excluded. The sample comprises individuals with varying levels of education, awareness, and experience. This study focused primarily on Uttar Pradesh (UP), one of India's most populous states, to acquire insights from a region with a diverse socioeconomic profile and a rising but still emerging digital infrastructure. UP provides a unique framework for studying the uptake of digital payments because it includes both rural and urban inhabitants, making it an indicator of greater national financial inclusion efforts. A structured questionnaire using the Google form was created and used for gathering primary data which is attached in Table 12 (see in appendices). Individuals received the questionnaire through different online platforms, and we got 443 responses in return. After acquiring the responses and sorting them, 436 were found valid for further analysis. In 1977, Cochran developed a method that is regarded appropriate for estimating sample size when the study population is huge. Using the calculation, it was determined

that the minimal sample size for this research was 384 (Cochran, 1977). Thus, a sample size of 436 is appropriate for this particular study. We used the convenience sampling approach, which had been recommended in previous studies (Alrawad et al., 2023), (Amnas et al., 2023), (Bajunaied et al., 2023), and (Senyo and Osabutey, 2020). Table 1 presents the demographic profile of the individuals who were part of this survey.

| Demographic Variable | Groups              | Frequency | Percentage |
|----------------------|---------------------|-----------|------------|
| Gender               | Male                | 322       | 73.9       |
|                      | Female              | 114       | 26.1       |
| Age                  | 21-25               | 124       | 28.4       |
|                      | 26-30               | 158       | 36.2       |
|                      | 31-35               | 96        | 22.0       |
|                      | 36-40               | 36        | 8.3        |
|                      | 41-45               | 22        | 5.0        |
| Education            | High School         | 12        | 2.8        |
|                      | Graduation          | 122       | 28.0       |
|                      | Post Graduation     | 212       | 48.6       |
|                      | Ph.D.               | 80        | 18.3       |
|                      | Others              | 10        | 2.3        |
| Occupation           | Student             | 176       | 40.4       |
|                      | Private Employee    | 102       | 23.4       |
|                      | Government Employee | 56        | 12.8       |
|                      | Businessman         | 52        | 11.9       |
|                      | Private Employee    | 50        | 11.5       |
| Income               | Below 20,000        | 156       | 35.8       |
|                      | 20,000-40,000       | 72        | 16.5       |
|                      | 40,000-80,000       | 96        | 22.0       |
|                      | 80,000-1,00,000     | 74        | 17.0       |
|                      | Above 1,00,000      | 38        | 8.7        |

**TABLE 1: Demographic Profile of the Respondents**

### Data analysis technique and measures

To achieve the research objectives, this study incorporated a construct to TPB. Thus, covariance-based structural equation modelling (CB-SEM) was used to verify and confirm the proposed theory. The aspects of the study include attitude, subjective norms, PBC, trust, behavioral intention, and financial inclusion. The scales for the items range from 1 (strongly disagree) to 5 (strongly agree), with each dimension measured using a five-point Likert scale. A five-point Likert scale was used in this study because it provides a balance between measurement precision and respondent cognitive ease, especially for heterogeneous populations in growing countries such as India (Joshi et al., 2015). It reduces respondent fatigue while collecting a wide range of agreement levels, which is critical for surveying people with different levels of education and digital literacy. The appendix contains all scales with the coding of each measuring item used in this study. Attitude, subjective norms, PBC, behavioral intention, trust, and financial inclusion were all measured using items that were modified from previously approved scales and then contextualized for the study's emphasis on digital payment systems. Furthermore, the quantitative data was examined using statistical methods. IBM SPSS AMOS 21, Microsoft Excel, and SPSS 23 were used to analyze the data that was gathered.

## Results

For the measurement and structural model analysis, a CB-SEM approach was employed. Initially, we assessed the reliability and validity of the data; subsequently, we evaluated the measurement and structural models; and finally, we conducted mediation analysis.

### Reliability and validity analysis

The measurement model is a key component of CB-SEM since it verifies the constructs used in the study by assessing their reliability and validity. Reliability refers to the consistency and stability of a measurement instrument, while validity assesses the extent to which an instrument accurately measures what it is intended to measure (Bolarinwa, 2015). Both are essential for generating reliable and generalizable results. Cronbach's alpha and composite reliability scores are used here to measure the reliability and internal consistency of scales by calculating the correlations between their items. A Cronbach's alpha value of 0.7 or higher typically implies reliability in social sciences (Hair et al., 2014). Composite reliability, which is often used in SEM to find the reliability of latent constructs, should be higher than 0.7 and is regarded as the point of acceptance (Fornell and Larcker, 1981). Cronbach's alpha coefficients ranged from 0.748 to 0.917 and composite reliability scores in this study ranged from 0.792 to 0.899, as indicated in Table 2. These values demonstrate reliability and internal consistency among the constructs.

| Constructs                       | Items | Mean | S.D. | $\lambda$ | CA    | CR    | AVE   |
|----------------------------------|-------|------|------|-----------|-------|-------|-------|
| Attitude (AU)                    | AU1   | 4.09 | .804 | 0.807     | 0.804 | 0.819 | 0.603 |
|                                  | AU2   | 4.09 | .851 | 0.673     |       |       |       |
|                                  | AU3   | 4.15 | .853 | 0.839     |       |       |       |
| Subjective Norm (SN)             | SN1   | 4.16 | .782 | 0.732     | 0.748 | 0.792 | 0.560 |
|                                  | SN2   | 4.16 | .795 | 0.685     |       |       |       |
|                                  | SN3   | 4.19 | .838 | 0.822     |       |       |       |
| Perceived Behavior Control (PBC) | PBC1  | 3.96 | .903 | 0.864     | 0.825 | 0.866 | 0.684 |
|                                  | PBC2  | 3.79 | .954 | 0.797     |       |       |       |
|                                  | PBC3  | 4.15 | .839 | 0.818     |       |       |       |
| Behavioral Intention (BI)        | BI1   | 4.16 | .784 | 0.767     | 0.906 | 0.863 | 0.612 |
|                                  | BI2   | 4.30 | .745 | 0.827     |       |       |       |
|                                  | BI3   | 4.08 | .890 | 0.754     |       |       |       |
|                                  | BI4   | 4.29 | .787 | 0.78      |       |       |       |
| Trust (TU)                       | TU1   | 4.23 | .797 | 0.811     | 0.862 | 0.849 | 0.653 |
|                                  | TU2   | 4.17 | .789 | 0.773     |       |       |       |
|                                  | TU3   | 4.16 | .792 | 0.839     |       |       |       |
| Financial Inclusion (FI)         | FI1   | 4.15 | .767 | 0.824     | 0.917 | 0.899 | 0.692 |
|                                  | FI2   | 4.20 | .745 | 0.841     |       |       |       |
|                                  | FI3   | 4.16 | .745 | 0.851     |       |       |       |
|                                  | FI4   | 4.16 | .772 | 0.810     |       |       |       |

**TABLE 2: Reliability and Convergent Validity Analysis**

S.D. = Standard Deviation;  $\lambda$  = Factor Loadings; CA = Cronbach's Alpha; CR = Composite Reliability; AVE = Average Variance Extracted

Convergent validity is created based on the high degree of correlation among indicators of a construct. A construct's Average Variance Extracted (AVE) value must exceed the threshold of 0.50 to establish convergent validity (Hair et al., 2021). Table 2 shows that all constructs in the model have AVE values above 0.50, indicating good convergent validity. Discriminant validity draws the attention on the extent to

which the concepts involved in the construction of the model are different from one another. The discriminant validity was assessed using the Fornell-Larcker criterion, which involved assessing the square root of each AVE loaded along the diagonal by off-diagonal items. The diagonal elements in Table 3 indicates the square root of each construct's AVE. To ensure discriminant validity, these values should exceed the off-diagonal correlations in their corresponding rows and columns. All constructs i.e., Attitude (0.776), Subjective Norm (0.748), Perceived Behavior Control (0.827), Behavioral Intention (0.782), Trust (0.808), and Financial Inclusion (0.832), meet this criterion. Given that the diagonal values (square roots of AVE) are consistently higher than the inter-construct correlations in their rows and columns, the constructs indicate a good discriminant validity.

|     | AU    | SN    | PBC   | BI    | TU    | FI    |
|-----|-------|-------|-------|-------|-------|-------|
| AU  | 0.776 |       |       |       |       |       |
| SN  | 0.708 | 0.748 |       |       |       |       |
| PBC | 0.698 | 0.495 | 0.827 |       |       |       |
| BI  | 0.664 | 0.469 | 0.633 | 0.782 |       |       |
| TU  | 0.698 | 0.600 | 0.565 | 0.760 | 0.808 |       |
| FI  | 0.544 | 0.359 | 0.563 | 0.709 | 0.669 | 0.832 |

TABLE 3: Discriminant Validity Analysis

AU = Attitude; SN = Social Norms; PBC = Perceived Behavior Control; BI = Behavioral Intention; TU = Trust; FI = Financial Inclusion

Assessment of measurement model

First-order confirmatory factor analysis (CFA) was used to determine the measurement model in order to evaluate construct validity, CR, and model fit. Additionally, the study used a number of statistics, including CMIN, GFI, AGFI, NFI, CFI, and RMSEA, to ascertain the indicators of goodness-of-fit. Table 4 displays the model fit indices for the measurement models.

| Fit Indices | Recommended Value | Observed Value |
|-------------|-------------------|----------------|
| $\chi^2/df$ | <5                | 4.964          |
| GFI         | >0.90             | 0.921          |
| AGFI        | >0.80             | 0.853          |
| NFI         | >0.90             | 0.937          |
| CFI         | >0.90             | 0.949          |
| RMSEA       | <0.08             | 0.072          |

TABLE 4: Measurement Model Assessment

$\chi^2/df$  = chi-square/Degrees of Freedom Ratio; GFI = Goodness-of-Fit Index; AGFI = Adjusted Goodness-of-Fit Index; NFI = Normed Fit Index; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation

The measurement model's fit indices suggest an acceptable fit between the data and the hypothesized model, based on widely accepted thresholds. The chi-square/degree of freedom ( $\chi^2/df$ ) ratio is 4.964, which falls within the acceptable range of less than 5, indicating a reasonable fit (Marsh and Hocevar, 1985). The Goodness of Fit Index (GFI) is 0.921, exceeding the recommended value of 0.90 (Hu and Bentler, 1998), suggesting that the model explains a substantial proportion of the observed variance. Similarly, the Normed Fit Index (NFI) and Comparative Fit Index (CFI) are 0.937 and 0.949, respectively, both above the threshold of 0.90 (Hair et al., 2010) (Bentler, 1990), further indicating strong model fit. The Adjusted Goodness of Fit Index (AGFI) is 0.853, which is exceeding the ideal threshold of 0.80 (Byrne, 2016), indicating a moderate model fit. Lastly, the Root Mean Square Error of Approximation (RMSEA) is 0.072, which is below the stringent threshold of 0.08, suggests an acceptable fit (Browne and Cudeck,



1992). Overall, the observed fit indices collectively support the adequacy of the measurement model.

Assessment of structural model

Several statistics, including CMIN, GFI, AGFI, NFI, CFI, and RMSEA, were employed to determine the structural model's goodness-of-fit indicators as mentioned below in Table 5. The model fit indices demonstrate an acceptable and strong overall model fit, as most observed values meet or exceed the recommended thresholds. The chi-square/df ( $\chi^2/df$ ) ratio is observed at 4.991, which falls within the acceptable range of less than 5, indicating a reasonable fit of the model to the data (Hair et al., 2021). The GFI is 0.930, exceeding the recommended value of 0.90, signifying that the model explains a large proportion of the variance in the data. Similarly, the AGFI, with a value of 0.871, surpasses the threshold of 0.80, confirming an adequate adjustment for model complexity.

Additionally, the NFI is 0.939, and the CFI is 0.950, both exceeding the recommended threshold of 0.90, which indicates a strong improvement over the baseline model and an excellent comparative fit. The RMSEA is 0.076, which is below the threshold of 0.08, confirming a good approximate fit of the model in the population. These results collectively validate the structural model's adequacy and suggest that the hypothesized relationships align well with the observed data, supporting further analysis and interpretation.

| Fit Indices | Recommended Value | Observed Value |
|-------------|-------------------|----------------|
| $\chi^2/df$ | <5                | 4.991          |
| GFI         | >0.90             | 0.930          |
| AGFI        | >0.80             | 0.871          |
| NFI         | >0.90             | 0.939          |
| CFI         | >0.90             | 0.950          |
| RMSEA       | <0.08             | 0.076          |

TABLE 5: Structural Model Assessment

GFI = Goodness-of-Fit Index; AGFI = Adjusted Goodness-of-Fit Index; NFI = Normed Fit Index; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation

| Hypotheses | Structural Path                                   | Path Estimate | P-values | Result        |
|------------|---------------------------------------------------|---------------|----------|---------------|
| H1a        | Attitude → Behavioral Intention                   | 1.089         | .013     | Supported     |
| H1b        | Subjective Norms → Behavioral Intention           | -.833         | .202     | Not Supported |
| H1c        | Perceived Behavior Control → Behavioral Intention | .455          | ***      | Supported     |
| H2         | Behavioral Intention → Financial Inclusion        | .796          | ***      | Supported     |

TABLE 6: Results of Hypotheses Testing

The hypotheses testing results in Table 6 reveal insightful relationships between the constructs under study. The effect of Attitude (AU) on Behavioral Intention (BI) (H1a) is significant and supported, as indicated by a path estimate of 1.089 and a P-value of 0.013. However, the relationship between Subjective Norms (SN) and Behavioral Intention (BI) (H1b) is not supported, with a path estimate of -0.833 and a P-value of 0.202, implying that social pressures may not strongly influence behavioral intentions in this context. The hypothesis H1c, which posits that Perceived Behavioral Control (PBC) affects Behavioral Intention (BI), is strongly supported with a path estimate of 0.455 and a highly significant P-value ( $P < 0.001$ ). Additionally, the influence of Behavioral Intention (BI) on Financial Inclusion (FI) (H2) is also significant and supported, with a path estimate of 0.796 and a highly significant P-value ( $P < 0.001$ ).

Mediation analysis

Trust plays a critical role in mitigating users' security concerns when adopting digital payment systems.



Users in situations with low financial literacy and technology exposure are frequently hesitant to utilize digital technologies due to concerns about fraud, data misuse, or system failure. However, trust-both in the technology and the organizations that support it-serves as a psychological buffer against these concerns. For example, in India, the UPI has been mostly successful due to customer's trust in government-backed systems and features such as two-factor authentication, biometric verification, and real-time transaction alerts. These techniques improve perceived security and reliability, boosting trust (Ministry of Finance, 2024). When users perceive that a system is secure, supported by respectable organizations, and operates transparently, they are more inclined to accept and use it. This research has used mediation analysis to examine the role of trust in converting behavioral intentions of the individuals into financial inclusion. Two steps were followed to examine the mediating effect as recommended by Baron and Kenny (Baron and Kenny, 1986). As shown in Table 7, behavioral intention (BI) has a strong positive effect on trust (TU) ( $\beta = 0.780$ ,  $P < 0.001$ ), and both BI ( $\beta = 0.621$ ,  $P < 0.001$ ) and trust ( $\beta = 0.223$ ,  $P = 0.001$ ) significantly influence financial inclusion (FI), indicating that trust plays a mediating role in the relationship between BI and FI. The first stage involves investigation of the proposed model without the use of trust as a mediator, and results show that behavioral intention had a positive and substantial total effect on financial inclusion ( $c = 0.829$ ,  $P = 0.004$ ) as shown in Table 8. The model was run again in the second stage using trust as a mediator and direct effect was calculated ( $c' = 0.648$ ,  $P = 0.004$ ) as shown in Table 9. The two-tailed significance of total, direct, and indirect effects of 500 bootstrap samples were computed.

Based on the analysis, it can be inferred that while the overall influence of BI on FI has a standardized value of 0.829, this impact is lowered to 0.648 when trust is present as a mediator. According to Table 10, there is 0.181 mediation by trust. Thus, we can accept H3 as shown in Table 11.

|    |    | Path Estimate | P-Value |
|----|----|---------------|---------|
| TU | BI | .780          | ***     |
| FI | BI | .621          | ***     |
| FI | TU | .223          | .001    |

TABLE 7: Regression Weights: (Group Number 1-Default Model)

TU = Trust; BI = Behavioral Intention; FI = Financial Inclusion

|    | BI   | TU   |
|----|------|------|
| TU | .796 | .000 |
| FI | .829 | .228 |

TABLE 8: Standardized Total Effects (Group Number 1-Default Model)

TU = Trust; BI = Behavioral Intention; FI = Financial Inclusion

|    | BI   | TU   |
|----|------|------|
| TU | .796 | .000 |
| FI | .648 | .228 |

TABLE 9: Standardized Direct Effects (Group Number 1-Default Model)

TU = Trust; BI = Behavioral Intention; FI = Financial Inclusion

|    | BI   | TU   |
|----|------|------|
| TU | .000 | .000 |
| FI | .181 | .000 |

TABLE 10: Standardized Indirect Effects (Group Number 1-Default Model)

TU = Trust; BI = Behavioral Intention; FI = Financial Inclusion

Based on Tables 8 and 9, it can be inferred that while the overall influence of BI on FI has a standardized value of 0.829, this impact is lowered to 0.648 when trust is present as a mediator. According to Table 10, there is 0.181 mediation by trust. As shown in Table 7, behavioral intention (BI) has a strong positive effect on trust (TU) ( $\beta = 0.780$ ,  $P < 0.001$ ), and both BI ( $\beta = 0.621$ ,  $P < 0.001$ ) and trust ( $\beta = 0.223$ ,  $P = 0.001$ ) significantly influence financial inclusion (FI), indicating that trust plays a mediating role in the relationship between BI and FI. Thus, we can accept H3 as shown in Table 11.

| Hypothesis | Structural Path                                    | Path Estimate | P-Values | Result    |
|------------|----------------------------------------------------|---------------|----------|-----------|
| H3         | Behavioral Intention → Trust → Financial Inclusion | 0.648         | 0.004    | Supported |

TABLE 11: Result of Mediation Analysis

Discussion

This study advances our knowledge of the behavioral factors influencing the adoption of digital payments and how they affect financial inclusion in India, one of the leading and most socioeconomically diverse rising economies in the world. India has made impressive progress in expanding access to formal financial institutions, particularly for underprivileged or previously unbanked communities, primarily due to the growth of digital financial services. This study offers a comprehensive framework to explain how behavioral components at the individual level impact use of digital financial instruments by utilizing the TPB and incorporating trust as a mediating factor. This study offers significant insights into the factors influencing financial inclusion, particularly the roles of attitude, subjective norms, PBC, behavioral intention, and trust.

The results offer a nuanced perspective on the TPB constructs. Hypothesis H1a, which postulated that attitude positively influences behavioral intention, was supported ( $\beta = 1.089$ ,  $P = 0.013$ ). This highlights the critical role of positive perceptions toward digital payment services in shaping the intention to use them. A favorable attitude reflects a strong belief in the benefits, accessibility, and convenience of financial products, which can significantly impact users' willingness to adopt them. Previous studies, such as those by Ajzen (Ajzen, 1991) and Fishbein and Ajzen (Fishbein and Ajzen, 2010), have consistently demonstrated that attitudes are strong predictors of intention, reinforcing the relevance of this construct in the current study. In the Indian context, where awareness and familiarity with digital technologies are growing but not yet widespread, these insights are particularly important.

Interestingly, subjective norms (H1b) did not show a significant influence on behavioral intention ( $\beta = -0.833$ ,  $P = 0.202$ ). This suggests that social pressures, such as family or peer expectations, do not significantly motivate individuals to engage with digital payment options in this context. This finding diverges from the Theory of Planned Behavior's original proposition but aligns with research suggesting that in emerging markets, financial behavior may be driven more by personal confidence and experiential factors than by societal expectations (Abrahamse and Steg, 2011). This transition may be particularly evident in India, where widespread smartphone adoption, rising digital literacy, and the growth of personalized fintech platforms have resulted in increased autonomy in financial decisions. Although India has long been considered a collectivist country, data suggest that digital revolution is gradually encouraging more individualistic financial behavior-particularly among younger, urban, and digitally connected individuals (Srite and Karahanna, 2006). As digital ecosystems grow, subjective norms may lose impact in favor of more direct cognitive drivers such as perceived control, institutional trust, and personal attitude, emphasizing the importance of understanding TPB components in the context of changing socio-cultural and technological environments.

Perceived behavioral control (H1c) was strongly supported ( $\beta = 0.455$ ,  $P < 0.001$ ), underscoring its role as a powerful predictor of intention. This indicates that individuals' belief in their ability to access and

effectively use digital payment services significantly drives their intention to adopt them. As Taylor and Todd ([Taylor and Todd, 1995](#)) suggested, PBC reflects not only self-efficacy but also the availability of resources, such as smartphones, internet access, and institutional support. In resource-constrained environments, such control becomes crucial-not just for adoption but for sustained engagement with digital services. This is particularly relevant in emerging markets, where resource accessibility plays a pivotal role in fostering financial inclusion.

The results for H2, which found that behavioral intention significantly influences financial inclusion ( $\beta = 0.796, P < 0.001$ ), highlight the importance of strong user intention in driving the adoption of digital payment services. This aligns with TPB, which posits that intention is the most immediate antecedent to behavior ([Ajzen, 1991](#)). Furthermore, empirical evidence from studies in developing economies has consistently demonstrated that individuals with a clear intent to use digital payment are more likely to take proactive steps toward inclusion ([Demirguc-Kunt et al., 2018](#)). This implies that in the context of digital finance, raising awareness alone is insufficient; instead, measures aimed at fostering trust, education, and design are needed to increase intention.

Furthermore, H3, which investigated the mediating role of trust in the relationship between behavioral intention and financial inclusion, was supported ( $\beta = 0.648, P = 0.004$ ). This underscores the significance of trust as a mediating factor between behavioral intention to use digital payment services and financial inclusion. One important factor influencing consumers' acceptance of digital modes of payment is trust. When consumers believe a digital payment platform is dependable and trustworthy, they are more inclined to use it ([Rawat et al., 2024](#)). As such, this finding supports the argument that trust serves as both a catalyst and a safeguard for financial inclusion, fostering greater engagement with financial services.

Overall, the findings suggest an integrated behavioral paradigm that advances both theory and practice. The study theoretically extends TPB by focusing on trust as a fundamental mediating mechanism, providing a more detailed explanation of how intention translates into inclusive financial behavior. In practice, the research shows that developing positive attitudes, permitting perceived control, and establishing trust are more effective techniques than relying solely on social influence. To achieve long-term acceptance, governments and fintech providers must move their attention away from advertising campaigns and toward user education, intuitive design, and effective customer service. It highlights that financial inclusion is about more than just infrastructure or access; it is also about aligning digital financial services with the behavioral realities and expectations of the intended users.

## Implications

This study adds to the theoretical depth of the TPB by empirically evaluating its constructs in the context of digital payment adoption in an emerging market. Additionally, the use of trust as a mediating variable enhances TPB by addressing a critical psychological feature. The findings highlight the importance of concentrating on user experience design, education, and support mechanisms that promote positive attitudes and a sense of control over digital transactions for practitioners in the fintech sector and financial service providers. Prioritizing trust-building strategies including fee transparency, data security, fraud prevention, and prompt customer service is important. Digital platforms that are user-friendly, culturally adaptable, and accessible across literacy levels are more likely to translate intention into persistent usage, especially among rural and low-income people. The results underline the necessity of focused digital financial inclusion programs that extend beyond the installation of infrastructure from a policy perspective. Campaigns to foster trust, laws protecting consumers, and basic digital literacy initiatives aimed at marginalized populations should be the main focus of government initiatives. Adoption and trust will be further increased by policies that support data protection, institutional responsibility, and equitable dispute resolution. Digital financial involvement in underserved areas can also be greatly impacted by concentrating on enhancing PBC through support services, internet connectivity, and smartphones availability.

## Limitations and future research direction

While this study sheds light on the behavioral determinants of digital payment adoption and its relationship to financial inclusion, some drawbacks should be addressed. The study concentrates primarily on a specific region or demographic group in India. While this enables for in-depth study, it limits the finding's applicability throughout the country's different populations. Cultural, linguistic, and infrastructure disparities across areas may have varied effects on behavioral intentions and trust in digital systems. The data were collected through a cross-sectional survey, which examines user perceptions at a specific point in time. This limits our ability to make causal inferences or assess how intentions and behaviors change over time. A longitudinal approach would provide more dynamic information about digital payment usage patterns. The use of self-reported data raises the possibility of social desirability and recall bias. Participants may misrepresent their use or intention to use digital payment systems, or they may underreport problems. This may have an impact on the accuracy of behavioral intention and trust components. Although trust was included to the TPB framework, other pertinent factors including perceived risk, technological anxiety, digital literacy, and financial incentives were left out. These

elements might be important, particularly in rural or low-income areas. Participants in the study were implicitly assumed to have at least basic access to digital infrastructure (such as mobile phones and internet connectivity), which may not accurately represent the situation in underprivileged or distant places. This limitation restricts the findings to people who are already on the verge of being digitally included.

To build on the findings of this study, future research should use longitudinal designs to look at how behavioral intentions toward digital payments vary over time, particularly in response to technological, economic, or policy developments. To improve generalizability, future studies could compare different regions of India or developing nations with similar socioeconomic profiles. This would help identify contextual elements that influence trust and adoption differently. Incorporating other crucial variables, such as financial literacy, perceived risk, or cultural influences, could provide a more complete picture of the barriers and facilitators to financial inclusion. Furthermore, investigating the role of emerging technologies, such as blockchain-based payment systems and artificial intelligence-powered financial tools, may give light on their potential to transform digital payments and inclusion. Demographic characteristics may influence the relationships described in the TPB framework. Future research should look into how gender, age, and education level affect the strength of intention or trust, particularly among rural and semi-urban communities. Although trust as a mediator was quantitatively validated in this study, qualitative research (such as focus groups or interviews) may provide more in-depth understanding of how trust is established or undermined in the context of digital financial services, particularly among demographics that have not been included in the past or among first-time users. Future research may also look into the influence of certain government policies or programs (e.g., PM Jan Dhan Yojana, Digital India) on digital payment acceptance and financial inclusion to see which interventions have measurable outcomes.

## Conclusions

This study examined the factors driving digital payment system adoption in India and how they promote financial inclusion, especially for underserved groups. It was guided by the objective of identifying the major behavioral drivers that motivate people to use digital payments and understanding how these behaviors affect overall financial inclusion outcomes. Grounded in the TPB and extended through the inclusion of trust as a mediating variable, the study produced some significant findings. Attitude and PBC were found to significantly influence behavioral intention, while subjective norms had no significant effect—suggesting that digital payment adoption in India may be driven more by personal efficacy and confidence than by social expectations. Behavioral intention, in turn, significantly predicted financial inclusion, reaffirming the TPB's core proposition that intention is a key driver of behavior. Furthermore, trust was identified as a significant mediator, strengthening the pathway between behavioral intention and actual financial inclusion. These results contribute in multiple ways. By integrating trust in the fintech context, the study theoretically expands on TPB and offers a more thorough comprehension of user behavior in emerging economies. From a practical standpoint, it emphasizes how crucial it is to encourage positive user attitudes, boost users' sense of control over digital tools, and establish institutional trust in order to support the broad adoption of digital payment systems. The findings encourage the creation of inclusive, trust-based digital financial literacy initiatives and infrastructure expenditures that cater to underserved and rural communities at the policy level. In a nutshell, this study advances our understanding of digital financial behavior and provides a behavioral paradigm that supports India's broader attempts at digital inclusion and equitable economic development.

## Appendices

| Constructs                 | Items | Questions                                                                                     | Sources                                                                           |
|----------------------------|-------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Attitude                   | AU1   | Digital payment is advantageous in every domain of transactions.                              | (Srivastava and Singh, 2022)                                                      |
|                            | AU2   | Digital payment provides convenience, and it is very trendy.                                  |                                                                                   |
|                            | AU3   | Use of digital payment is the really thrilling and nice experience.                           |                                                                                   |
| Subjective Norm            | SN1   | Most people in my social network use eco-friendly products.                                   | (Xu et al., 2022)                                                                 |
|                            | SN2   | Most people in my social network want me to use more low-polluting products in the future.    |                                                                                   |
|                            | SN3   | Using eco-friendly products is what most people in my social network think I should be doing. |                                                                                   |
| Perceived Behavior Control | PBC1  | I know how to buy through mobile payment.                                                     | (Taylor and Todd, 1995)                                                           |
|                            | PBC2  | I feel that buying through mobile payment is not problematic.                                 |                                                                                   |
|                            | PBC3  | I have enough time to purchase through mobile payment.                                        |                                                                                   |
| Behavioral Intention       | BI1   | I plan to use Fintech in future.                                                              | (Venkatesh et al., 2003) (Agarwal and Karahanna, 2000) (Senyo and Osabutey, 2020) |
|                            | BI2   | I intend to continue to use Fintech frequently.                                               |                                                                                   |
|                            | BI3   | I expect my use of Fintech tools to continue in the future.                                   |                                                                                   |
|                            | BI4   | I will always try to use Fintech services for my transactions.                                |                                                                                   |
| Trust                      | TU1   | I have no trust on safety and reliability features of fintech innovations.                    | (Shaw, 2014)                                                                      |
|                            | TU2   | I don't trust that while using fintech innovations my financial information is secure.        |                                                                                   |
|                            | TU3   | I don't trust that while using fintech innovations my personal information remains safe.      |                                                                                   |
| Financial Inclusion        | FI1   | It is possible to employ fintech to expand access to banking services in India.               | (Asif et al., 2023) (Pennington et al., 2003)                                     |
|                            | FI2   | I do not find any reason to be cautious while using fintech tools.                            |                                                                                   |
|                            | FI3   | Using the Fintech tools is a good idea.                                                       |                                                                                   |
|                            | FI4   | The probability that I would consider using fintech tools in future is high.                  |                                                                                   |

TABLE 12: Research Questionnaire

## Additional Information

### Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

**Concept and design:** Srishti Chandel, Saumya Chandel

**Acquisition, analysis, or interpretation of data:** Srishti Chandel

**Drafting of the manuscript:** Srishti Chandel

**Critical review of the manuscript for important intellectual content:** Srishti Chandel, Saumya Chandel

## Disclosures

**Human subjects:** Consent was obtained or waived by all participants in this study. **Animal subjects:** All authors have confirmed that this study did not involve animal subjects or tissue. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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