

Adoption and Suitability of Electronic Payment Systems among Transgender Individuals: A Study of Accessibility, Trust, and Financial Empowerment

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Abstract

Electronic payment systems have evolved very fast, which has transformed the world in terms of financial transactions, as they have increased efficiency, transparency, and financial inclusion (Anagreh et al., 2024; Adholiya et al, 2020). In India, mobile wallets, Unified Payments Interface (UPI) and internet banking are actively encouraged as instruments of inclusive economic development (Chandak, 2024). The benefits of this digital financial revolution, however, have not been enjoyed by all social groups equally (Mpofu & Mhlanga, 2022). The transsexuals who were socially marginalised, discriminated, and economically marginalised in the past continue to encounter numerous challenges in the use and successful use of electronic payment systems (Raj & Juned, 2022). The present paper will review the use and relevance of electronic payment systems among transgenders in respect to three major factors, which are accessibility, trust, and financial empowerment. The research analyzes the utilization trends, perceived benefits, and issues with the form of digital financial service usage among transgender people, utilizing the mixed-method research design that involves the survey questions and semi-structured interviews. The findings suggest that despite its huge potential, electronic payment systems can be applied to achieve financial autonomy and economic inclusion of transgender people, the lack of trust in institutions, identity verification issues, digital illiteracy, and perceptions of exclusion are the key barriers to implementation and further uptake. The paper connects to the current literature in digital financial inclusion by anticipating the lived experiences of transgender people and offers policy and managerial implications of how to build electronic payment systems, that are inclusive, grounded on trust, and accessible to everyone.

Keywords: Electronic payment systems, Transgender people, Digital financial inclusion, Accessibility, Trust, Financial empowerment, FinTech.

Introduction

The development of electronic payment systems is among the most

dramatic changes in modern financial ecosystems (Iheanachor et al., 2023). Economic transactions between people have been revolutionised by digital payment technologies, such as mobile wallets, internet banking, contactless cards, and real-time payment interfaces (Putrevu and Mertzanis, 2024). Governments and financial organizations around the world define electronic payments in an ever-increasing manner as their financial inclusion, economic empowerment, and sustainable development tools (Hashemizadeh et al., 2023). Policy programs like Digital India, Jan Dhan-Aadhaar-Mobile (JAM) trinity and the popularity of the Unified Payments Interface (UPI) have led to a rapid shift towards cashless transactions in various socio-economic groups in India (Singh and Singh, 2024). Even with these achievements, digital financial inclusion is yet to be achieved equally. Marginalised people especially those excluded because of gender identity usually experience systemic discrimination restricting access to formal financial systems (Mendis et al., 2023). Such a group is transgender people who are still subjected to social stigma, economic insecurity, and institutional discrimination (Kinitz et al., 2025). Despite the fact that legal recognition of transgender persons in India has developed due to legal and legislative interference, socio-economic exclusion remains, which impacts access to education, workplaces, health care, and financial services (Pandaya and Redcay, 2021). Electronic payment systems can become strong financial empowerment tools in the hands of transgender people (Raj and Juned, 2022) as they allow making transactions safer, decrease reliance on informal economies that are often based on cash usage, and become involved in formal financial systems. Simultaneously, digital payments also create new types of exclusion, especially when systems are based on strict systems of identity checks, binary gender categories, or high-level digital literacy (Martin and Taylor, 2021). The lack of trust, privacy, and the fear of being discriminated also influence the adoption behaviors of transgender users (Fairfax, 2025). Current studies on digital payments have concentrated more on mass consumers, small businesses, or rural people, and did not include gender-diverse groups in most cases (Aidis et al., 2022). Research that concerns the financial inclusion of transgender individuals is likely to concentrate on access to bank accounts (Sengupta and

Mundi, 2025) or welfare programs, and does not focus on the appropriateness and experience of using electronic payments. This paper aims to fill this gap by evaluating how the transgender people perceive, adopt, and use electronic payment systems and how the systems affect their perception of financial empowerment. The basic goals of this study are threefold: first, to examine the adoption rate of electronic payment systems among trans individuals; secondly, to study the impact of accessibility and trust on the adoption behaviour; and thirdly, to evaluate the level to which digital payments can play their role in financial empowerment. This paper is an attempt to be significant both to the academic field and policy discussion by placing the analysis to the point of interplay of technology adoption and social inclusion with gender justice.

Review of Literature

Electronic Payment Systems and Financial Inclusion.

E-payment is widely recognised as an enabler of financial inclusion, particularly in developing economies. It has been shown that through digital payments, transaction costs decrease, there is increased transparency, and it allows people to engage in formal financial systems (Demirguc-Kunt et al., 2022). Mobile payment interfaces have been shown to enhance access to financial services for underserved segments of the population, including low-income families and informal workers. Theories of technology adoption, such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), have been widely employed in research on the adoption of electronic payments. Perceived usefulness, ease of use, social influence, and facilitating conditions are consistently identified as important determinants of adoption (Venkatesh et al., 2012). Nonetheless, critics claim that these models tend to undermine the importance of social identity, structural inequalities, and power relations that influence technology use among marginalised populations.

Digital Financial Exclusion, Gender, and Identity. The issue of gender is a significant factor in determining access to and the use of financial technologies. Research indicates that women and gender minorities face increased disadvantages in digital finance due to a low level of digital literacy, limited access to devices, and social and cultural

conventions (Sahay et al., 2020). In the case of transgender people, the barriers are increased by stigma, discrimination, and the inability to have legal identity congruence. The literature on transgender financial inclusion reveals that there are difficulties in opening bank accounts, a lack of correlation between gender identity and documentation, and informal employment (Badgett et al., 2019). Such difficulties usually force transgender people to engage in informal economic relations, in which cash flows prevail, and financial stability is weak.

Availability of Electronic Payment Systems. Digital finance is not simply accessible due to the physical access to devices or the internet. It involves usability, selection of languages, identity recognition, and amicable interfaces. Studies emphasize that unplanned production of exclusion may occur because of the digital platforms that are developed without taking into account the needs of different users (Donner and Tellez, 2008). Proper representation, inclusive design and non-discriminatory customer service are also accessibility issues to transgender persons. India Aadhaar-based authentication requirement has had both positive and negative outcomes. Even though it has become accessible to a broader audience, it has also presented a problem to those who do not fit into the history books in regards to their gender (Ramanathan, 2021; Adholiya et al., 2012). These contradictions could act as hindrances to the hassle-free use of the online payment systems.

Digital Payments Adoption and Trust. Digital financial adoption is anchored on trust. Confidence in technology, institutions, and regulatory systems is a crucial factor in determining users' adoption of electronic payment systems. Research indicates that marginalised groups tend to have less institutional trust due to past experiences of being locked out and discriminated against (Gefen et al., 2003). In the case of transgender people, the lack of trust can be increased with the fear of the loss of data, the fear of the uncovering of identity, and adverse experiences with financial institutions that may have happened previously. It is shown that perceived discrimination is a significant factor that decreases the use of formal financial services (Muralidharan et al., 2022).

Fintech and Financial Empowerment. Financial empowerment encompasses independence, the ability to make informed economic decisions, and control over one's financial resources. Electronic payment systems would enable more empowerment, savings, credit accessibility, and involvement in digital marketplaces. Nevertheless, equitable access and meaningful use are the necessary conditions of empowerment outcomes. Research on marginalised groups suggests that digital finance alone does not guarantee empowerment without supportive policies, financial literacy programs, and the inclusion of institutional practices (Kabeer, 2017). Dignity, safety and recognition in financial systems are also the means of empowerment of transgender people.

Research Methodology

Research Design

The research design chosen is a mixed-methods approach, which incorporates both quantitative data from surveys and qualitative data from interviews. This method will allow understanding the patterns of adoption in their entirety without leaving out subtle experiences and attitudes of transgender people towards electronic payment systems.

Sample and Data Collection

Transgender individuals residing in urban and semi-urban areas served as the primary data collection points. The purposive sampling method was employed to represent the diverse age groups, educational backgrounds, and occupational categories. The survey questionnaire will also be given to 250 respondents, and the in-depth interviews shall be organised with 20 respondents. The questionnaire also assessed accessibility, trust, frequency of use, perceived benefits, and financial empowerment. The personal experiences, issues, and coping mechanisms related to digital payments were discussed through interviews.

Data Analysis Techniques

The descriptive statistics, correlation analysis, and regression analysis were used to analyse the quantitative data and discover relationships among accessibility, trust, and adoption. The thematic analysis was used to analyse qualitative data and determine recurring patterns and insights.

Data Analysis and Discussion

Before the data analysis, the reliability of the scale is measured. For this purpose, the Delphi technique was utilised. The expert opinion is based on the views of 5 respondents from two NGO working for the betterment of transgender people. Thereafter, the data of 20 respondents were collected and analysed using SPSS software for a

reliability test. A reliability analysis was conducted to determine the internal consistency of the measurement scales used in the research. The Cronbach's alpha coefficient was used because it is generally recognised as a measure of scale reliability in the social sciences and management research studies. A Cronbach's Alpha of 0.70 or above is regarded as acceptable, indicating good internal consistency (Table 1).

Table 1: Reliability Analysis (Cronbach's Alpha)

Construct	Number of Items	Cronbach's Alpha (α)
Accessibility (ACC)	5	0.821
Trust (TRU)	4	0.846
Adoption of Electronic Payment Systems (ADP)	4	0.873
Financial Empowerment (FEMP)	4	0.889
Overall Scale Reliability	17	0.901

Reliability Results Interpretation. The Cronbach's Alpha values of all constructs range from 0.821 to 0.889, which is higher than the minimum acceptable value of 0.70. The internal consistency is spectacular, as demonstrated by the overall scale reliability of 0.901. These findings affirm that the measurement items are effective in describing the underlying constructs of accessibility, trust, adoption, and financial empowerment amongst transgender individuals.

Confirmatory Factor Analysis (CFA)

Confirmatory Factor Analysis (CFA) was conducted to test the measurement model of the constructs and analyse their convergent and discriminant validity. Structural Equation Modelling (SEM) and the AMOS software were used to

conduct CFA. The measurement model consisted of four latent constructs: Accessibility, Trust, Adoption of Electronic Payment Systems, and Financial Empowerment.

Measurement Model Specification

The specification of the measurement model is as shown in Table 2. All constructs were assessed based on a number of examined variables (items) from previous studies, which were validated and modified to fit the context of transgender digital financial inclusion. Every factor loading was defined to load on its respective latent construct, and only the covariance of error terms was allowed on theoretically justified bases.

Table 2: Standardised Factor Loadings

Construct	Item Code	Factor Loading
Accessibility	ACC1	0.720
	ACC2	0.790
	ACC3	0.810
	ACC4	0.760
	ACC5	0.740
Trust	TRU1	0.830
	TRU2	0.850
	TRU3	0.780
	TRU4	0.800
Adoption	ADP1	0.860
	ADP2	0.880
	ADP3	0.820
	ADP4	0.840

Construct	Item Code	Factor Loading
Financial Empowerment	FEMP1	0.890
	FEMP2	0.870
	FEMP3	0.840
	FEMP4	0.860

The Standardised factor loadings are all above 0.70, which is quite high in terms of item reliability and equally sufficient for convergent validity.

Convergent Validity

The measure of convergent validity was assessed using

Average Variance Extracted (AVE) and Composite Reliability (CR). AVE scores above 0.50 and CR scores above 0.70 indicate satisfactory convergent validity in Table 3.

Table 3: Convergent Validity Measures

Construct	Composite Reliability (CR)	Average Variance Extracted (AVE)
Accessibility	0.86	0.56
Trust	0.88	0.65
Adoption	0.9	0.69
Financial Empowerment	0.91	0.72

Interpretation

All constructs satisfy the recommended thresholds for CR and AVE, confirming strong convergent validity.

Discriminant Validity

Discriminant validity was determined through the Fornell-Larcker test, and the square root of AVE of constructs should be higher than their correlation with other constructs, as per Table 4.

Table 4: Discriminant Validity (Fornell–Larcker Criterion)

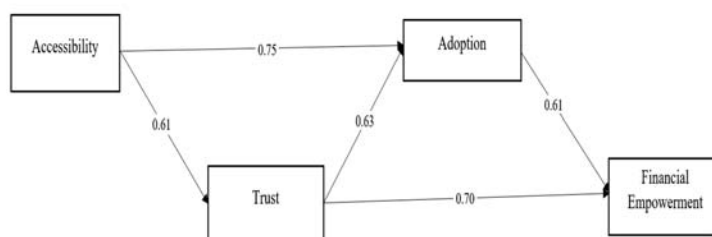
Construct	ACC	TRU	ADP	FEMP
Accessibility (ACC)	0.75			
Trust (TRU)	0.61	0.81		
Adoption (ADP)	0.67	0.64	0.83	
Financial Empowerment (FEMP)	0.59	0.62	0.7	0.85

(Diagonal values represent $\sqrt{AVE}$)

Interpretation

The square root of AVE for each construct exceeds the inter-construct correlations, confirming adequate discriminant validity.

Figur-1: SEM model



In Figure 1, the PLS-SEM framework will be used to analyse the relationships between Accessibility, Trust, Adoption, and Financial Empowerment regarding electronic payment systems among transgender people. According to the model, it is assumed that Accessibility has a direct impact on Trust and Adoption, whereas Trust has an indirect impact on Adoption. Adoption, in turn, serves as the major determinant of Financial Empowerment. The mediating effects of Trust between the relationships of Accessibility and Adoption, and of Adoption and Financial

Empowerment, are also reflected by the model, thus showing the causal order in which accessible and trustworthy digital payment systems mediate the effects of financial empowerment.

Model Fit Indices

The overall goodness-of-fit of the measurement model was assessed using multiple fit indices, as recommended in the SEM literature (Table 5).

Table 5: Model Fit Indices

Fit Index	Recommended Value	Obtained Value
χ^2/df	< 3.00	2.14
GFI	> 0.90	0.92
AGFI	> 0.90	0.9
CFI	> 0.95	0.96
TLI	> 0.95	0.95
RMSEA	< 0.08	0.061

All the model fit indices are within acceptable ranges, indicating that the measurement model fits the observed data well.

Measurement Model Summary of Validation

The reliability and validity tests demonstrate that the constructs employed in this research are statistically sound and theoretically robust. The Alpha values of Cronbach's show a high degree of internal consistency, whereas CFA scores suggest high levels of convergent and discriminant validity. The measurement model has a good fit, which confirms that it is suitable to be used in further regression and structural analyses.

Adoption Patterns of Electronic Payment Systems

The results indicate that the use of electronic payment systems among transgender individuals is moderate, with applications based on UPI being the most popular. The respondents who were younger, more educated, and digitally literate were more likely to use it.

Accessibility and Usage

The following predictor of adoption happened to be accessibility. The difficulties stated by the respondents consisted of identity verification, low digital literacy, and

the absence of inclusivity. customer support. Respondents added that the platforms that fail to recognise non-binary identities lead to the feeling of being excluded.

Trust and Institutional Confidence

Adoption decisions were dependent on the level of trust. The frequency of usage was high in questionnaires, where respondents reported placing more trust in financial institutions and digital platforms. The intention to use electronic payment systems was hindered by concerns about discrimination or fear of data misuse.

Financial Empowerment Outcomes

The use of electronic payments was positively associated with perceived financial empowerment. According to the respondents, financial control was enhanced, formal economic activities increased, and the use of cash went down. However, accessibility and trust were found to mediate the disproportional outcomes of empowerment.

Conclusion and Recommendations

As the paper has developed, the potential of electronic payment systems to enhance financial inclusion and empowerment of the transgender population is tremendous. Factors and accessibility, on the other hand, have great

effects on the adoption and appropriateness. Identity-related problems, structural obstacles, and institutional distrust remain impediments to the transformative potential of digital finance. The study recommends that policymakers and financial organisations should bear in mind the principle of inclusive design, limit identity verification processes, and allocate resources to specific digital literacy indicators. Trust needs to be developed through non-discriminatory use, an open data policy, and participation, in order to foster long-term adoption. The research focuses on the experiences of transgender individuals, thereby helping to create a more inclusive vision of digital financial ecosystems and highlighting the need to approach the issue of financial inclusion intersectionally.

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