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Beyond Convenience: Financial Literacy, Trust and Perceived Security as Determinants of UPI Adoption among Rural Consumers in Coimbatore District

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Abstract: *The rapid expansion of digital payment infrastructure has transformed the manner in which consumers conduct everyday financial transactions in India. Among the various digital payment mechanisms, the Unified Payments Interface (UPI) has become an important component of the country's digital payment ecosystem by enabling instant account-to-account transactions through mobile applications and interoperable payment infrastructure. Although the diffusion of UPI has expanded considerably, adoption in rural communities cannot be understood solely through transaction volume or technological availability. Financial literacy, perceptions of security, trust in digital payment systems, and perceived usefulness may influence whether rural consumers adopt and continue using UPI.*

The present study proposes an empirical framework for examining the influence of financial literacy, perceived security, trust, perceived usefulness and perceived ease of use on UPI adoption among rural consumers in Coimbatore District, Tamil Nadu. The study integrates constructs derived primarily from the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2), while incorporating trust and perceived security to reflect the distinctive characteristics of digital financial transactions. Previous research has identified financial literacy, usefulness, ease of use, perceived financial risk, trust and security as relevant dimensions of digital-payment adoption in rural India.

The proposed study adopts a quantitative research design. Primary data are to be collected from rural UPI users in selected areas of Coimbatore District using a structured questionnaire. Descriptive statistics, reliability analysis, correlation analysis and multiple regression may be employed, with mediation analysis or structural equation modelling used if the final sample and measurement model support such analysis. The study contributes a geographically focused framework for understanding how knowledge and perceptions interact in rural UPI adoption. The findings are expected to be useful to banks, payment-service providers, financial-literacy programmes and policymakers seeking to strengthen safe and inclusive digital-payment usage.

Keywords: *UPI, digital payments, financial literacy, perceived security, trust, rural consumers, technology adoption, Coimbatore District, financial inclusion.*

I. INTRODUCTION

Digitalisation has substantially changed the structure of financial transactions in India. Consumers increasingly use mobile applications, QR codes, internet banking and other electronic channels to make payments for goods, services, utility bills and person-to-person transfers. Among these technologies, the Unified Payments Interface has emerged as one of the most visible components of India's digital payment ecosystem.

UPI allows users to initiate bank-account-based transactions through participating applications without requiring the recipient's bank-account details for every transaction. Its interoperability and mobile-based functionality have contributed to its widespread use in both consumer and merchant transactions.

However, national transaction volumes do not necessarily indicate that digital-payment adoption is uniform across social, economic and geographical groups. Rural consumers may experience different conditions from urban consumers, including differences in digital literacy, smartphone access, internet reliability, financial knowledge, exposure to digital fraud, confidence in digital interfaces and access to assistance when transactions fail.

This distinction is particularly important because payment adoption is not simply a technological decision. A consumer may have access to a smartphone and bank account but still prefer cash because of limited knowledge, fear of fraud, uncertainty regarding transaction failure, unfamiliarity with payment applications or lack of confidence in resolving disputes.

Coimbatore provides an appropriate setting for examining these relationships. The district combines urban, semi-urban and rural communities and has substantial commercial and agricultural activity. Previous studies have examined digital payments in rural Coimbatore, but the present study focuses specifically on the combined mechanism of financial literacy, perceived security, trust, usefulness and ease of use in UPI adoption.

Therefore, the present study proposes an integrated framework to investigate whether financial literacy, perceived security, trust, perceived usefulness and perceived ease of use are associated with UPI adoption among rural consumers in Coimbatore District.

II. STATEMENT OF THE PROBLEM

Digital payments offer potential advantages to rural consumers, including transaction convenience, reduced dependence on physical cash, transaction records and access to formal financial infrastructure. However, technological availability alone does not guarantee meaningful adoption.

Rural consumers may encounter limited digital financial knowledge, uncertainty regarding transaction procedures, fear of financial fraud, concerns about privacy, lack of confidence in payment applications, network and connectivity problems, difficulties in recovering failed transactions, limited awareness of grievance-redressal mechanisms and dependence on others for digital transactions.

The present study therefore asks whether access to digital payment technology automatically leads to confident adoption, or whether financial knowledge, security perceptions and trust determine whether consumers are willing to use UPI.

III. RESEARCH GAP

Existing studies have examined digital-payment adoption using variables such as awareness, convenience, usefulness, ease of use and demographic characteristics. However, the combined relationship between financial literacy, perceived security and trust within a geographically focused rural UPI model remains worthy of further empirical investigation.

Previous research in and around Coimbatore has examined rural digital-payment perceptions and UPI awareness. The present study seeks to differentiate itself by examining how financial literacy and perceived security contribute to trust and, in turn, to UPI adoption.

Accordingly, the study addresses the need for a geographically focused empirical model connecting digital financial literacy, perceived security, trust, perceived usefulness and perceived ease of use with UPI adoption among rural consumers in Coimbatore District.

IV. OBJECTIVES OF THE STUDY

- 1) To examine the level of UPI usage among rural consumers in Coimbatore District.
- 2) To measure the level of digital financial literacy among rural UPI users.
- 3) To examine the influence of financial literacy on UPI adoption.
- 4) To examine the influence of perceived security on trust in UPI transactions.
- 5) To examine the relationship between trust and UPI adoption.
- 6) To examine the influence of perceived usefulness on UPI adoption.
- 7) To examine the influence of perceived ease of use on UPI adoption.
- 8) To determine whether trust mediates the relationship between perceived security and UPI adoption.
- 9) To examine whether demographic characteristics are associated with UPI usage behaviour.

V. RESEARCH QUESTIONS

RQ1: What is the level of UPI usage among rural consumers in Coimbatore District?

RQ2: Does digital financial literacy influence UPI adoption?

RQ3: Does perceived security influence trust in UPI?

RQ4: Does trust influence UPI adoption?

RQ5: Do perceived usefulness and perceived ease of use influence UPI adoption?

RQ6: Does trust act as a mediating mechanism between perceived security and UPI adoption?

RQ7: Do demographic characteristics correspond with differences in UPI usage behaviour?

VI. THEORETICAL FOUNDATION

A. Technology Acceptance Model

The Technology Acceptance Model developed by Davis identifies perceived usefulness and perceived ease of use as important determinants of technology acceptance. In the context of UPI, consumers may perceive the system as useful because it allows fast payments, reduces the need to carry cash and provides transaction records. A consumer who can easily scan a QR code, enter an amount, authenticate a payment and verify the transaction may be more willing to use UPI regularly.

B. Unified Theory of Acceptance and Use of Technology 2

UTAUT2 extends technology-acceptance theory to consumer settings. It incorporates constructs such as performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value and habit. For the present research, selected technology-acceptance constructs are combined with financial literacy, security and trust because these variables are particularly relevant to financial transactions.

C. Trust

Trust is incorporated because digital payment involves uncertainty and dependence on technological and institutional systems. A consumer who trusts a payment system may believe that transactions will be processed correctly, money will reach the intended recipient, personal information will be protected and problems will receive appropriate support.

D. Perceived Security

Perceived security represents the consumer's subjective assessment of the safety of digital-payment transactions. It includes perceptions concerning protection of bank-account information, protection of personal information, authentication mechanisms, transaction safety, protection from fraud and confidence in the payment system.

E. Digital Financial Literacy

Digital financial literacy goes beyond general financial literacy. It includes knowledge and skills required to use digital financial services safely and effectively, including QR-code payments, UPI PIN security, transaction confirmation, identifying fraudulent links, checking transaction records and handling failed transactions.

VII. CONCEPTUAL FRAMEWORK

Digital Financial Literacy → UPI Adoption

Perceived Security → Trust → UPI Adoption

Perceived Usefulness → UPI Adoption

Perceived Ease of Use → UPI Adoption

Demographic characteristics such as age, gender, education, occupation and income are included as control or grouping variables.

VIII. HYPOTHESES

H1: Digital financial literacy has a significant positive influence on UPI adoption among rural consumers.

H2: Perceived security has a significant positive influence on trust in UPI transactions.

H3: Trust has a significant positive influence on UPI adoption.

H4: Perceived usefulness has a significant positive influence on UPI adoption.

H5: Perceived ease of use has a significant positive influence on UPI adoption.

H6: Trust mediates the relationship between perceived security and UPI adoption.

H7: UPI usage behaviour differs significantly across selected demographic characteristics.

IX. RESEARCH METHODOLOGY

A. Research Design

The study adopts a quantitative, descriptive and analytical research design. A structured questionnaire will be used to collect primary data from rural consumers who have access to and/or use UPI services.

B. Study Area

The study is proposed to be conducted in selected rural areas of Coimbatore District, Tamil Nadu. To improve geographical representation, rural respondents may be selected from multiple blocks rather than a single village or locality.

C. Population

The target population consists of adult rural consumers residing in Coimbatore District who have access to a bank account, a mobile phone capable of digital payment, and knowledge of or experience with UPI.

D. Sample Size

A target sample of approximately 400 respondents is recommended. The final usable response count must be reported after data collection.

E. Sampling Technique

A multistage sampling procedure is recommended. First, select rural blocks; second, select villages; third, identify eligible respondents; and fourth, collect responses using systematic or purposive sampling according to field accessibility. Where possible, a probability-based approach should be preferred.

F. Questionnaire Design

Section A: Demographic profile—age, gender, education, occupation, household income, marital status, residence, smartphone ownership, bank-account ownership and internet access.

Section B: UPI usage profile—primary application, duration of use, frequency, transaction purpose, approximate transaction value, merchant/person-to-person usage, bill payments and experience of failed transactions.

Section C: Main constructs—respondents rate statements on a five-point Likert scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

G. Digital Financial Literacy Items

DFL1. I understand how UPI payments work.

DFL2. I know that my UPI PIN should not be shared with anyone.

DFL3. I can identify suspicious payment requests.

DFL4. I know how to verify whether a UPI transaction has been completed.

DFL5. I know what steps to take when a digital payment fails.

DFL6. I know how to report a suspicious digital-payment transaction.

DFL7. I understand the risks associated with sharing OTPs and payment credentials.

DFL8. I feel confident using digital financial services independently.

H. Perceived Security Items

PS1. I believe UPI transactions are adequately protected.

PS2. I believe my financial information is protected when using UPI.

PS3. I feel safe using a UPI application for payments.

PS4. UPI authentication mechanisms provide adequate protection.

PS5. I believe UPI reduces risks associated with carrying cash.

PS6. I am confident that unauthorized transactions can be reported and addressed.

I. Trust Items

TR1. I trust UPI as a payment system.

TR2. I trust banks and payment applications to process my UPI transactions correctly.

TR3. I believe UPI transactions are dependable.

TR4. I feel confident that the recipient will receive the payment correctly.

TR5. I believe payment-service providers will assist users when transaction problems occur.

TR6. I am comfortable relying on UPI for regular payments.

J. Perceived Usefulness Items

- PU1. UPI makes my payments more convenient.
- PU2. UPI saves time compared with cash transactions.
- PU3. UPI is useful for my regular financial transactions.
- PU4. UPI makes it easier to transfer money.
- PU5. UPI helps me maintain a record of transactions.

K. Perceived Ease of Use Items

- PEOU1. Learning to use UPI is easy for me.
- PEOU2. I can complete UPI transactions without assistance.
- PEOU3. The steps involved in making a UPI payment are easy to understand.
- PEOU4. I can quickly learn new features of UPI applications.
- PEOU5. Using UPI requires little mental effort.

L. UPI Adoption Items

- AD1. I regularly use UPI for payments.
- AD2. I prefer UPI for suitable transactions rather than cash.
- AD3. I intend to continue using UPI.
- AD4. I would recommend UPI to people in my community.
- AD5. I expect my use of UPI to increase in the future.
- AD6. I am willing to use UPI for a wider range of transactions.

M. Pilot Study

Before the main survey, a pilot study involving approximately 30–50 respondents is recommended. The purpose is to determine whether respondents understand the questions, whether technical terms require explanation, whether the questionnaire is too long, whether response options are appropriate, and whether preliminary reliability is acceptable. Questions with unclear wording should be revised before the main survey.

N. Reliability and Validity

Internal consistency should be assessed using Cronbach's alpha. A commonly used benchmark is an alpha value of approximately 0.70 or higher, although acceptable reliability depends on the construct, number of items and research context. If SEM is employed, construct reliability and validity should also be examined using Composite Reliability, Average Variance Extracted, convergent validity and discriminant validity. These statistics must be calculated from actual collected data.

O. Data Analysis Plan

Descriptive statistics: Frequency and percentage will be used for demographic variables; mean and standard deviation can be calculated for the principal constructs.

Reliability analysis: Cronbach's alpha will be used to examine internal consistency.

Correlation analysis: Pearson's correlation coefficient can be used to examine the direction and strength of relationships among the major constructs.

Multiple regression: $UPI\ Adoption = \beta_0 + \beta_1 DFL + \beta_2 PS + \beta_3 TR + \beta_4 PU + \beta_5 PEOU + \epsilon$.

Mediation analysis: Trust may be examined as a mediator between perceived security and UPI adoption. The indirect effect should preferably be tested using bootstrapping.

Group comparisons: Depending on the data, t-tests or ANOVA may be used to examine differences across theoretically relevant demographic groups.

P. Ethical Considerations

Participation should be voluntary. Respondents should be informed about the purpose of the study, the academic nature of the research, voluntary participation, confidentiality, anonymity, approximate time required and their right to withdraw.

The questionnaire must never ask for a UPI PIN, OTP, bank-account password, debit-card PIN, CVV, complete bank-account number or other authentication credentials.

Q. Proposed Results Presentation

The results section should be completed only after the actual questionnaire data have been analysed. Demographic frequencies, reliability coefficients, descriptive statistics, correlation coefficients, regression coefficients and mediation results should all be reported from the genuine dataset.

Do not insert invented response counts, p-values, coefficients or hypothesis decisions.

R. Discussion Framework

Once the data are available, the discussion should connect empirical results with previous research rather than simply repeating statistical tables. If financial literacy is significantly associated with UPI adoption, the finding can be compared with research on digital financial literacy and digital-payment adoption. If perceived security is significantly associated with trust, the result can be discussed in relation to research on perceived security and continued digital-payment use. If trust, usefulness or ease of use are significant, the findings can be related to established technology-acceptance literature. Non-significant results should also be reported transparently.

S. Practical Implications

Implications for banks: provide simple, local-language programmes covering safe UPI use, PIN protection, fraud identification, transaction verification, failed-payment procedures and complaint mechanisms.

Implications for payment-service providers: improve interfaces, regional-language support, transaction-status messages, help facilities, fraud warnings and complaint procedures.

Implications for financial-literacy programmes: incorporate digital financial literacy, including safe use of payment applications and recognition of digital fraud.

Implications for rural communities: local institutions, self-help groups, community organisations and educational institutions can support demonstration-based digital-payment education.

T. Theoretical Contribution

The study applies technology-acceptance concepts to rural UPI adoption, extends a technology-centred perspective by incorporating financial literacy and perceived security, and positions trust as a potential mechanism connecting security perceptions with adoption behaviour.

U. Social and Financial-Inclusion Implications

Digital payments can potentially support financial inclusion by connecting individuals to formal financial infrastructure. The present study focuses specifically on Coimbatore rather than assuming that findings from other regions necessarily apply to rural Tamil Nadu.

V. Limitations of the Study

The study is geographically limited to selected rural areas of Coimbatore District. Findings may not automatically generalise to all rural consumers in Tamil Nadu or India.

The study uses self-reported questionnaire data, and respondents may overestimate or underestimate their actual digital-payment use.

The cross-sectional design limits causal interpretation.

Digital-payment technology changes rapidly, so perceptions may change over time.

Adoption may differ according to age, education, income, occupation, smartphone access and digital experience.

W. Scope for Future Research

Future studies can compare rural and urban consumers, examine changes in trust and security perceptions over time, and focus on women users, elderly consumers, rural entrepreneurs, agricultural households, small merchants, self-help groups and migrant workers. Comparative studies of UPI, wallets, cards and internet banking are also possible.

X. CONCLUSION

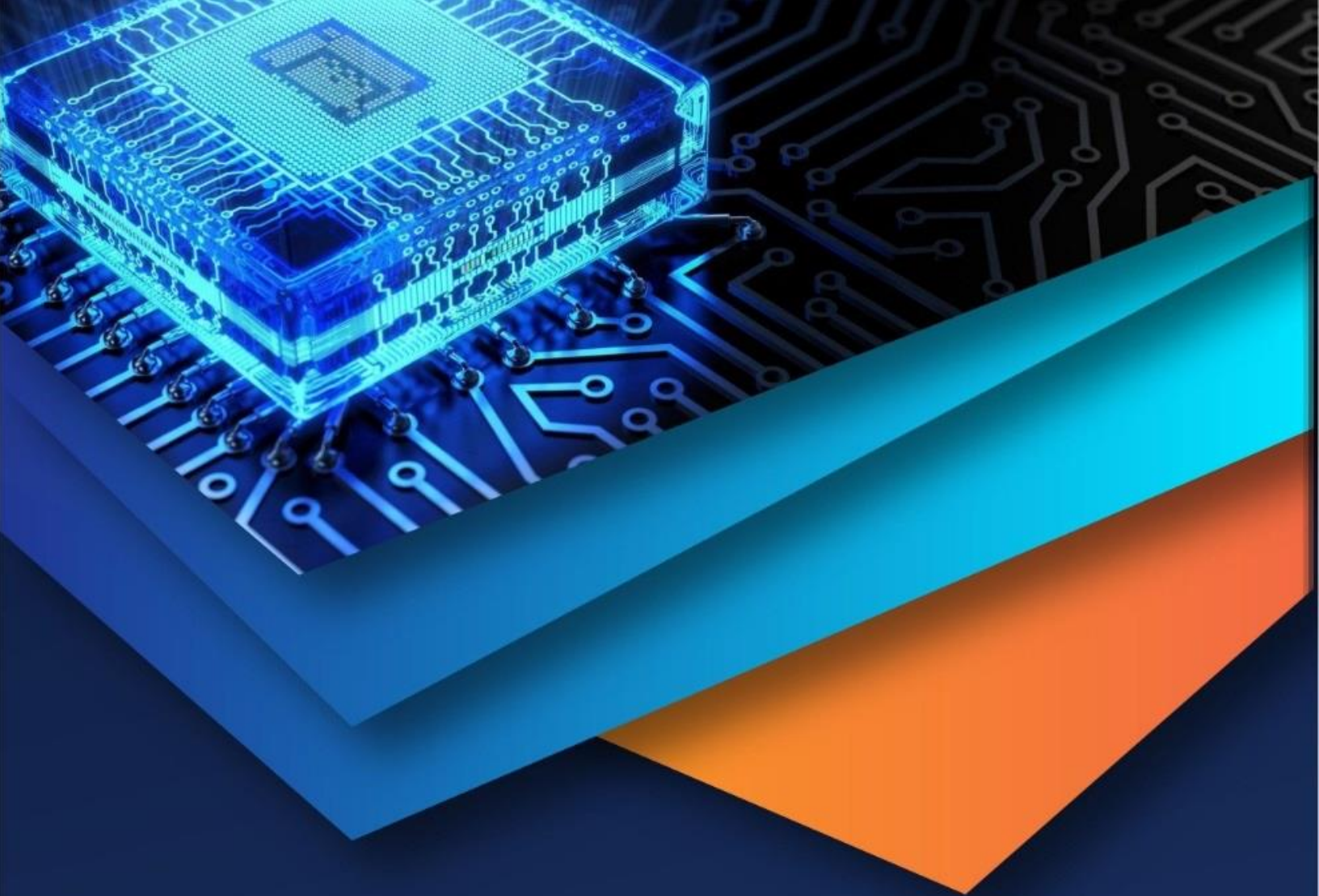
The expansion of UPI has fundamentally changed the Indian digital-payment landscape. However, transaction volume alone cannot explain the individual-level processes through which rural consumers adopt and continue using digital payments. For rural consumers, adoption may involve more than convenience; it can involve knowledge, confidence, perceived security and trust.

The present study proposes an integrated framework connecting digital financial literacy, perceived security, trust, perceived usefulness and perceived ease of use with UPI adoption among rural consumers in Coimbatore District. The framework draws from technology-acceptance and trust-related research and is intended to generate an empirically testable model.

The objective should not simply be to increase the number of digital transactions. Sustainable digital financial inclusion requires users who understand the technology, recognise risks, trust the system and can use digital-payment services independently and safely.

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