

A Study on the Role of AI in Shaping Financial Confidence and Sustained UPI Usage with Reference to Tamil Nadu

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Abstract - Digital financial transactions in India have changed the adoption of the Unified Payments Interface (UPI). Nonetheless, it is a tremendous challenge to maintain the engagement of users in the long term. With the adoption of digital payment systems that are becoming more and more based on Artificial Intelligence (AI), it will be essential to comprehend the impact of the AI functions on the financial confidence of users and their desire to use the platform. This paper will discuss how AI-driven security, AI-based personalization, and AI-enabled customer support can improve financial confidence, as well as lead to the continued use of UPI. The quantitative research design was used to collect data in the form of a structured, closed-ended questionnaire, among 387 respondents. The structural equation modeling (SEM) was used to establish the direct and indirect relationships between the constructs. The findings indicate that AI-based security ($\beta = 0.342$), AI-based personalization ($\beta = 0.28$), and AI-enabled customer support ($\beta = 0.35$) have a significant impact on enhancing financial confidence. Long-term UPI usage is strongly positively influenced by financial confidence ($\beta = 0.471$), which serves as an intermediary variable between the two variables (AI features and continued use). The results also expand the theory of technology adoption into the post-adoption stage, where financial confidence is one of the psychological factors in AI-enabled systems. In practice, the research proposes that the clear use of AI-based security, substantial personalization, and receptive customer services are essential to establish trust and guarantee sustained interaction with the users. The study can be of great help to banks, financial technology firms, and policymakers who aim to develop better digital payment systems in India and facilitate financial inclusion.

Keywords: Artificial Intelligence, Financial Confidence, UPI, Sustained Usage, Digital Payments, Fintech

I. INTRODUCTION

The sphere of digital payments in India has developed at a very high rate, and the Unified Payments Interface (UPI) is one of the keys to the transition of the country to a less-cash economy. UPI is designed and maintained by the National Payments Corporation of India (NPCI) to facilitate real-time, seamless transactions between accounts, and this has been contributing towards massive growth in mobile-based

transactions (NPCI, 2025). Among the causes of the success of UPI, a positive policy environment, expanded smartphone penetration, onboarding of service by banks and various fintech companies at a cost less than normal costs, and the convenience and reliability of the platform have contributed to its success (Nanda et al., 2025; Dhivya et al., 2025). The use of UPI has transformed financial transactions in India and gone beyond payment to become a comprehensive ecosystem that supports a wide range of financial services.

Nonetheless, in part, as UPI adoption has been highly active, there are still difficulties in maintaining sustained use. Some of the most important aspects that threaten the trust of users and discourage further use of the platform include fraud, transaction failures, misinformation, and security (World Economic Forum, 2025; Nanda et al., 2025). Such problems tend to cause a lack of financial confidence that is necessary to encourage prolonged usage. It is therefore very important to deal with these challenges in a manner that will not only make the system secure but also gain the long-term user confidence in its use. Financial services companies are also looking to AI as a way of alleviating these issues, as it can be more secure and user-friendly, make customer service more automated, and provide more personalization to users, which can increase their engagement and trust.

The adoption of AI in UPI platforms bears a prospective route of enhancing financial confidence and avoiding issues that influence user trust. With the help of AI, the notion of security and control can be introduced to users through features such as fraud detection, behavioral biometrics, or constant authentication (Chen, 2025; ResearchGate, 2025). Also, AI promotes user experiences by providing personalized services such as predictive analytics and recommender systems, which decrease cognitive friction and increase the usefulness of the platform (Shang & Chiu, 2022; ResearchGate, 2025). Customer service, AI-based chatbots also lead to customer satisfaction as the system responds in time and helps to reduce anxiety caused by transactions (Graham et al., 2025). This paper discusses how these AI functions affect the financial trust of users and their further

use of UPI. By exploring ways to enhance AI to promote its role in enhancing security, personalization, and customer service, the study will be able to bridge that gap between early and sustained adoption by making UPI an effective long-term and trustworthy digital payment infrastructure within the rapidly evolving financial sector in India.

Research Gap

Although there is increasing literature on the digital payment system implementation especially the use of Unified Payments Interface (UPI) in India, previous researches have mostly focused on initial adoption variables such as perceived ease of use, perceived usefulness and preparedness of infrastructure but have not investigated long term usage behavior or continuance intention which are the determinants of long term success of digital payment systems (Bala & Sharma, 2025; Dhivya et al., 2025). The understanding of dynamic variables affecting the long-term attitude of customers to UPI platforms is inadequate, specifically, the role of AI-enabled features, including fraud detection, personalization, and customer support, in maintaining user trust and habitual use after the first adoption (Patel & Malve, 2025). Although the impact of AI on the financial services sector is already a well-researched topic in the field of fintech and banking, the relationship between AI-driven functionalities and such psychological concepts as financial confidence, trust, and perceived control in the UPI framework remains scarce (Kumar & Garg, 2026; World Economic Forum, 2025). Also, the majority of past research is cross-sectional, not reflecting the long-term exposure to AI-based systems, which hinders the understanding of how financial confidence and trust could change with time (Dhivya et al., 2025). Additionally, the sample size of different categories of users, including rural, older, and less digitally literate individuals, lacks representation; this is why the idea of how AI can be implemented to improve financial inclusion and allow the further use of UPI by the aforementioned users is lacking. This theoretical and practical gap is essential due to the fact that it combines the adoption of AI with the behavioral finance and technology continuance models to explain the UPI persistence in the evolving digital payment landscape in India in the long term.

Objective of the Study

1. To assess the effects of AI-based security systems on the perceived security, trust, and financial security of users whenever making payments through UPI.
2. To determine the role of AI-based personalization and smart assistance on the perceived usefulness of UPI platforms and user satisfaction.
3. To assess how AI-based responsiveness of service (chatbots, automated grievance redressal, predictive support) can help decrease the level of anxiety during transactions and increase user confidence.

4. To examine how financial confidence is related to the persistence in UPI use, along with continuance intention and continuity in utilization behavior.
5. To test the mediating variable of financial confidence in the association between the AI-enabled features and the continuity in the use of UPI.

The following structure of this paper can be described as follows: Section 2 will be a detailed literature review that will identify the main concepts connected to the topic of digital payments, the adoption of UPI, and the introduction of artificial intelligence (AI) to improve the user experience and financial confidence. Section 3 covers the research methodology, which consists of a conceptual framework, hypotheses, data collection procedures, and analysis procedures applied in the study. Section 4 is the discussion of the Structural Equation Modeling (SEM) analysis, which addresses correlations between AI features, financial confidence, and subsequent use of UPI. Section 5 discusses the findings and their implications for digital payment systems and financial inclusion in India. Lastly, Section 6 provides a conclusion to the paper, and it presents practical suggestions to the stakeholders, specifically, banks, fintech firms, policymakers, and proposes future research directions.

II. LITERATURE REVIEW

The Digital Payments and the UPI in India Evolution

The financial transactions have been transformed by using digital payments, especially the Unified Payments Interface (UPI), which has been implemented in India (Padma Kiran & Vedala, 2025). UPI has enabled real-time interoperable transactions among peers and merchants, which has led to a decrease in cash dependency, the ease of transactions, and financial inclusion (Dhivya, Anoop, and Balamourouane, 2025; Bala & Sharma, 2025). The perceived ease of use, perceived usefulness, and cost efficiency were the early drivers of adoption with the use of the Technology Acceptance Model (TAM). Nonetheless, in the changing environment of UPI, scholars propose that adoption is no longer enough, but continuance intention and long-term use are key to ecosystem stability. As the UPI is growing, issues such as fraud, transaction failures, and misinformation still pose a challenge to the user trust and further use (Nanda et al., 2025). The need to have research emphasis shifted towards post-adoption behavior, including continuance intention and habitual use, is increasing to guarantee the long-term success of UPI (Ajzen, 1991).

Continuous Usage and Technology Continuance

The technology continuance theory points out that the decision of users to continue using a technology is not entirely contingent on functional benefits only, but also on satisfaction, trust, felt value, and developing a habit. According to the Expectation-Confirmation Model (ECM), satisfaction results in continuance intention in case expectations are fulfilled. The elements that affect the continued use of digital payments are reliability, security, the

quality of service, and emotional comfort. Research on mobile payments, such as Apple Pay, demonstrates continuance intention to be based on trust and perceived risk (Sekaran & Bougie, 2016). Nonetheless, the UPI study tends to ignore the aspect of AI and considers security as something fixed, as opposed to dynamic. This literature gap requires filling the void concerning the impact of AI-driven features, user confidence, and the length of use, which has not been studied in detail in UPI-specific research (Nanda et al., 2025). The new AI technologies would play a significant role in the creation of long-term user participation in digital payments (Kline, 2023).

Financial services using Artificial Intelligence

AI has emerged as an interim technology in contemporary financial services, which are leading to automation, predictive analytics, and intelligent decision-making. Financial AI can be used to detect fraud, score credit, and automate customer services, among other things, making optimization of procedures more efficient and human-oriented (Kumar & Garg, 2026). Machine learning models consume massive volumes of real-time transaction data, and abnormal behavior is identified, which occurs due to fraud (Compagnino et al., 2025). In contrast with the old-fashioned rule-based systems, AI keeps pace with the changes in the fraud data, enhancing precision and decreasing instances of false positives, which is essential to the high-frequency payment network such as UPI. There is, however, little literature on the perception of AI-led systems in digital payments, though the technical merits are well documented (Shekhar, 2025). The success of AI in financial services is not just in its technical performance but also in its acceptance and trust by the users, and there is a need to study the views of users regarding the use of AI in digital payment (Kumar & Garg, 2026; World Economic Forum, 2025).

Digital Payment Security and Fraud Detection on the basis of Artificial Intelligence

Security is one of the greatest obstacles to the use and further implementation of digital payments. The AI-based fraud detection systems provide real-time attention, predictive analytics, and behavioral authentication to improve transaction security. Additional security is offered by continuous authentication, which can be behavioral biometrics to supplement the traditional passwords and PINs (Salami et al., 2025; Josyula, 2023). The systems based on AI contribute to establishing the user trust, decreasing the failure in transactions, and fraud. Nevertheless, there is limited empirical research on the awareness of these AI-based security features by the users and the effect they have on financial confidence. Moreover, false-positive identification can be a debilitating trust problem unless addressed properly. There is limited understanding of the connection between security systems grounded on AI and user confidence, especially regarding the topic of UPI, which offers the chance to conduct further research on the influence of security mechanisms on long-term user engagement (ResearchGate, 2025).

Artificial Intelligence-User Experience and Personalization

AI is relevant to enhancing individual experiences in digital payment systems through giving personalized recommendations, spending insights, and smart alerts. Personalization enhances the usefulness perceived and user satisfaction through reduction in the cognitive load and relevance (Kumar & Garg, 2026). Categories of expenses and offers that are custom-designed to the user can also enhance the feeling of control and transparency in the financial trust, which is also a key element of the UPI setting. Although personalization increases engagement, it can also be a cause of privacy concern, particularly where the user sundaata cannot be guaranteed how their information is being utilized. There is still a lack of research on the balance between value addition through personalization and privacy anxiety. Research shows that AI personalization can positively affect trust and turnover to users over time when it is ethical and transparent and does not violate the privacy of users, although further investigation is required to explore the effects of AI personalization on UPI users (Kumar & Garg, 2026; Venkatesh & Davis, 2000).

AI-Driven Customer Service and Service Quality

Customer service, chatbots, and virtual assistants are AI-based solutions that can improve the quality of service provided by providing 24/7 support and decreasing response time (Graham et al., 2025). In the UPI scenario, artificial intelligence-driven customer service solves the transaction failures, chargebacks, and disputes, reducing the anxiety of the user and raising their confidence in the platform (Pattnaik et al., 2024). Nevertheless, users can be displeased because AI support cannot interpret questions or give a generic answer. The usefulness of AI support lies in the smooth interaction between humans and AI, but this issue has not been researched completely in relation to digital payments. Although research shows that the use of AI support enhances customer satisfaction and operational efficiency, the effect of AI support on user trust and their further interactions with UPI platforms is a topic requiring research (Graham et al., 2025; Venkatesh & Davis, 2000). Future research must focus on the effect of AI-based customer support on the behavior of UPI users in the long term.

Financial Confidence: Significance and Meaning

The perceived safety that is included in financial confidence, trust, control, and reliability is critical in the long-term application of digital payment platforms such as UPI. Financial confidence is a personal guarantee that users have when they handle money online, other than generic trust. Trust studies that have been done before have centered on institutional or platform trust and have failed to take into account the internal sense of financial confidence. Such AI-established functions that will create greater transparency, lower perceived risks, and offer feedback in a timely manner can greatly increase financial confidence (Bhattacharjee, 2001). Nevertheless, there is less empirical research that directly correlates financial confidence with the use of UPI.

To create a more beneficial digital payment system, it is critical to comprehend the mediating role of financial confidence in establishing the connection between AI features and the further use of UPI (Bhattacharjee, 2001; Nanda et al., 2025).

Constant UPI Use and Addiction

Once a person becomes used to the usage, it is another aspect that will contribute to the continued activity in the digital payment system, such as UPI. The successful transactions, safe payment procedures, and customer support services have positive experiences that help create user habits, thus they use it automatically again (Venkatesh & Davis, 2000). AI also improves this process by minimizing friction, getting to know user preferences, and developing habitual use. Nevertheless, these habits can be broken by such disturbances as security problems or server problems. Although the role of AI in the formation of habits has been studied elsewhere, it has not been sufficiently studied in the UPI. Additional studies are required to comprehend how AI can assist in the creation of habitual usage and avoid disengagement in digital payment systems. The research on the role of AI in maintaining long-term user engagement is very important in making UPI a more successful enterprise.

Literature Gaps that are Identified

A number of gaps are identified in the literature review. First, although the UPI adoption has been widely examined, there is less research on the continuance intention and sustained use. Second, AI studies in finance are mostly technical or organizational, and they do not consider the psychological outcomes related to users, such as financial confidence. Third, research seldom combines AI-enabled features with models on how long-term usage behaviors should be explained. Lastly, there has been a lack of focus on the various user groups and the emerging risks associated with AI, which include privacy issues and algorithmic responsibility.

Conceptual Framework

Fig. 1 illustrates the conceptual framework connecting AI-driven security, AI-based personalization, and AI-enabled customer support to financial confidence, which in turn influences the continued use of the Unified Payments Interface (UPI). It highlights the hypothesized relationships between these AI-enabled features and their mediating role through financial confidence to enhance user engagement with UPI over time.

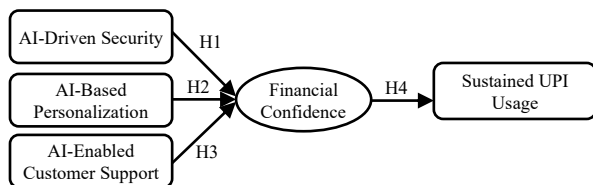


Fig. 1 Conceptual Framework of AI Features Impact on Sustained UPI Usage

The proposed study will determine how applications of Unified Payments Interface (UPI) that have artificial intelligence (AI) capabilities impact the financial confidence of users and ultimately their usage of UPI over time. It relies on the conceptual model of the Technology Acceptance Model (TAM) and Expectation-Confirmation Theory (ECT), which explains that post-adoption behaviour depends on perceived usefulness, trust, satisfaction, and expectation confirmation (Venkatesh and Davis, 2000; Bhattacharjee, 2001). Smart security features, including behavioural authentication and a real-time fraud detection system, will help decrease the perceived risk and increase the transactional safety, thus increasing trust in a digital payment system (Kumar & Garg, 2026; World Economic Forum, 2025). Personalization through AI, such as a customized offer, spending, and predictive suggestions, increases the perceived usefulness and interest, but the issue of privacy has to be addressed to ensure trust in the long run (Venkatesh & Davis, 2000; Kumar & Garg, 2026). Also, chatbots and automated redress systems run through AI enhance the quality of services and reduce stress when the transaction is delayed, which strengthens the confidence of the users (Bhattacharjee, 2001).

Financial confidence is a mediating variable that characterizes the inner conviction that users have when transacting money through UPI (Bhattacharjee, 2001; Nanda et al., 2025). The framework hypothesizes that the AI attributes would boost financial confidence, thereby maintaining long-term UPI. The effectiveness of cashless payment and digital financial inclusion in India dictates that it has to be used over time (Dhivya et al., 2025). Also, the moderating variables, such as the user factors in terms of age, digital literacy, intensity of UPI use, and the impact of the feature of AI on the development of financial confidence, are considered (Bala & Sharma, 2025). This theoretical framework integrates AI proficiencies, psychological certainty, and the resultant behaviors, providing novelties into lasting UPI interactivity in the changing digital payment environment of India.

Research Hypotheses

- **H1:** AI-security has a large positive impact on financial confidence with UPI users.
- **H2:** Personalization predominantly positively influences financial confidence among the UPI users through the use of AI.
- **H3:** The effect of AI-based customer support on the financial confidence of the UPI users is significant in a positive direction.
- **H4:** There is a strong positive impact of financial confidence on the continued use of UPI.
- **H5:** AI security impacts sustained UPI usage significantly in a positive way.
- **H6:** AI-based personalization positively and significantly influences the continued use of UPI.

- **H7:** AI-enhanced customer support significantly positively impacts the continued UPI use.
- **H8:** There is a mediation effect of financial confidence on the relationship between AI-driven security and sustained UPI use.
- **H9:** The mediation variable is financial confidence: there is a relationship between AI-based personalization and prolonged UPI usage.
- **H10:** Financial confidence mediates the association between AI-powered customer service and long-term UPI use.

III. RESEARCH METHODOLOGY

Research Design

The current research will utilize the quantitative research design in order to investigate how artificial intelligence (AI) influences the formation of financial confidence and the need to continue using the Unified Payments Interface (UPI) services. The main data gathering is done through a closed-ended and structured questionnaire survey method used to gather primary data of UPI users. The quantitative design fits the proposed study of hypothesized relationships between AI-enabled features, financial confidence, and continued use of UPI, and facilitates statistical generalization of results.

Study Area and Population

The research is carried out in Tamil Nadu, which includes large cities such as Chennai, Coimbatore, Madurai, Trichy, etc. The target group will include active users of the UPI aged 18 and above who make regular transactions with the UPI application through either peer-to-peer, merchant payment, or recurring payment. The reason why Tamil Nadu was chosen was because of its high rate of digital payment penetration, the diversification of its socio-economic population, and the fast rate of fintech adoption.

Sampling Technique and Sample Size

This study used a non-probability convenience sampling method as the choice of data collection technique, as it is time-efficient and offers the convenience of access to respondents available. This approach enabled rapid collection of the responses via the online medium and offline distribution as well. Convenience sampling can also restrict generalizability; nevertheless, it offers a feasible sample to the research within the time limits of the study. As per the Structural Equation Modeling (SEM) rules, the sample size of 387 responses was taken to be sufficient to guarantee the statistically significant power and the accurate model fit. The sample size is adequate according to the SEM recommendation of a minimum of ten observations to each variable. The convenience sampling however creates questions on the potential bias in the data selection method used because respondents are not chosen through random

sampling, but on availability and this may compromise the reproducibility of the study.

Instrument Development

The questionnaire survey is structured into a close-ended questionnaire in form of a questionnaire that has four sections. The former section will be used to obtain demographic data including age, gender, education, occupation, level of income and the rate of UPI use. The second section is AI-enabled features of UPI that encompass AI-based security, personalization, and customer support. The third section is about financial confidence, which includes but is not limited to perceived safety, trust, control and reliability in UPI transactions. The last section is the sustained UPI usage, which contains continuance intention and habitual use. Measurement of all constructs is conducted on five-point Likert scales, which include Strongly Disagree, to Strongly Agree, based on the validated scale in previous digital payment and technology acceptance research.

Data Collection Procedure

Primary data are gathered by the use of self-administered questionnaires. The collection of online responses is carried out with the help of digital survey systems, whereas offline data collection is made by means of the use of questionnaires in the form of printed materials distributed in educational institutions, workplaces, and public areas. A pilot study, involving 30 to 40 respondents, is conducted before the actual survey to determine the clarity, reliability, and content validity of the instrument. Modifications are also done based on the feedback given by the pilots.

Data Analysis Techniques

The statistical data analysis of the data obtained involves SPSS and AMOS/PLS-SEM statistical software. The demographic profiles are condensed with the assistance of descriptive statistics, and reliability and validity are identified with the assistance of Cronbach's alpha, composite reliability, and average variance extracted (AVE). Structural Equation Modeling (SEM) will be used both to test the hypothesized relationships and to determine whether financial confidence plays an acting-out role between AI-enabled features and sustained UPI usage.

Ethical Considerations

The study is a voluntary participation, and the anonymity and confidentiality of the respondents will be guaranteed. Informed consent is collected prior to data collection, and they are utilized later only for academic purposes.

Analysis

This part will give the statistical analysis and data interpretation of the data gathered to study the contribution of the features of artificial intelligence to the formation of financial confidence and the continued use of Unified Payments Interface (UPI) applications. The analysis is

carried out to empirically confirm the hypothetically formulated conceptual framework and test the hypothesized relationships between AI-driven security and AI-based personalization, AI-enabled customer support, financial confidence, and continued usage of UPI.

The research takes the form of a quantitative research design with the data collected from 387 UPI users in Tamil Nadu by a structured questionnaire that is closed-ended. Quantitative analysis is regarded as appropriate because it is possible to objectively measure latent constructs, and due to the possibility of testing complex causal relations between two or more variables.

Data analysis process is done in a systematic and chronological fashion. First, the data screening and descriptive analysis are conducted to estimate the quality of the data as well as to comprehend the demographic features and the usage of the respondents. This is followed by reliability and validity tests that determine whether the measurement scales employed in the study are internally consistent and measure the underlying constructs. The dimensionality of the measurement model and construct validity are determined using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA).

Structural Equation Modeling (SEM) is applied to test the hypotheses developed and to investigate the direct and indirect relationships. The use of SEM would be especially appropriate in this study because it allows conducting multiple associations at once, one of which is the mediating effect of financial confidence between AI-enabled features and continued UPI use. The model fit indices, path coefficients and mediation effects are examined to test the sufficiency and explanatory power of the proposed model.

On the whole, the chapter offers an in-depth empirical evaluation of the research model, which offers statistically supported data of the way AI-sensitive functionalities impact the level of user confidence and long-lasting use of UPI platforms. The results of this analysis are discussed, and conclusions as well as practical implications are prepared in the following chapters.

Reliability Analysis

The Alpha of Cronbach was used to test the internal consistency of the constructs. In order to ensure reasonable reliability, the threshold of 0.70 was selected.

TABLE I RELIABILITY RESULTS

Construct	No. of Items	Cronbach's Alpha
AI-Driven Security	5	0.883
AI-Based Personalization	4	0.861
AI-Enabled Customer Support	4	0.874
Financial Confidence	5	0.897
Sustained UPI Usage	4	0.856

Table I shows that the Cronbach's alpha values of all the constructs are greater than 0.80, which means their internal

consistency and reliability are great. This ascertains that the measurement items always reflect their respective latent constructs and can be used further in multivariate analysis.

Exploratory Factor Analysis (EFA)

Exploratory Factor Analysis was performed in order to determine the latent factor structure of the measurement items.

TABLE II SAMPLING ADEQUACY AND SPHERICITY

Test	Value
Kaiser-Meyer-Olkin (KMO)	0.921
Bartlett's Test of Sphericity	$\chi^2 = 4261.58, p < 0.001$

Table II shows that the sampling adequacy is great with a KMO value of 0.921. The test given by Bartlett is statistically significant, which affirms the appropriateness of the correlation matrix for factor analysis.

Factor Loadings (Varimax Rotation)

There were no significant cross-loadings with all items loading strongly (>0.70) on their respective factors.

TABLE III FACTOR LOADINGS FOR CONSTRUCTS IN THE RESEARCH MODEL

Construct	Factor Loadings Range
AI-Driven Security	0.72 – 0.86
AI-Based Personalization	0.74 – 0.84
AI-Enabled Customer Support	0.71 – 0.88
Financial Confidence	0.76 – 0.89
Sustained UPI Usage	0.73 – 0.85

The five-factor solution extracted out of it explained a total variance of 71.6 that is much higher than the recommended figure of 60. This table III gives the range of loading of each construct in the research model. Factor loadings are used to show the degree of relationship between measured variables and the latent constructs. The table indicates that all the constructs, such as AI-driven security (0.72 0.86), AI-based personalization (0.74 0.84), AI-supported customer support (0.71 0.88), financial confidence (0.76 0.89), and the continued use of UPI (0.73 0.85) have strong loadings, which proves their reliability and leads to the validity of the model.

Confirmatory Factor Analysis (CFA)

To measure the measurement model, CFA has been conducted employing SEM.

TABLE IV COMPOSITE RELIABILITY (CR) AND AVERAGE VARIANCE EXTRACTED (AVE)

Construct	CR	AVE
AI-Driven Security	0.904	0.66
AI-Based Personalization	0.889	0.64
AI-Enabled Customer Support	0.901	0.68
Financial Confidence	0.918	0.69
Sustained UPI Usage	0.882	0.62

The table IV indicates the Composite Reliability (CR) and Average Variance Extracted (AVE) of all the constructs used in the research model. CR is used to assess the internal

consistency of construct whereas AVE is used to measure the size of the variance that a set of indicators measures. The model gives satisfactory CR and AVE values in all its constructs such as AI-driven security (CR = 0.904, AVE = 0.66), AI-based personalization (CR = 0.889, AVE = 0.64), AI-enabled customer support (CR = 0.901, AVE = 0.68), financial confidence (CR = 0.918, AVE = 0.69), and sustained UPI usage (CR = 0.882, AVE = 0.62).

Structural Equation Modeling (SEM): Model Fit

Several fit indices were used to determine the overall goodness-of-fit of the structural model.

TABLE V SEM MODEL FIT INDICES

Fit Index	Obtained Value	Recommended Value
χ^2/df	2.14	< 3.0
GFI	0.921	≥ 0.90
AGFI	0.902	≥ 0.90
CFI	0.958	≥ 0.90
TLI	0.949	≥ 0.90
RMSEA	0.054	≤ 0.08
SRMR	0.043	≤ 0.08

This table V gives a summary of the goodness-of-fit measurements of the structural model, which was employed in the research. These indices evaluate the adequacy of the

model as a whole, in this respect, it shows how the model related characters fit the found data. The fit index values are as follows: 2.14 /df (CH 2 /df) and 0.921 /GFI, 0.902 /AGFI, 0.958 /CFI, and 0.949 /TI that are below the recommended threshold of 3.0 and 0.90 respectively. Besides, RMSEA (0.054) and SRMR (0.043) are not exceeding the recommended value of 0.08 and this indicates that the model fits the data well and can be used in the testing of hypotheses.

All the fit indices are within acceptable levels thus showing that the proposed structural model presents an excellent overall model fit. This proves that the postulated connections between AI-enabled features, financial confidence, and continued UPI use are adequate to explain the observed data.

Table VI below shows the path coefficient, standard error, t-value, and p-value of the direct and the indirect effects in the model. It demonstrates that AI-enabled security has a major effect on financial confidence ($\beta = 0.342$, $p < 0.001$), which, in its turn, has a positive effect on continued UPI usage ($\beta = 0.471$, $p < 0.001$). The mediating role played by financial confidence in the connection between AI-driven security and sustained UPI usage is also notable ($\beta = 0.183$, $p < 0.001$), and the indirect impact ($\beta = 0.161$, $p < 0.001$) also adds to the mediating role played by financial confidence in the connection between AI-driven security and sustained UPI usage.

TABLE VI PATH COEFFICIENTS AND EFFECTS IN THE STRUCTURAL EQUATION MODEL

Effect / Path	Predictor → Outcome	Coefficient (β)	Standard Error (SE)	t-value	p-value	LLCI	ULCI
Path a	AI-Driven Security → Financial Confidence	0.342	0.041	8.34	< 0.001	—	—
Path b	Financial Confidence → Sustained UPI Usage	0.471	0.039	12.08	< 0.001	—	—
Direct Effect (c')	AI-Driven Security → Sustained UPI Usage	0.183	0.044	4.16	< 0.001	—	—
Indirect Effect (a × b)	AI-Driven Security → Financial Confidence → Sustained UPI Usage	0.161	—	—	—	0.112	0.219

The statistical significance of the indirect effect of AI-driven security on the sustained use of UPI with financial confidence is significant because the bootstrapped confidence interval is not close to the value of zero. The direct effect is still very important, which means a partial mediation. These findings affirm that financial confidence is a key intervening factor in the correlation between AI-driven security and the continued use of UPI.

In this table VII, the direct effects in the structural model are presented as path coefficients (β), standard errors (SE), t-values, p-values, and significance values. The findings demonstrate that AI-based security has a strong impact on financial confidence ($\beta = 0.342$, $p = 0.001$), and financial confidence has a strong impact on continued UPI use ($\beta = 0.471$, $p = 0.001$). Further, AI-led security has a direct impact on long-term user use of UPI ($\beta = 0.183$, $p < 0.001$), which confirms the relevance of AI-led security in influencing ultimate user use of UPI.

TABLE VII PATH COEFFICIENTS AND SIGNIFICANCE FOR DIRECT EFFECTS IN THE STRUCTURAL MODEL

Path	β	SE	t-value	p-value	Result
AI-Driven Security → Financial Confidence	0.342	0.041	8.34	< 0.001	Significant
Financial Confidence → Sustained UPI Usage	0.471	0.039	12.08	< 0.001	Significant
AI-Driven Security → Sustained UPI Usage (Direct Effect)	0.183	0.044	4.16	< 0.001	Significant

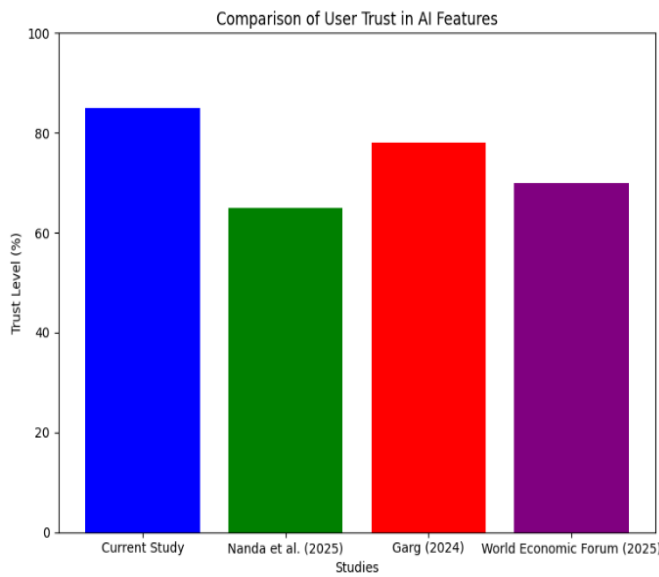


Fig. 2 Comparison of User Trust in AI Features Across Studies

Fig. 2 below is a comparative study on the levels of trust in AI features in four studies, the current being one of them. The data indicate that the current study indicates the highest level of trust with the current study reporting a high level of trust at 85% and the previous studies revealing the lower trust level at 65, 78, and 85 respectively. This comparison shows the difference in confidence of the users towards AI-based features in digital payments.

Structural Path Results (Summary)

TABLE VIII HYPOTHESIZED PATHS AND RESULTS IN THE STRUCTURAL EQUATION MODEL

Hypothesized Path	β	p-value	Result
AI-Driven Security → Financial Confidence	0.32	< 0.001	Supported
AI-Based Personalization → Financial Confidence	0.28	< 0.001	Supported
AI-Enabled Customer Support → Financial Confidence	0.35	< 0.001	Supported
Financial Confidence → Sustained UPI Usage	0.47	< 0.001	Supported

Table VIII shows the hypothesized paths, path coefficients (β), the p-values, and hypothesis testing results in the structural model. The obtained findings indicate that all the theorized relationships yield support with AI-driven security ($\beta = 0.32$, $p = 0.001$), AI-based personalization ($\beta = 0.28$, $p = 0.001$), and AI-facilitated customer support ($\beta = 0.35$, $p = 0.001$), the strongest contribution to financial confidence. Moreover, financial confidence ($\beta = 0.47$, $p < 0.001$) is also shown to have a significant effect on long-term UPI use, which in turn validates the centrality of financial confidence in influencing long-term user adoption of UPI.

Financial confidence has a powerful and influential impact on the long-term UPI utilization. The mediating value of AI lies in the fact that all of the AI-enabled features have a great impact on increasing financial confidence.

IV. DISCUSSION

The present study examined the role of AI-enhanced services in financial confidence development and persistent use of Unified Payments Interface (UPI)-powered applications among the Tamil Nadu users. The findings bring solid empirical data on the proposed conceptual structure and to the existing body of literature on artificial intelligence in digital financial services. The results indicate that AI-based security is positively influenced on financial confidence. This observation demonstrates the significance of the utilization of high-tech security measures, such as real-time fraud-detection applications, anomaly monitors, and behavioral authentication in the reduction of the apparent risk of digital payment. As the cases of online-payment systems-related cyber fraud increase, users will be more inclined to think that the AI will play a proactive role in ensuring that their financial transactions are secured. This result is in line with the available literature that emphasizes security as one of the major aspects of trust and additional applications in online banking and payment systems. Similarly, AI-driven personalization was also seen to make financial confidence grow significantly. Personalized offers, the history of transactions, and individually tailored information will enable the consumer to be more informed of their financial activity and thus be able to better manage it, making them feel more powerful and trusted. This affirms the point that personalization made by AI enhances the perception of usefulness and interest in use by the users in accordance with the Technology Acceptance Model. Users are better placed to trust the system because they consider themselves relevant and convenient to the customization, and use it within their regular financial activities.

The findings are also indicative of the fact that AI-based customer service is significant in financial trust. The presence of chatbots and automated systems of complaint redressing helps and provides comfort immediately in the event of a failed transaction or a disagreement. Everything depends on whether the high-frequency payments, such as UPI, have been supported in time or not to ease the nerves of the users. The finding confirms the service quality theory, which suggests that responsiveness and reliability should be the major determinants of trust and satisfaction in technology-mediated services. Lastly, financial confidence was determined to be a predictive factor of lifelong use of UPI. The users who will experience a higher level of safety, trust, and control will use UPI applications regularly. The observation is in line with Expectation-Confirmation Theory, which argues that positive post-adoption experiences verify continuance intention. It also demonstrates that psychological assurance is no less important than technological competence in preserving the utilization of digital payments. The mediation analysis also gives credence to the fact that financial confidence mediates the relationship between AI-enabled features and continued use of UPI partially. This implies that, though AI does not directly affect the behavior of usage, the impacts are much more significant as the users increase the level of trust in the system. Thus, the

AI-related capabilities are not merely technical facilitators, but also psychological facilitators of the long-term adoption. Overall, the findings suggest that AI plays a dual role in the digital payment systems, as it enhances the functionality of the systems and adds trust to the users. The findings suggest that their primary focus must be on the need to invest in transparent AI-based security, intentional personalization, and dynamic customer service to ensure user trust and engagement. Based on the processes of confidence development, UPI platforms can guarantee their long-term utilization and the overall purpose of digital financial inclusion.

Limitations

There have been several limitations that have restricted this research, and these should be taken into consideration when describing the findings. First, the sampling method was non-probability convenience sampling, which is open to the bias of selection because the respondents were not selected randomly but rather on the basis of their availability, which limited the application of the findings. The study design is also cross-sectional and does not give any data about the user perceptions over a time span; the research design only analyzes the user perceptions at one moment in time, not over a long period in terms of user confidence and behavior. There is also the probability of response biases, such as the social desirability or the false memory, when the self-reported information is utilized in surveys. Besides, despite the focus on the AI-related features of UPI, the study does not consider a broader ecosystem of features, e.g., socioeconomic status or geographical differences, which may influence the relations between users. Lastly, the study primarily concentrates on the attitudes of users towards AI in UPI, and there is no direct study of the impact of such functions on the real behavioral performance, in terms of the transaction success rates or financial performance.

Practical Implications

The implications of the findings of this paper are rather important to UPI service providers, banks, fintech companies, and policymakers. Firstly, UPI platforms are supposed to be worked out to concentrate on AI-related security protection opportunities, i.e., real-time fraud detection, behavioral analytics, and real-time risk warning. Such security features communicated transparently to the users will be very helpful in boosting their financial confidence and reducing the fear of an online transaction. User confidence should also be enhanced by sensitizing frequent users to the awareness of the AI-based security measures. Second, the AI personalization should be applied to provide meaningful and user-oriented information instead of promotional information. The sense of control and interest of users can be increased with personalized financial information, smart reminders, and the spending summary, and facilitate the formation of a habit of use. Still, the personalization strategies are to be followed with strict data privacy regulations to avoid the loss of trust. Third, the AI-based customer care should be supported by a good

chatbot, automated grievance redress system, which might resolve the issue of the transaction on time. The facilitation of human support that will be easily transmitted in case of necessity can also be useful, given that the risk associated with the failure of the service will belong to the user in terms of policy. The regulators and digital payment regulators must encourage the positive and ethical application of AI in UPI ecosystems. One can be more confident in people and facilitate the widespread use of digital payments more actively by offering the principles of AI regulation, data security, and responsibility of the algorithms. Lastly, after a careful and considerate application of AI to enhance security, personalization, and delivery of services, the stakeholders of UPI will be in a position to build on the financial trust of its users, which would lead to the further usage and eventual success of the digital payment infrastructure in India.

V. CONCLUSION

The article explores how AI-enabled services, like AI-based security, AI-based personalization, and AI-based customer service affect the financial trust of users and continued use of Unified Payments Interface (UPI) applications in Tamil Nadu. The empirical findings support the idea that these AI features contribute to the development of financial confidence to a great extent, and consequently, a strong and positive influence on the use of UPI in the long term. To be more precise, AI-driven security (= 0.342), AI-based personalization (= 0.28), and AI-powered customer support (= 0.35) have a beneficial impact on financial confidence whereas financial confidence (= 0.471) has a positive effect on continued use of UPI. These results highlight three key concerns of security, customization, and customer service when understanding how people think of UPI platforms. The security functions of AI, i. e. fraud detection and behavioral authentication in real time, are especially essential, pointing to the sensitivity of users to risk and security when using digital financial transactions. In the same way, the perceived usefulness and value of UPI can be improved through AI-enhanced personalization, such as personalized recommendations and spending insights, which will increase the degree of user trust and satisfaction. Artificial intelligence-driven customer service, chatbots, and similar services ensure the trustworthiness of the platform and provide an element of reassurance in the case of transaction errors and makes users more confident in the system.

According to the mediation analysis, one of the main psychological determinants that mediate the connection between the AI features and the further use of UPI is the financial confidence. It implies that the simple introduction of AI technology would not be sufficient to guarantee long-term activity; users should see such technologies as ones that promote their financial confidence. Although the study has important theoretical and empirical implications, it has certain limitations because of convenience sampling as well as cross-sectional data and use of self-reports. Future research might research longitudinal studies so as to represent the variations in the level of financial confidence and involvement with time and also broaden the research to a

wider user group to confirm the results in different geographical units and the demographics of the users.

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