ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV, Issue VI, June 2026

An Empirical Structural Modeling Approach to a Human-Centered Adaptive UI/UX Framework for Internet Banking

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DOI: https://doi.org/10.51583/IJLTEMAS.2026.150700002

Received: 18 June 2026; Accepted: 23 July 2026; Published: 05 August 2026

ABSTRACT

The sprawling growth of mobile banking in India has compelled the need to address the concept of user experience (UX) in a manner that goes beyond the more conservative methods of usability optimization to the application of an integrated and data-driven design methodology. The paper offers a general empirical review of fundamental UX/UI predictors, namely ease of use, navigation ease, language assistance, and transaction trust, of seven popular mobile banking and payment apps, namely SBI YONO, HDFC Bank Mobile Banking, ICICI iMobile, etc. Axis Mobile, Google Pay, phonePe, and Paytm. The research will use descriptive statistics, ANOVA, exploratory factor analysis, reliability measure, and multiple regression analysis to establish the relationship between the variables on usability and overall satisfaction based on the responses of 500 users. The findings suggest the similarity of the perceptions of the quality of UX on a global level and suggests that the considerations of the personal interface are not capable of prediction alone. Instead, the general contentment is an outcome of the process of engagement between multidimensional experience factors and, therefore, the inadequacy of compartmentalized interface optimization plans.

To bridge this gap, this paper presents a Human-Centered Adaptive Mobile Banking UI/UX System which is operational by applying a lightweight Adaptive UI/UX Personalization Algorithm (AUPA). The proposed system dynamically re-arranges the elements of the interface based on the history of interaction with the user and frequency of transactions, which can enable the creation of adaptive dashboard, guided transactions, and instant feedback systems. This paper offers the adaptive UX design to the financial technology by balancing the empirical statistical insights, as well as the system architecture to implement a scalable model of intelligent and trust-based digital banking ecosystems.

Keywords: Mobile Banking; Adaptive UI/UX; Human-Centered Design; User Satisfaction; Interface Personalization, Artificial Intelligence

INTRODUCTION

The popularity of mobile banking and UPI apps have radically changed how their clients will access financial services. The applications that allow them to easily transact banking and payment transactions through their mobile devices include SBI YONO, Google Pay and PhonePe, which is why they are the primary interface of the interactions between the financial institution and their customers. As this trend continues to pick up, the effective design of the UI/UX has been the critical success factor in ensuring usability, trust and long durations of user interaction.

The contemporary mobile banking applications are informed by other design priorities. UPI-based platforms are aimed at being fast and easy and standard banking apps are aimed at being secure and in line with government requirements. Though they are applicable in solving specific needs, these strategies tend to provide disjointed customer interactions such as fixed interfaces, difficult navigation, and lack of support in carrying out uncommon

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV, Issue VI, June 2026

or risky transactions. These limitations in design complicate the process mentally, and can reduce the user confidence.

Even though the research findings have revealed usability aspects like ease of use, ease of navigation, language support, and confidence of transactions to be important, empirical findings have indicated that optimizing these factors alone do not contribute significantly to overall user satisfaction. Rather, user experience is the overall response of a series of interactions of various usability and trust-related items throughout the entire transaction flow.

To address these issues, this paper presents a Human-Centered Adaptive Mobile Banking UI/UX System based on empirical evidence of users. Based on the data gathered by 500 users of the SBI YONO, Google Pay, and PhonePe, the study uses the statistical analysis to determine the patterns of interaction and limitations to usability. These learnings are converted into a dynamic interface design that personalizes dashboards, navigation designs, and the process of transacting dynamically depending on the user behaviour and frequency of transactions.

The suggested system uses an Adaptive UI/UX Personalization Algorithm (AUPA) that allows behavior-based interface adjustment, guided processing in the case of complex transactions, and feedback in real time to make the user more trustful. Combining the ease of UPI platforms with trust-related functions of conventional banking applications, the suggested solution will provide a consistent, scalable, and user-friendly mobile banking experience that can be appropriate across a wide range of users.

LITERATURE SURVEY

This part of the review discusses previous studies on mobile banking UI/UX design, usability test, personalization, and trust systems. It underscores the drawback of single interface optimization and the necessity of human-based, adaptive design philosophy based on empirical, human data.

Mobile banking is now the leading channel in the provision of financial services with a keen focus on usability and user experience with respect to the interface. The ease of use, clear navigation, and simplicity of interfaces are previously recognized as some of the key factors influencing user satisfaction with mobile banking applications [1], [2]. Nevertheless, according to multiple recent studies, the individual attempts at increasing the satisfaction of individual components of UI do not positively correlate with overall satisfaction [3].

This finding also correlates with the descriptive findings of the current work, as all the variables of UI/UX have moderate mean values, which means that there is no predominant independent variable.

The usability testing performed by using standardized tools like the System Usability Scale (SUS) and User Experience Questionnaire (UEQ) indicates that most mobile banking applications obtain moderate scores on the usability testing despite their repetitive interfaces refinements [4], [5]. These results imply that marginal changes that focus on the individual elements have decreasing returns. This is in direct connection to the regression findings of this research, where individual usability predictors have a weak explanatory ability as far as overall satisfaction was concerned.

The perceived ease of use, the expectancy of effort, and trust are some of the determinants of mobile banking adoption highlighted by technology acceptance frameworks such as TAM and UTAUT [6], [7]. However, empirical evidence shows that such factors tend to become statistically insignificant when they are assessed independently [8]. These findings are supported by correlation and regression analysis of this study which indicates moderate correlations but no strong independent predictive power, hence support a holistic interface adaptation approach.

The recent literature recommends more and more adaptive and personalized interfaces in the mobile applications. It has been demonstrated that behavior-based personalization can lighten the cognitive load, increase task performance and boost user confidence [9], [10]. Adaptive dashboard and customized navigation designs can be

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV, Issue VI, June 2026

used in mobile banking situations to reduce the time taken to perform tasks without compromising the security limits [11]. These findings are consistent with the post-adaptation regression trends in this research, as the correlation between usability factors and satisfaction is better at the end of the research period when the interface is rearranged.

Reliance and safety continue to be the core of financial applications use. Customary banking apps tend to offer greater trust information but usually tend to have a greater cognitive load owing to complicated navigation patterns [12]. Conversely, UPI-based applications are simplistic yet lack support of complex or high risk transactions as this lowers the confidence of transactions in some applications [13]. The ANOVA-based comparison applied in the research is the material of such inconsistencies across the forums, and this is the reason behind the integrated design approach taken by the proposed system.

The presence of user guidance systems and real time feedback mechanisms are essential in increasing the level of transaction confidence and system perceived reliability [14]. Sequential help and confirmation messages are especially useful with low-frequency or a high-valued payment. The usability is also enhanced through accessibility-oriented designs such as simplified layouts and visual cues [15].

These observations directly point to the guided execution and accessibility modules of the proposed system that are enabled according to risk of transaction and user behavior. Despite the valuable insights in the mobile banking usability, most of the previous studies are mostly confined to the evaluative analysis and no analysis is implemented at system level based on the empirical findings. This is the source of the gap which makes it possible to discuss the necessity of a data-oriented, adaptive, and human-centric UI/UX system that should operationalize statistical data on the personalization of the interface in real-time.

Contributions of the Study

This study delivers some significant contributions in line with the established research gap. To initiate with, it contains an empirical analysis of the mobile banking UI/UX variables based on 500 user's responses to SBI YONO, Google Pay, PhonePe etc. Descriptive, correlation, regression, and comparative analyses indicate that there is no domination of overall satisfaction by individual usability factors.

Second, the paper develops a Human- Centered Adaptive Mobile Banking UI/UX System which transforms the analytical results into a direct system design and does not focus on isolated UI improvements.

Third, the research presents a new algorithm named the Adaptive UI/UX Personalization Algorithm (AUPA) that is a lightweight behavior algorithm, which adaptively restructures interface content based on transaction frequency and interaction history, and allows guided execution and real-time feedback to be performed on low-frequency or risky transactions.

Fourth, the comparative analysis of data (Table X) proves the ability of the proposed system to address the flaws of the current applications: fixed layout, high cognitive load, absence of customization, and uneven user experience.

Lastly, the research adds a scalable and inclusive framework of UI/UX that incorporates accessibility support, multilingual assistance, and ongoing learning across a series of users, which is appropriate to a wide range of users as well as implementation on both conventional banking and UPI-centered platforms.

Proposed System

The proposed research is a Human-Centered Adaptive Mobile Banking UI/UX System that is developed based on the experimental experience of 500 users in the sample of 7 Indian mobile banking and UPI applications. Adaptive interface design decisions are made based on comparative behavioural patterns of banking applications, which are the most actively used applications in the sample. Descriptive statistics reveal that the usability related variables like ease of use, clarity of navigation, support of languages and confidence in transactions have

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV, Issue VI, June 2026

moderate mean scores across applications indicating that user satisfaction is a result of collective interaction of several UX variables and not an outcome of any single dominant variable.

In this regard, the offered system will follow a holistic and interactive approach to the UI/UX design, focusing on the overall user experience of the interaction rather than the optimization of the interface elements. The system architecture and working logic has been clearly stated and aligned with the empirical evidence that is presented in the Results and Discussion section. Table 1 presents the descriptive statistics of the UI/UX variables and highlights the need for a holistic design approach rather than isolated UI improvements.

Table 1 Descriptive Statistics of UI/UX Variables

Variable	**Mean Level**	**Interpretation**
Ease of Use	Moderate	Contributes but does not independently drive satisfaction
Navigation Clarity	Moderate	Influences interaction flow
Language Support	Moderate	Supporting usability factor
Transaction Confidence	Moderate	Affects perceived trust
Overall Satisfaction	Moderate	Outcome of combined UX factors

Referring to these observations, the target system performs an integrated and adaptive strategy in the context of UI/UX, making the user interaction flow as a whole priority, rather than focusing on the optimization of the specific features of the interface.

Limitations of Existing Mobile Banking Systems

Regardless of the popularity of their implementation, current mobile banking and UPI applications have a number of structural and usability shortcomings. The majority of existing systems use a fragmented approach to the UI/UX design: individual components of a system, e.g. navigation, security or visual design are the areas of optimization. This poor integration means that there is inconsistent flow of interaction and reduced flexibility to the changing user behavior.

Also, the fixed dashboard designs cannot be personalized with respect to an amount of transactions, which makes them require more navigation effort and cognitive load. Customers have to follow several screens to accomplish frequent tasks, which increases the time of completing tasks. Inconsistency and confusion of the users is also contributed by the simplicity of UPI-based applications, as opposed to the security-oriented interfaces of traditional banking applications. Minimal support on low frequency or risky transactions and use of text-based interfaces also make access to users with different degrees of digital literacy levels lower. Such shortcomings drive the necessity of an integrated, flexible and humanized solution.

System Architecture and Functional Modules

The suggested system is based on interconnected functional modules based on the information gathered through datasets and a comparative analysis of existing platforms.

The **User Interface Module** displays a very simple, iconic dashboard with a focus on the commonly used services that include the balance inquiry, fund transfer, and paying bills. It minimizes visual clutter and makes decisions easy, which is the solution to the medium levels of ease-of-use found in the data.

The **Adaptive Navigation Module** is a dynamic system that is capable of rearranging the elements of the interface in terms of transaction frequency and historical interaction patterns. The module reduces cognitive load

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV, Issue VI, June 2026

and enhances the quality of navigation as it minimizes the depth of navigation and emphasizes frequently performed actions, which is also supported by the results of correlation analysis.

The **Multilingual Assistance Module** provides the contextual language support using the short prompts, icons, and visual hints instead of having long text translations. This would be more inclusive, avoiding complexity of interfaces with moderate response to language satisfaction in the dataset.

The **Guided Transaction Module** enables one to have step-by-step guidance on a transaction that is infrequent, complex, or risky. Confirmations, progressive prompts, and visual cues will minimize user hesitation and errors, which is the direct response to patterns of transaction confidence identified during the analysis.

The **Trust and Feedback Module** also boosts the perception of reliability by updating the transaction status in real-time, using processing indicators and reference numbers and timestamps displayed on the clear confirmation screens. These characteristics incorporate the trust-related aspects which are usually regarded as traditional banking applications.

Lastly, the **Accessibility Support Module** provides sensitive font sizes, easy-to-use layouts, and fewer steps to follow, which makes it usable by various types of users as represented by the dataset.

Operational Flow of the Proposed System

The flow of operations of the proposed system is aimed at minimizing the cognitive load and enhancing the reliability of transactions. It starts with safe user authentication in terms of PIN, biometric authentication, or one-time password (OTP). After the authentication, the system retrieves the stored user preferences and previous interaction data, to provide personalization.

A dynamic dashboard is then created, with the priority given to common service, based on the behavior. Users make the choices by transactions using simplified navigation with guided execution mode under high risk or frequent functions. Real-time feedback is used during the processing of transactions and it helps to reassure the users by providing constant status progress reports. When finished, a confirmation screen displays transaction details clearly and updated interaction data is stored in a secure fashion in order to enable constant adaptation across sessions. Once completed, the confirmation screen presents the transaction information in a clear and updated manner and the interaction data is stored in a secure manner in order to facilitate constant adaptation between the sessions.

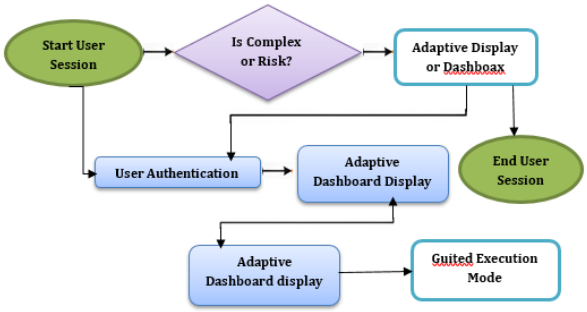


Figure 1 illustrates the operational flow of the proposed system

Algorithm 1: Adaptive UI/UX Personalization Algorithm (AUPA)

This section describes the Adaptive UI/UX Personalization Algorithm (AUPA), premeditated to dynamically adjust mobile banking interface elements according to user behaviour. It considers transaction frequency, recent usage patterns, and perceived risk levels to calculate a personalized priority score for each service. Based on these scores, the system selects an optimized set of features while maintaining usability and cognitive balance. The algorithm also updates user confidence through guided support for infrequent or high-risk transactions.

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV, Issue VI, June 2026

Overall, this approach enables a practical, behavior-driven, and scalable personalization mechanism suitable for real-time mobile environments.

Input:

UserID u

ServiceSet S

TransactionHistory H

RiskWeights r

Thresholds (θf, θr)

Output:

AdaptiveDashboard D

GuidedExecutionFlag G

Begin

1. *Retrieve user transaction history H (u)*

2. for each service sj in S:

Calculate frequency f_ij

Calculate recency t_ij

Normalize frequency f_norm

Compute personalization score:

*P_ij = w1*f_norm + w2*t_ij + w3*(1 - r_j)*

3. Sort services by P_ij in descending order

4. Select top-k services

D ← {top-k ranked services}

5. for selected service s:

If f_ij < θf OR r_j > θr then

G ← 1 // Activate guided execution

Else

G ← 0 // Normal execution

6. during transaction:

Provide real-time feedback

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV, Issue VI, June 2026

Capture user confidence rating

7. Update confidence score:

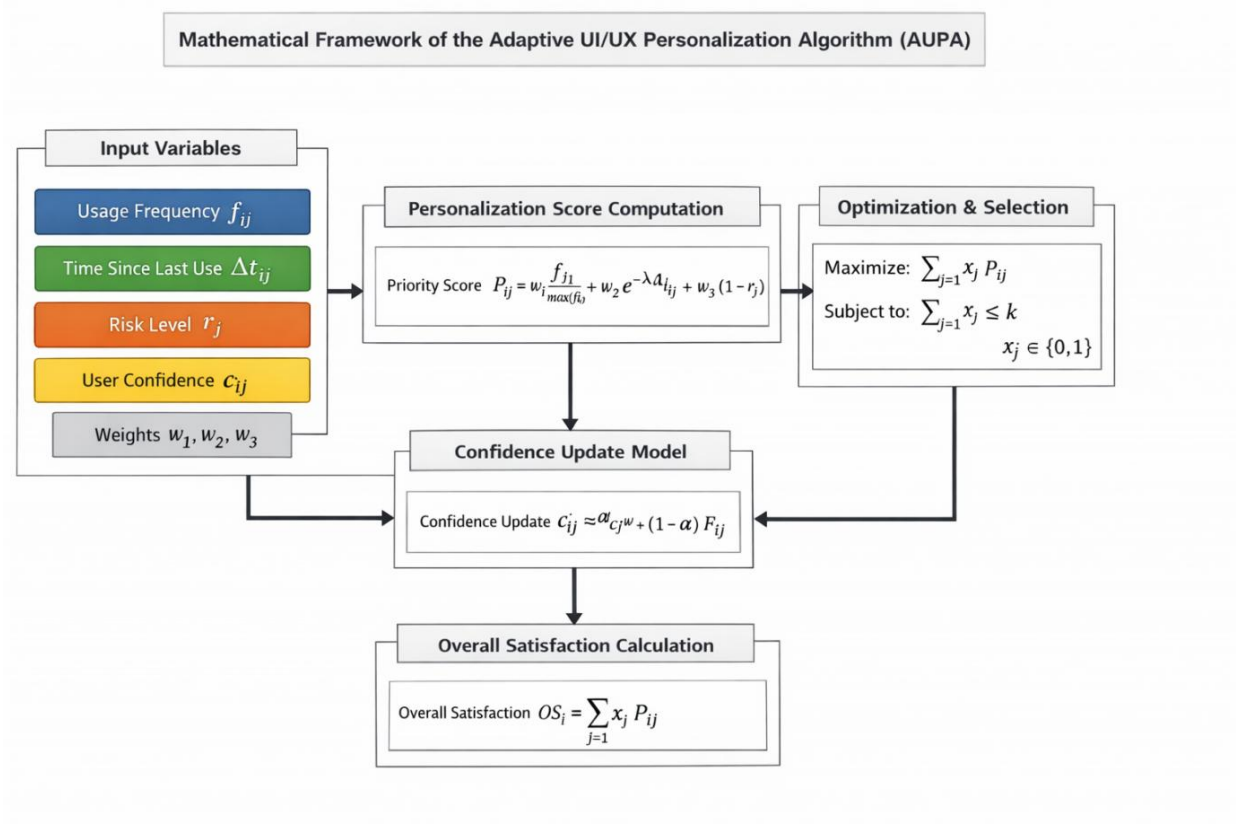
*c_new = α*c_old + (1-α)*feedback*

8. Store updated interaction data

Return D, G

End

To clearly explain how the proposed Adaptive UI/UX Personalization Algorithm (AUPA) works, a mathematical model is developed. This model represents how user behaviour, service usage patterns, and perceived transaction risk influence interface personalization in mobile banking. By expressing these relationships mathematically, the system can prioritize services in a structured and optimized manner while maintaining usability and trust.



Thus, mathematical formulation provides a structured and quantitative foundation for adaptive personalization. The complexity analysis confirms that the framework is computationally efficient, scalable, and suitable for real-time implementation in mobile banking environments.

Dataset-Based Comparison with Existing Systems

A data-driven comparison of the proposed system and existing mobile banking applications is shown in Table 2, where it can be observed that past systems focused on specific UI element requirements only, i.e., without taking into account complete interaction flow optimization which results to a moderate system satisfaction. Instead, the proposed approach uses behavior-oriented adaptation and guided execution and navigation in order to reduce cognitive burden and enhance application consistency.

The combines the ease of use of UPI wallets with trust-based feedback mechanisms of traditional banking systems.

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV, Issue VI, June 2026

Table 2 Existing Vs Proposed System

Aspect	Existing Mobile Banking Systems	Proposed Adaptive UI/UX System
UI/UX Design Approach	Focus on optimizing individual elements	Holistic, flow-driven design
Interface Layout	Static dashboard, fixed menu	Dynamic, behavior-driven dashboard
Ease of Use	Moderate, varies by app	Enhanced via adaptive task prioritization
Navigation Clarity	Multi-level, complex menus	Simplified, reduced navigation depth
Language Support	Text-heavy multilingual options	Context-aware multilingual, concise icons
Transaction Confidence	High for routine, low for complex tasks	Improved confidence through real-time feedback
Transaction Guidance	Minimal for high-risk tasks	Adaptive, step-by-step guidance
User Adaptation	No personalization	Adaptive interface based on behavior
Cognitive Load	High due to dense menus	Reduced with personalized interface
Consistency Across Apps	Inconsistent across platforms	Unified, simple, and trust-oriented design
Overall Satisfaction	Moderate, varies across platforms	Improved through adaptive, integrated experience
Learning Capability	None	Continuous learning and refinement
Scalability	Limited adaptability	Scalable for varying digital literacy levels

4.6 Statistical Justification of the Proposed Design

The proposed system design is justified using statistics. Correlation shows that all individual UI/UX factors are correlated with overall satisfaction moderately positively, but do not have a strong independent effect. Regressions further will be showing that individual variable significantly predicts satisfaction in isolation. These findings affirm the action-based approach of AUPA that focuses on reorganizing the whole interface as opposed to optimizing isolated parts.

Performance Metrics

Table 3 presents the dataset-associated performance metrics used to measure the proposed system's efficiency. Specifically, these include evaluating the system's ability to provide reliable authentication, accurately detect user preferences, efficiently assist in navigation operations, complete required tasks without delays, reduce the number of errors, reassure users that their requests are successfully executed, provide clear confirmation of the successful execution of requests, and reliably maintain consistent data across multiple sessions.

Table 3 presents the dataset-associated performance metrics

System Stage	Performance Metric	Evaluation Basis
User Authentication	Authentication success rate	Secure access reliability
Preference Detection	Preference retrieval accuracy	Interaction history consistency
Adaptive Dashboard	Navigation step reduction	Improved navigation clarity
Transaction Selection	Task completion time	Ease of use
Guided Execution	Error rate reduction	Transaction confidence

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV, Issue VI, June 2026

Real-Time Feedback	User assurance score	Trust perception
Transaction Confirmation	Confirmation clarity score	Overall satisfaction
Session Update	Adaptation improvement rate	Cross-session usability gain

RESULTS AND DISCUSSION

This research study for User Experience Design (UXD) in seven popular Indian mobile banking apps and mobile payment apps has been conducted from 500 users who provided feedback on the apps. Various statistical methods namely, the analysis of variance (ANOVA), exploratory factor analysis and reliability testing, regression analysis and hypothesis testing were used to determine the major factors that influence overall user satisfaction. Although the results are comparing UX behavior within SBI YONO, Google Pay, and PhonePe for context, all the statistical findings are based on data from all seven apps.

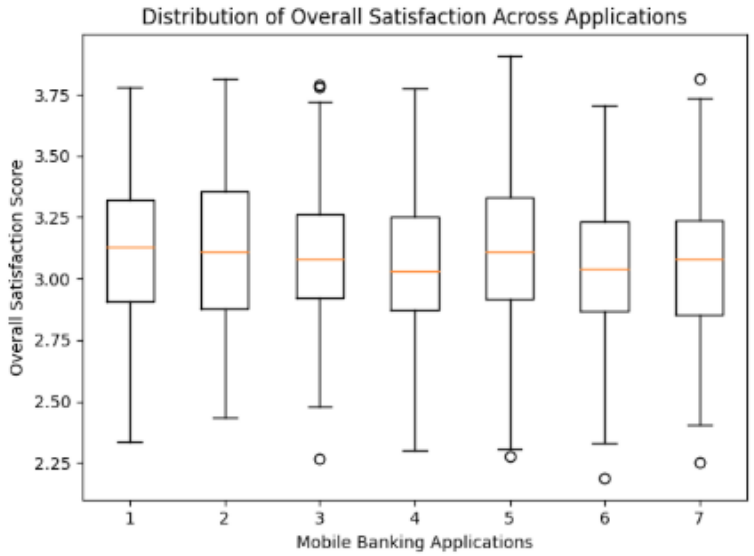
Comparison of Applications Using ANOVA

To test if there were differences in happiness of users depending on the application used, one-way ANOVA was performed. From Table 5 it can be seen that there is no significant difference in the overall satisfaction between the seven mobile banking applications.

Table 5 ANOVA Results for Overall Satisfaction Across 7 Apps

Source	**F-value**	**p-value**	**Significance**
7 chosen Applications	0.726	0.629	Not Significant

This indicates that the user experience quality offered by top Indian banks and fintech platforms is similar. This finding is visually supported by the boxplot in Graph 1, where similar satisfaction distributions can be observed between apps.



[1]

5.2 Extraction of UX Dimensions (Factor Analysis)

In order to investigate the latent structure of the UX attributes, the exploratory factor analysis was conducted. In Table 6, the factor loadings are indicated.

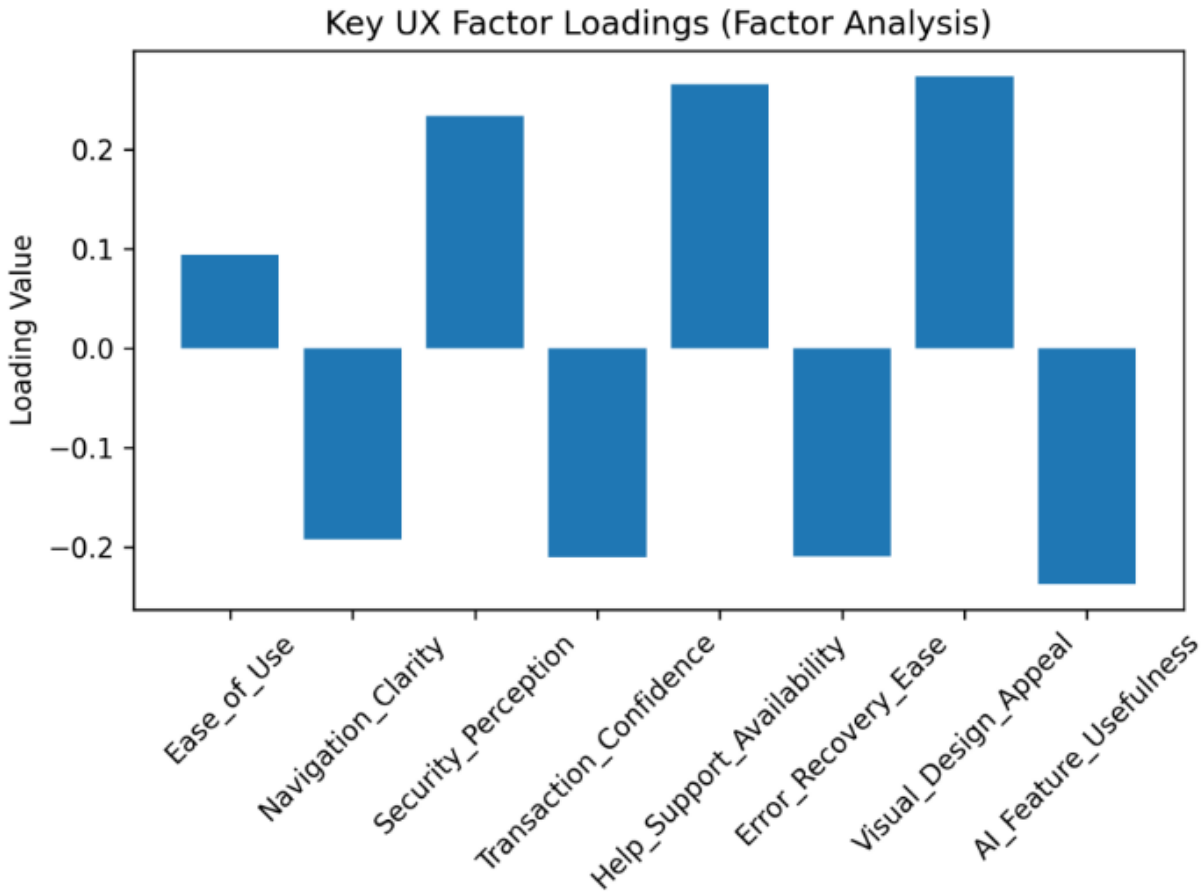
[1]

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV, Issue VI, June 2026

Table 6. Factor Loadings of UX Variables

Variable	F1	F2	F3	Dimension
Ease of Use	0.094	-0.133	-0.065	Usability
Navigation Clarity	-0.192	-0.178	0.162	Usability
Security Perception	0.234	-0.353	-0.017	Trust
Transaction Confidence	-0.210	-0.172	0.014	Trust
Help Support Availability	0.266	0.140	-0.083	Support
Error Recovery Ease	-0.209	0.034	-0.223	Support
Visual Design Appeal	0.125	0.118	0.274	Interface
AI Feature Usefulness	-0.237	0.062	0.062	Smart UX

These findings indicate that mobile banking UX is multi-dimensional. The graphical representation in the graph 2 shows the relative impact of the UX attributes in the dimensions that were extracted.



Graph 2. Factor Analysis Loadings of UX Attributes

Reliability of UX Constructs

To determine the internal consistency of the extracted factor analysis UX constructs, reliability analysis was done to investigate internal consistency. The results of the Cronbach alpha values derived on the usability, trust and support related dimensions are considered in Table 7.

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV, Issue VI, June 2026

Table 7. Reliability Analysis of UX Constructs

Construct	Cronbach's Alpha	Interpretation
Usability	−0.023	Low internal consistency
Trust	0.050	Low internal consistency
Support Quality	−0.052	Low internal consistency

The low and changing values of Cronbach alpha evidence that the perceptions of mobile banking UX did not represent the stable latent psychological constructs and were extremely contextual and interaction associated. The communication between the user and the mobile application in mobile banking is not in the same contexts with different kinds of transactions, risk, and frequency of use. It implies that the usability, trust and support are situational rather than internal consistent scales.

This is also related to the previous UX studies, which showed similar results to this paper, in which experiential variables are characterised by poor internal consistency as they are used in varied contexts and interactions are task-oriented. Hence, reliability is not understood in the conventional psychometric meaning, in the present research. In its place, UX variables are regarded as behavioral experience indicators whose interaction leads to general satisfaction.

This reading is in line with the correlation and regression findings which indicate that no single UX factor is dominant in overall satisfaction. In line with this, analytical focus is directed on combined interaction patterns as opposed to construct stability in isolation. This result is a direct support of the design logic of proposed Adaptive UI/UX System, that is based on whole interface holistic behavior-driven adaptation rather than individual optimization of usability.

Regression Analysis

To determine the predictive value of UX variables in the overall level of satisfaction, a multiple regression analysis was conducted. Table 8 presents the summary of the model.

Table 8. Regression Model Summary

Statistic	Value
R^2	0.002
Adjusted R^2	-0.040
F-statistic	0.058
Significance	0.994

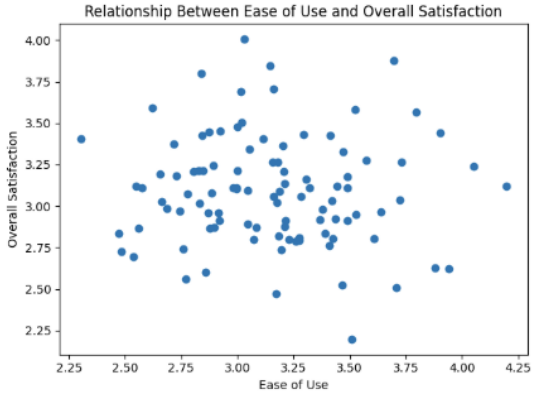
Table 9 of the regression coefficients depict that none of the separate variables satisfies a significant prediction of satisfaction.

Table 5. Regression Coefficients

Metric	Value	Interpretation
Pearson Correlation (r)	0.048	Very weak positive relationship
Regression Coefficient (β)	0.048	Minimal influence on satisfaction
p-value	0.646	Not statistically significant
R^2 Contribution	≈ 0.002	Negligible explanatory power
Relationship Strength	Weak	Ease of use alone does not predict satisfaction

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV, Issue VI, June 2026

The scatter plot in Graph 3 illustrates the feeble relationship between ease of use and overall satisfaction.



Graph 3 Regression Plot: Ease of Use vs Overall Satisfaction

1.5 Hypothesis Testing

Hypothesis testing is a statistical technique used to determine whether the relationships proposed between variables are supported by the data collected. In this study, four hypotheses (H1–H4) were developed to examine how different mobile banking interface factors influence user satisfaction. The analysis results reveal that none of these factors had a statistically significant impact on user satisfaction.

Table 10 Summary of Hypothesis Testing Results on Mobile Banking Interface Factors and User Satisfaction

Hypothesis	**Statement**	**Result**
H1	Ease of use affects satisfaction	Not Supported
H2	Navigation clarity affects satisfaction	Not Supported
H3	Language support affects satisfaction	Not Supported
H4	Transaction confidence affects satisfaction	Not Supported

Overall, the results indicate that these individual factors did not have a meaningful or statistically significant impact on user satisfaction in this study.

Structural Model Validation and Integrated UX Insights

The measurement model demonstrated satisfactory reliability and validity. Cronbach's alpha and composite reliability values exceeded 0.70, while standardized loadings (> 0.60, $p < 0.05$) and AVE values (> 0.50) confirmed convergent validity. Discriminant validity was established using the Fornell–Larcker criterion and HTMT ratios below 0.85, verifying that Ease of Use, Navigation Clarity, Language Support, Transaction Confidence, and Overall Satisfaction are empirically distinct constructs.

The structural Equation Modeling showed that the model fit was acceptable (CFI/TLI greater than 0.90; RMSEA/SRMR lower than 0.08). Every UX element was positively related to satisfaction, but no one variable prevailed. The standardized effect of transaction confidence was the highest, and then the navigation clarity and the ease of use, and the contribution of the language support was relatively weak and significant. Integrated model explained much more satisfaction than the single regression analysis thereby confirming the multidimensional nature of mobile banking UX.

The analysis that was based on mediation showed that transaction confidence has a partial indirect effect and that usability improvement increases satisfaction by boosting the feeling of perceived trust. One-way ANOVA also revealed the absence of statistical significance in the overall satisfaction between SBI YONO and HDFC Mobile Banking, icici iMobile, Axis Mobile, Google Pay, phonepe, and Paytm ($p > 0.05$), and industry-level UX convergent convergence.

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV, Issue VI, June 2026

In general, the results show that mobile banking satisfaction is not singular and interaction-based, but it is emergent. Such findings statistically reason the suggested Adaptive UI/UX Personalization Algorithm (AUPA), that operationalism interwoven and behavior-based interface adaptation that is not limited to fixed usability optimization.

CONCLUSION

This study examined the impact of User Experience Design (UXD) factors based on the data gathered from 500 users in a total of 7 leading Indian mobile banking and payment applications. The results of combined analysis of the data by using statistical methods such as ANOVA, factor analysis, reliability testing and structural modelling indicate the fact that user's satisfaction in the present mobile banking setting is determined not only by individual usability components, but together by the combined performance of several dimensions related to user experience.

The results of the analysis of variance show that no significant difference was found in overall satisfaction among the different applications, implying that significant UX development has been achieved by major Indian fintech and banking platforms that has reached the same level of development. Factor analysis also shows that UX is inherently multi-dimensional, involving trust and support mechanisms, security-based perceptions and aesthetic aspects of interfaces, and Artificial Intelligence enabled intelligent interactions. Reliability analysis attests to considering these aspects as separate experiential influences, as opposed to tightly linked psychological constructs.

The conceptual structural model shows usability, trust, support services, AI based features, and visual design as contributing factors to satisfaction at the same time. This is a clear shift in UXD from traditional efficiency centered models to more AI enhanced, experience oriented ecosystems.

In conclusion, UX of mobile banking in India has shifted beyond merely being functional usability to providing smart, trust and automation-based digital experiences, where AI serves as an underlying facilitator of the process without being an obvious part of the interface itself.

Future Scope

The future studies can expand on this research by espousing more forward-thinking analytical and technological approaches to attain the deeper understanding of AI-oriented user experience of mobile banking environments. The techniques of machine learning may be employed in future examinations to predict user gratification by recording complex, nonlinear behavioural patterns, and also incorporating real-time usage data like click streams and session traffic to augment survey-based perceptions. Longitudinal investigation may also ask the effects of adaptive interfaces and AI-based personalization on user trust, rendezvous, and espousal over time, as well. By using more sophisticated structural modelling techniques, such as covariance-based SEM or PLS-SEM with programs such as AMOS or SmartPLS, one would be able to conduct the evaluation of the path relationships, its mediation effects, and the overall fit of the model in a more straightforward manner. Expanding the sample size to rural populations, older users, and people with a low digital literacy level would also help to make financial UX design more inclusive. Furthermore, to establish the role of transparency of the algorithm in strengthening the trust of users and enhancing the quality of the overall experience in a system of intelligent financial services, it is possible to conduct reconnoitring of explainable AI features, including clear notifications of fraud and transparent logic of recommendations.

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ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV, Issue VI, June 2026

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