A Study of User Loyalty in Mobile China Merchant Bank:A Perspective Based on Technology Perception and User Experience

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Abstract. Taking China Merchants Bank (CMB) as a case study, this research investigates the impact of digital transformation in retail banking on user loyalty. Integrating customer value theory, privacy calculus theory, and the technology acceptance model, this research construct a theoretical framework of "Technology Application Perception → User Experience → User Loyalty". These findings indicate that commercial banks should continuously optimize the design of technological functionalities with user needs as the core focus. They should prioritize delivering multi-dimensional user value through experience, while simultaneously enhancing the digital adaptability of diverse user segments through tiered management to enable personalized service provision. The empirical results of this study can provide targeted suggestions for determining the future direction of digital transformation in commercial banks' retail business, helping them recognize the importance of user-centeredness. By empirically analyzing the impact of users' perception of digital technology and how to indirectly enhance user loyalty through improving user experience, this paper can assist commercial banks' digital platforms in providing more precise and effective services in the future, thereby increasing user stickiness.

Keywords: China Merchants Bank, Technology Application Perception, Customer Experience, User Loyalty.

1. Introduction

The rapid advancement of financial technology (FinTech) is driving banks worldwide to undertake strategic restructuring centered on digitalization. The Financial Technology Development Plan (2022-2025) issued by the People's Bank of China in 2023 emphasizes building a user-centered digital financial service system. It mandates banking institutions to leverage artificial intelligence, big data, and other technologies to enhance service accessibility, accuracy, and user stickiness. Currently, Internet financial platforms dominate over 94% of the retail payment market by leveraging their scenario-based ecosystem advantages, posing a "disintermediation" challenge to traditional banks and compelling them to accelerate the digital transformation of their retail businesses. China Merchants Bank (CMB) exemplifies successful transformation within the industry.

Digital transformation involves the deep application of digital technologies to reconfigure business processes, models, and user interactions, aiming to enhance efficiency and create value. It represents a systemic change [1]. In commercial banking, the core elements of digital transformation are technology-driven operations, user-centricity, and ecosystem integration. Technology-driven approaches primarily rely on artificial intelligence, blockchain, and other technologies to optimize risk management and improve marketing precision and operational efficiency [2]. User-centricity entails adhering to user needs and providing personalized, scenario-based services through user demand data analysis [3]. Ecosystem integration focuses on extending traditional business boundaries and embedding financial services into daily life contexts. The goal of digital transformation in retail banking is to expand user touchpoints and elevate service efficiency. Current models encompass mobile payments and e-wallets, smart investment and financial management, and scenario-based finance enabled by open banking. As a benchmark for retail banking in China, CMB demonstrates strengths in technology, experience, and ecosystem. From a technological perspective, CMB has built full-stack financial technology capabilities covering AI customer service and intelligent risk control.

From an experience perspective, it has validated a transformation path centered on user experience. From an ecosystem perspective, CMB has established the dual-platform matrix of "CMB APP" and "Palm Life APP," creating a closed-loop ecosystem spanning "finance-consumption-socialization". User acceptance of digital technology is a key determinant of digital transformation effectiveness. The classic Technology Acceptance Model (TAM) remains a foundational theoretical reference, positing that perceived usefulness (PU) and perceived ease of use (PEOU) are core motivators for user technology adoption [4]. The application of this theory in banking is exemplified by the Unified Theory of Acceptance and Use of Technology (UTAUT) model, which explains user willingness to adopt mobile banking [5]. Specifically, user technology perception can be subdivided into perceived usefulness, perceived ease of use, and perceived risk. These measure, respectively, the efficiency and value users believe technology use provides, the perceived difficulty of using the technology, and user concerns regarding technology security and personal privacy leakage [6], particularly crucial in financial services involving personal assets. Technology perceptions can influence users' usage intention and loyalty both directly (via PU and PEOU) and indirectly (through user experience, satisfaction, etc.) [7].

While digital transformation is widely regarded as essential for the future of banking, its actual impact on customer loyalty remains debated. A 2022 report by the China Banking Association revealed user dissatisfaction with the complexity of banking app functionalities and operations. Concerns over privacy also lead users to restrict data authorization, reflecting that current digitalization efforts often constitute mere "technology stacking," misaligned with user psychology and needs. Furthermore, extant theoretical research primarily focuses on either technology adoption models or unidimensional loyalty measurements. Studies on bank transformation from finance/loyalty theory perspectives and marketing perspectives have long been separated, necessitating interdisciplinary integration to elucidate the value creation logic of digital transformation. This research investigates the transmission path of "Technology Investment → User Experience → Loyalty Behavior." Starting from the consumer usage perspective, it integrates research on technology application perception, user experience, and actual user loyalty behavior. The study uses CMB as a classic and representative case.

2. “Perception of Technology Adoption – User Experience – User Loyalty” Model (PUU Model)

2.1. PUU Model Theory

The Technology Acceptance Model (TAM) posits that user acceptance of technology is determined by perceived usefulness (PU) and perceived ease of use (PEOU). PU assesses how much the technology improves efficiency, while PEOU assesses its operational ease. Both factors directly influence users' intentions and behaviors regarding technology use [4]. TAM provides a mature theoretical framework for this study to quantify the relationship between technological features and user behavior. It facilitates constructing a direct path model from technology perception to loyalty and extends the explanatory scope for other variables.

Customer value theory emphasizes that users evaluate the overall value of a product or service based on its practical benefits, psychological satisfaction, and social recognition, which subsequently influences their loyalty behavior [8]. Functional value, emotional value, and social value represent the three key dimensions users consider. This theory helps refine the mediating mechanism of user experience in this study. It clarifies how technological functionalities translate into users' multidimensional value perceptions during digital transformation, providing a theoretical basis for optimizing service design in the CMB APP and similar joint-stock commercial banks.

The Stimulus-Organism-Response (SOR) theory suggests that stimuli from the external environment affect users' internal psychological states, ultimately leading to changes in user behavior [9]. This theory provides a macro-level perspective for this study. It aggregates the key variables (technology application perception, user experience, user loyalty) within a behavioral response

framework, enhancing the study's systematic nature and explanatory power. SOR supports the analysis of the dynamic process in technology-driven behaviors during digital transformation: technological features (Stimulus) influence user experience (Organism), which subsequently impacts loyalty behavior (Response).

Based on these theoretical foundations, this study positions user loyalty as the dependent variable, technology application perception as the independent variable, and user experience as the mediating variable, constructing the full-path research model: "Technology Perception → User Experience → User Loyalty".

2.2. The Determination of PUU Model

User loyalty is the core outcome variable in this study. It refers to users' sustained preference for and commitment to CMB's retail services, specifically manifested in repeated usage, active recommendation, and resistance to substitute offerings [10]. Considering that a multidimensional model more comprehensively covers the logical progression from users' rational cognition to actual behavior, avoiding the limitations of unidimensional measurement, and acknowledging the high switching costs and trust dependence characteristic of banking, this study adopts a four-dimensional loyalty model: cognitive loyalty, affective loyalty, intentional loyalty, and behavioral loyalty.

Technology application perception is the core independent variable. It denotes users' subjective evaluation of the value, ease of use, and risk associated with the technological applications implemented by CMB APP during its digital transformation. Based on the specificity of TAM and the financial industry context, this study defines three dimensions: perceived usefulness (operationalized as functional completeness), perceived ease of use (operationalized as technical stability), and perceived risk (operationalized as privacy protection strength).

Functional completeness reflects users' perception of the comprehensiveness of services and functions within the CMB APP – whether coverage is sufficiently broad and encompasses all necessary usage scenarios.

Technical stability captures users' evaluation of the system's smoothness and reliability (low failure rate) during CMB APP usage – enabling users to complete tasks efficiently.

Privacy protection strength represents users' trust in the CMB APP's security measures (e.g., data encryption, biometrics) and their confidence in appropriately and securely authorizing data access. Stronger perceptions across these three dimensions indicate a more positive view of CMB APP's technology application, potentially driving user psychology and behavior. Therefore, hypothesize:

H1: Technology application perception (functional completeness) is significantly and positively related to user loyalty.

H2: Technology application perception (technical stability) is significantly and positively related to user loyalty.

H3: Technology application perception (privacy protection strength) is significantly and positively related to user loyalty.

User experience acts as the mediating variable in this study. It refers to the overall feeling users derive from interacting with CMB APP's digital transformation services, encompassing three dimensions based on customer value theory: functional value, emotional value, and social value. Functional value refers to the perceived improvement in service efficiency compared to traditional channels experienced while using the CMB APP – the ability to accomplish user goals effectively. Emotional value refers to the pleasure or enjoyment users experience during CMB APP usage.

Social value refers to the sense of identity, status, or social capital users associate with using the CMB APP – experiencing recognition or respect.

Stronger perceptions across these three dimensions indicate a more positive user experience with the CMB APP. This mediating variable connects technological attributes to user behavior and is crucial for revealing the underlying mechanism. Therefore, hypothesize:

H4: The functional value dimension of user experience mediates the relationship between technology application perception and user loyalty.

H5: The emotional value dimension of user experience mediates the relationship between technology application perception and user loyalty.

H6: The social value dimension of user experience mediates the relationship between technology application perception and user loyalty.

The specific theoretical framework of the PUU Model is depicted in Figure 1.

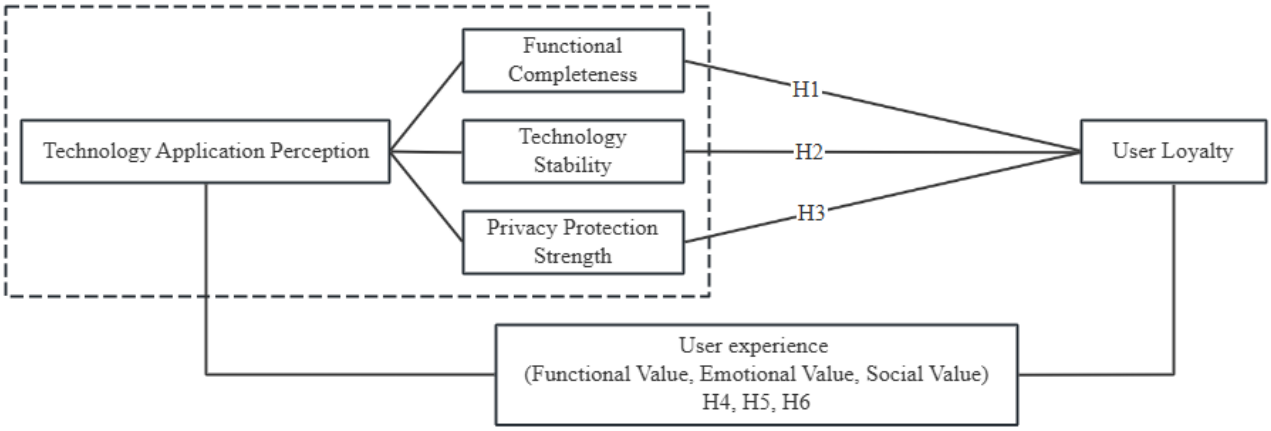

Figure 1. PUU Model Structure

3. Results

3.1. Data Sources

Data regarding user experience and loyalty during CMB APP usage were collected through a combination of online and offline surveys across multiple provinces in China. The questionnaire comprised four structured sections: basic user attributes, user perception of technology application, user experience assessment, and user loyalty measurement.

A total of 349 questionnaires were collected. After eliminating blank, contradictory, and responses from individuals who had never used the CMB App (to target the effective population), 279 valid questionnaires remained for analysis. The sample includes users of diverse genders, ages, and income levels, reasonably reflecting the characteristics and needs of CMB APP's user base.

3.2. Reliability test

Reliability analysis assesses the consistency and stability of the measurement scales. As shown in Table 1, all Cronbach's α coefficients exceed 0.7, indicating good internal consistency and reliability for all constructs, allowing for further analysis.

Table.1. Reliability Analysis Results

Variable	Cronbach's Alpha
Functional Perfection	0.825
Technical Stability	0.864
Intensity of Privacy Protection	0.840
Perception of Technology Application	0.941
Functional Value	0.860
Emotional Value	0.855
Social Value	0.857
User Experience	0.944
User Loyalty	0.903
Overall Sample	0.980

3.3. Validity analysis

To assess the validity of the measurement scales, Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity were conducted to determine suitability for factor analysis. As shown in Table 2, the KMO value is 0.987 (exceeding 0.6), and Bartlett's test is significant ($\chi^2 = 6908.465,\ df = 351,\ p < 0.00$), indicating the sample data is highly suitable for factor analysis.

Table.2. KMO and Bartlett's Test

KMO Metric		0.987
Bartlett's Measure of Spherical Test	Approximate Chi-Square	6908.465
	Df	351
	Sig.	0.000

3.4. Linear Regression Analysis

Linear regression analysis based on the 279 valid samples was conducted to test H1-H3. Results indicate that functional completeness ($\beta = 0.392,\ t = 7.863,\ p < 0.01$), technical stability ($\beta = 0.348,\ t = 7.276,\ p < 0.01$), and privacy protection strength ($\beta = 0.205,\ t = 4.186,\ p < 0.01$) all exhibit significant positive effects on user loyalty. The overall model is significant ($F(3, 275) = 479.199,\ p < 0.001$) with strong explanatory power ($R^2 = 0.839,\ Adjusted\ R^2 = 0.838$). Multicollinearity diagnostics showed moderate correlations between independent variables (VIF range: 4.136-4.449; Tolerance range: 0.225-0.242), below the severe multicollinearity threshold ($VIF > 10$). The Durbin-Watson statistic ($D - W = 2.087$) indicates independence of residuals. Detailed results are presented in Table 3.

Table.3. Linear Regression Analysis Results

	Regression Coefficient	95% CI	Covariance Diagnosis	
			VIF	Tolerance
Constant	0.171 (1.864)	-0.009~0.351	-	-
Functional Perfection	0.392** (7.863)	0.294~0.489	4.449	0.225
Technical Stability	0.348** (7.276)	0.254~0.441	4.136	0.242
Privacy Protection Strength	0.205** (4.186)	0.109~0.301	4.278	0.234
Sample Size		279		
R^2		0.839		
Adjusted R^2		0.838		
F-Value		F(3,275) = 479.199, p = 0.000		
Note: Dependent Variable = User Loyalty				
D-W Value = 2.087				
*p<0.05 **p<0.01 t-value inside parentheses				

3.5. Mediation Effect Test

To test H4-H6, the latent variables (functional value, emotional value, social value, user loyalty, technology application perception) were averaged to create composite scores. Multiple linear regression analyses were performed using the following models:

User Loyalty = 0.167 + 0.945 * Technology Application Perception

Functional Value = 0.124 + 0.969 * Technology Application Perception

Emotional Value = 0.073 + 0.968 * Technology Application Perception

Social Value = 0.163 + 0.949 * Technology Application Perception

User Loyalty = 0.111 + 0.481 * Technology Application Perception + 0.124 * Functional Value + 0.199 * Emotional Value + 0.158 * Social Value

Using the bias-corrected bootstrap method (5000 samples), results confirmed that functional value, emotional value, and social value each play a significant partial mediating role in the relationship between technology application perception and user loyalty. Therefore, H4, H5, and H6 are supported.

4. Conclusions

The evolution of FinTech and societal changes necessitate timely reforms in traditional industries. To balance innovation with customer retention, this study examined the mechanism linking the digital transformation of CMB's retail banking to user loyalty. Focusing on users with CMB APP experience, it investigated the relationship between technology perception and loyalty, the mediating role of user experience (across functional, emotional, and social value dimensions). The findings demonstrate significant positive correlations between the three dimensions of technology application perception (functional completeness, technical stability, privacy protection strength) and user loyalty. Furthermore, the functional, emotional, and social value dimensions of user experience partially mediate the relationship between perceived technology application and user loyalty.

In summary, this study makes several contributions. First, integrating customer management theory, financial innovation theory, and the TAM model, it elucidates the mechanism between digital transformation and user loyalty in CMB's retail banking. This enriches the application of marketing theories in finance and offers a novel perspective for predicting loyalty and enhancing digital platforms. Second, by identifying user experience as a parallel partial mediator, the study clarifies the pathway through which technology perception influences loyalty decisions, enhancing understanding of the digital transformation-loyalty mechanism. Third, focusing specifically on recent CMB APP users enhances the practical relevance and targeted nature of the findings for joint-stock commercial banks.

The results provide actionable insights for applying marketing theory in finance: Technical Design Optimization: Commercial banks should regularly update mobile app functionalities. Incorporating demand research features within user profiles and developing "aging-friendly" and "simplified" interface options can cater to diverse user preferences. Enhanced Experience Management: Embedding instant feedback mechanisms during app usage and visualizing service efficiency improvements (e.g., time saved) can demonstrate functional value. Designing elements for emotional interaction and building a user care system can enhance emotional value. Despite these contributions, limitations exist. This study focuses solely on users of China Merchants Bank's mobile platform, lacking comparative analysis with other bank types or sizes. Additionally, the cross-sectional data limits the exploration of temporal dynamics within the proposed relationships. The financial industry is significantly influenced by the economic environment. Future research should employ longitudinal designs to track how the hypothesized relationships evolve under changing economic conditions, industry competition, and macro policies. Comparative studies across different bank types would yield more nuanced and generalizable managerial implications.

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