

Exploring the Customer Journey and Experience in the Digital Banking Era Through the Lens of Online Flow State

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The rapid digitalization of banking services enhances transaction speed, security, and convenience; however, challenges persist in technology acceptance, regulatory readiness, and the optimization of Digital Customer Experience (DCX), particularly among younger consumers. This study explores the customer journey and experience in the digital banking era through the lens of online flow state, a comprehensive model explaining the antecedents and consequences of DCX in digital banking. By integrating Information Integration Theory, Multi-Attribute Utility Theory, Value Co-Creation Theory, Attitude–Behavior Context Theory, and Flow Theory, the study proposes Online Flow State as a central mediating mechanism linking service attributes and behavioral outcomes. A quantitative approach was employed, with data collected from 214 young digital banking users in Jakarta and surrounding areas using purposive non-probability sampling. Structural Equation Modeling with Partial Least Squares (SEM-PLS) was applied for hypothesis testing. The results indicate that Awareness and Knowledge, Technology and Innovation, and User Interface significantly influence Online Flow State, which in turn strongly enhances DCX. These findings underscore the importance of immersive digital experiences in fostering engagement and long-term loyalty.

Keywords: Digital Customer Experience; Online Flow State; Customer Engagement; Customer Loyalty; Value Co-Creation; Digital Banking; SEM-PLS.

INTRODUCTION

In the current era, characterized by the rapid expansion of the digital landscape, competition in the banking sector is increasingly shaped by the quality and innovation of digital services Arinta, Y. N., & Widyastuti, E. (2024). The digitalization of banking services provides substantial benefits, including reduced operational costs, improved time efficiency, enhanced security monitoring, and the delivery of higher-quality services. From the customer's perspective, digital banking enables faster, safer, and more convenient transactions (Boufounou et al., 2022; Kitsios et al., 2021; Mahribi, 2020). Hui et al., (2026) highlight that digital banking competitiveness increasingly depends on system reliability, ease of use, and perceived security, particularly among young adults. Although digital platforms enhance efficiency and convenience, service disruptions and security concerns remain critical challenges that may hinder customer satisfaction. Despite these advantages, the performance of digital banking services remains suboptimal, particularly in emerging markets where technological availability does not always translate into meaningful customer engagement (Hilal & Varela-Neira, 2022).

Prior research has extensively examined digital banking adoption through technology acceptance perspectives, service quality frameworks, and customer journey models. However, these approaches predominantly conceptualize customer experience as a rational and linear evaluation process. As a result, they emphasize cognitive assessments such as perceived usefulness, ease of use, and service attributes, while paying limited attention to the psychological immersion that occurs during digital interaction. Empirical findings related to satisfaction, loyalty, and continued usage have therefore shown inconsistencies, suggesting that cognitive-based explanations alone may be insufficient to explain sustained digital engagement (Al Hawari et al., 2023; Nurahmasari et al., 2023). Recent evidence highlights the importance of technological investment, security enhancement, public awareness, effective risk handling, and regulatory support as critical enablers of digital banking utilization (Nurahmasari et al., 2023). Nevertheless, these structural enablers do not automatically generate compelling experiential engagement, indicating a conceptual omission in the literature.

This gap becomes more significant when considering younger generations, particularly Generation Z, who are characterized by strong digital exposure, creativity, individualism, and a preference for expressive and memorable experiences (Korshunova, 2019;). Indonesia presents a substantial opportunity for digital banking expansion due to its large productive-age population and limited access to banking services among millions of citizens, as reported by Google, Temasek, dan Bain & Company (2019). Although prior studies acknowledge the importance of younger consumers in accelerating digital adoption, they primarily focus on demographic or technological readiness factors rather than examining how immersive digital experiences shape behavioral commitment. Given Generation Z's experiential orientation, understanding the psychological mechanisms underlying digital engagement becomes theoretically essential.

Digital banking operates as a complex service ecosystem in which transactions occur across multiple touchpoints and channels (Verhoef et al., 2021; Kandil, O., Dessart, L., Standaert, W., & Bosma, M., 2024). While Digital Customer Experience (DCX) has been conceptualized as a multidimensional construct involving cognitive, emotional, and behavioral components, empirical studies tend to operationalize it through observable service attributes. Zulfahmi et al. (2026) emphasize that digital customer experience significantly influences youth engagement and behavioral intentions in digital platforms, highlighting its strategic role in shaping sustained interaction outcomes. This creates a theoretical fragmentation between structural service design and experiential psychology. In particular, existing customer journey and digital banking studies have not sufficiently

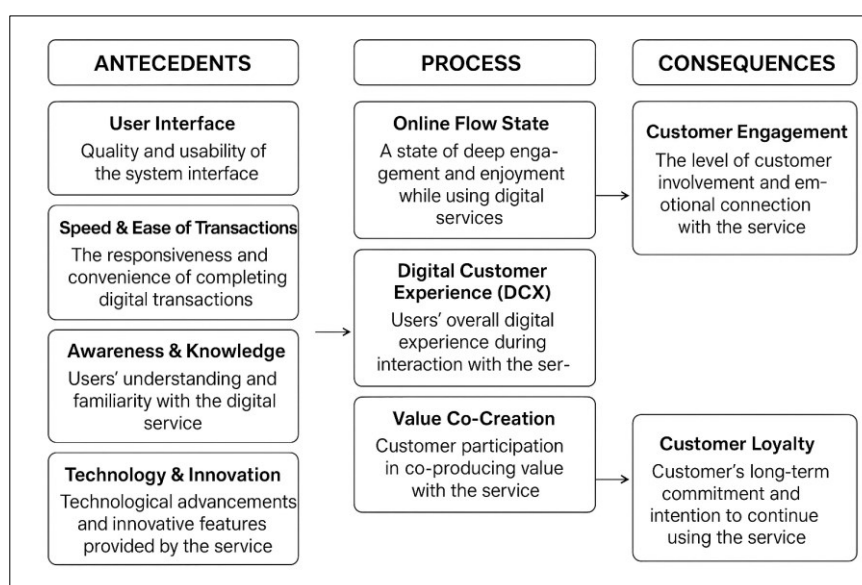
incorporated the online flow state as a mediating mechanism that explains how evaluative cognition transforms into deep engagement and loyalty outcomes.

To address this omission, this study develops a comprehensive conceptual model of DCX by integrating Information Integration Theory Anderson (2016), Multi-Attribute Utility Theory (Keeney & Raiffa, 1976), Value Co-Creation Theory (Vargo & Lusch, 2014; Leavy 2014), Attitude–Behavior Context (ABC) Theory (Bechler, Tormala, & Rucker, 2021), and Flow Theory (Nakamura & Csikszentmihalyi, 2002). Information Integration Theory explains how individuals combine multiple informational cues to form judgments, while Multi-Attribute Utility Theory clarifies how customers evaluate alternative service attributes. ABC Theory provides insight into how beliefs mediate the relationship between external stimuli and behavioral consequences, and Value Co-Creation Theory highlights the collaborative processes through which firms and customers jointly create value. Flow Theory (Nakamura & Csikszentmihalyi, 2002), introduces the experiential dimension by explaining how deep concentration, enjoyment, and temporal immersion emerge during digital interaction. By positioning online flow state as a central mediating construct linking DCX attributes with behavioral outcomes, this study addresses the conceptual gap and empirical inconsistencies in prior digital banking and customer journey research, thereby offering a more psychologically grounded explanation of sustained engagement and loyalty.

LITERATURE REVIEW

This study proposes an integrated conceptual framework that links technological antecedents, experiential processes, and behavioral consequences in digital banking services. The model positions Digital Customer Experience (DCX) as the central mechanism through which service features influence psychological states, customer participation, engagement, and ultimately loyalty. By integrating Flow Theory, Service-Dominant Logic, and Engagement Theory, the framework conceptualizes digital service experience as a structured and sequential process. Figure 1 illustrates the proposed relationships among the study variables.

Figure 1. Conceptual Framework of Digital Service Experience



H1–H5: User interface, transaction speed and convenience, security, as well as technology and innovation, influence the online flow state.
H6: Online flow state influences DCX.
H7: DCX influences customer engagement.
H8: DCX influences value co-creation.
H9: Value co-creation influences customer engagement.
H10: Customer engagement influences customer loyalty.
H11: Online flow state influences customer engagement through DCX.
H12: DCX influences customer engagement through value co-creation.
H13: Online flow state influences customer engagement through DCX and value co-creation.
H14: DCX influences customer loyalty through customer engagement.
H15: Online flow state influences customer loyalty through DCX and customer engagement.
H16: Value co-creation influences customer loyalty through customer engagement.
H17: DCX influences customer loyalty through value co-creation and customer engagement.
H18: Online flow state influences customer loyalty through DCX, value co-creation, and customer engagement.
H19: Online flow state influences value co-creation through DCX.

Hypotheses Development

Digital Customer Experience Framework (H1–H19)

1. Theoretical Foundation of Digital Customer Experience (DCX)

The conceptual foundation of Digital Customer Experience (DCX) originates from the experience economy perspective proposed by Pine and Gilmore (1998), who argue that products and services function as media for staging experiences. Extending this view, Klaus and Maklan (2012) conceptualize customer experience across three key dimensions: post-purchase experience, brand experience, and service experience. In digital contexts, Silalahi and Rufaidah (2017) refine this construct by identifying digital service experience, digital image experience, digital touchpoint experience, and digital broadband experience as core dimensions of DCX.

Customer journey theory further strengthens this perspective. Lemon and Verhoef (2016) emphasize that experiences are shaped across multiple touchpoints throughout the customer journey, while Bolton et al. (2018) highlight the integration of digital, physical, and social realms in delivering seamless experiences. Kandil et al. (2024) describe customer journey complexity across pre-purchase, purchase, and post-purchase stages

Collectively, these perspectives position DCX as a holistic, system-level experiential construct shaped by technological and relational interactions across the journey.

2. Antecedents of DCX

Empirical studies identify multiple technological antecedents of DCX. Ahmad et al. (2022), Arinta and Widyastuti (2024), Kandil et al. (2024), and Nurahmasari et al. (2023) demonstrate that interface design, service efficiency, trust mechanisms, and technological innovation significantly influence experiential outcomes. However, prior research frequently treats these variables independently rather than as an integrated experiential mechanism within digital banking ecosystems.

Drawing from these studies, UI/UX enhances usability and cognitive fluency, while speed and convenience reduce friction across different journey stages. Additionally, security and trust lower perceived financial risk, and technological innovation further enhances the personalization and intelligence of services.

H1: User interface quality positively influences Online Flow State.

H2: Transaction speed and convenience positively influence Online Flow State.

H3: Perceived security and trust positively influence Online Flow State.

H4: Technological innovation positively influences Online Flow State.

H5: System accessibility positively influences Online Flow State.

3. Online Flow State as Experiential Mechanism

Flow theory provides the psychological explanation for immersive digital interaction. Harris (2000) and Ertemel et al. (2021) describe online flow as a state characterized by absorption, perceived control, time distortion, and intrinsic enjoyment. While flow has been examined extensively in e-commerce, its application in digital banking remains underexplored. When digital systems minimize friction and enhance clarity, users are more likely to experience immersion, which enhances perceived experiential quality.

H6: Online Flow State positively influences Digital Customer Experience.

H7: Online Flow State positively influences Customer Engagement.

4. Digital Customer Experience → Value Co-Creation

Service-dominant logic (Prahalad & Ramaswamy, 2004; Vargo & Lusch, 2014, 2017) posits that value emerges through interaction rather than passive consumption. Ahmad et al. (2022) empirically demonstrate that participatory mechanisms enhance relational value. High-quality DCX creates motivational readiness for customers to engage in co-creation behaviors such as feedback provision and community participation.

H8: Digital Customer Experience positively influences Value Co-Creation.

5. Value Co-Creation → Customer Engagement

Engagement theory conceptualizes engagement as cognitive, emotional, and behavioral investment (Hollebeek, 2011; Brodie et al., 2013). Leibtag (2013) emphasizes that community-building mechanisms strengthen engagement intensity. Co-creation enhances psychological ownership and relational embeddedness, thus intensifying engagement.

H9: Value Co-Creation positively influences Customer Engagement.

6. Digital Customer Experience → Customer Engagement

High experiential quality plays a crucial role in shaping users' perceptions of a service or product. It not only evokes strong emotional resonance, allowing users to form meaningful connections, but also promotes cognitive involvement, encouraging them to actively process and reflect on their experiences. By integrating both affective and cognitive dimensions, experiential quality enhances overall satisfaction, strengthens engagement, and can influence long-term loyalty and positive behavioral intentions.

H10: Digital Customer Experience positively influences Customer Engagement.

7. Customer Engagement → Customer Loyalty

Customer loyalty reflects long-term commitment and repurchase intention (Kotler, P., & Keller, K. L. 2016; Verhoef et al., 2017). Huang and Liao (2015) demonstrate that engagement strengthens loyalty formation in digital environments. Becker and Jaakkola

(2020) emphasize that experiential integration across touchpoints reinforces loyalty outcomes.

H11: Customer Engagement positively influences Customer Loyalty.

8. Direct Experiential Effects on Loyalty

H12: Digital Customer Experience positively influences Customer Loyalty.

H13: Online Flow State positively influences Customer Loyalty.

H14: Value Co-Creation positively influences Customer Loyalty.

9. Mediation and Serial Mediation Effects

Integrating Flow Theory, Service-Dominant Logic, Customer Journey Theory, and Engagement Theory suggest a sequential experiential mechanism: technological antecedents → flow → DCX → co-creation → engagement → loyalty. Prior literature has examined these constructs separately, but theoretical integration remains limited.

H15: Online Flow State mediates the relationship between antecedents and DCX.

H16: DCX mediates the relationship between Flow and Engagement.

H17: Value Co-Creation mediates the relationship between DCX and Engagement.

H18: Customer Engagement mediates the relationship between DCX and Loyalty.

H19: Online Flow State, DCX, Value Co-Creation, and Customer Engagement sequentially mediate the relationship between antecedents and Customer Loyalty.

RESEARCH METHOD

This study employs a cross-sectional explanatory survey design aimed at testing the theoretical relationships proposed in the framework. The design is explicitly positioned as a theory-testing approach rather than merely quantitative research, enabling empirical validation of the hypothesized causal relationships among technological antecedents, Online Flow State, Digital Customer Experience (DCX), value co-creation, customer engagement, and customer loyalty within a structural model. Unlike simple descriptive quantitative approaches, this design allows for a systematic examination of the connections between digital experience, engagement, and loyalty. By focusing on these relationships, the study goes beyond merely describing patterns, seeking instead to explore how these factors influence one another in a meaningful way.

The target population consists of young adults aged 18 to 35 living in the Greater Jakarta area, including Jakarta, Bogor, Depok, Tangerang, and Bekasi, who actively use digital banking services. For operational clarity, “young adults” are defined as individuals aged 18–35 who use digital banking services at least once per month. This group was chosen because young adults are considered “digital natives” and represent the primary drivers of fintech adoption, with the digital literacy necessary to provide informed and nuanced feedback on digital customer experience (DCX). A purposive non-random sampling method was employed to ensure that respondents met specific criteria regarding age and active usage. This sampling approach ensures construct relevance and respondent expertise, although it implies that findings should be interpreted with caution in terms of statistical generalizability beyond the defined segment. While this approach limits the ability to generalize findings to the broader population, it strengthens the internal validity of the study by focusing on respondents who are highly relevant and knowledgeable about the topic.

Data were collected through an online survey using Google Forms between May and August 2025. Respondents were recruited through digital communities and social media platforms related to banking and fintech services. Respondents were initially screened

to confirm their residency and frequency of digital banking use. Ethical considerations were strictly observed, with participants fully informed about the purpose of the study, their right to withdraw at any time, and the guarantee that their responses would remain anonymous. A total of 214 valid responses were obtained, which satisfies PLS-SEM sample size requirements by exceeding the “10-times rule” based on the maximum number of structural paths directed at a single endogenous construct and providing sufficient statistical power for detecting medium effect sizes. This sample size is adequate for Partial Least Squares Structural Equation Modeling (PLS-SEM) given the complexity of the structural model.

All constructs were measured using multi-item scales adapted from established literature, ensuring both relevance and conceptual accuracy while translating the items into the local context. Each construct was operationalized using between three and six items, depending on the original scale specification. Antecedent variables were adapted from Davis (1989) and Venkatesh et al. (2003, 2012), online flow state from Agarwal and Karahanna (2000), DCX from Silalahi and Rufaidah (2017), value co-creation from Auh et al. (2007), Vargo and Lusch (2017), and Prahalad and Ramaswamy (2004), customer engagement from Brodie et al. (2013) and Leibtag (2013), and customer loyalty from Verhoef et al. (2017). A back-translation procedure was applied to ensure semantic equivalence between the original and translated versions of the items. All items were measured on a five-point Likert scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). The quality of the measurement model was evaluated through internal consistency using Cronbach’s Alpha and Composite Reliability (≥ 0.70), convergent validity with Average Variance Extracted (≥ 0.50), and discriminant validity through HTMT (< 0.90) and Fornell-Larcker criteria.

Data analysis was conducted using SmartPLS 4.0, with PLS-SEM chosen because it allows for maximizing the explained variance in endogenous constructs and handling a complex structural model without assuming strict multivariate normality. PLS-SEM was selected over covariance-based SEM due to its suitability for predictive and theory-testing purposes, its robustness to non-normal data distributions, and its capacity to model complex mediation relationships efficiently. The analysis followed a two-stage process, first assessing the reliability and validity of the latent constructs in the measurement (outer) model, and then testing the hypothesized relationships in the structural (inner) model, including the extent to which the independent variables explain the dependent variables (R^2) and effect sizes (f^2). Bootstrapping with 5,000 resamples was used to assess the statistical significance of the path coefficients and any mediating effects in the model.

RESULTS

Table 1. Demographic Profile

Demographic Data	Frequency (N)	Percentage (%)
Age		
17–24 years	147	68.7
25–35 years	45	21
36–45 years	1	0.5
46–55 years	3	1.4
>55 years	18	8.4
Gender		
Male	75	35
Female	139	65
Occupation		
Student	131	61.2

Private-sector employee	49	22.9
Entrepreneur	11	5.1
Civil servant (ASN)	9	4.2
State-/Regional-owned enterprise employee (BUMN/BUMD)	6	2.8
Others	8	3.7
Educational Background		
Junior High School	2	0.9
Senior High School	130	60.7
Diploma	12	5.6
Bachelor's degree (S1)	67	31.3
Master's/Doctoral degree (S2–S3)	3	1.4
Monthly Expenditure		
0–1 million IDR	69	32.2
1–3 million IDR	67	31.3
3–5 million IDR	45	21.0
>5 million IDR	33	15.4

Based on the demographic data presented in Table 1, respondents who use digital banking services are predominantly young individuals, with the majority (68.7%) falling within the age range of 17–24 years, followed by those aged 25–35 years (21.0%). The proportion of respondents above 35 years decreases significantly, with only 0.5% in the 36–45 age group, 1.4% in the 46–55 group, and 8.4% aged above 55 years. In terms of gender distribution, digital banking users are more widely represented by females (65.0%) compared with males (35.0%). Regarding employment status, most respondents are students (61.2%), indicating high adoption among younger individuals who are still pursuing their education. Private-sector employees constitute the second-largest group at 22.9%, followed by entrepreneurs (5.1%), civil servants (4.2%), state-/regional-owned enterprise employees (2.8%), and others (3.7%). The respondents' educational background is primarily concentrated at the senior high school level (60.7%) and bachelor's degree level (31.3%). A smaller proportion of respondents holds a junior high school qualification (0.9%), a diploma (5.6%), or a master's/doctoral degree (1.4%).

Monthly expenditure varies across respondents. The largest proportion falls within the 0–1 million IDR range (32.2%), followed by 1–3 million IDR (31.3%). Respondents with monthly spending of 3–5 million IDR account for 21.0%, while those with expenditures exceeding 5 million IDR constitute 15.4%. In general, based on the demographic analysis, it can be concluded that digital banking users are predominantly young individuals aged 17–35 years, mostly female, with the majority being students or private-sector employees, and generally holding a senior high school or bachelor's degree qualification. Their spending patterns are relatively diverse, although most fall under the category of monthly expenditures below 3 million IDR. This indicates that digital banking services are highly relevant and widely adopted by digitally active younger generations with varying consumption patterns.

Table 2. Descriptive Statistics, Validity, and Reliability Result Antecedents Variables

Item	LF	M	SD	CA	CR	AVE
User Interface						
1 The user interface of this digital banking application is visually appealing and comfortable to use.	0.725	0.715	0.055	0.811	0.869	0.571

2	The design of the digital banking application is consistent across pages, making it easier to understand the function of each feature (menu, buttons, icons, colors, and text), allowing me to complete transactions quickly.	0.808	0.800	0.044			
3	The appearance of this digital banking application looks modern and professional.	0.780	0.781	0.034			
4	I rarely experience difficulty finding the features I need.	0.673	0.672	0.050			
5	Overall, I am satisfied with the user interface of this digital banking application.	0.786	0.784	0.037			
Transaction Speed and Convenience							
1	Transaction processes in this digital banking application are fast and without obstacles.	0.723	0.721	0.041	0.854	0.892	0.579
2	I can perform various transactions (transfers, payments, credit card checks, loan information, etc.) with simple steps.	0.760	0.757	0.042			
3	I rarely experience delays when conducting transactions in this digital banking application.	0.770	0.768	0.035			
4	The information needed to complete transactions is easy to access and clear.	0.780	0.778	0.035			
5	Transaction notifications (success/failure) appear quickly and accurately.	0.712	0.708	0.049			
6	Overall, I am satisfied with the speed and convenience of the transaction process in this digital banking service.	0.816	0.815	0.031			
Awareness and Knowledge							
1	I am aware of the benefits of using digital banking services compared to conventional services.	0.784	0.782	0.037	0.862	0.897	0.591
2	I keep myself updated with the latest information regarding this bank's digital services.	0.716	0.716	0.034			

3	I am familiar with the various features available in this bank's digital application.	0.790	0.787	0.037			
4	I understand how to use the features in the digital banking application (account opening, digital credit application, bill payment, transfers, etc.).	0.769	0.767	0.036			
5	I know how to maintain the security of my digital banking account.	0.797	0.795	0.028			
6	I understand the procedures for resolving issues and disruptions when using digital banking services.	0.756	0.752	0.041			
Security and Usability							
1	The digital banking application is easy to use, and I can perform login and navigation without special assistance.	0.763	0.762	0.043	0.857	0.897	0.636
2	The guidance or information in the application helps me understand how to make transactions.	0.801	0.799	0.032			
3	I am confident that my personal and financial data are well protected in this digital banking application.	0.786	0.786	0.027			
4	The authentication system (PIN, fingerprint, OTP, Face ID) provides adequate protection.	0.809	0.804	0.036			
5	I trust that this bank has a reliable and continuously updated digital security system.	0.826	0.822	0.033			
Technology and Innovation							
1	Transaction processes in the digital banking application are very fast due to the technology used.	0.750	0.749	0.041	0.884	0.912	0.633
2	This digital banking application has technological capabilities that allow me to perform multiple transactions simultaneously.	0.807	0.806	0.031			

3	The technology used in this digital banking application makes my transaction experience more efficient and practical.	0.798	0.796	0.034			
4	The digital banking application offers innovative solutions to address everyday banking problems.	0.801	0.797	0.037			
5	I feel that this bank continually innovates to meet my digital banking needs.	0.779	0.777	0.035			
6	New features introduced in this digital banking application enhance my transaction experience.	0.838	0.838	0.030			

Based on the results of the analysis presented in Table 2 using the SmartPLS application, it is evident that all constructs in this study meet the required criteria for validity and reliability. This is reflected in the loading factor values of each indicator, which generally exceed 0.7, indicating that these indicators contribute effectively in representing their respective latent constructs. In addition, the Average Variance Extracted (AVE) values for all constructs are above the minimum threshold of 0.5, suggesting that the variables are able to explain more than half of the variance of the indicators measuring them. In terms of reliability, all constructs also demonstrate strong results. The Cronbach's Alpha values for each construct range from 0.811 to 0.884, and the Composite Reliability (CR) values are similarly high, ranging from 0.869 to 0.912. Both measures are well above the minimum required threshold of 0.7, indicating that the items within each construct possess strong internal consistency. Overall, these findings confirm that the measurement instruments used in this study are reliable and valid for further analysis, including the examination of relationships among constructs within the structural model.

Table 3. Discriminant Validity (Cross Loading)

	AP	CE	CL	DC	KK	KEC	OF	TI	UI	VCC
AP1	0.784	0.527	0.568	0.635	0.658	0.700	0.638	0.658	0.605	0.519
AP2	0.716	0.595	0.567	0.539	0.481	0.516	0.515	0.500	0.444	0.562
AP3	0.790	0.517	0.557	0.616	0.665	0.638	0.546	0.602	0.539	0.544
AP4	0.769	0.481	0.516	0.545	0.562	0.583	0.558	0.609	0.538	0.458
AP5	0.797	0.503	0.514	0.567	0.589	0.605	0.542	0.580	0.558	0.546
AP6	0.756	0.519	0.540	0.537	0.552	0.551	0.558	0.552	0.519	0.560
CE1	0.526	0.749	0.617	0.473	0.425	0.428	0.515	0.442	0.437	0.447
CE2	0.528	0.823	0.592	0.449	0.384	0.426	0.477	0.391	0.366	0.567
CE3	0.577	0.849	0.680	0.593	0.505	0.499	0.590	0.520	0.480	0.653
CE4	0.558	0.776	0.626	0.602	0.501	0.531	0.598	0.529	0.487	0.645
CE5	0.516	0.786	0.603	0.523	0.404	0.427	0.480	0.451	0.415	0.613
CL1	0.542	0.532	0.720	0.642	0.624	0.643	0.647	0.630	0.558	0.522
CL2	0.459	0.559	0.734	0.581	0.528	0.561	0.562	0.551	0.453	0.482
CL3	0.497	0.615	0.777	0.533	0.421	0.450	0.490	0.455	0.424	0.548

	AP	CE	CL	DC	KK	KEC	OF	TI	UI	VCC
CL4	0.569	0.592	0.809	0.616	0.511	0.600	0.613	0.575	0.470	0.631
CL5	0.602	0.673	0.753	0.578	0.472	0.498	0.591	0.564	0.438	0.670
CL6	0.578	0.622	0.809	0.660	0.567	0.611	0.641	0.667	0.490	0.619
DC1	0.557	0.477	0.527	0.778	0.601	0.599	0.640	0.629	0.553	0.523
DC2	0.543	0.469	0.593	0.767	0.587	0.618	0.647	0.632	0.546	0.516
DC3	0.591	0.582	0.667	0.759	0.613	0.585	0.609	0.622	0.527	0.633
DC4	0.630	0.505	0.597	0.794	0.684	0.663	0.701	0.702	0.581	0.593
DC5	0.583	0.555	0.651	0.797	0.635	0.683	0.707	0.733	0.589	0.639
KEC1	0.572	0.438	0.545	0.578	0.565	0.723	0.578	0.629	0.489	0.489
KEC2	0.593	0.484	0.518	0.621	0.645	0.760	0.608	0.636	0.549	0.495
KEC3	0.601	0.456	0.571	0.653	0.620	0.770	0.593	0.664	0.561	0.514
KEC4	0.623	0.452	0.608	0.662	0.701	0.780	0.639	0.687	0.680	0.513
KEC5	0.551	0.404	0.485	0.556	0.591	0.712	0.538	0.617	0.549	0.429
KEC6	0.630	0.426	0.579	0.622	0.658	0.816	0.634	0.697	0.635	0.500
KK1	0.634	0.419	0.511	0.622	0.763	0.679	0.586	0.660	0.607	0.455
KK2	0.620	0.506	0.543	0.700	0.801	0.640	0.622	0.687	0.605	0.477
KK3	0.586	0.511	0.585	0.608	0.786	0.611	0.598	0.622	0.579	0.535
KK4	0.580	0.403	0.514	0.627	0.809	0.682	0.623	0.677	0.590	0.504
KK5	0.624	0.393	0.531	0.639	0.826	0.694	0.611	0.697	0.576	0.473
OF1	0.576	0.543	0.582	0.619	0.634	0.657	0.750	0.647	0.589	0.575
OF2	0.601	0.526	0.600	0.693	0.635	0.664	0.812	0.704	0.544	0.603
OF3	0.535	0.571	0.643	0.624	0.534	0.545	0.780	0.597	0.593	0.564
OF4	0.561	0.513	0.567	0.667	0.532	0.574	0.754	0.621	0.556	0.532
OF5	0.569	0.464	0.600	0.699	0.629	0.622	0.797	0.647	0.617	0.574
TI1	0.541	0.404	0.541	0.592	0.656	0.627	0.584	0.750	0.467	0.421
TI2	0.596	0.476	0.555	0.665	0.672	0.643	0.623	0.807	0.578	0.505
TI3	0.596	0.443	0.565	0.712	0.713	0.677	0.674	0.798	0.631	0.507
TI4	0.596	0.495	0.613	0.687	0.618	0.674	0.645	0.801	0.577	0.521
TI5	0.675	0.521	0.624	0.708	0.668	0.740	0.720	0.779	0.646	0.608
TI6	0.622	0.465	0.650	0.700	0.678	0.738	0.687	0.838	0.588	0.520
UI1	0.472	0.375	0.403	0.508	0.505	0.552	0.526	0.487	0.725	0.389
UI2	0.550	0.442	0.460	0.568	0.567	0.597	0.572	0.552	0.808	0.451
UI3	0.519	0.396	0.458	0.519	0.565	0.578	0.559	0.550	0.780	0.383
UI4	0.497	0.423	0.465	0.498	0.483	0.498	0.505	0.525	0.673	0.452
UI5	0.588	0.442	0.518	0.610	0.663	0.637	0.636	0.646	0.786	0.495
VC1	0.503	0.555	0.532	0.569	0.461	0.452	0.522	0.500	0.428	0.742
VC2	0.514	0.509	0.578	0.544	0.482	0.496	0.584	0.496	0.472	0.767
VC3	0.536	0.633	0.602	0.589	0.445	0.492	0.550	0.486	0.401	0.776
VC4	0.564	0.596	0.668	0.644	0.518	0.550	0.622	0.538	0.475	0.813
VC5	0.549	0.559	0.548	0.544	0.466	0.501	0.551	0.491	0.456	0.769

Based on Table 3, which presents the results of the discriminant validity test through cross-loading analysis, it can be concluded that each indicator exhibits the highest loading value on the construct it is intended to measure compared to other constructs.

This indicates that each indicator can clearly distinguish one construct from another. For example, indicator CL4 has the highest loading value of 0.804 on the Customer Loyalty construct compared to its loadings on other constructs. Similarly, other indicators demonstrate the same pattern, in which the loading value on their primary construct is consistently higher than the loadings on other constructs. This pattern provides evidence that each construct has specific indicators that do not significantly overlap with those of other constructs, thereby confirming that discriminant validity has been achieved. Therefore, it can be concluded that the measurement model in this study demonstrates strong discriminant validity. Each indicator is able to measure its intended construct specifically, without significant overlap with other constructs. These findings further reinforce that the instrument used in this study is well-structured and suitable for subsequent structural analysis within the PLS-SEM model.

Table 4. Hypothesis Testing Direct Effect

	Hypothesis	Original Sample (O)	t-statistics	p-value	Conclusion
H1	Awareness & Knowledge → Online Flow State	0.122	2.035	0.042	Accepted
H2	Customer Engagement → Customer Loyalty	0.784	22.395	0.000	Accepted
H3	DCX → Customer Engagement	0.258	3.265	0.001	Accepted
H4	DCX → Value Co-Creation	0.749	15.579	0.000	Accepted
H5	Security & Usability → Online Flow State	0.052	0.559	0.576	Rejected
H6	Transaction Speed → Online Flow State	0.103	1.234	0.218	Rejected
H7	Online Flow State → DCX	0.849	27.383	0.000	Accepted
H8	Technology & Innovation → Online Flow State	0.442	4.792	0.000	Accepted
H9	User Interface → Online Flow State	0.218	3.498	0.001	Accepted
H10	Value Co-Creation → Customer Engagement	0.546	6.697	0.000	Accepted

Table 4 presents a summary of the hypothesis testing results for the direct effects among variables in the research model. The findings indicate that out of the ten proposed hypotheses, eight are accepted while two are rejected. Hypothesis H1 states that Awareness & Knowledge positively influence Online Flow State. With an Original Sample (O) value of 0.122, a t-statistic of 2.035, and a p-value of 0.042, this hypothesis is accepted, suggesting that higher levels of user awareness and knowledge regarding digital banking services increase the likelihood of achieving an online flow state during usage. Furthermore, H2, which examines the impact of Customer Engagement on Customer Loyalty, shows highly significant results, with an Original Sample (O) of 0.784, a t-statistic of 22.395, and a p-value of 0.000. This hypothesis is accepted, reinforcing that high customer engagement strongly and directly contributes to enhanced customer loyalty. H3 and H4 emphasize the role of DCX. H3 demonstrates that DCX positively affects Customer Engagement (Original Sample (O) 0.258, t-statistic 3.265, p-value 0.001), and is therefore accepted. This indicates that a positive digital experience can enhance customer engagement. Meanwhile, H4 reveals an even stronger influence of DCX on Value Co-Creation (Original Sample (O) 0.749, t-statistic 15.579, p-value 0.000), which is also accepted. This finding highlights that high-quality digital experiences play a critical role in fostering value co-creation between service providers and customers.

On the other hand, two hypotheses are rejected. H5, which evaluates the effect of Security & Convenience on Online Flow State, is rejected because the p-value (0.576) exceeds the conventional significance threshold (typically 0.05), despite having a positive Original Sample (O) of 0.052 and a t-statistic of 0.559. Similarly, H6, which tests the effect of Speed on Online Flow State, is rejected with a p-value of 0.218, even though the Original Sample (O) is 0.103 and the t-statistic is 1.234. The rejection of these hypotheses indicates that, within the context of this study, security, convenience, and speed do not directly serve as primary drivers of the online flow state as initially hypothesized, or their effects are too small to be considered statistically significant. Next, H7 confirms the significant influence of Online Flow State on DCX (Original Sample (O) 0.849, t-statistic 27.383, p-value 0.000), and is therefore accepted. This result suggests that when users enter an online flow state, their overall digital experience is substantially enhanced. Subsequently, H8 demonstrates that Technology & Innovation significantly affect Online Flow State (Original Sample (O) 0.442, t-statistic 4.792, p-value 0.000), leading to acceptance of this hypothesis. This implies that the sophistication of technology and innovation within digital banking services facilitates users in achieving an online flow state. H9 is also accepted, showing that User Interface has a significant impact on Online Flow State (Original Sample (O) 0.218, t-statistic 3.498, p-value 0.001). An intuitive and well-designed user interface contributes to users' flow experience.

Finally, H10, which investigates the effect of Value Co-Creation on Customer Engagement, is accepted with an Original Sample (O) of 0.546, t-statistic of 6.697, and p-value of 0.000. This confirms that when customers feel involved in the process of value creation, their engagement with the service increases accordingly. Overall, the direct effect hypothesis testing results provide important insights into the factors influencing online flow state, DCX, customer engagement, value co-creation, and customer loyalty within the context of digital banking services. Although security, convenience, and speed are not found to be direct determinants of the online flow state, other factors, such as awareness, knowledge, technology, innovation, and user interface, play crucial roles. Additionally, a positive DCX is vital in promoting customer engagement and value co-creation, which ultimately strengthens customer loyalty.

Table 5. Hypothesis Testing Indirect Effect

	Hypothesis	Original Sample (O)	t-statistics	p-value	Conclusion
H11	Online Flow State → DCX → Customer Engagement	0.219	3.251	0.001	Accepted
H12	DCX → Value Co-Creation → Customer Engagement	0.409	5.736	0.000	Accepted
H13	Online Flow State → DCX → Value Co-Creation → Customer Engagement	0.348	5.188	0.000	Accepted
H14	DCX → Customer Engagement → Customer Loyalty	0.202	3.113	0.002	Accepted
H15	Online Flow State → DCX → Customer Engagement → Customer Loyalty	0.172	3.077	0.002	Accepted
H16	Value Co-Creation → Customer Engagement → Customer Loyalty	0.428	6.242	0.000	Accepted
H17	DCX → Value Co-Creation → Customer Engagement → Customer Loyalty	0.321	5.254	0.000	Accepted

H18	Online Flow State → DCX → Value Co-Creation → Customer Engagement → Customer Loyalty	0.272	4.729	0.000	Accepted
H19	Online Flow State → DCX → Value Co-Creation	0.636	10.914	0.000	Accepted

Table 5 summarizes the indirect effect testing and demonstrates that all proposed mediation hypotheses are supported. H11 is accepted, confirming that online flow state exerts a significant indirect effect on customer engagement through DCX, indicating that immersive online experiences strengthen engagement when they translate into positive digital interactions. H12 is accepted, showing that value co-creation significantly mediates the relationship between DCX and customer engagement, meaning that digital experiences enhance engagement more strongly when customers actively participate in creating shared value. H13 is accepted and validates the sequential mediation from online flow state through DCX and value co-creation to customer engagement, highlighting a layered experiential mechanism. H14 is accepted, confirming that DCX indirectly increases customer loyalty through customer engagement, reinforcing the central role of engagement as a relational bridge. H15 is accepted and demonstrates that online flow state contributes to customer loyalty through the combined mediating roles of DCX and customer engagement. H16 is accepted, indicating that value co-creation enhances customer loyalty indirectly via customer engagement, emphasizing the importance of participatory value processes. H17 is accepted and supports a cascading pathway in which DCX influences customer loyalty through value co-creation and customer engagement. H18 is accepted, confirming the full sequential chain from online flow state to customer loyalty through DCX, value co-creation, and customer engagement. Finally, H19 is accepted, establishing that online flow state significantly affects value co-creation indirectly through DCX. Collectively, these findings demonstrate that DCX and customer engagement function as pivotal mediators within the model, amplifying the influence of online flow state and value co-creation on customer loyalty and revealing a multi-stage experiential process in digital banking that culminates in stronger relational outcomes.

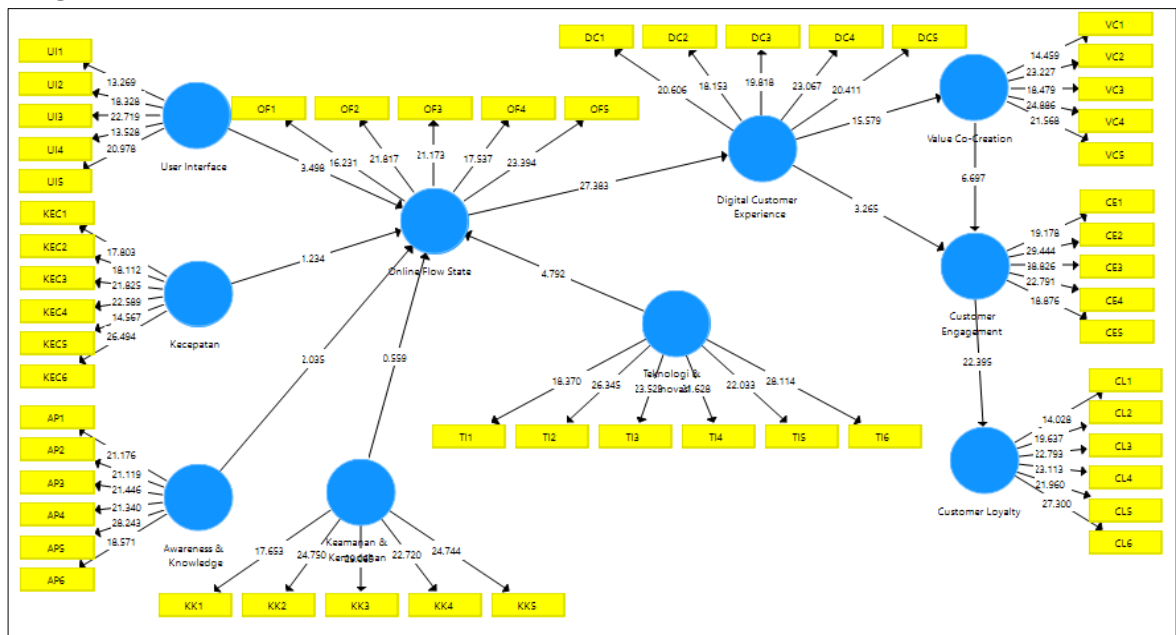
Table 6. R-Square Test

Variable	R Square	R Square Adjusted
Customer Engagement	0.576	0.572
Customer Loyalty	0.614	0.613
Digital Customer Experience (DCX)	0.722	0.720
Online Flow State	0.737	0.731
Value Co-Creation	0.561	0.559

Table 6 presents the results of the analysis of the coefficient of determination (R Square) and the Adjusted R Square for five dependent variables, namely customer engagement, customer loyalty, DCX, online flow state, and value co-creation. The R-squared values indicate the extent to which the independent variables explain the variance in the respective dependent variables. For the customer engagement variable, the R-squared value is 0.576, indicating that 57.6% of the variance in customer engagement can be explained by the independent variables in the model, namely DCX and value co-creation. The customer loyalty variable has an R-squared value of 0.614, meaning that 61.4% of

the variance in customer loyalty can be explained by customer engagement. The DCX variable has an R-squared value of 0.722, showing that 72.2% of the variance in DCX can be explained by online flow state. The online flow state variable has an R Square value of 0.737, indicating that 73.7% of the variance in online flow state can be explained by the independent variables in the model, namely user interface, transaction speed, convenience, awareness and knowledge, security and ease of use, as well as technology and innovation. Meanwhile, the value co-creation variable has an R-squared value of 0.561, meaning that 56.1% of the variance in value co-creation can be explained by DCX. The Adjusted R Square values for each variable show that adjustments for the number of predictors do not substantially reduce the R-squared values, thereby strengthening the validity of the model.

Figure 2. Structural Model



DISCUSSION

In the context of digital transformation, the customer journey has become a key element for banks in understanding how consumers interact with their digital services from the initial stage of exploration to becoming loyal users. The customer journey not only reflects transactional stages but also illustrates how consumers develop perceptions, emotional experiences, and levels of satisfaction toward the services provided. For younger generations (Millennials and Gen Z), who are widely recognized as digital natives, expectations toward banking services are significantly higher than those of previous generations. They demand digital banking experiences that are fast, convenient, secure, personalized, and enjoyable, ranging from account opening and transactions to after-sales services. By mapping the customer journey, banks are able to identify crucial touchpoints where user experience can be enhanced. When aligned with the research model, these touchpoints correspond to the stages of Antecedents, Process, and Consequences.

Within the antecedents stage, an examination of the perceptions of young consumers (the research sample) reveals noteworthy findings: user interface, awareness and knowledge, as well as technology and innovation, influence the online flow state. Factors such as user interface (UI), awareness/knowledge, and technology/innovation serve as

prerequisites for enabling users to enter a flow state while interacting with digital banking services. Among younger users, experiencing flow characterized by seamless, enjoyable, and immersive interactions leads to stronger recall, greater preference for the service, and a higher likelihood of loyalty (Ertemel et al., 2021). A deeper assessment of the research instruments shows that a strong UI (intuitive design, ease of use, visually appealing interface) enables users to feel comfortable and reduces friction during digital interactions. When usage barriers are minimized, users can more easily enter a state of "flow," marked by heightened focus, minimal distraction, and a sense of control over the system. Awareness and knowledge in the context of digital banking reflect users' understanding of features, operational processes, and perceived benefits, reducing cognitive barriers.

Furthermore, technological sophistication and innovation (e.g., new features, responsive interfaces, instant transactions, gamification, and personalization) enhance the attractiveness, speed, and continuity of digital interactions. Low technical barriers and relevant innovations create a seamless experience that facilitates flow. These findings support previous research (Ertemel et al., 2021; Jamshidi et al., 2018). However, antecedent factors related to security, trust, and convenience were found to have no significant influence on the online flow state. This indicates that younger users, as digital natives, view convenience, trust, and security as baseline expectations. In other words, if digital banking apps fail to provide such features, they will stop using them; however, the presence of these features alone is insufficient to trigger a flow experience or intention to use. This finding aligns with Lestari et al. (2023), who, using the TAM model, found that trust and convenience influence intention to use digital banking in Indonesia. This study suggests that for younger users, experiencing a deep state of flow requires more than basic functionality; it requires engagement, immersion, control, and temporal absorption enabled by added elements such as feature innovation, emotional involvement, digital entertainment, appropriate challenge levels, and personalization.

Conceptually, the research indicates that flow state enhances DCX. When a digital banking platform (e.g., mobile banking application) is designed to enable an immersive experience, characterized by minimal interruptions, responsiveness, seamless interactions, and relevant content, users are more likely to experience flow. Thus, the flow state acts as an enabler for creating positive DCX. The findings further show that DCX promotes value co-creation. In the digital banking context, value co-creation has a direct and positive effect on customer experience (Ertemel et al., 2021; Bilgihan et al., 2014). Customers who participate in co-creation tend to perceive enhanced experiences. With a positive digital experience, customers are more willing and motivated to contribute (e.g., providing feedback, using customization features, participating in service design), thereby facilitating value co-creation. These findings are consistent with studies by Amini et al. (2025) and Peña-García et al. (2021). Moreover, this study addresses a research gap by demonstrating that flow state facilitates value co-creation through customer experience. Because flow enhances DCX, customers become more engaged, focused, and inclined to participate actively. In the context of digital banking, this research provides evidence that deeply immersive digital experiences (flow) can encourage customers to become more active, confident, and creative in their interactions with banks, thereby strengthening co-creation.

The outcomes of co-creation (e.g., more relevant services, personalization, innovation) provide added value for both banks and customers, strengthening relationships and enhancing future experiences. Consequently, banks aiming to excel in DCX and value co-creation must design digital services that foster flow and offer mechanisms for customer participation. In the consequences stage of the research model, this study reveals important findings: DCX strengthens customer engagement and subsequently

promotes customer loyalty. Given that the majority of respondents are young consumers, digital natives whose lifestyles align with digital banking, the results illustrate that young users require deeper forms of interaction, beyond mere transactional functionality. Digital services that facilitate rich experiences, community features, feedback loops, gamification, or aesthetically appealing interfaces lead young users to feel engaged rather than simply being users. Previous studies (Lestari et al., 2023) support these findings, emphasizing that banks optimizing DCX will foster higher engagement among younger consumer segments. The hypothesis testing further confirms that interactive digital experiences enhance engagement, which in turn drives loyalty. This study, therefore, addresses another research gap by demonstrating how DCX drives customer engagement, which subsequently influences customer loyalty. When examined in detail, a strong DCX is essential for attracting and retaining younger users. Positive DCX increases engagement, making young customers more active, more frequent in their interactions, and more connected to the digital banking platform. According to Amini et al. (2025), user-friendly, responsive, and intuitive digital platforms make young users feel comfortable, increasing their interaction frequency. High engagement then becomes a foundation for loyalty, not merely due to the banking products but because of the strong experience-based relationship.

The findings reinforce theoretical and empirical insights suggesting that the path to loyalty is mediated by engagement, which creates emotional and psychological attachment to the bank's brand or services, beyond routine transactions. When young users frequently engage, feel comfortable, and perceive the service as "mine" (personalized), switching costs increase and loyalty strengthens. Loyalty, therefore, is not merely transactional frequency but reflects commitment. Users remain with a digital bank because they feel well-served and perceive high experiential value. As Verhoef et al. (2017) assert, in the digital era, loyalty is built through "consistent, personal, fast, and interactive digital experiences," rather than through promotions. From the sequential modelling of how DCX is formed within the digital banking context among young users across the stages of antecedents, process, and consequences, an overarching conclusion emerges: loyalty among younger generations develops when digital experiences are not merely adequate but deeply resonate with their lifestyle ("the bank understands me"). Such resonance reduces the likelihood of switching to competitors. One study found that customer engagement with digital banks positively influences repurchase intentions and retention among Millennials (Soelasih & Sumani, 2022). Continuous digital communication and interaction (e.g., relevant push notifications, digital events, online communities), supported by enjoyable experiences such as modern interfaces, gamification, rapid feedback, and social/community features within the application, strengthen engagement. In this context, banks must optimize mobile banking applications with features relevant to young users, including simplified account opening, e-wallet integration, subscription management, spending analytics, and timely notifications to reinforce DCX.

CONCLUSION

This study aimed to examine the causal mechanism through which technological innovation, user interface design, and other foundational digital factors influence customer loyalty in digital banking, with Online Flow State and Digital Customer Experience (DCX) positioned as key mediating variables. Specifically, the research sought to understand how online flow shapes value co-creation and customer engagement, and how these variables collectively contribute to loyalty among young consumers.

The findings confirm a structured strategic causal chain. Technological innovation and user interface design significantly generate Online Flow State, which subsequently

enhances users' perceptions of Digital Customer Experience. A superior digital experience encourages value co-creation and strengthens customer engagement, ultimately fostering customer loyalty. All proposed indirect-effect hypotheses are supported, reinforcing the existence of a complex mediating structure in which Online Flow State and DCX indirectly influence Customer Engagement and Value Co-Creation before leading to Customer Loyalty. The strongest empirical effect appears along the path Online Flow State → Digital Experience → Value Co-Creation, highlighting the importance of managing users' psychological conditions holistically within digital environments. Conversely, Security & Convenience and Speed do not exhibit significant direct effects on Online Flow State, suggesting that these factors operate as hygiene elements essential to maintain but insufficient to actively enhance flow.

Theoretically, this study contributes to the digital service and customer behaviour literature by integrating Online Flow State and Digital Customer Experience into a multistage mediation framework that explains how experiential and psychological factors translate into loyalty outcomes. It extends prior models by empirically validating the indirect pathways through which engagement and value co-creation function as critical transmission mechanisms. Practically, the findings imply that digital organizations should prioritize functional innovation and immersive interface design rather than relying solely on operational reliability. Competitive advantage in digital banking is therefore rooted not merely in system stability, but in the strategic orchestration of experiential and co-creative elements that cultivate long-term loyalty.

For future research, scholars are encouraged to explore this model across different demographic segments, industries, or cultural contexts to enhance generalizability. Longitudinal designs could also be employed to examine the dynamic evolution of flow and loyalty over time. Additionally, future studies may incorporate moderating variables such as digital literacy or trust to further refine the explanatory power of the model. From a practical perspective, digital firms should implement layered intervention strategies that simultaneously enhance online flow and DCX, facilitate structured collaborative spaces for value co-creation, optimize the customer journey to ensure cohesive experiential design, and adopt multistage performance measurement systems that assess not only loyalty outcomes but also intermediate indicators such as flow, engagement, and co-creation.

LIMITATION

This study is subject to several limitations. The cross-sectional design limits causal inference and does not capture changes over time. The sample, restricted to young digital banking users, may limit generalizability to other populations and contexts. The use of self-reported questionnaire data may introduce common method bias. Additionally, the model did not include potential moderating variables or broader experiential factors that could further explain customer loyalty formation.

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DECLARATION OF CONFLICTING INTERESTS

The authors declare that there is no conflict of interest with respect to the authorship or the publication of this article.

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