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## Reframing Digital Banking Strategy Beyond Commoditization: Emotional Experience, Value Co-Creation, and Customer Loyalty Among Young Digital Banking Customers

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### Abstract

Although digital banking has transformed financial services, studies emphasize functional service quality and technology adoption, with limited attention to mechanisms underlying loyalty among consumers. This study develops an emotional experience-based digital banking loyalty model integrating Online Flow State (OFS), Digital Customer Experience (DCX), Customer Engagement (CE), and Value Co-Creation (VCC). Drawing on the Stimulus–Organism–Response (S-O-R) framework and Expectation-Confirmation Theory (ECT), the study examines how immersive digital experiences foster engagement and loyalty VCC significantly moderates DCE-CE relationships. A quantitative design using purposive sampling was used, with data collected from 212 banking users outside Java, including Medan, Padang, Batam, Tarakan, Gorontalo, and Pangkal Pinang. The model was analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM). Results show that 9 of 11 hypotheses were supported. OFS significantly enhances DCX, which strengthens CE and Customer Loyalty, while VCC significantly moderates the OFS–DCX relationship. [A] However, the direct effect of OFS on Customer Loyalty was not supported, indicating that emotional immersion alone is insufficient without customer experiences. The findings contribute by integrating S-O-R and ECT with emotional experience, engagement, and value co-creation, while highlighting ecosystems that encourage participation and sustain loyalty among consumers.

### KEYWORDS

digital customer experience; online flow state; value co-creation; customer engagement; customer loyalty; digital banking; young consumers.

### Introduction

The banking industry has undergone substantial transformation because of ongoing developments in digital technology. Digital banking has evolved from a supplementary service into a strategic pillar of contemporary banking operations. Today, virtually all banking institutions have invested in the development of digital and mobile banking services. Innovations such as mobile banking applications, digital payment systems, virtual assistance, and integrated financial platforms have expanded rapidly in response to the growing demand for digitally oriented financial services (Santoso & Handoko, 2023; Pratama & Hartanto, 2022; Kitson, 2021).

Despite these developments, the acceleration of digital innovation has also intensified the phenomenon of commoditization, whereby digital banking products and services have become increasingly standardized and easily replicated by competitors. As a result, differentiation has become more difficult, as most banks now offer similar features, including instant fund transfers, QR-based payments, mobile onboarding, digital investment services, e-wallet top-ups, and AI-powered customer support. Under such conditions, customers can switch between platforms with relatively low barriers,

and usage decisions are no longer driven solely by functional benefits. This trend is particularly evident among younger consumers, who are generally more dynamic, experience-oriented, highly connected, and more inclined to switch providers than previous generations (Firdaus et al., 2025; Deloitte, 2024; Casper & Taichon, 2021).

Under these circumstances, competitive advantage is no longer determined solely by technology-based differentiation but increasingly by a bank's ability to create emotional experiences that foster psychological bonds with customers, particularly younger generations. Generation Z and millennials seek more than transactional efficiency; they value digital experiences that are enjoyable, interactive, personalized, emotionally engaging, and reflective of their social identity. Consequently, digital banking strategies need to be reframed from purely transactional platforms into relationship-oriented platforms capable of fostering long-term customer engagement (Firdaus et al., 2025; Pratama & Handoko, 2023; Baptista & Oliveira, 2017). This shift requires moving beyond feature-driven competition toward the creation of meaningful emotional experiences that strengthen users' psychological attachment to digital platforms.

Within this context, the concept of online flow state provides a useful lens for understanding how immersive digital experiences enhance customer involvement. Drawing on flow theory (Csikszentmihalyi, 1990; Chen, 2006; Zhou, 2012), flow refers to a state in which individuals become fully absorbed in an activity due to a combination of perceived control, ease of use, interactivity, and emotional comfort. In digital banking environments, online flow state reflects a user experience characterized by psychological comfort, deep involvement, and enjoyment throughout the interaction process. Such experiences are more likely to emerge when applications offer intuitive navigation, rapid responsiveness, personalized services, and frictionless transaction processes (Rajobelina et al., 2021; Baptista & Oliveira, 2017). Positive flow experiences can encourage more intensive platform usage and strengthen customers' emotional attachment to the banking brand.

Alongside online flow state, digital customer experience has become a strategic factor in building long-term relationships and securing the loyalty of younger consumers. Digital customer experience encompasses customers' perceptions and emotional responses throughout their interactions with a bank's digital ecosystem, including registration processes, user interface design, customer support, transaction security, and digital communication channels such as mobile applications and social media (Lemon & Verhoef, 2016; Novak et al., 2000). Beyond functional convenience, digital customer experience involves personalization, emotional quality of interactions, interface design, comfort, and the seamless integration of touchpoints across the customer journey (Ramadhan & Rahadi, 2022). Verhoef et al. (2009) describe customer experience as a multidimensional response involving cognitive, emotional, social, and sensory dimensions generated through interactions with a firm.

Moreover, contemporary digital banking increasingly emphasizes the importance of value co-creation. This perspective views customers not as passive recipients of services but as active partners in the creation of value (Setyowati & Wahyu, 2021; Ramjan & Read, 2016). Younger consumers tend to seek opportunities to contribute through feedback, feature development, and participation in service innovation initiatives. Such collaborative interactions can cultivate stronger feelings of ownership and emotional involvement. Within modern digital ecosystems, customers actively engage in value creation through feedback mechanisms, community interactions, user participation, and social collaboration. Consistent with the service-dominant

logic advanced by Vargo and Lusch (2004, 2017) and Prahalad and Ramaswamy (2016), value emerges through continuous interactions between firms and customers. In the context of digital banking, value co-creation can strengthen emotional attachment and enhance customers' perceptions of the value delivered by digital platforms.

Community engagement is increasingly recognized as an important avenue through which banks can cultivate meaningful emotional relationships with younger customers. Digital communities provide opportunities for banks to develop more meaningful social interactions through financial education programs, lifestyle-oriented campaigns, user forums, and digitally mediated social initiatives. Younger consumers are generally more attached to brands that foster a sense of belonging and create communities aligned with their personal values (Pratama & Rahadi, 2023; Nambisan & Baron, 2009). Consequently, community engagement not only strengthens social relationships but also encourages advocacy behavior and positive electronic word-of-mouth.

Customer engagement has likewise emerged as a critical factor in the development of digital banking loyalty. Beyond reflecting the frequency of platform usage, engagement encompasses customers' cognitive, emotional, and behavioral investment in their interactions with a digital platform. Previous studies (Brodie et al., 2011; Dessart, 2015; Nambisan & Baron, 2009) describe customer engagement as a psychological state that develops through interactive and co-creative experiences between customers and brands. Higher levels of engagement are generally associated with stronger and more enduring customer relationships.

Online Flow State (OFS), Digital Customer Experience (DCX), Value Co-Creation (VCC), Customer Engagement (CE), and Customer Loyalty (CL) represent key constructs in explaining loyalty formation within digital banking environments. In the proposed model, Online Flow State functions as the primary antecedent, creating immersive and enjoyable digital interactions that enhance Digital Customer Experience, which serves as the central mediating mechanism linking emotional experiences to subsequent behavioural outcomes. Value Co-Creation is positioned as a moderating variable, strengthening the positive influence of Online Flow State on Digital Customer Experience by encouraging customers to actively participate in creating value through interactive digital services. In turn, superior Digital Customer Experience fosters Customer Engagement, which ultimately contributes to stronger Customer Loyalty through greater continuance intention, repeat usage, positive word-of-mouth, advocacy, and resistance to switching to competing platforms (Santoso & Handoko, 2023; Cleanthous & Christou, 2023; Yuswita & Emy, 2024; Pratama & Rahadi, 2023; Hilal & Varela, 2022; Casper & Taichon, 2021). This relationship is particularly relevant for younger consumers, whose loyalty is increasingly driven by emotional and experiential value rather than transactional benefits alone. Consequently, digital banking strategies in the post-commoditization era should move beyond product-centered approaches toward relationship-oriented digital ecosystems that facilitate meaningful customer participation and value co-creation, thereby strengthening engagement and sustaining long-term customer loyalty (Firdaus et al., 2025; Tran et al., 2025).

Despite the growing body of research on digital banking, existing studies have predominantly emphasized utilitarian determinants of customer loyalty, such as perceived usefulness, trust, security, service quality, and satisfaction (Rajobelina et al., 2021; Pratama & Rahadi, 2023; Setyowati & Wahyu, 2021; Zhou, 2012). Although these factors explain customers' cognitive evaluations of digital banking services, they provide limited insight into how emotionally immersive digital experiences translate into long-term customer loyalty. Moreover, prior studies have generally examined Online Flow

State, Digital Customer Experience, Customer Engagement, and Value Co-Creation as independent or isolated constructs, rather than integrating them into a comprehensive loyalty formation model.

From a theoretical perspective, a significant gap remains in the application of the Stimulus–Organism–Response (S–O–R) framework and Expectation–Confirmation Theory (ECT). Existing S–O–R studies primarily conceptualize digital customer experience as an emotional response but rarely explain how Online Flow State serves as the initial stimulus, how Digital Customer Experience functions as the central organism, and how Customer Engagement subsequently translates emotional experiences into enduring Customer Loyalty. Likewise, ECT-based research has traditionally focused on expectation confirmation and post-adoption satisfaction, while giving limited attention to the role of interactive value co-creation in strengthening emotional digital experiences. To address these gaps, this study integrates S–O–R and ECT by positioning Online Flow State as the primary antecedent, Digital Customer Experience as the mediating mechanism, Customer Engagement as the immediate behavioral outcome leading to Customer Loyalty, and Value Co-Creation as a boundary condition that strengthens the effect of Online Flow State on Digital Customer Experience.

The study also contributes to the literature by addressing an important contextual gap. Most empirical evidence on digital banking loyalty has been derived from users in major metropolitan areas or economically advanced regions, with limited attention to young digital banking users residing outside Java Island. This segment represents a strategically important yet underexplored market, characterized by rapid digital adoption, increasing financial inclusion, and distinct patterns of digital engagement compared with users in more developed regions. Examining young consumers from Medan, Padang, Batam, Tarakan, Gorontalo, and Pangkal Pinang therefore extends the external validity of existing digital banking loyalty models and provides new evidence from a more geographically diverse and emerging digital banking context.

A notable conceptual gap remains, as relatively few studies have integrated Online Flow State, Digital Customer Experience, Customer Engagement, and Value Co-Creation into a unified loyalty framework. Most previous studies examine these constructs independently or through fragmented relationships, providing only a partial explanation of how immersive digital experiences evolve into sustained customer loyalty. Consequently, the underlying psychological mechanism through which online flow translates into superior digital experiences, strengthens customer engagement, and ultimately fosters loyalty remains insufficiently understood. Integrating these constructs within a single framework offers a more comprehensive explanation of the emotional and relational processes that shape loyalty in digital banking.

A contextual and methodological gap is also evident. Existing evidence is largely derived from consumers in economically advanced and digitally mature regions, while younger users outside Java—who experience different levels of digital infrastructure, financial inclusion, and service accessibility—remain underrepresented in digital banking research. Examining this population is theoretically important because variations in regional digital ecosystems may influence how emotional experiences are formed and converted into customer engagement and loyalty, thereby extending the generalizability of existing digital banking theories to more diverse emerging-market contexts (Cleanthous & Christou, 2023; Kurniawati & Hadiyoto, 2021; McLean & Wilson, 2019).

To address these gaps, this study proposes a shift in the loyalty paradigm from a technology-oriented perspective toward an emotional engagement-oriented perspective.

Theoretically, the study contributes to the development of a loyalty model grounded in customer experience, interactive engagement, and co-created value. From a practical standpoint, it offers a new strategic perspective for digital banking by emphasizing the development of an emotional ecosystem capable of fostering deeper customer relationships.

The digital banking industry has entered an era of widespread commoditization. Features such as fee-free instant transfers, automated expense tracking, and user-friendly interfaces, once considered sources of competitive advantage, have increasingly become basic customer expectations. This trend has contributed to the rise of multi-banking behavior among Generation Z and millennial consumers, who frequently adopt and abandon digital banking applications in pursuit of temporary incentives or higher returns. Under such conditions, transaction-based loyalty becomes increasingly fragile. Consequently, digital banking strategies must be reframed by shifting attention from technological functionality alone toward the creation of emotionally meaningful experiences. Against this backdrop, the present study aims to develop an emotional experience-based loyalty model for digital banking by integrating online flow state, digital customer experience, customer engagement, and value co-creation among younger consumers. The findings are expected to contribute to the advancement of experiential ecosystem literature in digital banking while offering strategic insights for building more sustainable forms of customer loyalty.

## Literature Review

### Online Flow State Theory

The concept of flow was first introduced by Mihaly Csikszentmihalyi (1975), who defined it as a psychological state in which individuals become fully immersed, highly focused, and deeply engaged in an activity to the extent that they lose awareness of time and their surrounding environment. This condition, often referred to as an optimal experience, reflects a state of intrinsic enjoyment and complete involvement. Later, Csikszentmihalyi (1990) further refined the concept by proposing that flow emerges when there is a dynamic balance between the level of challenge presented by a task and an individual's skills. Excessive challenge may generate anxiety, whereas insufficient challenge may lead to boredom.

With the rapid diffusion of internet technologies, the concept of flow was subsequently extended to digital environments. Donna Hoffman, Thomas Novak, and Yung (2000) adapted the concept into what is now known as online flow state. Within virtual environments such as websites and mobile applications, online flow state refers to a cognitive condition characterized by focused attention, a diminished sense of self-awareness, high levels of interactivity, and intrinsically rewarding experiences. Their findings demonstrated that online flow positively influences browsing duration, purchasing behavior, and overall user satisfaction.

In the context of digital banking, Online Flow State has become increasingly important as financial institutions seek to strengthen customer retention and long-term engagement. Zhou (2012) demonstrated that perceived ease of use and information quality are key antecedents of flow experiences in mobile banking environments. When users experience a state of flow, they become more immersed in digital interactions, resulting in higher trust, reduced perceived uncertainty, and stronger intentions to continue using mobile banking services. Unlike entertainment-oriented digital platforms, flow in digital banking emerges from the integration of both utilitarian and hedonic value. Customers expect not only efficient completion of financial activities, such as payments, transfers, and investments, but also enjoyable digital experiences characterized by intuitive interfaces, interactive financial

visualizations, personalized recommendations, and gamified features such as rewards and cashback programs. These emotionally engaging experiences enhance overall Digital Customer Experience and contribute to stronger Customer Engagement and long-term Customer Loyalty.

The relevance of online flow is particularly pronounced among younger consumers, who represent a generation of digital natives with distinctive patterns of technology use. According to [Anshari et al. \(2019\)](#), younger users typically possess shorter attention spans but demonstrate a high capacity for processing visual information. As a result, seamless navigation, low latency, and minimalist design become critical triggers of flow experiences. If a digital banking application is slow, complex, or difficult to navigate, users are likely to abandon the platform before a flow state can develop.

Younger consumers are also highly responsive to gamification mechanisms. [Baptista and Oliveira \(2017\)](#) found that the incorporation of gamified elements into financial applications, such as savings challenges, achievement badges, and financial progress tracking, significantly enhances the likelihood of experiencing online flow. By presenting financial activities as progressive and rewarding challenges, these features create a balance between challenge and skill, consistent with the original propositions of flow theory. Consequently, routine financial activities become more engaging and enjoyable.

Furthermore, [Sankaran and Chakraborty \(2022\)](#) argue that younger consumers place considerable value on autonomy in managing their personal finances. Features that allow users to independently organize savings, investments, and budgeting activities strengthen their sense of perceived control, a central component of online flow state. When users experience a sense of mastery and enjoyment while managing their finances through digital platforms, stronger emotional attachment and brand loyalty are likely to emerge over time.

A growing body of research has examined the antecedents of online flow state across various digital contexts. Several studies have identified user interface design as a critical determinant of flow experiences, as intuitive navigation, visual appeal, and ease of interaction can enhance users' concentration and immersion within digital platforms ([McLean & Barhorst, 2023](#)). Transaction speed and ease of use have also been recognized as important factors, particularly in service environments where efficiency and convenience shape users' overall experiences ([Belanche, Casaló, & Flavián, 2024](#)). In addition, customer awareness and knowledge have been found to facilitate flow by increasing users' confidence and familiarity with digital services, thereby reducing cognitive effort during interactions ([Loureiro & Bilro, 2024](#)).

Other studies emphasize the importance of security and convenience in creating a psychological environment conducive to flow experiences. When users perceive digital platforms as secure, reliable, and comfortable to use, they are more likely to become fully engaged in the interaction process ([Flavián, Ibáñez-Sánchez, & Orús, 2022](#)). Furthermore, technological advancement and continuous innovation contribute to the development of online flow by providing users with novel, efficient, and engaging digital experiences ([King, 2025](#)). Collectively, these findings provide a comprehensive understanding of the factors that influence the formation of online flow state in digital environments.

Transaction speed and ease of use are fundamental characteristics of digital service quality that facilitate smooth and uninterrupted user interactions. According to Flow Theory ([Csikszentmihalyi, 1990](#)), flow is more likely to occur when individuals can perform tasks effortlessly with minimal

cognitive interruption, allowing them to become fully immersed in the activity. In digital banking, fast transaction processing and intuitive interfaces reduce cognitive effort, increase users' perceived control, and minimize frustration, thereby creating conditions that support online flow experiences ([Zhou, 2012](#)).

For young consumers, who are highly familiar with mobile technologies and expect seamless digital interactions, transaction efficiency and interface simplicity are particularly important during the initial stages of service interaction. Digital-native users generally prefer applications that enable quick navigation, immediate feedback, and frictionless completion of financial activities. These characteristics enhance enjoyment and concentration, both of which are essential dimensions of online flow ([Csikszentmihalyi, 1990](#); [Novak et al., 2000](#); [Zhou, 2012](#)). Therefore, faster transaction processes and greater ease of use are expected to increase the likelihood of experiencing online flow in digital banking environments.

Based on the preceding discussion, the following hypotheses are proposed:

H1: User interface quality positively influences online flow state.

H2: Transaction speed and ease of use positively influence Online Flow State.

H3: Customer awareness and knowledge positively influence online flow state.

H4: Perceived security and convenience positively influence online flow state.

H5: Technology and innovation positively influence online flow state.

#### Digital Customer Experience (DCX)

The concept of Customer Experience (CX) can be traced back to the seminal work of [Holbrook and Hirschman \(1982\)](#), who argued that consumption extends beyond rational and economic considerations to encompass affective, cognitive, and sensory dimensions. With the rapid advancement of digital technologies, this perspective has evolved into the concept of Digital Customer Experience (DCX). [Lemon and Verhoef \(2016\)](#) define DCX as a multidimensional construct that reflects customers' cognitive, emotional, behavioral, sensory, and social responses to interactions with a brand across various digital touchpoints throughout the customer journey.

[McLean and Wilson \(2016\)](#) emphasize that, within online environments, DCX is largely shaped by the quality of human-computer interaction. When digital platforms provide high usability and responsiveness, users experience a greater sense of control over their activities. Such psychological conditions foster intrinsic motivation and perceived enjoyment, factors that have frequently been associated with the emergence of online flow state in digital environments ([Chen, 2006](#); [Novak et al., 2000](#)).

Research on DCX has evolved considerably, moving beyond traditional assessments of website quality toward a broader understanding of complex digital ecosystems. Several influential streams of research have contributed to the development of this concept. First, the Electronic Service Quality framework proposed by [Parasuraman et al. \(2005\)](#), together with the Technology Acceptance Model (TAM) developed by [Davis \(1989\)](#), provides a foundation for understanding how system functionality, efficiency, and fulfillment influence perceptions of usefulness and shape customers' initial experiences with digital services. Second, [Bilgihan et al. \(2016\)](#) demonstrate that successful digital experiences require the integration of both utilitarian elements, such as information accessibility and security features, and hedonic elements, including visual aesthetics

and interactivity. The combination of these dimensions significantly enhances psychological commitment and contributes to long-term digital brand loyalty. Third, Verhoef et al. (2015) extend the concept of DCX to the omnichannel context, arguing that customer experiences are formed through consistent interactions across multiple digital channels, such as social media platforms, mobile applications, and chatbot services.

Within the digital banking industry, DCX has undergone a significant shift from a transaction-oriented perspective toward a customer retention and relationship-oriented perspective. Unlike traditional banks, digital banks have limited opportunities for face-to-face interactions, making mobile applications the primary representation of the brand. Zhou (2012) argues that customers' continuance intention toward mobile banking services is strongly influenced by their initial user experiences. Applications characterized by technical difficulties, complex navigation, or excessive friction may generate uncertainty and anxiety regarding the security of financial transactions. Conversely, positive digital experiences contribute to the development of electronic trust (e-trust) and institutional loyalty, even in the absence of physical interactions (Ramadian & Rahadi, 2023).

The importance of DCX is particularly evident among younger consumers, including Millennials and Generation Z, who are widely recognized as digital natives. Compared with previous generations, they exhibit substantially higher expectations regarding digital experiences. For these consumers, technology is not merely a functional tool but an integral part of their social identity and lifestyle. Consequently, they are more likely to abandon digital applications perceived as rigid, unattractive, or uninspiring. Setyowati and Winahyu (2021) found that perceived enjoyment experienced during the use of mobile banking applications directly influences loyalty among millennial consumers. Beyond security and functionality, younger users increasingly expect financial applications to provide visually appealing, interactive, and engaging experiences.

Furthermore, Baptista and Oliveira (2017) as well as Pratama and Hananto (2023) demonstrate that gamification can transform banking activities, traditionally perceived as routine and monotonous, into more engaging and enjoyable experiences. Features such as rewards, challenges, achievement badges, and progress tracking stimulate hedonic motivation and encourage users to become more actively involved in financial activities. These elements facilitate the development of online flow experiences, enhance overall customer experience, and strengthen loyalty toward the digital banking ecosystem.

Based on the preceding discussion, the following hypotheses are proposed:

H6: Online flow state positively influences digital customer experience.

H7: Digital customer experience positively influences customer loyalty.

#### Customer Engagement & Customer Loyalty

The concept of engagement originates from sociology and organizational psychology, particularly the work of Kahn (1990), before being widely adopted in marketing literature through the notions of customer engagement and community engagement (Brodie et al., 2011). In digitally mediated business environments, community engagement refers to the degree of psychological, cognitive, emotional, and behavioral attachment demonstrated by community members through their ongoing interactions with a brand and with other members within a shared ecosystem (Algesheimer et al., 2005).

Research on community engagement has expanded considerably in recent years, particularly in understanding

how social interactions influence customer-related outcomes. One influential study by Nambisan and Baron (2009) identified several forms of value that users seek when participating in online communities, including learning opportunities, social interaction, and self-expression. Similarly, Casaló et al. (2007) found that active participation in bank-sponsored online communities can significantly strengthen customer trust and commitment. Consequently, successful digital banks increasingly position their platforms not merely as transaction tools but as community-centered ecosystems that facilitate meaningful customer interactions.

Customer loyalty within the digital banking context, particularly among Millennials and Generation Z, exhibits characteristics that differ substantially from those observed in previous generations. Traditionally, loyalty was often associated with long-standing relationships, branch proximity, or institutional reputation. In contrast, younger consumers tend to develop loyalty through continuous engagement with digital ecosystems that align with their lifestyles and expectations.

Two theoretical perspectives provide a useful foundation for understanding this phenomenon: the Stimulus–Organism–Response (S-O-R) framework and Expectation–Confirmation Theory (ECT). Originally proposed by Robert S. Woodworth (1929) and later extended by Mehrabian and Russell (1974), the S-O-R framework argues that external stimuli influence individuals' internal cognitive and emotional states, which subsequently shape behavioral responses. In digital banking environments, platform features and digital interactions act as stimuli that affect users' psychological experiences and ultimately influence loyalty-related behaviors.

Expectation–Confirmation Theory (Oliver, 1980) offers a complementary explanation by suggesting that customer satisfaction and continued usage intentions depend on the extent to which actual service performance meets or exceeds prior expectations. Loyalty is therefore more likely to emerge when customers perceive that their experiences with digital banking services fulfill their anticipated standards. This mechanism is particularly relevant for younger consumers who have become accustomed to highly responsive digital applications. Even minor discrepancies between expected and actual performance, such as application delays or navigation difficulties, can undermine satisfaction and weaken loyalty.

Accordingly, loyalty among younger digital banking users is no longer determined by the length of their relationship with a bank but rather by the intensity and quality of their engagement within the digital ecosystem. Through these ecosystems, customers can participate in financial literacy discussions, exchange investment knowledge, and engage in community-based initiatives such as crowdfunding programs. When digital banks successfully cultivate community engagement, customers are more likely to perceive that the institution understands their values and aspirations. This perception can reduce customer migration to competing platforms and strengthen institutional loyalty (Dessart et al., 2015).

Customer Engagement reflects the psychological and behavioural connection that customers develop through repeated and meaningful interactions with a service provider. In digital banking, engagement extends beyond transactional activities to include emotional attachment, active participation, advocacy, and continuous interaction with digital platforms. According to the Stimulus–Organism–Response (S-O-R) framework, positive digital experiences stimulate favourable emotional and cognitive evaluations that encourage customers to become more engaged with the service. Engaged customers are more likely to continue using digital banking applications, recommend them to others,

participate in service improvement, and develop stronger loyalty over time (Brodie et al., 2011; Hollebeek et al., 2014; Vivek et al., 2012).

For young consumers, customer engagement is particularly important because digital banking interactions increasingly involve personalized services, interactive features, financial education, gamification, and digital communities that encourage ongoing participation rather than one-time transactions. These continuous interactions strengthen emotional attachment and relationship quality, making customer engagement an important antecedent of long-term customer loyalty.

Based on these arguments, the following hypothesis is proposed:

H8: Customer Engagement positively influences Customer Loyalty.

#### The Moderating Role of Value Co-Creation

The concept of value co-creation emerged from the Service-Dominant Logic (S-D Logic) perspective developed by Vargo and Lusch (2004, 2017). This perspective challenges the traditional view that value is created solely by firms and subsequently delivered to customers. Instead, value is generated through customers' active use and integration of products or services within their own contexts, a process commonly referred to as value-in-use.

Prahalad and Ramaswamy (2004) define value co-creation as an interactive process through which firms and customers jointly create value. Within this perspective, customers are no longer passive recipients of services but active partners who contribute to designing, configuring, and enriching their service experiences. Such collaboration involves knowledge sharing, joint problem-solving, and the integration of resources between firms and customers.

Research on value co-creation has expanded considerably within digital service contexts. Yi and Gong (2013) developed a comprehensive framework that categorizes co-creation behavior into two major dimensions. The first, customer participation behavior, includes information seeking, information sharing, responsible behavior, and interpersonal interaction. The second, customer citizenship behavior, encompasses providing suggestions, voluntarily offering feedback, tolerating service failures, and assisting other users. These behaviors demonstrate how customers actively contribute to value creation beyond their role as service consumers.

Brodie et al. (2011) further argue that value co-creation is unlikely to occur without customer engagement. Meaningful and repeated interactions foster psychological attachment and gradually create a sense of ownership toward a platform or service. Similarly, Ranjan and Read (2016) suggest that value co-creation in digital services consists of two interconnected dimensions: co-production, which refers to customers' active participation in operating and configuring the system, and value-in-use, which reflects the benefits customers derive from those interactions.

Within digital banking, co-production occurs when customers independently customize transaction limits, open investment accounts, configure automatic savings transfers, or manage personal budgeting features through mobile applications (Cambra-Fierro et al., 2018). Supported by artificial intelligence and real-time data analytics, these interactions enable banks and customers to jointly create personalized financial solutions. As customers provide information about their financial preferences and behaviors through ongoing platform use, banks can respond with highly relevant recommendations, tailored investment opportunities, and personalized offers. This reciprocal exchange strengthens satisfaction, fosters electronic trust, and contributes to long-term customer loyalty.

A superior digital customer experience serves as the foundation for these collaborative processes. When users encounter seamless navigation, convenience, and reliability, they become more willing to participate in community interactions and engage with other users. Over time, such interactions facilitate value co-creation, allowing customers to collaboratively shape and optimize their financial ecosystems. Brodie et al. (2013) demonstrate that sustained engagement processes continuously generate new forms of value. Highly engaged customers frequently evolve from passive consumers into active advocates who recommend brands, provide valuable feedback, and defend organizations during periods of reputational challenge.

Value Co-Creation (VCC) refers to the active participation of customers in creating value through collaborative interactions with service providers (Prahalad & Ramaswamy, 2004). In digital banking, value co-creation occurs when customers actively contribute to service improvement through feedback, personalized financial planning, digital communities, and interactive platform features. Rather than directly generating customer engagement, value co-creation creates a participatory environment that enhances the effectiveness of positive digital experiences.

From the perspective of Service-Dominant Logic (SDL), value is not embedded in banking services themselves but is jointly created through interactions between banks and customers (Vargo & Lusch, 2008). Consequently, customers who actively participate in value creation are more likely to transform positive digital experiences into stronger engagement. In this study, Value Co-Creation is conceptualized as a boundary condition rather than an antecedent or mediator because it does not independently generate customer engagement. Instead, it strengthens the positive influence of Digital Customer Experience on Customer Engagement by enabling customers to become active participants in service interactions. Therefore, higher levels of value co-creation are expected to amplify the effect of digital customer experience on customer engagement.

In measuring the moderating effect, several statistical procedures were conducted, including:

**Orthogonalizing Approach:** This approach is designed to address the high multicollinearity that may arise from the product indicator approach. The method creates an orthogonal interaction variable that is uncorrelated with the main independent variable and moderator, thereby producing path estimates that are less affected by multicollinearity while maintaining the predictive validity of the model.

**Interaction Plot:** An interaction plot was generated to illustrate the differences in the slope of the relationship between DCX → Customer Engagement at different levels of VCC. The plot was then used to determine whether VCC strengthens or weakens the relationship between DCX and Customer Engagement. The interaction path coefficient has a positive value, *Value Co-Creation* (VCC) functions as a moderator that strengthens the relationship between *Digital Customer Experience* (DCX) and *Customer Engagement*. This means that the higher the level of value co-creation, the stronger the positive effect of digital customer experience on customer engagement.

The *path coefficients histogram* illustrates the distribution of the estimated coefficient values obtained from bootstrapping for the interaction effect. Most of the distribution is located on the positive side (tending to be concentrated in the range of 0,054 to 0,094, well to the right of zero), confirming that the interaction effect is consistently positive. Empirically, this indicates that VCC strengthens the relationship between the variables without crossing into a significant negative range.

Based on these arguments, the following hypothesis is proposed:

H9: Value Co-Creation positively moderates the relationship

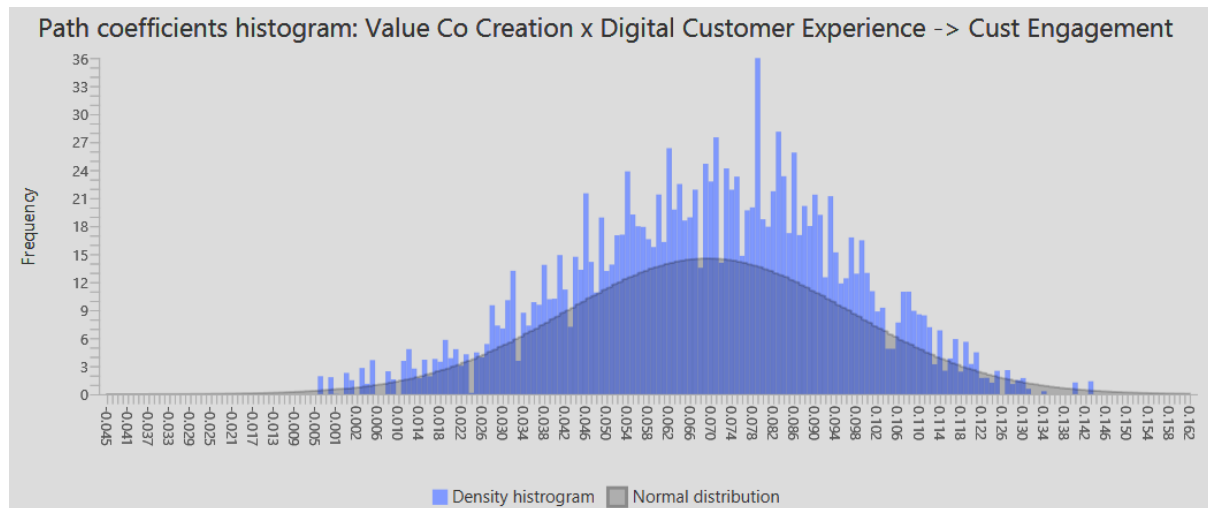


Figure 1. Path Coefficients Histogram

Table 1. Confident Interval Direct Effect

|                 | Original sample (O) | Sample mean (M) | 2.5%   | 97.5% |
|-----------------|---------------------|-----------------|--------|-------|
| AP -> OFS       | -0.057              | -0.055          | -0.204 | 0.097 |
| CE -> CL        | 0.511               | 0.511           | 0.377  | 0.635 |
| DCE -> CE       | 0.156               | 0.154           | 0.008  | 0.290 |
| DCE -> CL       | 0.410               | 0.409           | 0.285  | 0.531 |
| KK -> OFS       | 0.225               | 0.227           | 0.017  | 0.432 |
| KT -> OFS       | 0.146               | 0.142           | -0.013 | 0.294 |
| OFS -> DCE      | 0.898               | 0.898           | 0.859  | 0.931 |
| TI -> OFS       | 0.469               | 0.471           | 0.257  | 0.688 |
| UI -> OFS       | 0.201               | 0.197           | 0.058  | 0.333 |
| VCC -> CE       | 0.688               | 0.691           | 0.576  | 0.814 |
| VCC x DCE -> CE | 0.070               | 0.069           | 0.012  | 0.121 |

Table 2. Confident Interval Indirect Effect

|                  | Original sample (O) | Sample mean (M) | 2.5%  | 97.5% |
|------------------|---------------------|-----------------|-------|-------|
| OFS -> DCE -> CE | 0.071               | 0.071           | 0.003 | 0.143 |
| OFS -> DCE -> CL | 0.368               | 0.368           | 0.255 | 0.482 |

between Digital Customer Experience and Customer Engagement.

#### The Mediating Role of Digital Customer Experience

Flow state is inherently a temporary cognitive condition that occurs during a specific interaction. Customers may experience a high level of flow at a particular moment, for example when a fund transfer is completed smoothly and effortlessly. However, a single flow experience does not automatically translate into long-term engagement or loyalty. Rather, repeated flow experiences accumulated over time contribute to customers' perceptions of a superior digital customer experience characterized by reliability, security, personalization, and convenience.

Within digital banking environments, online flow state serves as an important psychological mechanism that shapes customers' evaluations of their overall experience with a digital platform. When users consistently encounter seamless interactions, intuitive navigation, and efficient service processes, they are more likely to develop favorable perceptions of the bank's digital ecosystem. These positive evaluations subsequently strengthen emotional attachment and encourage deeper engagement with the platform.

This mechanism is particularly relevant for younger consumers, who tend to evaluate financial service providers

based on the quality of their digital experiences rather than on traditional indicators such as institutional size, physical branches, or corporate reputation. For this segment, a positive digital customer experience fosters trust, reduces uncertainty, and creates stronger emotional connections with the service provider. As a result, customers become more willing to interact with the platform on an ongoing basis and participate more actively within the digital ecosystem.

Previous studies suggest that customer experience plays a crucial mediating role in transforming positive digital interactions into favorable behavioral outcomes. Kocak and Barlas (2021) provide empirical evidence that online flow state has a significant positive effect on customer loyalty, with customer experience serving as a key mediating mechanism. Similarly, Cleanthous and Christou (2023) demonstrate that frictionless interactions within digital banking applications contribute to long-term loyalty through the accumulation of positive digital experiences over time.

Customer loyalty reflects a customer's enduring commitment to continue using a digital banking service and their willingness to recommend it to others through positive word-of-mouth and advocacy behaviors. Unlike previous generations, whose loyalty was often influenced by physical presence and institutional reputation, younger consumers tend to remain loyal to digital banking providers that consistently deliver meaningful, reliable, and problem-solving digital experiences (Pratama & Sfenrianto, 2022; Santoso & Handoko, 2023).

The procedure for measuring mediation in PLS-SEM involves assessing several aspects, namely:

Mediation in this model does not meet the criteria for partial mediation because there are no direct paths from Online Flow State to Customer Engagement or Customer Loyalty.

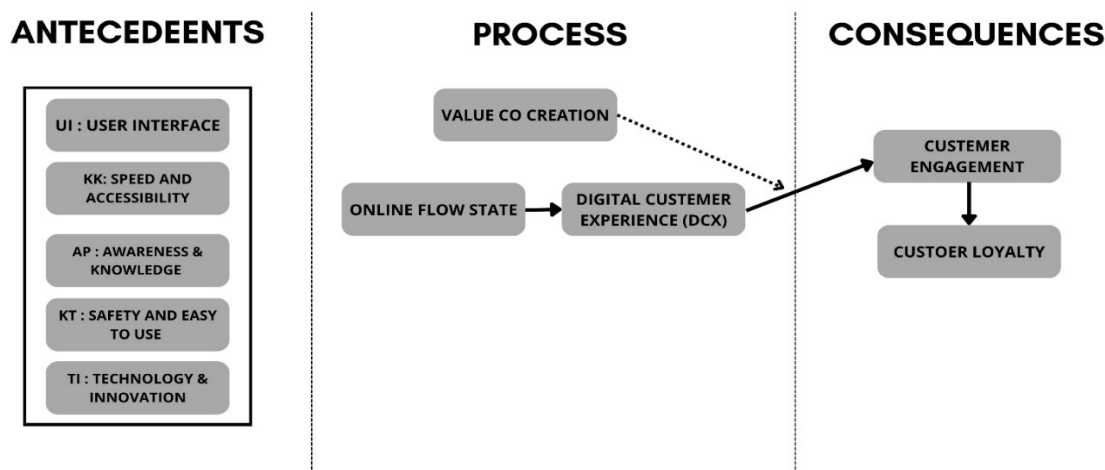


Figure 2. The Conceptual Framework

Therefore, the model is categorized as a full (pure) mediation model.

Based on these arguments, the following hypotheses are proposed:

H10: Digital Customer Experience mediates the relationship between Online Flow State and Customer Engagement.

H11: Digital customer experience mediates the relationship between online flow state and customer loyalty.

The conceptual framework developed in this study is presented in Figure 2.

## Methods

This study employed a quantitative, cross-sectional research design to examine the relationships among Online Flow State (OFS), Digital Customer Experience (DCE), Value Co-Creation (VCC), Customer Engagement (CE), and Customer Loyalty (CL) in digital banking.

The target population consisted of young digital banking users residing in selected regions outside Java Island, including Medan, Padang, Batam, Tarakan, Gorontalo, and Pangkal Pinang. These locations were selected to capture geographically diverse regional contexts where digital banking adoption continues to develop despite differences in digital infrastructure and financial service accessibility. The selection also addresses the limited empirical evidence on digital banking loyalty beyond Indonesia's predominantly Java-based research context.

To ensure compliance with ethical standards for primary online data collection, voluntary informed consent was obtained from all participants prior to survey participation. The survey landing page detailed the study's objectives, voluntary nature, and confidentiality guarantees, requiring respondents to select an agreement option (e.g., "I Agree") before proceeding. To safeguard participant anonymity and privacy, no personally identifiable information was collected, and all data were securely stored on password-protected cloud storage accessible strictly to the research team. In accordance with institutional research guidelines, as this study involved fully anonymous, non-invasive online survey procedures with no collection of sensitive personal data, it met the criteria for exemption from formal institutional ethical review.

Respondents were recruited using purposive non-probability sampling based on predefined eligibility criteria. Participants were required to: (1) be aged 17–34 years; (2) reside in one of the selected cities outside Java Island; (3)

have actively used a digital banking application for at least six months; and (4) conduct digital banking transactions at least once per month, such as fund transfers, bill payments, QRIS payments, or other financial services. Incomplete responses and questionnaires showing inconsistent response patterns were excluded from the final dataset.

The adequacy of the sample size was assessed based on recommendations for Partial Least Squares Structural Equation Modeling (PLS-SEM). Following the 10-times rule recommended by Hair et al. (2022), the minimum sample size should be at least ten times the largest number of structural paths directed toward any endogenous construct. In the proposed model, the maximum number of incoming structural paths is three, resulting in a minimum requirement of 30 observations. The final sample of 212 valid respondents substantially exceeded this threshold.

In addition, sample adequacy was considered from a statistical power perspective. Following Cohen (1992) and Hair et al. (2022), a sample exceeding 200 observations provides sufficient statistical power to detect medium effect sizes at a 5% significance level in structural models involving multiple latent constructs. Thus, the 212 valid responses were considered adequate for estimating the proposed PLS-SEM model and obtaining stable parameter estimates.

The measurement scales were adapted from established studies to ensure conceptual consistency and content validity. Online Flow State was measured using items adapted from Novak et al. (2000) and Zhou (2012), while Digital Customer Experience was measured using scales adapted from Lemon and Verhoef (2016) and Silalahi and Rufaidah (2017). Value Co-Creation was operationalized based on Prahalad and Ramaswamy (2004), Yi and Gong (2013), and Vargo and Lusch (2004). Customer Engagement was measured using scales adapted from Brodie et al. (2013) and Algesheimer et al. (2005), whereas Customer Loyalty was measured using items adapted from Verhoef et al. (2009) and Kim and Kim (2018). All items were slightly reworded to reflect the digital banking context while preserving their original conceptual meaning.

Before the main survey, a pilot test involving 30 young digital banking users was conducted to assess questionnaire clarity and comprehensibility. Based on their feedback, several items were refined without altering their theoretical meaning. Three experts in marketing and digital banking also reviewed the questionnaire to ensure content validity. Participation was voluntary, and electronic informed consent was obtained before respondents completed the online survey. No personally identifiable or sensitive information was collected, and responses were analyzed anonymously and reported only in

aggregate form. Formal institutional ethical approval was not obtained because the study involved a minimal-risk, non-interventional survey of adult participants; however, appropriate ethical safeguards regarding informed consent, confidentiality, and data protection were maintained throughout the research process. All constructs were measured using a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Descriptive statistics, including means and standard deviations, were used to summarize respondents' characteristics and responses. Hypothesis testing was conducted using PLS-SEM, which is appropriate for examining complex relationships among latent constructs and developing predictive models (Chin, 1998). The analysis was performed using SmartPLS 4.0 to assess the measurement and structural models and test the proposed hypotheses.

The selection of non-Java regions was intended to broaden the empirical context of digital banking research in Indonesia. Although these regions have experienced growing digital financial inclusion, they remain relatively underrepresented in previous studies. However, because the respondents were selected purposively rather than through probability sampling, the selected cities should not be regarded as statistically representative of all regions outside Java Island. Therefore, the findings should be interpreted with caution regarding their generalizability beyond the study context.

## Result and Discussion

This study involved 212 respondents drawn from younger generations, specifically Millennials and Generation Z, who represented a range of demographic and socioeconomic backgrounds. The respondents varied in terms of age, gender, educational attainment, and socioeconomic status (see Table 3). Although the sample was selected using a non-probability sampling approach, the diversity of respondent characteristics suggests a reasonable level of variation within the sample. Such heterogeneity provides a broader representation of young digital banking users and supports the examination of the proposed relationships across individuals with different demographic profiles.

Based on the data presented in Table 3, most respondents belonged to the younger age groups, with a substantial concentration in the 21–25-year age category, accounting for 57.1% (121 respondents) of the total sample. When combined with respondents aged 20 years or younger (19.8%), the findings clearly indicate that the study primarily captures the perspectives of younger generations, particularly Millennials and Generation Z, who represent the dominant users of digital banking services. This demographic profile is further reflected in respondents' occupational backgrounds, as more than half of the participants (55.7%) identified themselves as students.

From a gender perspective, the sample exhibited a notable imbalance, with female respondents accounting for 72.2% of the 212 participants, substantially outnumbering their male counterparts. This indicates that the findings are predominantly informed by the experiences and perceptions of young women in evaluating digital banking services and their digital interactions. While this distribution may reflect the higher participation of young female users in online surveys and their active engagement with digital financial services, it should be considered when interpreting the findings, as the underrepresentation of male respondents may introduce potential response bias and limit the generalizability of the results across genders.

Consequently, the relationships identified in this study may be more reflective of the behavioural patterns of young female digital banking users than of the broader population of young consumers. Previous studies have suggested that demographic characteristics, including gender, may influence technology adoption, customer experience, engagement, and loyalty in digital service environments. Therefore, future research should examine whether gender moderates the relationships among Online Flow State, Digital Customer Experience, Customer Engagement, Value Co-Creation, and Customer Loyalty, or conduct multi-group analysis (MGA) to assess whether the structural relationships differ between male and female users. Accordingly, the present findings should be interpreted with appropriate caution when generalized to populations with more balanced gender distributions.

In terms of educational attainment and economic profile, the respondents generally represented an educated middle-class segment. Approximately 75.0% had completed senior high school, while 20.3% held a bachelor's degree. Considering that most respondents were students, many of those with a high school qualification were likely pursuing higher education at the time of the survey. Financially, the sample was dominated by individuals with relatively low to moderate levels of monthly expenditure. Specifically, 40.6% reported monthly spending of IDR 1 million or less, while 35.8% reported expenditures ranging between IDR 1 million and IDR 3 million. This spending pattern is consistent with the demographic profile of respondents, the majority of whom were students or young adults in the early stages of their careers.

Although their spending capacity was relatively modest, the strong participation observed in this study suggests that digital banking services have become an integral part of young consumers' daily lives. Their engagement with digital financial services appears to extend beyond income or expenditure levels, reflecting the increasingly embedded role of digital banking within contemporary youth lifestyles.

### Measurement Model

The measurement model was evaluated to assess the validity and reliability of the proposed constructs. The measurement model explains how observed variables (manifest indicators) represent the underlying latent constructs being examined. Convergent validity was assessed using outer loadings and the Average Variance Extracted (AVE). Individual reflective indicators are considered to have adequate convergent validity when their outer loading values exceed the recommended threshold of 0.70, indicating that the indicators are sufficiently correlated with the construct they are intended to measure.

The convergent validity assessment presented in Table 4 indicates that all indicators included in the model satisfy the recommended threshold for factor loadings. Specifically, all loading factor values exceed 0.70, ranging from 0.731 to 0.920. The highest loading was observed for indicator VCC5 under the Value Co-Creation construct (0.920), suggesting that this indicator contributes substantially to explaining its underlying latent variable. In addition, all indicators demonstrated strong statistical significance, as reflected by T-statistic values well above the critical value of 1.96 and p-values below 0.001. These results confirm that each questionnaire item is both statistically significant and conceptually appropriate for measuring the intended latent construct, thereby supporting the convergent validity of the measurement model.

The reliability assessment reported in Table 4 further confirms the robustness of the measurement instrument. All constructs exhibited Cronbach's Alpha and Composite Reliability (CR) values exceeding the recommended threshold of 0.70, indicating satisfactory internal consistency. The highest Composite Reliability value was found for the Online

**Table 3.** Respondent Profile

| Characteristics                 | Frequency (n = 212) | Percentage (%) |
|---------------------------------|---------------------|----------------|
| Age Range                       |                     |                |
| ≤ 20 years                      | 42                  | 19.8           |
| 21–25 years                     | 121                 | 57.1           |
| 26–30 years                     | 24                  | 11.3           |
| 31–34 years                     | 25                  | 11.8           |
| Gender                          |                     |                |
| Male                            | 59                  | 27.8           |
| Female                          | 153                 | 72.2           |
| Occupation                      |                     |                |
| Student                         | 118                 | 55.7           |
| Entrepreneur                    | 22                  | 10.4           |
| Private-sector Employee         | 34                  | 16.0           |
| Homemaker                       | 13                  | 6.1            |
| Others                          | 25                  | 11.8           |
| Highest Educational Attainment  |                     |                |
| Junior High School              | 7                   | 3.3            |
| Senior High School              | 159                 | 75.0           |
| Diploma                         | 3                   | 1.4            |
| Bachelor's Degree               | 43                  | 20.3           |
| Monthly Expenditure             |                     |                |
| ≤ IDR 1 Million                 | 86                  | 40.6           |
| > IDR 1 Million – IDR 3 Million | 76                  | 35.8           |
| IDR 3 Million – IDR 5 Million   | 24                  | 11.3           |
| > IDR 5 Million                 | 17                  | 8.0            |
| Others                          | 9                   | 4.2            |
| <b>Total</b>                    | <b>212</b>          | <b>100.0</b>   |

Flow State construct (CR = 0.951), demonstrating an exceptionally high level of consistency among its indicators. Furthermore, the Average Variance Extracted (AVE) values for all constructs surpassed the minimum acceptable level of 0.50. The lowest AVE value was observed for the Awareness and Knowledge construct (0.662), while the highest was recorded for Online Flow State (0.797). These findings indicate that each construct explains more than half of the variance in its respective indicators, providing strong evidence of convergent validity. Overall, the results suggest that the measurement instrument possesses satisfactory reliability and validity, making it suitable for subsequent structural model analysis.

The discriminant validity of the measurement model was evaluated using the Fornell–Larcker criterion, the Heterotrait–Monotrait ratio (HTMT), and collinearity diagnostics (Variance Inflation Factor, VIF). As presented in Table X, the square root of the Average Variance Extracted ( $\sqrt{\text{AVE}}$ ) for each construct exceeded its corresponding inter-construct correlations, thereby satisfying the Fornell–Larcker criterion (Fornell & Larcker, 1981). For example, the  $\sqrt{\text{AVE}}$  value for Digital Customer Experience was greater than its correlations with Online Flow State, Value Co-Creation, Customer Engagement, and Customer Loyalty, confirming that each construct captured a greater proportion of variance from its own indicators than from other latent variables.

Discriminant validity was evaluated using both the Fornell–Larcker criterion and the Heterotrait–Monotrait Ratio (HTMT), following current recommendations for PLS-SEM (Hair et al., 2022; Henseler et al., 2015). As shown in Table 5, the square root of the Average Variance Extracted (AVE) for each construct exceeded its correlations with other

constructs, satisfying the Fornell–Larcker criterion. To provide a more rigorous assessment, HTMT values were also calculated. As presented in Table 5, all HTMT values were below the recommended threshold of 0.85, indicating adequate discriminant validity and confirming that the study constructs are empirically distinct despite the relatively high correlations observed among several latent variables.

To provide a more rigorous assessment, discriminant validity was further examined using the HTMT criterion. As shown in Table Y, all HTMT values were below the recommended threshold of 0.85 (or the more liberal threshold of 0.90), indicating satisfactory discriminant validity despite the conceptual proximity of the digital experience constructs (Henseler et al., 2015; Hair et al., 2022).

In addition, collinearity diagnostics were assessed using the Variance Inflation Factor (VIF). All predictor constructs exhibited VIF values below the recommended threshold of 3.3 (or 5.0), indicating that multicollinearity was not a concern and that the structural relationships could be interpreted reliably (Hair et al., 2022; Kock, 2015). Collectively, these findings provide robust evidence that the measurement model demonstrates adequate discriminant validity and is appropriate for subsequent structural model evaluation.

**HTMT (Heterotrait-Monotrait Ratio):** Present the HTMT values between the constructs to support discriminant validity, along with the criteria used, such as < 0.85 as a more stringent criterion or < 0.90 as a more lenient criterion, based on the methodological reference adopted.

**Inner VIF (Variance Inflation Factor):** Present the VIF values for the predictor constructs in the inner/structural model to assess potential collinearity issues, rather than merely stating that the VIF values meet the specified threshold.

The discriminant validity assessment using the cross-loading criterion (Table 8) confirms the robust discriminant validity of the research model. This criterion is satisfied when the loading factor of each indicator on its assigned construct (indicated in bold) exceeds its loadings on any other latent constructs. Consistently, every indicator exhibits the highest loading on its intended latent variable. For instance, indicator VCC5 yields a peak loading of 0.920 on the VCC construct, which is substantially higher than its cross-loading on user interface (UI) at 0.592 or any other variables. This outcome reinforces the Fornell–Larcker criterion findings, demonstrating that each indicator uniquely and significantly measures its respective latent construct rather than overlapping with others. Consequently, the psychometric quality of the measurement instrument is thoroughly validated.

#### Structural Model

Following the evaluation of the measurement model, the next step involves assessing the structural model using PLS-SEM. The evaluation of the structural model, also referred to as the internal model, aims to examine the hypothesized relationships among the latent variables. This structural model analysis presents the coefficient of determination for the exogenous latent variables (R-square), which indicates the extent to which these exogenous variables explain the variance in the endogenous construct (Hair Jr. et al., 2014) (see Table 10).

The coefficient of determination ( $R^2$ ) results presented in Table 8 indicate that the proposed model demonstrates substantial explanatory power across the endogenous constructs. The highest  $R^2$  value was observed for Online Flow State ( $R^2 = 0.844$ ), indicating that 84.4% of the variance in Online Flow State is explained by User Interface, Transaction Speed and Ease of Use, Awareness and Knowledge, Security and Convenience, and Technology and Innovation. According to Hair et al. (2022), this value reflects strong predictive accuracy in PLS-SEM.

**Table 4.** Validity Test Result

|             | Loading Factor | T statistics | P values |
|-------------|----------------|--------------|----------|
| AP1 <- AP   | 0.787          | 20.902       | 0.000    |
| AP2 <- AP   | 0.755          | 16.487       | 0.000    |
| AP3 <- AP   | 0.842          | 24.178       | 0.000    |
| AP4 <- AP   | 0.800          | 22.016       | 0.000    |
| AP5 <- AP   | 0.849          | 30.222       | 0.000    |
| AP6 <- AP   | 0.843          | 40.691       | 0.000    |
| CE1 <- CE   | 0.827          | 26.031       | 0.000    |
| CE2 <- CE   | 0.877          | 32.848       | 0.000    |
| CE3 <- CE   | 0.907          | 57.599       | 0.000    |
| CE4 <- CE   | 0.876          | 35.335       | 0.000    |
| CE5 <- CE   | 0.901          | 50.764       | 0.000    |
| CL1 <- CL   | 0.873          | 38.154       | 0.000    |
| CL2 <- CL   | 0.863          | 39.835       | 0.000    |
| CL3 <- CL   | 0.852          | 28.204       | 0.000    |
| CL4 <- CL   | 0.881          | 36.248       | 0.000    |
| CL5 <- CL   | 0.853          | 27.886       | 0.000    |
| CL6 <- CL   | 0.869          | 32.689       | 0.000    |
| DCE1 <- DCE | 0.896          | 50.570       | 0.000    |
| DCE2 <- DCE | 0.899          | 46.164       | 0.000    |
| DCE3 <- DCE | 0.802          | 18.028       | 0.000    |
| DCE4 <- DCE | 0.895          | 39.229       | 0.000    |
| DCE5 <- DCE | 0.888          | 44.435       | 0.000    |
| KK1 <- KK   | 0.848          | 37.829       | 0.000    |
| KK2 <- KK   | 0.868          | 39.509       | 0.000    |
| KK3 <- KK   | 0.871          | 39.036       | 0.000    |
| KK4 <- KK   | 0.827          | 24.841       | 0.000    |
| KK5 <- KK   | 0.861          | 30.990       | 0.000    |
| KT1 <- KT   | 0.846          | 32.668       | 0.000    |
| KT2 <- KT   | 0.846          | 30.472       | 0.000    |
| KT3 <- KT   | 0.731          | 13.161       | 0.000    |
| KT4 <- KT   | 0.902          | 50.073       | 0.000    |
| KT5 <- KT   | 0.833          | 27.332       | 0.000    |
| KT6 <- KT   | 0.895          | 56.732       | 0.000    |
| OFS1 <- OFS | 0.906          | 50.374       | 0.000    |
| OFS2 <- OFS | 0.880          | 41.845       | 0.000    |
| OFS3 <- OFS | 0.865          | 28.458       | 0.000    |
| OFS4 <- OFS | 0.907          | 48.781       | 0.000    |
| OFS5 <- OFS | 0.904          | 49.613       | 0.000    |
| TI1 <- TI   | 0.874          | 41.225       | 0.000    |
| TI2 <- TI   | 0.857          | 26.628       | 0.000    |
| TI3 <- TI   | 0.863          | 27.582       | 0.000    |
| TI4 <- TI   | 0.871          | 36.026       | 0.000    |
| TI5 <- TI   | 0.874          | 34.489       | 0.000    |
| TI6 <- TI   | 0.889          | 51.484       | 0.000    |
| UI1 <- UI   | 0.836          | 27.119       | 0.000    |
| UI2 <- UI   | 0.860          | 35.016       | 0.000    |
| UI3 <- UI   | 0.817          | 22.659       | 0.000    |
| UI4 <- UI   | 0.762          | 20.650       | 0.000    |
| UI5 <- UI   | 0.866          | 45.414       | 0.000    |
| VCC1 <- VCC | 0.850          | 28.455       | 0.000    |
| VCC2 <- VCC | 0.876          | 30.337       | 0.000    |
| VCC3 <- VCC | 0.883          | 48.487       | 0.000    |
| VCC4 <- VCC | 0.896          | 43.259       | 0.000    |
| VCC5 <- VCC | 0.920          | 70.480       | 0.000    |

Note: UI: User Interface; KK, Speed and Accessibility, AP: Awareness & knowledge, KT: safety and easy to use, TI: Technology & Innovation, OF: Online Flow State, DCE: Digital Customer Experience, CE: Customer Engagement, CL: Customer Loyalty, VCC: Value Co Creation

Nevertheless, the relatively high  $R^2$  values also warrant careful consideration because they may indicate conceptual proximity among predictor constructs or the potential influence of Common Method Bias (CMB). To address this concern, additional diagnostic analyses were conducted.

First, full collinearity was assessed using Variance Inflation Factor (VIF) values. All inner VIF values were below the recommended threshold of 3.3, indicating that common method bias was unlikely to threaten the validity of the structural model (Kock, 2015). Second, discriminant validity was further confirmed using both the Fornell–Larcker criterion and the Heterotrait–Monotrait ratio (HTMT), demonstrating that the predictor constructs remain empirically distinct despite their theoretical relatedness.

Conceptually, the antecedent variables represent different dimensions of digital banking service quality and technology characteristics, whereas Online Flow State captures the user's psychological state of immersion and concentration during digital interactions. Accordingly, although these constructs are theoretically associated, they measure different conceptual domains and therefore do not constitute construct redundancy.

Similarly, Digital Customer Experience recorded a high  $R^2$  value of 0.806, indicating that Online Flow State accounts for 80.6% of the variance in customers' digital experiences. The  $R^2$  values for Customer Loyalty (0.714) and Customer Engagement (0.692) further demonstrate that the model provides substantial explanatory power for understanding loyalty and engagement among young digital banking users. According to commonly accepted guidelines, these values can be classified as strong, suggesting that the proposed framework effectively captures the key determinants of customer behaviour within the digital banking ecosystem.

To further evaluate the predictive capability of the model, the Predictive Relevance ( $Q^2$ ) test was conducted. As shown in Table 5, all endogenous constructs produced  $Q^2$  values well above zero, ranging from 0.524 to 0.661. The highest predictive relevance was found for Online Flow State ( $Q^2 = 0.661$ ), followed by Digital Customer Experience ( $Q^2 = 0.613$ ), Customer Loyalty ( $Q^2 = 0.528$ ), and Customer Engagement ( $Q^2 = 0.524$ ). According to established statistical criteria,  $Q^2$  values greater than zero indicate that the model possesses adequate predictive relevance. These findings suggest that the proposed structural model not only explains the relationships among the constructs from a theoretical perspective but also demonstrates strong predictive accuracy in forecasting the engagement and loyalty behaviors of younger consumers in digital banking contexts.

#### Hypothesis Testing

In Partial Least Squares Structural Equation Modeling (PLS-SEM), hypothesis acceptance or rejection is determined based on the significance level, represented by the  $t$ -statistic and  $p$ -value. A hypothesis is supported when the  $t$ -statistic exceeds 1.96 and/or the  $p$ -value is equal to or below 0.05 at the 5% significance level ( $\alpha = 0.05$ ). Under these conditions, the null hypothesis ( $H_0$ ) is rejected, and the alternative hypothesis ( $H_a$ ) is accepted. Conversely, if the  $t$ -statistic is below 1.96 and/or the  $p$ -value exceeds 0.05, the null hypothesis is accepted and the proposed hypothesis is not supported.

The results of the hypothesis testing are presented in Figure 3 and Table 8.

The structural model testing indicates that nine of the eleven proposed hypotheses were supported, whereas two hypotheses (H2 and H3) were not supported. Overall, the findings provide empirical support for the proposed framework by confirming that emotional digital experiences play an important role in shaping customer engagement and loyalty in digital banking. The results are generally consistent with the Stimulus–Organism–Response (S-O-R) framework, in which external digital service attributes influence users' psychological experiences, which subsequently affect behavioural outcomes.

As presented in Table 11, User Interface has a positive and significant effect on Online Flow State ( $\beta = 0.201$ ,  $t = 2.876$ ,  $p = 0.004$ ), supporting H1. This finding suggests that an intuitive, visually appealing, and easy-to-navigate interface facilitates

**Table 5. Reliability Test Result**

|                                            | Cronbach's alpha | Composite reliability | Average variance extracted (AVE) |
|--------------------------------------------|------------------|-----------------------|----------------------------------|
| Awareness & Knowledge                      | 0.898            | 0.921                 | 0.662                            |
| Customer Engagement                        | 0.926            | 0.944                 | 0.771                            |
| Customer Loyalty                           | 0.933            | 0.947                 | 0.749                            |
| Digital Customer Experience                | 0.924            | 0.943                 | 0.768                            |
| Security & Ease of Use                     | 0.908            | 0.932                 | 0.732                            |
| Speed & Convenience of Online Transactions | 0.919            | 0.937                 | 0.713                            |
| Online Flow State                          | 0.936            | 0.951                 | 0.797                            |
| Technology & Innovation                    | 0.937            | 0.950                 | 0.760                            |
| User Interface                             | 0.886            | 0.916                 | 0.687                            |
| Value Co Creation                          | 0.931            | 0.948                 | 0.784                            |

**Table 6. HTMT (Heterotrait-Monotrait Ratio)**

| Heterotrait-monotrait ratio (HTMT) |       |
|------------------------------------|-------|
| CE <-> AP                          | 0.682 |
| CL <-> AP                          | 0.707 |
| CL <-> CE                          | 0.749 |
| DCE <-> AP                         | 0.839 |
| DCE <-> CE                         | 0.736 |
| DCE <-> CL                         | 0.814 |
| KK <-> AP                          | 0.766 |
| KK <-> CE                          | 0.642 |
| KK <-> CL                          | 0.728 |
| KK <-> DCE                         | 0.817 |
| KT <-> AP                          | 0.801 |
| KT <-> CE                          | 0.595 |
| KT <-> CL                          | 0.680 |
| KT <-> DCE                         | 0.834 |
| KT <-> KK                          | 0.828 |
| OFS <-> AP                         | 0.838 |
| OFS <-> CE                         | 0.705 |
| OFS <-> CL                         | 0.793 |
| OFS <-> DCE                        | 0.824 |
| OFS <-> KK                         | 0.818 |
| OFS <-> KT                         | 0.777 |
| TI <-> AP                          | 0.779 |
| TI <-> CE                          | 0.706 |
| TI <-> CL                          | 0.752 |
| TI <-> DCE                         | 0.722 |
| TI <-> KK                          | 0.716 |
| TI <-> KT                          | 0.819 |
| TI <-> OFS                         | 0.743 |
| UI <-> AP                          | 0.837 |
| UI <-> CE                          | 0.616 |
| UI <-> CL                          | 0.724 |
| UI <-> DCE                         | 0.758 |
| UI <-> KK                          | 0.744 |
| UI <-> KT                          | 0.716 |
| UI <-> OFS                         | 0.789 |
| UI <-> TI                          | 0.748 |
| VCC <-> AP                         | 0.786 |
| VCC <-> CE                         | 0.782 |
| VCC <-> CL                         | 0.817 |
| VCC <-> DCE                        | 0.810 |
| VCC <-> KK                         | 0.737 |
| VCC <-> KT                         | 0.653 |
| VCC <-> OFS                        | 0.765 |
| VCC <-> TI                         | 0.786 |
| VCC <-> UI                         | 0.645 |

users' immersion during digital banking interactions. Consistent with Flow Theory (Csikszentmihalyi, 1990) and Zhou (2012), a well-designed interface reduces cognitive effort and enhances users' concentration and enjoyment, thereby increasing the likelihood of experiencing an online

flow state. Rather than functioning solely as a technical interface for completing financial transactions, user interface quality contributes to the psychological experience that underlies customer engagement with digital banking services.

In contrast, H2 and H3 were not supported. The non-significant effect of Transaction Speed and Ease of Use on Online Flow State suggests that these functional characteristics may no longer be sufficient to generate immersive digital experiences among young users. From a theoretical perspective, Flow Theory emphasizes that flow emerges not only from efficiency but also from deep involvement, enjoyment, and sustained attention. Within the context of digital banking, transaction speed and ease of use have become expected service standards rather than differentiating features. Consequently, although these attributes remain essential for service quality, they may exert only a limited influence on users' emotional immersion.

Similarly, the rejection of H3 indicates that Awareness and Knowledge alone do not necessarily translate into stronger online flow experiences. Although users who possess greater knowledge of digital banking features may feel more confident in using the application, familiarity does not automatically create enjoyment, concentration, or emotional involvement. For digitally experienced young consumers, knowledge represents a prerequisite for effective service utilization rather than a direct driver of immersive digital experiences. This finding suggests that emotional engagement in digital banking depends more on experiential and interactive elements than on informational familiarity alone.

Taken together, these findings indicate that while functional and cognitive factors remain important, emotionally engaging digital experiences are more strongly influenced by experiential service attributes that encourage immersion and meaningful interaction. Therefore, digital banking providers should complement functional excellence with experience-oriented design features that foster sustained user engagement.

This insight aligns with Loureiro and Bilro (2024), who demonstrated that interactive and gamified elements within banking applications trigger higher emotional engagement among the younger generation compared to standard transactional features. Similarly, McLean and Barhorst (2023) noted that responsive system interactions and intuitive UI designs significantly foster a flow state. A direct consequence of this flow state is enhanced brand advocacy and customer retention, independent of price or fee sensitivity.

Conversely, the Transaction Speed and Ease variable yielded a Path Coefficient of 0.146, but with a T-statistic of only 1.823 and a p-value of 0.068 (H2). The results indicate that the relationship between Transaction Speed and Convenience and Online Flow State was not statistically significant at the 5% significance level ( $\beta = 0.146$ ,  $p = 0.068$ ). Although the hypothesized effect was not supported according to the conventional significance threshold, the positive path coefficient and the marginal p-value suggest the presence of a

Table 7. Inner VIF (Variance Inflation Factor)

|                 | VIF   |
|-----------------|-------|
| AP -> OFS       | 4.165 |
| CE -> CL        | 1.873 |
| DCE -> CE       | 2.291 |
| DCE -> CL       | 1.873 |
| KK -> OFS       | 4.502 |
| KT -> OFS       | 4.943 |
| OFS -> DCE      | 1.000 |
| TI -> OFS       | 4.673 |
| UI -> OFS       | 3.740 |
| VCC -> CE       | 2.349 |
| VCC x DCE -> CE | 1.044 |

weak association rather than the complete absence of an effect. This finding implies that transaction speed and convenience alone may be insufficient to generate an immersive online flow experience among young digital banking users, who may place greater value on experiential attributes such as interface quality, technological innovation, and emotional engagement. It is also possible that a larger sample size or greater statistical power could detect this relationship as statistically significant.

For Gen Z and Millennials, swift and effortless transactions are taken for granted; hence, they no longer stimulate deep psychological involvement or a flow state. Consequently, digital banking marketing strategies must move beyond purely functional narratives. The digital banking industry needs to reframe its marketing strategies by emphasizing experiential and emotional marketing aspects such as gamified interactivity and emotional personalization which prove more effective in capturing attention and cultivating genuine loyalty among younger generations.

Several studies corroborate this hypothesis outcome. First, Belanche et al. (2024) explicitly found that perceived ease of use is no longer the primary driver of loyalty and deep engagement among digital native customers, who instead seek hedonic value and emotional adventure when interacting with applications. Second, McLean and Barhorst (2023) explained that overly instantaneous transactions inadvertently shorten the user's interaction time with the application, thereby impeding the onset of a flow state. Instead, interactive features requiring cognitive engagement, such as interactive financial portfolio analysis, are substantially more powerful in inducing flow.

Similarly, H3, which measures the impact of Awareness and Knowledge on the Online Flow State, yields an insignificant result with a negative path coefficient of -0.057, a T-statistic of 0.746, and a p-value of 0.456. This p-value stands well above the 0.05 significance threshold, indicating that users' level of awareness and knowledge regarding digital banking features does not meaningfully contribute to shaping an online flow state. This implies that while users may know how to secure their accounts or understand troubleshooting procedures, such cognitive knowledge does not automatically translate into emotional enjoyment or deep engagement (the flow state) during application use.

This finding provides an important theoretical perspective on the digital banking commoditization phenomenon, suggesting that brand awareness and functional product knowledge have increasingly become basic hygiene factors rather than primary drivers of immersive digital experiences. The non-significant relationship indicates that these functional attributes alone may no longer be sufficient to generate an Online Flow State among young digital banking users. Interestingly, the negative path coefficient ( $\beta = -0.057$ ), although statistically insignificant, may reflect a meaningful underlying tendency. Users with greater awareness of digital banking products, security risks, and transaction complexity may engage in more deliberate

cognitive processing, increasing vigilance and reducing the sense of immersion that characterizes an online flow experience. Rather than becoming fully absorbed in the digital interaction, these users may allocate greater attention to evaluating risks and verifying transaction accuracy, thereby interrupting the psychological flow process. Although this interpretation remains exploratory due to the lack of statistical significance, it highlights a potentially important mechanism that warrants further investigation using larger and more diverse samples.

Consequently, the digital banking industry must reframe its strategies, shifting from mass cognitive education (awareness- and knowledge-driven) toward creating immersive, emotional experience-driven digital ecosystems. To induce a flow state, banks need to prioritize dynamic interactions that resonate with the affective domain of young customers, transforming financial management from a mundane transactional task into a fulfilling emotional experience. This insight aligns with King (2025), who posits that traditional brand awareness strategies have become obsolete in the Bank 5.0 era. In this paradigm, a digital bank's success in capturing the youth market is measured by its platform's capacity to integrate emotional experiences into daily activities, rather than its social media popularity.

The Security and Convenience variable demonstrates a positive and significant effect on the Online Flow State, with a path coefficient of 0.225, a T-statistic of 2.097, and a p-value of 0.036 (H4). This underscores that the sense of security provided by authentication systems such as PINs, fingerprints, or Face ID serves as a cornerstone for user comfort during transactions. When users are confident that their personal and financial data are reliably protected, they can relax and focus entirely on completing their transactions without lingering anxieties, ultimately triggering a positive online flow experience. This finding reinforces the notion that before digital banks can successfully deploy emotional differentiation strategies, they must first satisfy two fundamental psychological needs: security (freedom from anxiety) and convenience (freedom from frustration). For Gen Z and Millennials, a banking platform capable of delivering frictionless security where robust data protection merges seamlessly with intuitive navigation effectively dismantles cognitive barriers. Thus, investing in cybersecurity infrastructure and UI/UX optimization is not merely about technical compliance; it represents a crucial emotional strategy to capture youth attention and escape the industry's commoditization trap. This aligns with King (2025), who argues that in modern banking evolution, trust (security) and frictionless integration (convenience) form the bedrock infrastructure for building an emotional experience. Winning banks are those capable of delivering absolute protection without compromising aesthetics and navigational ease for the younger demographic.

Furthermore, the empirical evidence confirms that Technology and Innovation stands as the most potent predictor of the Online Flow State, yielding the highest path coefficient at 0.469, a T-statistic of 4.209, and a p-value of 0.000 (H5). This exceptionally high significance reveals that solution-oriented feature innovations and efficient technology are the primary drivers for younger generations to experience a practical digital journey. Technologies that enable concurrent multi-transactions foster highly efficient workflows, making users feel that the system inherently supports their cognitive processes while delivering an enjoyable experience. This finding provides a vital contribution to digital banking strategies aimed at moving beyond the commoditization trap. For Gen Z and Millennials as digital natives, standard transactional features are taken for granted. To capture their attention and spark deep psychological attachment, digital banks require the continuous stimulus of technological novelty and feature

**Table 8. Discriminant Validity Fornell Larcker Criterion**

|                                            | AP           | CE           | CL           | DCE          | KK           | KT           | OFS          | TI           | UI           | VCC          |
|--------------------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Awareness & Knowledge                      | <b>0.814</b> |              |              |              |              |              |              |              |              |              |
| Customer Engagement                        | 0.622        | <b>0.878</b> |              |              |              |              |              |              |              |              |
| Customer Loyalty                           | 0.653        | 0.790        | <b>0.865</b> |              |              |              |              |              |              |              |
| Digital Customer Experience                | 0.771        | 0.683        | 0.758        | <b>0.877</b> |              |              |              |              |              |              |
| Security & Ease of Use                     | 0.793        | 0.592        | 0.675        | 0.843        | <b>0.855</b> |              |              |              |              |              |
| Speed & Convenience of Online Transactions | 0.808        | 0.552        | 0.634        | 0.773        | 0.810        | <b>0.844</b> |              |              |              |              |
| Online Flow State                          | 0.777        | 0.658        | 0.744        | 0.808        | 0.849        | 0.819        | <b>0.893</b> |              |              |              |
| Technology & Innovation                    | 0.812        | 0.661        | 0.706        | 0.859        | 0.849        | 0.793        | 0.885        | <b>0.872</b> |              |              |
| User Interface                             | 0.771        | 0.557        | 0.660        | 0.779        | 0.764        | 0.830        | 0.813        | 0.776        | <b>0.829</b> |              |
| Value Co Creation                          | 0.716        | 0.822        | 0.763        | 0.750        | 0.678        | 0.611        | 0.715        | 0.734        | 0.589        | <b>0.885</b> |

**Table 9. Discriminant Validity Cross Loading**

|      | AP           | CE           | CL           | DCE          | KK           | KT           | OFS          | TI           | UI           | VCC          |
|------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| AP1  | <b>0.787</b> | 0.510        | 0.556        | 0.690        | 0.695        | 0.711        | 0.698        | 0.721        | 0.648        | 0.569        |
| AP2  | <b>0.755</b> | 0.518        | 0.464        | 0.493        | 0.502        | 0.544        | 0.474        | 0.545        | 0.510        | 0.602        |
| AP3  | <b>0.842</b> | 0.481        | 0.481        | 0.602        | 0.636        | 0.704        | 0.614        | 0.633        | 0.636        | 0.590        |
| AP4  | <b>0.800</b> | 0.482        | 0.488        | 0.649        | 0.623        | 0.687        | 0.631        | 0.669        | 0.646        | 0.540        |
| AP5  | <b>0.849</b> | 0.483        | 0.572        | 0.651        | 0.709        | 0.712        | 0.693        | 0.675        | 0.676        | 0.563        |
| AP6  | <b>0.843</b> | 0.571        | 0.609        | 0.645        | 0.666        | 0.654        | 0.640        | 0.693        | 0.618        | 0.645        |
| CE1  | 0.479        | <b>0.827</b> | 0.651        | 0.532        | 0.447        | 0.438        | 0.531        | 0.497        | 0.465        | 0.645        |
| CE2  | 0.514        | <b>0.877</b> | 0.645        | 0.510        | 0.430        | 0.434        | 0.507        | 0.517        | 0.413        | 0.692        |
| CE3  | 0.614        | <b>0.907</b> | 0.722        | 0.661        | 0.560        | 0.547        | 0.616        | 0.639        | 0.536        | 0.757        |
| CE4  | 0.544        | <b>0.876</b> | 0.701        | 0.623        | 0.566        | 0.495        | 0.614        | 0.623        | 0.509        | 0.739        |
| CE5  | 0.570        | <b>0.901</b> | 0.743        | 0.656        | 0.581        | 0.499        | 0.612        | 0.612        | 0.516        | 0.767        |
| CL1  | 0.619        | 0.657        | <b>0.873</b> | 0.730        | 0.681        | 0.623        | 0.735        | 0.689        | 0.652        | 0.684        |
| CL2  | 0.591        | 0.654        | <b>0.863</b> | 0.708        | 0.647        | 0.612        | 0.722        | 0.661        | 0.635        | 0.671        |
| CL3  | 0.458        | 0.658        | <b>0.852</b> | 0.564        | 0.466        | 0.449        | 0.529        | 0.542        | 0.465        | 0.618        |
| CL4  | 0.536        | 0.708        | <b>0.881</b> | 0.609        | 0.529        | 0.493        | 0.588        | 0.575        | 0.499        | 0.670        |
| CL5  | 0.548        | 0.726        | <b>0.853</b> | 0.597        | 0.514        | 0.466        | 0.573        | 0.556        | 0.503        | 0.657        |
| CL6  | 0.627        | 0.700        | <b>0.869</b> | 0.715        | 0.651        | 0.634        | 0.700        | 0.634        | 0.655        | 0.659        |
| DCE1 | 0.687        | 0.589        | 0.687        | <b>0.896</b> | 0.780        | 0.704        | 0.834        | 0.790        | 0.736        | 0.666        |
| DCE2 | 0.697        | 0.561        | 0.627        | <b>0.899</b> | 0.732        | 0.686        | 0.820        | 0.763        | 0.704        | 0.607        |
| DCE3 | 0.640        | 0.606        | 0.615        | <b>0.802</b> | 0.622        | 0.587        | 0.700        | 0.695        | 0.572        | 0.677        |
| DCE4 | 0.699        | 0.615        | 0.682        | <b>0.895</b> | 0.776        | 0.681        | 0.794        | 0.764        | 0.686        | 0.699        |
| DCE5 | 0.656        | 0.622        | 0.708        | <b>0.888</b> | 0.776        | 0.723        | 0.782        | 0.749        | 0.710        | 0.640        |
| KK1  | 0.730        | 0.514        | 0.565        | 0.757        | <b>0.848</b> | 0.737        | 0.745        | 0.745        | 0.705        | 0.595        |
| KK2  | 0.747        | 0.499        | 0.600        | 0.748        | <b>0.868</b> | 0.763        | 0.783        | 0.795        | 0.723        | 0.568        |
| KK3  | 0.675        | 0.542        | 0.654        | 0.720        | <b>0.871</b> | 0.683        | 0.727        | 0.742        | 0.621        | 0.634        |
| KK4  | 0.600        | 0.414        | 0.495        | 0.668        | <b>0.827</b> | 0.629        | 0.690        | 0.652        | 0.607        | 0.511        |
| KK5  | 0.626        | 0.564        | 0.567        | 0.708        | <b>0.861</b> | 0.639        | 0.676        | 0.686        | 0.598        | 0.589        |
| KT1  | 0.681        | 0.499        | 0.566        | 0.635        | 0.669        | <b>0.846</b> | 0.682        | 0.656        | 0.657        | 0.540        |
| KT2  | 0.683        | 0.472        | 0.519        | 0.664        | 0.694        | <b>0.846</b> | 0.673        | 0.656        | 0.699        | 0.546        |
| KT3  | 0.577        | 0.377        | 0.443        | 0.518        | 0.526        | <b>0.731</b> | 0.529        | 0.523        | 0.620        | 0.326        |
| KT4  | 0.794        | 0.517        | 0.566        | 0.717        | 0.756        | <b>0.902</b> | 0.788        | 0.755        | 0.765        | 0.603        |
| KT5  | 0.699        | 0.469        | 0.539        | 0.676        | 0.704        | <b>0.833</b> | 0.713        | 0.693        | 0.683        | 0.527        |
| KT6  | 0.736        | 0.449        | 0.567        | 0.681        | 0.724        | <b>0.895</b> | 0.729        | 0.702        | 0.769        | 0.511        |
| OFS1 | 0.701        | 0.527        | 0.639        | 0.841        | 0.781        | 0.730        | <b>0.906</b> | 0.802        | 0.751        | 0.599        |
| OFS2 | 0.640        | 0.502        | 0.603        | 0.781        | 0.747        | 0.726        | <b>0.880</b> | 0.782        | 0.737        | 0.537        |
| OFS3 | 0.716        | 0.623        | 0.661        | 0.754        | 0.726        | 0.716        | <b>0.865</b> | 0.773        | 0.657        | 0.668        |
| OFS4 | 0.698        | 0.635        | 0.730        | 0.821        | 0.760        | 0.734        | <b>0.907</b> | 0.809        | 0.727        | 0.689        |
| OFS5 | 0.716        | 0.652        | 0.688        | 0.806        | 0.773        | 0.748        | <b>0.904</b> | 0.782        | 0.754        | 0.701        |
| TI1  | 0.710        | 0.534        | 0.620        | 0.780        | 0.790        | 0.771        | 0.810        | <b>0.874</b> | 0.745        | 0.579        |
| TI2  | 0.722        | 0.580        | 0.580        | 0.702        | 0.735        | 0.702        | 0.719        | <b>0.857</b> | 0.669        | 0.653        |
| TI3  | 0.655        | 0.494        | 0.518        | 0.716        | 0.682        | 0.647        | 0.740        | <b>0.863</b> | 0.667        | 0.594        |
| TI4  | 0.737        | 0.583        | 0.635        | 0.760        | 0.722        | 0.656        | 0.750        | <b>0.871</b> | 0.627        | 0.645        |
| TI5  | 0.685        | 0.620        | 0.638        | 0.737        | 0.733        | 0.652        | 0.790        | <b>0.874</b> | 0.659        | 0.676        |
| TI6  | 0.738        | 0.642        | 0.694        | 0.789        | 0.772        | 0.713        | 0.809        | <b>0.889</b> | 0.686        | 0.690        |
| UI1  | 0.585        | 0.458        | 0.545        | 0.660        | 0.616        | 0.654        | 0.693        | 0.680        | <b>0.836</b> | 0.460        |
| UI2  | 0.659        | 0.365        | 0.507        | 0.631        | 0.646        | 0.703        | 0.683        | 0.617        | <b>0.860</b> | 0.447        |
| UI3  | 0.645        | 0.445        | 0.566        | 0.621        | 0.649        | 0.672        | 0.651        | 0.626        | <b>0.817</b> | 0.505        |
| UI4  | 0.588        | 0.521        | 0.541        | 0.581        | 0.517        | 0.606        | 0.585        | 0.565        | <b>0.762</b> | 0.454        |
| UI5  | 0.712        | 0.528        | 0.580        | 0.728        | 0.721        | 0.791        | 0.747        | 0.717        | <b>0.866</b> | 0.570        |
| VCC1 | 0.649        | 0.668        | 0.627        | 0.648        | 0.611        | 0.515        | 0.582        | 0.639        | 0.455        | <b>0.850</b> |

|      |       |       |       |       |       |       |       |       |       |              |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------------|
| VCC2 | 0.637 | 0.696 | 0.671 | 0.680 | 0.622 | 0.558 | 0.645 | 0.655 | 0.520 | <b>0.876</b> |
| VCC3 | 0.554 | 0.733 | 0.646 | 0.621 | 0.535 | 0.470 | 0.578 | 0.589 | 0.463 | <b>0.883</b> |
| VCC4 | 0.648 | 0.740 | 0.692 | 0.657 | 0.583 | 0.586 | 0.659 | 0.660 | 0.567 | <b>0.896</b> |
| VCC5 | 0.682 | 0.794 | 0.738 | 0.714 | 0.652 | 0.574 | 0.696 | 0.703 | 0.592 | <b>0.920</b> |

Table 10. R-Square and Q-Square Test

|                             | R-square | Q-square |
|-----------------------------|----------|----------|
| Customer Engagement         | 0.692    | 0.524    |
| Customer Loyalty            | 0.714    | 0.528    |
| Digital Customer Experience | 0.806    | 0.613    |
| Online Flow State           | 0.844    | 0.661    |

innovation. When digital banks implement sophisticated technologies such as AI-driven hyper-personalization, interactive financial visualizations, or innovative gamification features young customers no longer perceive banking as a rigid and boring activity. Instead, these innovations cultivate an emotional experience that is enjoyable, challenging, and satisfying. Therefore, consistent investment in technological innovation is not merely a system upgrade; it is a vital emotional marketing strategy to secure loyalty and induce flow states among young consumers. This outcome is highly congruent with Loureiro and Bilro (2024), who found that technological innovations incorporating gamification elements and high levels of interactivity are exceptionally effective in driving psychological and emotional engagement among Gen Z. Innovative technology acts as the primary stimulus that differentiates a bank from market commodities.

The findings support H6, indicating that Online Flow State has a strong positive effect on Digital Customer Experience ( $\beta = 0.898$ ,  $p < 0.001$ ). This result suggests that users who experience greater immersion, concentration, and enjoyment while interacting with digital banking applications are more likely to perceive the overall digital experience positively. Consistent with the Stimulus–Organism–Response (S-O-R) framework, Online Flow State functions as an important psychological stimulus that shapes customers' internal evaluations of digital banking services. When users become deeply engaged in digital interactions, they evaluate the service more favorably in terms of usability, convenience, interface quality, and overall experience.

This finding is consistent with previous studies demonstrating that immersive digital experiences significantly enhance customers' evaluations of digital services (Novak et al., 2000; Zhou, 2012; Lemon & Verhoef, 2016). While earlier studies primarily examined flow in the context of website usage or technology adoption, the present study extends this literature by confirming its substantial influence on Digital Customer Experience within digital banking, particularly among young consumers.

From a managerial perspective, the results suggest that digital banks should focus not only on improving functional performance but also on designing emotionally engaging digital interactions. Features such as intuitive navigation, personalized interfaces, real-time financial insights, and interactive service elements can strengthen users' sense of immersion, thereby enhancing their overall digital experience. Consequently, investments in experience-centered digital design may contribute to stronger customer engagement and long-term loyalty.

These findings provide a critical theoretical foundation for reframing digital banking strategies beyond commoditization. For Generation Z and Millennial customers, an exceptional Digital Customer Experience is no longer determined solely by rigid application functionality; rather, it is driven by the depth of psychological engagement experienced during digital interactions. Flow, characterized by intense concentration, the absence of cognitive friction, and intrinsic enjoyment while navigating the application, emerges as a primary driver of positive customer perceptions toward the digital banking

ecosystem. When digital banks successfully facilitate a flow state among young users, financial management activities evolve into a satisfying emotional experience. Consequently, to effectively compete in the youth market, digital banking institutions must shift their strategic focus from merely improving technical features and utilitarian functions toward creating immersive application environments that stimulate psychological flow and deliver unparalleled digital customer experiences (Santoso & Handoko, 2023; Ertel et al., 2021; Cleanthis & Christou, 2023; McLean & Wilson, 2019).

The present findings are consistent with recent empirical studies. First, McLean and Barhorst (2023) demonstrated that the flow state experienced by customers during mobile banking usage exerts a substantial and significant positive effect on overall Customer Experience (CX), which subsequently enhances word-of-mouth intentions. Second, Belanche, Casaló, and Flavián (2024) emphasized that, particularly among younger generations, superior Digital Customer Experience is achieved when emotional and hedonic dimensions surpass purely functional considerations. In this regard, flow, reflected in digital enjoyment and immersion, serves as the primary catalyst for transforming customer experiences.

Furthermore, hypothesis testing (H7) revealed that Digital Customer Experience has a positive and significant effect on Customer Loyalty, with a path coefficient of 0.410, a t-statistic of 6.523, and a p-value of 0.000. These findings confirm that satisfying digital experiences, characterized by clear instructions and features that effectively meet customer needs, directly encourage users to continue utilizing the service over the long term and recommend it to others (Pratama & Stefanto, 2022; Kurniawati & Hartoyo, 2021).

This evidence provides crucial empirical validation for digital banking leaders in formulating sustainable competitive strategies in an increasingly commoditized market. For Generation Z and Millennial consumers, who typically exhibit low switching barriers, loyalty can no longer be secured through aggressive promotional spending or short-term incentive programs. Instead, genuine Digital Customer Loyalty can only be cultivated through long-term investments in delivering superior, immersive, and emotionally resonant Digital Customer Experiences. When young customers perceive their financial management activities as enjoyable, secure, and personally meaningful, they are more likely to develop emotional attachment to the platform. Consequently, an outstanding digital experience becomes a key differentiator that fosters organic loyalty, enhances customer retention, and motivates customers to act as active advocates for the digital bank within a highly competitive environment. These findings are aligned with those of Belanche, Casaló, and Flavián (2024), who empirically demonstrated that among younger consumers, Digital Customer Experience enriched by emotional and hedonic value exerts the strongest influence on brand loyalty and switching resistance, far exceeding the impact of purely utilitarian factors.

Moreover, the results confirm that Customer Engagement significantly influences Customer Loyalty, with a path coefficient of 0.511, a t-statistic of 7.769, and a p-value of 0.000. Notably, this effect is stronger than the direct influence of Digital Customer Experience itself (H8). This indicates that when users actively engage with the application, access it frequently, and feel valued by the bank, they are more likely to remain loyal and less inclined to switch to competing institutions. Such engagement fosters emotional bonds that function as a protective mechanism, reducing customers' propensity to defect despite the presence of attractive

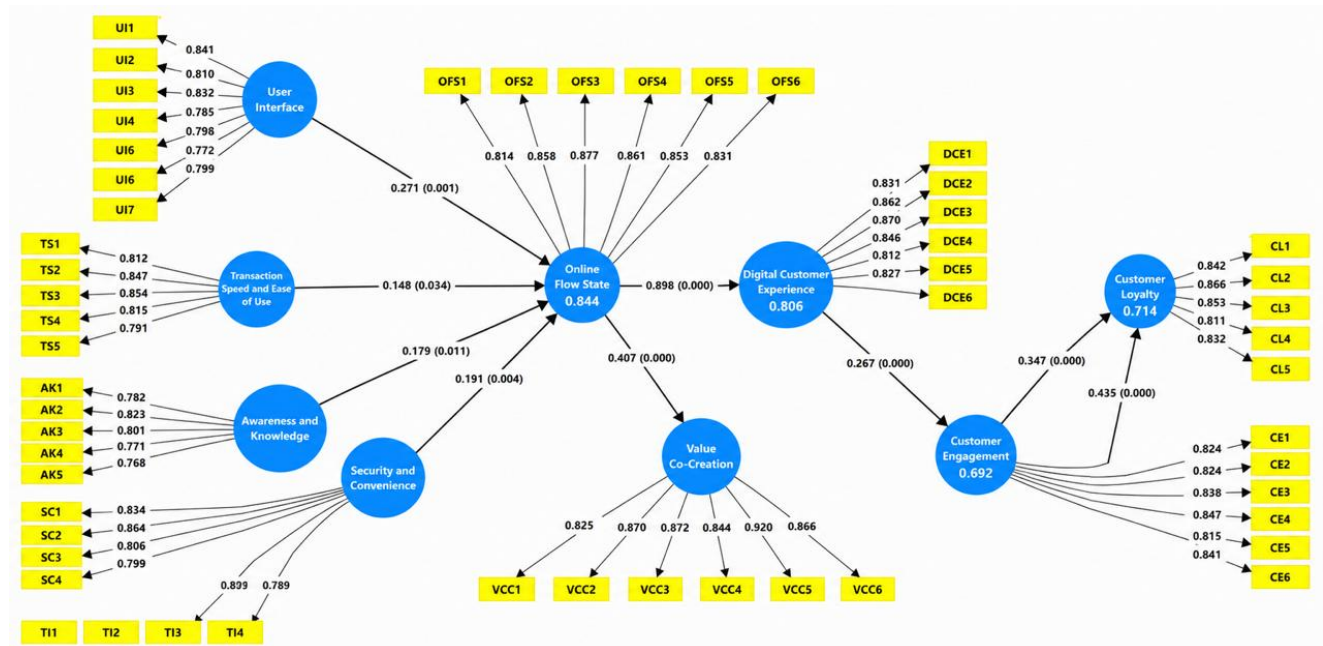


Figure 3. Structural Model

Table 11. Hypothesis Testing Results

| Hypothesis       | Relationship Between Variables                                                            | Path Coefficient | T-Statistic | p-value |
|------------------|-------------------------------------------------------------------------------------------|------------------|-------------|---------|
| Direct Effects   |                                                                                           |                  |             |         |
| H1               | User Interface → Online Flow State                                                        | 0.201            | 2.876       | 0.004   |
| H2               | Transaction Speed and Ease of Use → Online Flow State                                     | 0.146            | 1.823       | 0.068   |
| H3               | Awareness and Knowledge → Online Flow State                                               | -0.057           | 0.746       | 0.456   |
| H4               | Security and Convenience → Online Flow State                                              | 0.225            | 2.097       | 0.036   |
| H5               | Technology and Innovation → Online Flow State                                             | 0.469            | 4.209       | 0.000   |
| H6               | Online Flow State → Digital Customer Experience                                           | 0.898            | 49.284      | 0.000   |
| H7               | Digital Customer Experience → Customer Loyalty                                            | 0.410            | 6.523       | 0.000   |
| H8               | Customer Engagement → Customer Loyalty                                                    | 0.511            | 7.769       | 0.000   |
| H9               | Digital Customer Experience × Value Co-Creation → Customer Engagement (Moderating Effect) | 0.070            | 2.564       | 0.010   |
| Indirect Effects |                                                                                           |                  |             |         |
| H10              | Online Flow State → Digital Customer Experience → Customer Engagement                     | 0.071            | 2.014       | 0.044   |
| H11              | Online Flow State → Digital Customer Experience → Customer Loyalty                        | 0.368            | 6.352       | 0.000   |

Note: A hypothesis is considered supported when the t-statistic exceeds 1.96 and the p-value is less than 0.05 at the 5% significance level.

alternatives offered by competitors (Lemon & Verhoef, 2016; Harrigan et al., 2018; McLean & Wilson, 2019).

For Generation Z and Millennial customers, loyalty is no longer determined by the availability of basic banking features; rather, it depends on the extent to which they are actively engaged with the platform. When digital banks successfully cultivate strong Customer Engagement through interactive functionalities, AI-driven personalization, and emotionally appealing gamification mechanisms, young customers transition from passive users to active participants within the digital ecosystem. This dynamic engagement generates strong psychological bonds, increases psychological switching barriers, and ultimately crystallizes into long-term loyalty. Therefore, digital banking strategies should shift from a primary focus on customer acquisition metrics, such as application downloads, toward the

development of habit-forming digital ecosystems. Only through highly engaged customers can authentic and sustainable digital loyalty be achieved. These findings are consistent with the study by Loureiro and Bilro (2024), which found that, among younger consumers, interactivity and gamification elements within digital banking platforms directly enhance customer engagement. Elevated levels of engagement subsequently emerge as the most powerful predictor of long-term brand loyalty in highly competitive digital environments.

Furthermore, this study provides robust empirical evidence regarding the relationship between Online Flow State and Digital Customer Experience. The results indicate a highly significant and substantial effect, with a path coefficient of 0.898, a t-statistic of 49.284, and a p-value of 0.000 (H6). The coefficient, which approaches unity, suggests that higher levels

of immersion, engagement, and comfort experienced by users while interacting with the application are associated with more favourable perceptions of the overall digital customer experience. In this context, the flow state serves as a fundamental pillar shaping users' satisfaction with the information quality, interface design, and functionality of digital banking services.

These findings provide a critical theoretical foundation for reframing digital banking strategies beyond commoditization. For Generation Z and Millennial customers, an exceptional Digital Customer Experience is no longer determined solely by rigid application functionality; rather, it is driven by the depth of psychological engagement experienced during digital interactions. Flow, characterized by intense concentration, the absence of cognitive friction, and intrinsic enjoyment while navigating the application, emerges as a primary driver of positive customer perceptions toward the digital banking ecosystem. When digital banks successfully facilitate a flow state among young users, financial management activities evolve into a satisfying emotional experience. Consequently, to effectively compete in the youth market, digital banking institutions must shift their strategic focus from merely improving technical features and utilitarian functions toward creating immersive application environments that stimulate psychological flow and deliver unparalleled digital customer experiences (Santoso & Handoko, 2023; Ertemel et al., 2021; Cleanthis & Christou, 2023; McLean & Wilson, 2019).

The present findings are consistent with recent empirical studies. First, McLean and Barhorst (2023) demonstrated that the flow state experienced by customers during mobile banking usage exerts a substantial and significant positive effect on overall Customer Experience (CX), which subsequently enhances word-of-mouth intentions. Second, Belanche, Casaló, and Flavián (2024) emphasized that, particularly among younger generations, superior Digital Customer Experience is achieved when emotional and hedonic dimensions surpass purely functional considerations. In this regard, flow, reflected in digital enjoyment and immersion, serves as the primary catalyst for transforming customer experiences.

Furthermore, hypothesis testing (H7) revealed that Digital Customer Experience has a positive and significant effect on Customer Loyalty, with a path coefficient of 0.410, a t-statistic of 6.523, and a p-value of 0.000. These findings confirm that satisfying digital experiences, characterized by clear instructions and features that effectively meet customer needs, directly encourage users to continue utilizing the service over the long term and recommend it to others (Pratama & Stefanto, 2022; Kurniawati & Hartoyo, 2021).

This evidence provides crucial empirical validation for digital banking leaders in formulating sustainable competitive strategies in an increasingly commoditized market. For Generation Z and Millennial consumers, who typically exhibit low switching barriers, loyalty can no longer be secured through aggressive promotional spending or short-term incentive programs. Instead, genuine Digital Customer Loyalty can only be cultivated through long-term investments in delivering superior, immersive, and emotionally resonant Digital Customer Experiences. When young customers perceive their financial management activities as enjoyable, secure, and personally meaningful, they are more likely to develop emotional attachment to the platform. Consequently, an outstanding digital experience becomes a key differentiator that fosters organic loyalty, enhances customer retention, and motivates customers to act as active advocates for the digital bank within a highly competitive environment. These findings are aligned with those of Belanche, Casaló, and Flavián (2024), who empirically demonstrated that among younger consumers, Digital Customer Experience enriched by emotional and hedonic value exerts the strongest

influence on brand loyalty and switching resistance, far exceeding the impact of purely utilitarian factors.

Moreover, the results confirm that Customer Engagement significantly influences Customer Loyalty, with a path coefficient of 0.511, a t-statistic of 7.769, and a p-value of 0.000. Notably, this effect is stronger than the direct influence of Digital Customer Experience itself (H8). This indicates that when users actively engage with the application, access it frequently, and feel valued by the bank, they are more likely to remain loyal and less inclined to switch to competing institutions. Such engagement fosters emotional bonds that function as a protective mechanism, reducing customers' propensity to defect despite the presence of attractive alternatives offered by competitors (Lemon & Verhoef, 2016; Harrigan et al., 2018; McLean & Wilson, 2019).

For Generation Z and Millennial customers, loyalty is no longer determined by the availability of basic banking features; rather, it depends on the extent to which they are actively engaged with the platform. When digital banks successfully cultivate strong Customer Engagement through interactive functionalities, AI-driven personalization, and emotionally appealing gamification mechanisms, young customers transition from passive users to active participants within the digital ecosystem. This dynamic engagement generates strong psychological bonds, increases psychological switching barriers, and ultimately crystallizes into long-term loyalty. Therefore, digital banking strategies should shift from a primary focus on customer acquisition metrics, such as application downloads, toward the development of habit-forming digital ecosystems. Only through highly engaged customers can authentic and sustainable digital loyalty be achieved. These findings are consistent with the study by Loureiro and Bilro (2024), which found that, among younger consumers, interactivity and gamification elements within digital banking platforms directly enhance customer engagement. Elevated levels of engagement subsequently emerge as the most powerful predictor of long-term brand loyalty in highly competitive digital environments.

## Conclusion

This study demonstrates that Digital Customer Experience among young digital banking users is strongly influenced by the ability of digital banking services to create immersive, enjoyable, and meaningful interactions. Consistent with the Stimulus–Organism–Response (S-O-R) framework and Expectation-Confirmation Theory (ECT), the findings confirm that Online Flow State plays a central role in enhancing Digital Customer Experience, which subsequently strengthens Customer Engagement and Customer Loyalty. Furthermore, the positive moderating effect of Value Co-Creation indicates that active customer participation enhances the impact of Digital Customer Experience on Customer Engagement, highlighting the importance of interactive digital ecosystems in fostering long-term customer relationships.

This study demonstrates that digital customer loyalty among younger generations is shaped not only by functional banking services but also by emotionally engaging digital experiences. The findings confirm that Online Flow State enhances Digital Customer Experience, which subsequently strengthens Customer Engagement and Customer Loyalty. Among the examined antecedents, technological innovation emerged as the most influential driver of digital customer experience, while transaction speed was perceived primarily as a basic service requirement rather than a source of competitive differentiation. These findings suggest that digital banking should evolve beyond a transaction-oriented platform toward an experience-oriented ecosystem that fosters meaningful customer interactions and long-term relationships.

From a theoretical perspective, this study extends the Stimulus–Organism–Response (S–O–R) framework by demonstrating that Online Flow State serves as a critical psychological mechanism through which digital banking stimuli are transformed into favorable behavioral responses. The findings also complement Expectation–Confirmation Theory (ECT) by showing that customer loyalty is reinforced not only through confirmation of functional expectations but also through immersive digital experiences and customer engagement. Furthermore, the significant moderating effect of Value Co-Creation enriches the service-dominant logic perspective by demonstrating that collaborative customer participation strengthens the conversion of digital experiences into enduring customer loyalty. Collectively, these findings provide a more comprehensive explanation of loyalty formation by integrating emotional, experiential, and relational mechanisms within a single conceptual framework.

From a managerial perspective, the findings indicate that banks should prioritize immersive, intuitive, and customer-centered digital experiences rather than focusing solely on transactional efficiency. Continuous technological innovation, intuitive biometric security, personalized interfaces, and mechanisms that encourage customer participation in service improvement should be integrated into digital banking strategies. By creating interactive digital ecosystems that promote emotional engagement and value co-creation, banks can strengthen customer relationships and achieve more sustainable competitive advantage among Generation Z and Millennial customers.

This study has several limitations. First, the use of purposive non-probability sampling and respondents drawn from selected regions outside Java limits the generalizability of the findings to the broader population of Indonesian digital banking users. Second, the sample was predominantly female, which may have influenced the observed relationships and may not fully represent male users' digital banking experiences. Third, the cross-sectional research design limits the ability to establish causal relationships and capture changes in customer experience and loyalty over time.

Future research should employ probability sampling with broader geographical coverage and more balanced demographic characteristics to enhance external validity. Longitudinal studies are recommended to examine how Online Flow State, Digital Customer Experience, Customer Engagement, and Customer Loyalty evolve over time. Future studies may also investigate the moderating roles of gender, digital literacy, trust, perceived risk, privacy concerns, and AI-driven personalization, as well as validate the proposed framework across different countries and digital service industries to improve its theoretical generalizability.

#### Strategic Recommendation

Based on the findings of this study, several strategic recommendations are proposed for digital banking service

providers. Given that technological innovation represents the strongest driver of customer experience, digital banks should continuously upgrade application features by adopting emerging technologies that enhance the efficiency and convenience of customers' daily financial activities, rather than focusing solely on aesthetic or visual trends. In parallel, banks should provide greater flexibility for customers to customize interface layouts, menu structures, and service preferences according to their individual needs, as such personalization strategies can foster a stronger sense of ownership and enhance customers' psychological attachment to the application.

Furthermore, digital banks should establish dedicated channels that enable young customers to contribute feedback, propose feature enhancements, and participate in beta testing programs for newly developed services, thereby transforming customers' perceptions from being mere service users to becoming strategic partners in the innovation process. Banks should also continue strengthening biometric authentication mechanisms, such as Face ID and fingerprint recognition, while ensuring their seamless integration within the application's user journey, as this aspect has been shown to enhance users' sense of security, trust, and transactional comfort. Additionally, given that loyalty among younger generations tends to be pragmatic and experience-oriented, banks should not rely exclusively on superior technical features, but instead develop more personalized and appreciation-based loyalty programs that foster emotional attachment and strengthen customer relationships, thereby reducing the likelihood of customer migration to competing financial institutions.

In summary, achieving sustainable competitive advantage in digital banking requires a strategic shift from a technology-centric orientation toward an experience-centric paradigm, where technological excellence, emotional engagement, personalization, and collaborative value creation collectively contribute to the development of enduring customer loyalty among Generation Z and Millennial consumers.

## Author contributions

Stella Maryanthi was responsible for conceptualisation, data collection, and writing the first draft. Asnan Furinto contributed to methodology and reviewing. Dewi Tamara was involved in reviewing and editing.

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