



THE EFFECT OF USER EXPERIENCE ON CUSTOMER LOYALTY OF E-WALLETS WITH TRUST AS AN INTERVENING VARIABLE IN GENERATION Z ON MADURA ISLAND

Shanti Febriyani¹

Universitas Islam Negeri Madura, Madura, Indonesia

shantifebriyani098@gmail.com

Khotibul Umam²

Universitas Islam Negeri Madura, Madura, Indonesia

khotibul_umam@uinmadura.ac.id

Umarul Faruq³

Universitas Islam Negeri Madura, Madura, Indonesia

umarulfaruq@iainmadura.ac.id

Abstract

This study aims to analyze the effect of user experience on customer loyalty of the DANA e-wallet, with trust as an intervening variable, among Generation Z in Madura Island. A quantitative causal approach was used, with primary data collected through an online questionnaire using a five-point Likert scale. The sample consisted of 100 DANA users aged 17–28 years who had used the application for at least three months, selected through purposive sampling, with the sample size determined using the Slovin formula. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4. The results show that user experience has a positive and significant effect on trust ($\beta = 0.460$; $p = 0.003$) and on customer loyalty ($\beta = 0.149$; $p = 0.026$), although the direct effect on loyalty is weak. Trust has a positive and significant effect on customer loyalty ($\beta = 0.738$; $p < 0.001$) and partially mediates the effect of user experience on customer loyalty (indirect effect $\beta = 0.339$; $p = 0.004$). The model explains 21.1% of the variance in trust and 66.8% of the variance in customer loyalty. These findings indicate that improving the application interface must be accompanied by strengthening user trust to build long-term loyalty among Generation Z in non-urban areas.

Keywords: User Experience, Trust, Customer Loyalty, DANA E-Wallet, Generation Z



INTRODUCTION

The massive digital transformation has reconfigured the global payment system landscape, including in Indonesia. The acceleration of the national digital economy and finance shows a very progressive trend, supported by monetary authority policies and increasing penetration of financial technology. Indonesia's digital economy and finance growth is currently among the fastest in the world. Perry Warjiyo, Governor of Bank Indonesia, stated that Indonesia has become "*the fastest-growing digital economy*" (Ariesta, 2025). This certainly confirms Indonesia's strategic position in the global digital transformation landscape. This development is reflected in the performance of the national payment system in the third quarter of 2025, where digital payment transaction volume reached 12.99 billion transactions, a growth of 38.08% (*year-on-year*), confirming the intensification of the use of non-cash payment instruments (Bank Indonesia, 2025). This dynamic reflects a shift in public behavior toward more efficient, faster, and application-based payment systems.

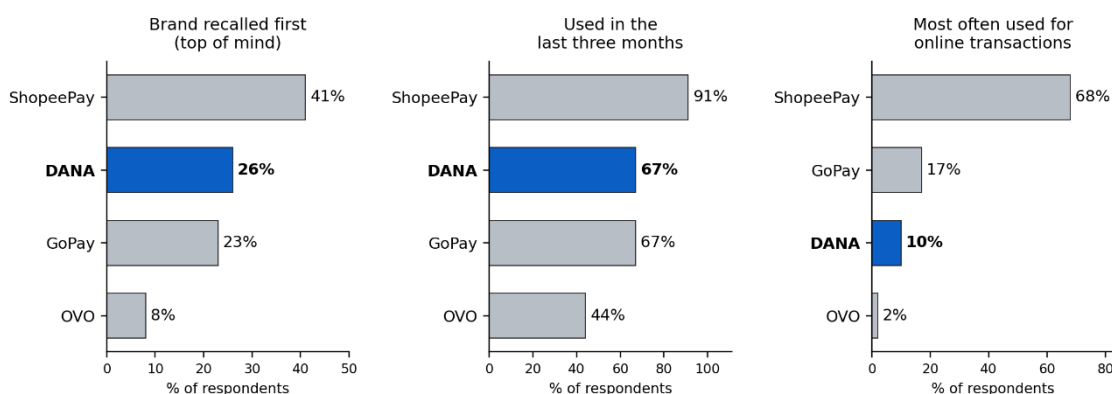
This growth is also driven by the increasing adoption of *Financial Technology*, particularly electronic payment systems that offer convenience, speed, and security in transactions (Utami & Kusumahadi, 2024). *E-wallets*, as a digital payment instrument, have become the primary choice for Indonesians, especially *Generation Z*, who have a high level of adaptation to digital technology. A national survey shows that 80% of respondents use digital wallets for their daily transaction needs (Wafa, 2025) while an *Indonesian report, Fintech Trends 2024* by JakPat noted that 96% of respondents already have or use *e-wallets* (Amalla & Rahman, 2025). This high penetration rate shows that *e-wallets* are no longer just an alternative, but have become an integral part of Indonesia's digital financial ecosystem, especially among *Generation Z*.

Generation Z, born between 1997 and 2012, is a *digital native cohort* that grew up with the development of information and communication technology (Karina et al., 2021). Demographically, *Generation Z* is the largest group in Indonesia, accounting for 27.94% of the total population, or approximately 74.93 million people (A'yun, 2025). Their adaptive, *mobile-oriented nature* and preference for instant services make this group the dominant user of digital financial services. A survey conducted by Katadata Insight Center with Zigi in September 2021 (reported in January 2022) showed that the *e-wallet adoption rate* among *Generation Z* reached approximately 68%, significantly higher than the use of bank ATM cards (35.4%) (Lavinda, 2022). This position places *Generation Z* as a strategic segment in the competitive *e-wallet industry*.

However, high penetration and app ownership do not automatically translate to user loyalty. A November 2025 Jakpat survey of 1,945 respondents ranked DANA as the most widely used *e-wallet* (72%), including among *Generation Z* (75%) (GoodStats, 2025a). A study by Ipsos Indonesia (2026) provides a more nuanced picture. As shown in Figure 1, DANA ranked second in first-place brand recall (26%), but only 10% of respondents named it as *the e-wallet* they most frequently use for online transactions, far behind ShopeePay (68%). In the same study, DANA ranked last among the four major *e-wallets* in monthly transaction frequency, and ShopeePay led in perceived security (55%). The two surveys differed in sample size and methodology, so the results are not directly comparable, but both show that owning or having used an app is not the same as using it intensively and repeatedly.

Figure 1

DANA's position compared to other major e-wallets on three indicators (Ipsos Indonesia, 2026)



Source: Adapted from Ipsos Indonesia (2026), *Digital Wallet Research 2026: User Behavior & Competitive Landscape* (press release, February 23, 2026). Note: Percentage of respondents; DANA is marked in blue.

This gap aligns with service selection patterns. Jakpat reports that ease of use (59%) and registered and supervised status by the Financial Services Authority (49%) are primary considerations, while promotions or rewards influence 21% of respondents (GoodStats, 2025b); Ipsos Indonesia (2026) also places promotions as a key driver in digital wallet selection. Furthermore, usage in the last three months across the four major e-wallets (91%, 67%, 67%, and 44%) exceeds 100%, indicating that many users use more than one *e-wallet* simultaneously (Ipsos Indonesia, 2026). In such circumstances, users may switch or split usage between applications based on convenience, security, or incentives, so repeat usage does not necessarily reflect commitment to a single platform. The



relevant issue for service providers like DANA is therefore not simply the number of users, but rather the factors that keep users engaged and loyal, particularly user experience and trust. To the author's knowledge, public data mapping the loyalty of DANA users on Madura Island is not yet available, so this research is aimed at filling this gap.

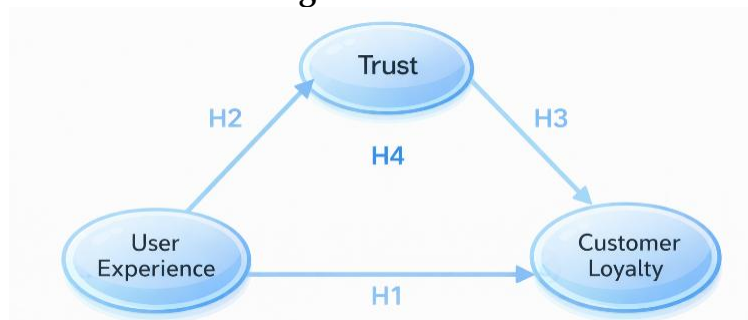
However, *Generation Z's digital behavior* is not entirely homogeneous across Indonesia. In non-urban areas such as Madura Island, there are indications of differences in digital service utilization patterns compared to metropolitan areas. The 2025 Indonesian Internet Profile Survey recorded an internet penetration rate of 83.53% in urban areas, while in rural areas it was 76.96%, with user contributions of 58.24% and 41.76%, respectively (Association of Indonesian Internet Service Providers, 2025) . Although the access gap is relatively small, differences in the intensity of digital service use and optimization are still evident. This difference indicates that despite relatively high internet access in rural areas, the intensity and utilization of digital services, including app-based financial services, are not yet fully optimized. Infrastructure factors, digital literacy, and local socio-cultural characteristics have the potential to influence the user experience and loyalty to *e-wallet services*.

In the context of differences in digital service utilization patterns in non-urban areas such as Madura Island, the quality of user experience *is* a crucial determinant in shaping digital consumer perceptions and behavior. *User experience* encompasses not only application functionality but also ease of navigation, interface design, system speed, and user emotional well-being (Putu et al., 2025) . A positive experience has the potential to increase *trust*, which in turn will become the foundation for *customer loyalty* (Rifa'i, 2019) . In the digital finance industry, which is fraught with security perception risks, *trust* plays a central role as a mediator between experience evaluation and long-term user commitment.

From an Islamic economic perspective, the use of digital financial services such as *e-wallets* is assessed not only for their convenience and efficiency, but also for their compliance with Sharia principles. These principles include honesty (*As-Shidqu*), transparency (*Ash-Shafafiyah*), and the avoidance of prohibited elements, such as *riba* (interest), *gharar* (uncertainty), and *maysir* (gambling). Therefore, *trust* in the context of *e-wallets* is not only related to technical aspects but also reflects Islamic ethical values in safeguarding user funds and information (Rahmi et al., 2025) .

Several studies in Indonesia have examined the behavior of digital financial service users. Several findings indicate that *intention to use plays a significant role in shaping fintech user loyalty* (Lasmini et al., 2021) . While other studies have found that user trust is influenced by user experience and perceived app security (Isaura et al., 2023) . Furthermore, one empirical study demonstrated that *user experience* and *trust* significantly influence user loyalty in digital services (Sidiq et al., 2026) . However, most studies are still general in nature, focusing on *fintech* or digital applications in general, without focusing on specific *e-wallet services*. Previous research has tended to focus on *e-wallet user satisfaction* among *Generation Z*. (Nugroho & Sundari, 2025) , but have not examined loyalty as a long-term variable, and most previous research has been conducted in urban areas. Therefore, empirical studies highlighting *Generation Z* in non-urban areas, focusing on specific *e-wallets* , such as DANA, are still limited. This study offers novelty by integrating *user experience* , *trust* , and *customer loyalty* into one model, emphasizing a focus on *Generation Z* in non-urban areas, and selecting the DANA *e-wallet* as the object of study.

Figure 2
Thinking Framework Model



Based on the empirical phenomena and research gaps, this study aims to analyze the influence of *user experience* on *customer loyalty* of the DANA e-wallet, with *trust* as an intervening variable among *Generation Z* on Madura Island. This study hypothesizes that *user experience* has a significant effect on *customer loyalty* among DANA e-wallet users (H1) and also influences *trust* (H2). Furthermore, *trust* has a significant effect on *customer loyalty* (H3). In addition, *trust* acts as a mediating variable connecting *user experience* with *customer loyalty* (H4). Theoretically, this study is expected to enrich the literature on digital consumer behavior in non-urban contexts. Practically, the findings of this study can serve as a basis for *e-wallet providers* in designing strategies to improve user experience and strengthen trust to build loyalty.



LITERATURE REVIEW

Customer Loyalty

Customer loyalty in this study is based on *the Relationship Marketing Theory* proposed by *Robert M. Morgan and Shelby D. Hunt* in 1994, which emphasizes that customer loyalty is formed through long-term relationships based on trust, satisfaction, and ongoing commitment between the company and the customer. This theory views relationship marketing as all marketing activities aimed at building, developing, and maintaining long-term, mutually beneficial relationships with various parties that contribute to the organization's success (Kuncoro et al., 2021) .

In Morgan and Hunt's (1994) framework, trust and commitment are key mediating variables that transform marketing efforts into long-term relationships: customers who believe a service provider is reliable and has integrity are more likely to commit to maintaining the relationship and are less likely to switch. In digital wallet services, this logic is relevant because users entrust funds and personal data to the service provider. Trust lowers the perceived risk of storage and transactions, while commitment is reflected in the willingness to continue using DANA despite the availability of alternative applications and competing promotions. Therefore, this study positions trust as a mechanism linking the experience of using the DANA application to loyalty. Commitment is not modeled as a separate construct; it is represented by the *retention and referrals dimensions of the customer loyalty construct*.

Conceptually, *customer loyalty* is the tendency of consumers to continue choosing and using a particular product or service repeatedly, even though there are other alternatives in the market (Agum et al., 2025) . Loyalty is not only repetitive behavior, but also reflects emotional commitment, satisfaction, and trust in a brand or service. In the context of digital services such as *e-wallets*, loyalty arises when users feel their satisfaction and trust *are* consistently met, so they tend to use the same platform continuously and recommend it to others.

In *Generation Z*, customer loyalty is heavily influenced by digital user experience *and* trust in the security and credibility of the platform (Hanif, 2019) . *Generation Z*, who grew up with digital technology, has high expectations for speed, ease of use, and application interface design. Empirical research shows that *e-wallet user loyalty* is formed when the digital experience is satisfying and supported by *trust*, which in turn impacts the desire to continue using the service and increases engagement in the digital ecosystem.



According to Kotler and Keller (Prasastin & Rahmah, 2025) , *Customer Loyalty* can be seen from the tendency to make consistent repeat purchases (Wiratama et al., 2026) , the ability to persist and not be easily influenced by negative information or offers from competitors (*retention*) (Haryono, 2025) , and the willingness to recommend products or services to others (*referrals*) (Mayo et al., 2023) as a form of satisfaction and trust in the company. Studies on *e-business platforms* confirm that the quality of digital services, *trust*, and *User Experience* significantly influence *Customer Loyalty*, making this variable crucial for understanding the behavior of Generation Z users in non-urban areas .

The literature distinguishes behavioral loyalty, which is observable repeat use, from attitudinal loyalty, which is psychological preference and commitment to a brand (Dick & Basu, 1994; Oliver, 1999). This distinction is important because repeat use does not necessarily reflect commitment: users may continue using an *e-wallet* solely because of promotions, habit, or limited alternatives. Dick and Basu (1994) refer to this as spurious loyalty, which is distinguished from true loyalty, which combines positive attitudes and repeat use. In this study, *the customer loyalty construct* encompasses both sides: *repeat purchase* represents the behavioral side, while *retention* (resistance to competitors' offers) and *referrals* (willingness to recommend) are more closely attitudinal. However, because data are collected through self-perception at a single point in time, this construct does not measure actual usage behavior such as transaction frequency, so the findings should be read as perceived loyalty.

Satisfaction is often viewed as a necessary but not sufficient antecedent to loyalty (Oliver, 1999), and is mentioned in the description above, but is not included as a variable in this research model. This limitation is conceptual. First, the Morgan and Hunt (1994) framework, which serves as the theoretical foundation, positions trust and commitment, not satisfaction, as the primary mediators. Second, this study focuses on trust as a mechanism explaining how user experience leads to loyalty. Consequently, the contribution of satisfaction cannot be separated from the influence of other variables, and some of the variance in *trust* and *customer loyalty* not explained by the model is likely related to satisfaction. Satisfaction is therefore worthy of inclusion in future research.

Trust

Trust in this study is based on the theory proposed by Roger C. Mayer, James H. Davis, and F. David Schoorman (1995) , which states that it is an individual's willingness to accept vulnerability to the actions of another party based on the expectation that the party will act positively. This theory places trust as the basis



for building sustainable relationships between individuals and trusted parties (Putri & Haryanti, 2025) .

From a sharia economic perspective, *trust* is closely related to the concept of *amanah*, which is trust that must be maintained with full responsibility, honesty (*sidq*), and transparency in all transactional activities. This principle emphasizes that every party entrusted with trust must safeguard the rights and interests of others and avoid prohibited elements such as usury, *gharar*, and *maisir*. Thus, trust in the context of financial services is not only rational but also has moral and spiritual dimensions that form the basis for building sustainable relationships (Mustofa, 2025) .

As the use of digital technologies such as *e-wallets* increases, consumer *trust* has become an important determinant influencing users' decisions to continue using a service and feel comfortable conducting non-cash transactions. Empirical research on *e-wallet services* in Indonesia shows that *e-trust* has a positive influence on *Customer Loyalty* and even strengthens the relationship between *e-service quality* and digital *Customer Loyalty* (Syafri & Ratnaningsih, 2025) .

Research on various *fintech platforms*, such as Flip.id (Safitri et al., 2023) and LinkAja (Gusman & Dwita, 2025) shows that *e-trust* has a significant impact on *customer loyalty*, confirming that *trust* is a key factor in building and maintaining long-term relationships between users and digital payment service providers. These findings indicate that the higher the level of *trust* users feel towards the security, integrity, and transparency of the service, the greater their tendency to remain loyal. Therefore, in the context of *e-wallets* such as DANA, *trust* not only plays a role as a trigger for initial adoption but also as a strategic foundation in building *customer loyalty*, especially among *Generation Z* who have high expectations for the quality and security of digital services.

Conceptually, *digital trust* consists of several interrelated dimensions, including integrity, namely the honesty and transparency of the platform (Mawih, 2025) ; competence, namely the platform's ability to process transactions quickly and accurately (Marie et al., 2023) ; goodwill (*benevolence*) (Wong, 2017) , namely the platform's seriousness in protecting user interests (Hutahuruk et al., 2025) and perceived security (Nurrahma et al., 2025) which emphasizes transaction security. *Generation Z* places special attention on the security dimension because they are highly sensitive to the risks of digital transactions, so *trust* becomes a strong foundation in building loyalty for this cohort.

The Law on Using the DANA E-Wallet from an Islamic Economic Perspective



The use of digital wallets (*e-wallets*) such as DANA from an Islamic economic perspective is essentially permissible as long as they comply with the principles of Islamic jurisprudence. The National Sharia Council of the Indonesian Ulema Council, through Fatwa No. 116/DSN-MUI/IX/2017, affirms that the use of electronic money is permissible as long as it does not contain elements of usury, gharar, and maysir and is used for halal activities (DSN-MUI, 2017) . Therefore, the use of *e-wallets* such as DANA can be declared valid according to sharia as long as they comply with the principles of fairness, transparency, and clarity in transactions.

In its implementation, the use of *e-wallets* from a muamalah fiqh perspective involves several contracts underlying the transaction. The balance *top-up process* can be categorized as a *sharf* (money exchange) contract (DSN-MUI, 2002) , which must be carried out in cash, while the balance stored in the *e-wallet system* can be viewed as a *wadi'ah yad amanah contract*, namely a deposit that must be maintained by the service provider (DSN-MUI, 2017) . The relationship between the *e-wallet* provider and *the merchant* can be classified as an *ijarah* (service) contract (DSN-MUI, 2000) while the provision of incentives such as *cashback* can be categorized as a *ju'alah contract*. (DSN-MUI, 2017) . All of these contracts are declared valid as long as they comply with sharia provisions as stipulated in the Fatwa of the National Sharia Council of the Indonesian Ulema Council, so it can be concluded that the use of *e-wallets* such as DANA is permitted in Islam as long as they do not contain prohibited elements and maintain the principles of trust and fairness in every transaction.

User Experience

The approach to *User Experience* in this study is based on a theoretical foundation that explains the interaction between humans and technological systems. Primarily, this concept is based on *Human-Computer Interaction (HCI)* developed by *Stuart K. Card, Thomas P. Moran, and Allen Newell (1983)* , which emphasizes that the quality of interaction between humans and systems will affect efficiency, comfort, and user perception (Nusantara et al., 2023) .

User Experience is defined as the overall experience a system or application provides to users, making the interaction engaging and enjoyable. *User Experience* encompasses an individual's perceptions, responses, and assessments of ease of use, interface design, and experience in understanding available information (Mahmudi, 2025) . This concept emphasizes that the success of a digital product is determined not only by technical functionality but also by the quality of the user experience. Similarly, ISO 9241-210 defines *User Experience* as a person's



perceptions and responses resulting from the use or anticipated use of a system (International Organization for Standardization (ISO), 2019) .

In the context of *e-wallets* , the quality of user experience *plays* a crucial role in shaping digital attitudes and behaviors, especially among *Generation Z* , known as *digital natives* with high expectations for speed, ease of use, and app design. A positive experience not only increases user satisfaction but also encourages long-term engagement and commitment to digital platforms (Ningrum & Yudistria, 2025) . Empirical research shows that the quality of experience significantly influences user *trust* and engagement, ultimately strengthening *customer loyalty*. (Syafri & Ratnaningsih, 2025) . Research on *Generation Z*'s digital wallet behavior in urban Indonesia found that *user experience* significantly correlates with satisfaction and builds loyalty in this cohort (Aenussyifa et al., 2025) . This finding confirms that in *e-wallet* services like DANA, an optimal *user experience not only increases positive perceptions but also builds trust*, which in turn strengthens *customer loyalty* among *Generation Z*.

Conceptually , *User Experience* can be understood as a multidimensional construct that includes ease of use or *usability* (Rodiah & Melati, 2020) , quality of interaction or *interaction design* (Andria & Untoro, 2019) , clarity of information structure or *information architecture* (Afandi, 2006) , quality of information presentation or *content strategy* (Ameylda et al., 2025) , and understanding of user needs (Putrianto et al., 2024) obtained through *user research* (Alifah Amalia Arif, nd) . In *Generation Z* , an optimal digital experience integrates these dimensions so that users feel comfortable, trust, and encouraged to continue using *e-wallet services* sustainably.

Theoretical Synthesis and Inter-Variable Relationships

The three variables in this study are viewed as a series of interrelated arguments, not as stand-alone concepts. The *Human-Computer Interaction Framework* explains that the quality of the interaction between users and systems influences efficiency, convenience, and user perceptions (Card et al., 1983; Nusantara et al., 2023). In financial services, these perceptions translate into assessments of the service provider's capabilities and good faith: smooth, accurate, and understandable transactions serve as signals of competence and integrity, which, according to Mayer et al.'s (1995) trust model, foster users' willingness to accept vulnerability, namely by handing over funds and personal data. This argument underpins the hypothesis that *user experience* influences *trust* (H2) and is consistent with Flavián et al. (2006) and Isaura et al. (2023).



Furthermore, *Relationship Marketing Theory* (Morgan & Hunt, 1994) places trust as the foundation of commitment and the desire to maintain relationships, so *trust* is expected to influence *customer loyalty* (H3), as found in Flip.id (Safitri et al., 2023) and LinkAja (Gusman & Dwita, 2025). When these two relationships occur simultaneously, *trust* acts as a connecting mechanism between experience and loyalty (H4): a good experience does not automatically make users loyal, but first builds confidence that the service is safe and reliable. The direct influence of *user experience* on *customer loyalty* (H1) can arise through convenience and habits that reduce the desire to switch (Flavián et al., 2006). The relationship between these variables is depicted in Figure 2.

From an Islamic economic perspective, trust in *e-wallets* is related to trustworthiness, as the balance is viewed as a deposit (*wadi'ah yad amanah*) that the service provider must safeguard (DSN-MUI, 2017). This dimension reinforces the argument that *trust* is not merely a technical assessment but also an ethical one, making strengthening trust a crucial part of building loyalty.

RESEARCH METHOD

This study uses a quantitative approach with a causal approach, aiming to analyze the influence of *user experience* on customer loyalty of the DANA *e-wallet* , with *trust* as an intervening variable among *Generation Z users* on Madura Island. The quantitative approach was chosen because it allows for empirical hypothesis testing using numerical data, allowing for objective and reliable measurement of relationships between variables (Damanik et al., 2025) . This quantitative approach supports the analysis of causal relationships between the variables that are the focus of the study.

The unit of analysis in this study is individual DANA *e-wallet users* belonging to the *Generation Z group* , namely those aged 17 to 28 years and have actively used the DANA *e-wallet* for at least the past three months. The focus of the analysis lies in user behavior and perceptions regarding the experience of using the application, trust in the platform, and loyalty to digital services. The selection of *Generation Z* as research subjects is based on their characteristics as a generation that grew up in the digital era (*digital natives*), so they tend to have high expectations for ease of access, security, and quality of interaction in using digital services.

The study population consisted of all DANA *e-wallet users* on Madura Island who met the inclusion criteria, including demographics such as age, gender, education, occupation, and active DANA *e-wallet user status* . The sample size was determined using the *Slovin formula*. (Antoro, 2024) with a population of



Generation Z in four districts on Madura Island (Sumenep, Pamekasan, Sampang, Bangakalan) of 904,574 people (BPS, 2025) and a margin of error of 10%, resulting in 100 respondents. The sampling technique used *purposive sampling* with the criteria of respondents domiciled on Madura Island, aged 17–28 years, and being DANA *e-wallet users* for at least three months. This approach allows the study to obtain a representative sample of the *Generation Z cohort* in the area that is the focus of the study, namely on Madura Island.

Data collection was conducted through a closed questionnaire compiled in *Google Form* and distributed online through social media, such as *WhatsApp* and *Instagram*. The questionnaire instrument measures independent, intervening, and dependent variables. *User experience* is measured through ease of use (Rodiah & Melati, 2020), interaction quality (Andria & Untoro, 2019), clarity of information structure (Afandi, 2006), quality of information presentation (Ameylda et al., 2025), and understanding of user needs (Putrianto et al., 2024); *trust* is measured through platform integrity (Mawih, 2025), service competence (Marie et al., 2023), platform goodwill (Wong, 2017) and transaction security (Nurrahma et al., 2025); Meanwhile, *customer loyalty* is measured through *repeat purchases* (Wiratama et al., 2026), *retention* (Haryono, 2025), and *referrals* (Mayo et al., 2023). All variables use a Likert scale of 1–5, with 1 = Strongly Disagree and 5 = Strongly Agree. The emphasis on the dimensions of *User Experience*, *trust*, and *customer loyalty* is adjusted to the characteristics of *Generation Z* to accurately capture their perceptions and behaviors.

Data analysis was conducted using variance-based Structural Equation Modeling (SEM) with the Partial Least Squares (PLS) method through SmartPLS 4 software. PLS-SEM was used because it is in accordance with the research objectives which are predictive and involve relationships between latent variables. The analysis was conducted through outer model evaluation to test the validity and reliability of the construct through outer loading, Average Variance Extracted (AVE), composite reliability (CR), Cronbach's alpha, Fornell-Larcker, heterotrait-monotrait ratio (HTMT), and cross loading, as well as inner model evaluation which includes VIF, coefficient of determination (R^2), effect size (f^2), and testing of direct and indirect effects. Significance testing was conducted using the bootstrapping technique for 5,000 subsamples, using a two-sided test at a significance level of 5% with the percentile bootstrap method (Setiabudhi et al., 2024).



RESULTS AND DISCUSSION

Respondent Characteristics

The questionnaire was distributed online via Google Form from April 8 to May 6, 2026. All respondents reported being DANA e-wallet users. Respondent profiles are presented in Table 1.

Table 1.
Respondent Profile

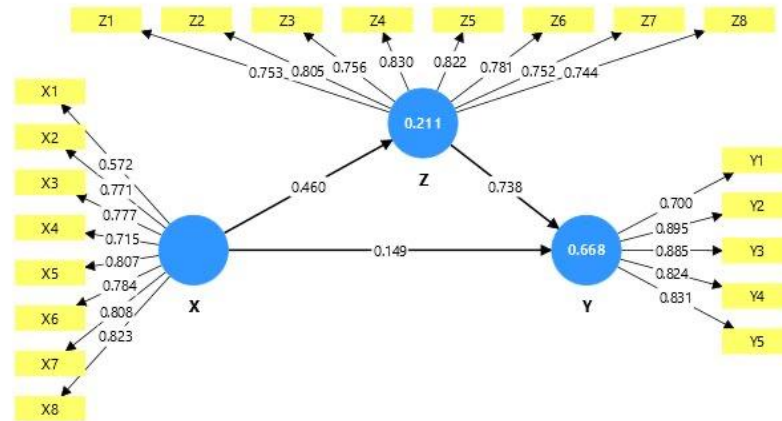
Profile	Amount	%
Gender		
Woman	56	56.0%
Man	44	44.0%
Age		
17-22 years	83	83.0%
23-28 years old	17	17.0%
Domicile		
Pamekasan	33	33.0%
Lacquer	25	25.0%
Bangkalan	23	23.0%
Sumenep	19	19.0%
Work		
Student	76	76.0%
Students	7	7.0%
Employee	6	6.0%
Entrepreneur/Self-	7	7.0%
Employed/Businessman/Pioneer		
Others (Assistant MUA, Assistant Lecturer, Midwife, Not Working)	4	4.0%
Length of time using DANA		
>6 Months	75	75.0%
3-6 Months	25	25.0%

Respondents were predominantly female (56.0%) and aged 17–22 (83.0%), with the majority working as students (76.0%). Regionally, respondents came from all four regencies on Madura Island, with the largest number coming from Pamekasan (33.0%) and Sampang (25.0%). All respondents had used DANA for at least three months, with the majority for more than six months (75.0%), so they generally had sufficient user experience to assess the app's quality,

trustworthiness, and loyalty. This profile aligns with the characteristics of Generation Z, the digital native cohort that is the focus of this study.

Evaluation of Measurement Model (Outer Model)

The results of the model estimation using the PLS-SEM Algorithm are shown in Figure 3, which contains the outer loading of each indicator, the path coefficient between constructs, and the R^2 value for the endogenous construct.



Description: X = User Experience; Z = Trust; Y = Customer Loyalty.

Source: SmartPLS 4 output (2026).

Outer loading is used to assess how strongly each indicator reflects the latent construct it measures (Hair et al., 2019). The results in Table 2 show that 19 of the 21 indicators have outer loadings above 0.70, with a range of 0.715 to 0.895. Indicator Y1 has a loading of 0.700 (0.6998), practically at the 0.70 limit, while indicator X1 has a loading of 0.572. Both are statistically significant in the bootstrapping results (Y1: $t = 6.324$; $p < 0.001$; X1: $t = 3.288$; $p = 0.001$). According to Hair et al. (2011), indicators with loadings of 0.40–0.70 are considered for removal only if the removal increases the AVE or composite reliability above the threshold. Since the AVE and CR of the User Experience and Customer Loyalty constructs already meet the criteria, X1 and Y1 are retained in the model.

Table 2.

Outer Loading, AVE, Cronbach's Alpha, and Composite Reliability

Constructs and Indicators	Loading (λ)	AVE	Alpha (α)	CR (ρ_c)
<i>User Experience (X)</i>				
X1	0.572	0.579	0.897	0.916
X2	0.771			
X3	0.777			
X4	0.715			



X5	0.807			
X6	0.784			
X7	0.808			
X8	0.823			
Trust (Z)				
Z1	0.753	0.610	0.908	0.926
Z2	0.805			
Z3	0.756			
Z4	0.830			
Z5	0.822			
Z6	0.781			
Z7	0.752			
Z8	0.744			
Customer Loyalty (Y)				
Y1	0.700	0.689	0.885	0.917
Y2	0.895			
Y3	0.885			
Y4	0.824			
Y5	0.831			

Convergent validity is strengthened by the AVE values of all constructs being above 0.50, namely User Experience 0.579, Trust 0.610, and Customer Loyalty 0.689 (Hair et al., 2019). The reliability test shows Cronbach's alpha values of 0.897 (X), 0.908 (Z), and 0.885 (Y), composite reliability (ρ_a) of 0.915 (X), 0.910 (Z), and 0.893 (Y), and composite reliability (ρ_c) of 0.916 (X), 0.926 (Z), and 0.917 (Y). All values exceed the limit of 0.70 so that the instrument is declared to have good internal consistency.

Discriminant validity was tested using the Fornell-Larcker, HTMT, and cross-loading criteria. In the Fornell-Larcker criteria (Table 3), the root of the AVE of User Experience (0.761) is greater than its correlation with Customer Loyalty (0.488) and Trust (0.460), and the root of the AVE of Customer Loyalty (0.830) is also greater than its correlation with Trust (0.806). However, the root of the AVE of Trust (0.781) is slightly smaller than the Trust–Customer Loyalty correlation (0.806) (Fornell & Larcker, 1981). The HTMT value between Trust and Customer Loyalty of 0.895 exceeds the conservative limit of 0.85 but is still below the limit of 0.90 (Henseler et al., 2015), while the HTMT of User Experience–Customer Loyalty (0.536) and User Experience–Trust (0.473) are far below both limits. Meanwhile, cross-loadings indicate that each indicator has



the highest value on the construct it measures. Thus, discriminant validity is met for User Experience, but only marginally for Trust and Customer Loyalty. Both constructs are conceptually closely related, so the path coefficients between them should be interpreted with caution.

Table 3.

Discriminant Validity (Fornell-Larcker Criterion)

Construct	X	Y	Z
User Experience (X)	0.761		
Customer Loyalty (Y)	0.488	0.830	
Trust (Z)	0.460	0.806	0.781

Multicollinearity tests showed that the indicator VIF values (outer VIF) ranged from 1.484 to 4.148, while the inter-construct VIFs (inner VIF) ranged from 1.000 to 1.268. All values were below 5, indicating no serious collinearity issues (Hair et al., 2019).

Structural Model Evaluation (Inner Model)

The evaluation of the structural model focused on the coefficient of determination (R^2), effect size (f^2), and the significance of the path coefficients. Based on Hair et al.'s (2019) criteria, R^2 values of 0.75, 0.50, and 0.25 are categorized as strong, moderate, and weak, respectively. Table 4 shows that the R^2 for Trust is 0.211 (adjusted R^2 0.203), meaning that User Experience explains 21.1% of the variation in Trust (weak category, below the 0.25 threshold), while 78.9% is influenced by other factors outside the model. The R^2 for Customer Loyalty is 0.668 (adjusted R^2 0.661), meaning that the combination of User Experience and Trust explains 66.8% of the variation in Customer Loyalty (moderate category), while 33.2% is influenced by other variables.

Table 4.

R- Square and Effect Size (f^2) Values

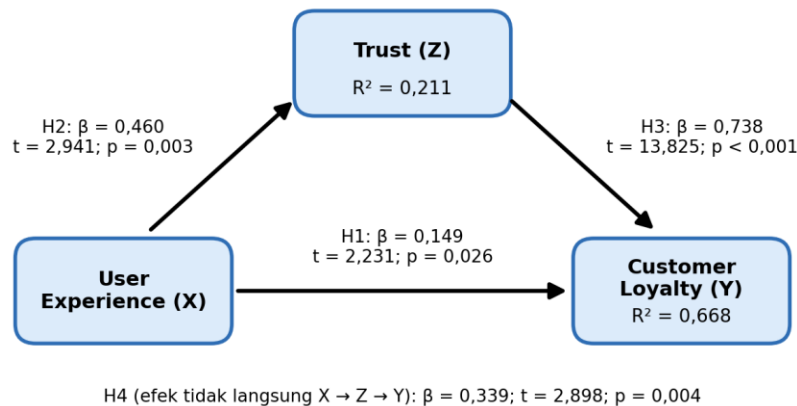
Variable/Path	R^2	R^2 Adjusted	f^2
Trust (Z)	0.211	0.203	
Customer Loyalty (Y)	0.668	0.661	
X → Y			0.053 (small)
X → Z			0.268 (moderate)
Z → Y			1,293 (large)

The f^2 value shows that the direct contribution of *User Experience* to *Customer Loyalty* is relatively small (0.053), the contribution of *User Experience* to *Trust* is moderate (0.268), and the contribution of *Trust* to *Customer Loyalty* is relatively large (0.268). is classified as very large (1.293). The model fit index produces SRMR 0.091, d_ULS 1.903, d_G 0.854, *chi-square* 424.424, and NFI 0.732. The SRMR value is slightly above the recommended limit of 0.08 (Hu & Bentler, 1999; Henseler et al., 2016) and the NFI is still below the 0.90 commonly used as a reference, so the model fit is considered marginal and the research results should be read as a predictive-exploratory analysis as is common in PLS-SEM.

Hypothesis Testing

Direct effect testing was performed using a two-tailed test at a 5% significance level. The hypothesis was accepted if the t-statistic value was greater than 1.96 and the p-value was less than 0.05. A 95% bootstrap percentile confidence interval (CSI) that did not include zero was used to check the robustness of the results (Hair et al., 2019; Setiabudhi et al., 2024). The test results are shown in Figure 4 and Table 5.

Figure 4
Results of Structural Model Testing (Bootstrapping)



Source: processed from SmartPLS 4 output (2026).



Table 5.
Results of the Direct Effect Test

Hypothesis	β	Std. Dev.	T. Statistics	P Value	Confidence Interval	Decision
H1: $X \rightarrow Y$	0.149	0.067	2,231	0.026	[-0.019; 0.246]	Accepted (weak)
H2: $X \rightarrow Z$	0.460	0.156	2,941	0.003	[0.215; 0.771]	Accepted
H3: $Z \rightarrow Y$	0.738	0.053	13,825	< 0.001	[0.636; 0.848]	Accepted

The results in Table 5 show that *User Experience* has a positive and significant effect on *Customer Loyalty* ($\beta = 0.149$; $t = 2.231$; $p = 0.026$), so H1 is accepted with caveats. However, the magnitude of the effect is small ($f^2 = 0.053$) and the 95% *bootstrap percentile confidence interval* [-0.019; 0.246] includes zero so the robustness check is not met. The t-test and confidence interval are therefore not fully aligned, and this evidence of a direct effect is weak and should be interpreted with caution. *User Experience* also has a positive and significant effect on *Trust* ($\beta = 0.460$; $t = 2.941$; $p = 0.003$), so H2 is accepted, and *Trust* has a positive and significant effect on *Customer Loyalty* ($\beta = 0.738$; $t = 13.825$; $p < 0.001$), so H3 is accepted.

The indirect effect (mediation) testing is presented in Table 6. The indirect effect of *User Experience* on *Customer Loyalty* through *Trust* is 0.339 and significant ($t = 2.898$; $p = 0.004$) with a 95% confidence interval [0.162; 0.585] that does not include zero, so H4 is accepted. The total effect of *User Experience* on *Customer Loyalty* is 0.488 ($t = 4.309$; $p < 0.001$). Because the direct and indirect effects are both significant and positive, *Trust* acts as a complementary partial mediator according to the approach of Zhao et al. (2010) and Nitzl et al. (2016). The *variance accounted for* (VAF) value of 69.5% indicates that approximately 70% of the total effect of *User Experience* on *Customer Loyalty* is channeled through *Trust*.



Table 6.

Results of the Indirect Effect and Total Effect Tests

Hypothesis	β	Std. Dev.	T. Statistics	P Value	Confidence Interval	Decision
H4: $X \rightarrow Z$ $\rightarrow Y$ (indirect)	0.339	0.117	2,898	0.004	[0.162; 0.585]	Accepted
$X \rightarrow Y$ (total effect)	0.488	0.113	4,309	< 0.001	[0.285; 0.715]	-

The Influence of User Experience on Customer Loyalty

The test results show that *User Experience* has a positive and significant effect on *Customer Loyalty* of DANA users in Generation Z on Madura Island ($\beta = 0.149$; $t = 2.231$; $p = 0.026$), so H1 is accepted. This finding is in line with Hanif (2019) and Sidiq et al. (2026) who reported that user experience influences the loyalty of digital service users, as well as with Feny and Rangkuti (2026) who placed *user experience* alongside *trust* as determinants of loyalty on *e-business platforms*. The better users assess the ease of navigation, interface design, and speed of the DANA system, the more likely they are to reuse the service, persist over competitors' offers, and recommend it to others.

However, this direct effect is relatively small ($f^2 = 0.053$) and the strength of the evidence is limited. The *percentile confidence interval narrowly encompasses zero*, and the *post-hoc* power for this path is only 43.9% at the 5% level, whereas SmartPLS output indicates that an effect of this magnitude would only be detected with 80% power in approximately 278 respondents (see Cohen, 1988). Therefore, H1 is more accurately read as a weak direct effect hovering around the significance threshold, while the total effect ($\beta = 0.488$) is much larger and operates primarily through *Trust*. This pattern is consistent with *Relationship Marketing Theory*, which views loyalty as being formed through long-term relationships based on trust and commitment (Morgan & Hunt, 1994). Flavián et al. (2006) also report that *usability* influences loyalty through satisfaction and trust, and Ningrum and Yudistria (2025) place quality of experience, trust, and satisfaction as a series of factors that shape *e-wallet user engagement and loyalty*.

Furthermore, respondents' *User Experience* scores were very high and relatively uniform (mean 4.27; standard deviation 0.56). This could be interpreted as indicating that Gen Z, as *digital natives*, views *interface quality* as a minimum standard, resulting in less differentiation in loyalty levels between users. This interpretation is conjectural and needs to be tested in further research.

**The Influence of User Experience on Trust**

User Experience was shown to have a positive and significant effect on *Trust* ($\beta = 0.460$; $t = 2.941$; $p = 0.003$) with a medium *effect size* ($f^2 = 0.268$), thus H2 was accepted. The better users rated the ease of navigation, interface design, system speed, and comfort of using DANA, the greater their trust in the service. This finding is consistent with Flavián et al. (2006) who showed that the usability of a platform increases consumer trust, with Isaura et al. (2023) who found that *fintech user trust* is influenced by user experience and perceived application security, and with Syafri and Ratnaningsih (2025) who reported that the quality of experience influences trust in *e-wallet services*. Within Mayer et al.'s (1995) trust framework, smooth, accurate, and understandable transactions serve as signals of the service provider's competence and integrity, which then makes users willing to hand over their funds and personal data.

Although significant, the R^2 for *Trust* was only 0.211 (weak category). This means that approximately 78.9% of the variation in trust is formed by factors outside the model. Factors worth considering in future research include perceptions of data security (Nurrahma et al., 2025), provider reputation, and service compliance with Sharia principles, considering that the use of electronic money is permitted as long as it is free from elements of usury, *gharar*, and *maysir* (DSN-MUI, 2017). For Muslim users in Madura, trust in *e-wallets* is not only technical but also reflects the values of trustworthiness, honesty, and transparency in safeguarding user funds and information (Rahmi et al., 2025).

The Influence of Trust on Customer Loyalty

Trust has a positive and significant effect on *Customer Loyalty* with the largest path coefficient in the model ($\beta = 0.738$; $t = 13.825$; $p < 0.001$) and a very large *effect size* ($f^2 = 1.293$), so H3 is accepted. Users who trust the security, integrity, and transparency of DANA tend to reuse the service, resist competitors' offers, and are willing to recommend it to others. These results are in line with studies on various digital financial platforms, namely Safitri et al. (2023) on Flip.id, Gusman and Dwita (2025) on LinkAja, Syafri and Ratnaningsih (2025) on *e-wallets*, and Agum et al. (2025) who position *e-trust* as a mediator in the formation of *e-loyalty*. More generally, these results support Chaudhuri and Holbrook (2001) who showed that brand trust drives loyalty, as well as *Relationship Marketing Theory* which places trust as the foundation of long-term relationships (Morgan & Hunt, 1994).

From an Islamic economic perspective, the balance stored in an *e-wallet* is viewed as a trust (*wadi'ah yad amanah*) that the service provider must safeguard



(DSN-MUI, 2017). Trust that user funds and information are managed responsibly and transparently therefore forms a strong basis for users' continued loyalty. However, the magnitude of this coefficient should be interpreted with caution. The high *Trust - Customer Loyalty correlation* (0.806) and greater than the square root of the *AVE of Trust* (0.781), as well as the HTMT of 0.895, indicate that the two are closely related, and data were collected from a single source at a time, thus magnifying the observed relationship. Furthermore, 17 out of 100 respondents provided identical answers to all items (12 respondents answered 5 and 5 respondents answered 4), which may reduce data variation.

The Mediation Role of *Trust* in the Influence of *User Experience* on *Customer Loyalty*

The indirect effect of *User Experience* on *Customer Loyalty* through *Trust* is significant ($\beta = 0.339$; $t = 2.898$; $p = 0.004$), thus H4 is accepted. Since both direct and indirect effects are significant and unidirectional, *Trust* acts as a complementary partial mediator with a VAF of 69.5% (Zhao et al., 2010; Nitzl et al., 2016). This confirms the idea proposed in the introduction that in the digital financial industry, which is full of security perception risks, trust is a link between experience evaluation and long-term user commitment. This finding is also in line with Agum et al. (2025) and Syafri and Ratnaningsih (2025), who emphasized the role of *e-trust* in linking digital service quality with loyalty in *e-wallet services*. A good experience on the DANA application contributes directly to loyalty, but the greatest impact occurs when the experience successfully builds confidence that the service is safe, honest, and reliable.

Based on the overall results, all four research hypotheses were accepted, with the caveat that the direct effect of *User Experience* on *Customer Loyalty* (H1) was weak and hovered around the significance limit. Theoretically, this study adds to the literature on digital consumer behavior in a non-urban context by demonstrating that for Generation Z on Madura Island, the experiential pathway to loyalty is primarily through trust. Practically, *e-wallet providers* like DANA should view interface improvements and system speed as an initial investment that must be followed by strengthening trust, for example through transaction and data security, transparency of fees and promotions, and clarity in complaint handling and user fund management in accordance with the principle of trustworthiness. Investing solely in appearance is not enough to build long-term loyalty.

The results of this study need to be generalized with caution. The sample consisted of 100 respondents from Madura Island, determined using the Slovin formula at a 10% error rate and selected using a *purposive sampling technique*.



Respondents were predominantly aged 17–22 years (83.0%) and students (76.0%). The data were *cross-sectional* and based on self-perception. The discriminant validity between *Trust* and *Customer Loyalty* was only marginally met; the model fit was marginal (SRMR = 0.091), and one *User Experience indicator* (X1) had a *loading* below 0.70. The power of the direct path $X \rightarrow Y$ was also inadequate with this sample. Future research is recommended to increase the sample size, compare urban and non-urban areas, and include other variables such as satisfaction, perceived security, and religiosity.

CONCLUSION

This study concludes that User Experience has a positive and significant effect on Trust ($\beta = 0.460$; $p = 0.003$) and Customer Loyalty ($\beta = 0.149$; $p = 0.026$) among Generation Z DANA e-wallet users on Madura Island, although its direct effect on loyalty is weak. Trust has a positive and significant effect on Customer Loyalty ($\beta = 0.738$; $p < 0.001$) and acts as a partial mediator (indirect effect $\beta = 0.339$; $p = 0.004$; VAF 69.5%), thus all four hypotheses are accepted. Practically, e-wallet providers need to combine interface improvements and system speed with strengthening trust through security, transparency, and trustworthy fund management. Future research is recommended to expand the sample, compare urban and non-urban areas, and include variables such as satisfaction, perceived security, and religiosity.

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