

Gamification as a Strategy to Boost Hedonic and Utilitarian Value for Increased User Satisfaction and Loyalty with a PLS-SEM Approach

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Abstract

The electronic wallet market in Indonesia is growing rapidly, yet the primary challenge remains low user loyalty due to intense market competition and the tendency of users to switch applications for promotions. This study explores how gamification features build user loyalty by generating utilitarian and hedonic values that drive user satisfaction. Through a quantitative approach, this research employs Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze the experiences of 170 active digital wallet users, selected via purposive sampling. The findings reveal a strong positive relationship between gamification and the formation of both hedonic ($t = 18.214$) and utilitarian ($t = 19.328$) values. This shows that users perceive game elements not only as entertainment but also as providing clear functional benefits. Furthermore, both values are proven to mediate the influence of gamification on user satisfaction, with hedonic value found to have a more dominant role in shaping satisfaction compared to utilitarian value. Ultimately, user satisfaction acts as a primary predictor of loyalty ($t = 25.130$), explaining 58.4% of its variance. This study concludes that a gamification strategy that balances functional aspects with emotional enjoyment is highly effective in enhancing long-term user retention.

Keywords- Gamification, Utilitarian value, Hedonic value, Satisfaction, Loyalty.

1. Introduction

Digital wallets (e-wallets) have systematically replaced cash-based transactions by digitizing traditional financial services. Digital wallets facilitate a wide array of financial activities, encompassing merchant payments and seamless fund transfers, credit purchases, and bill payments quickly, practically, and relatively safely using only a device and an internet connection. Indonesia's e-wallet market has expanded swiftly, with platforms like DANA, OVO, and GoPay, locked in intense competition to retain their active user bases (Dash, 2023). This growth is supported by high internet and smartphone penetration,

government policies related to the national non-cash movement, and the evolving consumption patterns of users who are increasingly habituated to virtual financial activities (Prasetyaningrum et al., 2024).

However, despite the high initial adoption rate, one of the biggest challenges for the e-wallet industry is building and maintaining user loyalty. Several studies have shown that while the number of e-wallet users is increasing, their behavior tends to be price-sensitive, they easily switch apps due to promotions, and they have not yet demonstrated strong long-term loyalty (Gusmao et al., 2025). In Indonesia, the digital market tends to be heavily influenced by discount promotions, cashback, and free shipping, so consumers easily switch platforms when incentives diminish. This makes loyalty a strategic issue for companies, not just focusing on acquiring new users but also considering how to retain existing users through valuable and sustainable experiences (Yang et al., 2023).

Previous studies have identified several determinants of e-wallet loyalty, including e-service quality, perceived ease of use, trust, security, and user satisfaction. Research on OVO, DANA, and other e-wallet users shows that service quality and navigational ease enhances gratification, which directly translates into robust user retention. In some studies, the extent to which ease of use directly drives and trust on loyalty is not always significant, but the satisfaction variable plays a very important mediator in shaping loyalty. This means that a consistent and satisfying positive experience is key for users to continue using an e-wallet and not switch to competitors (Bi et al., 2024).

Similar findings were also seen in research in the e-commerce sector in Indonesia. A study on gamification affordances among e-commerce users found that gamification affordances (especially task / quest types) the optimization of emotional and functional value significantly catalyzed customer fulfillment, which in turn solidified long-term loyalty (Gandasari & Mauritsius, 2023). Gamification not only provides fun, enjoyment, but also utilitarian benefits such as financial incentives and a sense of efficiency, thus producing a double positive effect on user experience. Gamification has been shown to have an indirect influence on cultivating user commitment through the enhancement of pleasure-based and instrumental values, leading to superior fulfillment. This suggests that well-designed Gamified systems act as a strategic catalyst to bolster user retention amidst a saturated and competitive marketplace (Nisar & Whitehead, 2016).

Theoretically, the sequential relationship where gamification affordances act as catalysts for heightened perceived values, which in turn propel user satisfaction and robust loyalty can be explained through several frameworks (Aydinliyurt et al., 2021). First, the value approach emphasizes that consumer decisions and behavior are strongly influenced by their perceived value, both functional (utilitarian) and emotional/hedonic value. When gamification is able to provide both enjoyment and practical benefits, users tend to evaluate the experience positively and develop higher satisfaction. Second, the uses and gratifications theory states that consumers utilize media/technology to fulfill both utilitarian (efficiency, information) and hedonic (entertainment, relaxation) needs. Gamification in e-wallets provides a means of fulfilling both types of needs simultaneously. Third, studies on loyalty show that satisfaction is a key mediator that acts as a mediating link between service excellence and perceived reliability, perceived enjoyment, and other factors on loyalty (Bi et al., 2024). Within this framework, gamification is seen as one of the antecedents that acts as an antecedent to hedonic and utilitarian values, triggering a developmental chain that leads to customer contentment and culminates in solidified loyalty.

To untangle these direct and indirect relationships, this study uses Partial Least Squares Structural Equation Modeling (PLS-SEM) (Misara et al., 2025). This method is widely used in e-wallet, e-commerce, and gamification research because it is able to handle moderate sample sizes, data

distributions that do not have to be normal, and predictive models. With PLS-SEM, it can be tested how much influence gamification has on hedonic and utilitarian values, how these two values affect satisfaction, and the extent to which satisfaction and these values contribute to e-wallet user loyalty (Prasetyaningrum et al., 2024).

Thus, the urgency of research on the development of a gamification model for e-wallet user loyalty through the mechanism functions of hedonic and utilitarian dimensions, alongside the construct of satisfaction supported by industry competitive conditions, previous empirical findings, and the existence of open research gaps in the current literature. By synthesizing this background information, the study delineates its primary goals and structural model, providing a clear roadmap for the empirical evaluation using PLS-SEM that follows.

Despite the extensive literature on initial e-wallet adoption, there is a significant gap in understanding post-adoption switching behavior. This study is needed to explain how gamified retention strategies prevent users from abandoning the app once promotions end. The subsequent sections of this article are organized to provide a systematic overview of the research. Section 2 delineates the theoretical framework and hypothesis development. Section 3 details the methodological approach, including sampling and measurement scales. Section 4 presents the empirical results and discussion, while Section 5 concludes the study with theoretical contributions, managerial implications, and future research directions.

2. Theoretical Foundation

Recent studies in the domain of e-wallet services (e.g., Seng & Hee, 2021; Tabaeian et al., 2024) have predominantly focused on service quality and initial adoption. However, our literature survey indicates a scarcity of empirical research addressing how gamification directly bridges the transition from initial adoption to continuous loyalty through dual-value mediation (hedonic and utilitarian). This study fills this void by mapping these interrelations within the Indonesian market context.

To strengthen the conceptual model and elucidate the underlying causal mechanisms, this study integrates Uses and Gratifications Theory (UGT) and Technology Continuance Theory (TCT). UGT (Katz et al., 1973) explains the *formation of value*: gamified mechanics act as interactive stimuli that actively fulfill users' intrinsic/emotional needs (Hedonic Value) via playfulness, and extrinsic/goal-oriented needs (Utilitarian Value) via tangible financial rewards.

To justify how these perceived values translate into long-term retention, this study draws upon TCT (Bhattacharjee, 2001; Liao et al., 2009). While UGT clarifies *why* users engage, TCT provides the *behavioral link*: when these gamification-derived gratifications meet user expectations, they foster a profound sense of Satisfaction. Consequently, this satisfaction mitigates post-adoption switching behavior, crystallizing into sustained Loyalty. Together, integrating UGT and TCT provides a robust causal pathway linking gamified stimuli to post-adoption behaviors.

2.1 Gamification in Digital Services and E-Wallets

In non-recreational domains, gamification acts as a framework that adapts game-based incentives to optimize task performance and user satisfaction, designed to stimulate targeted behaviors and optimize user engagement through competitive and achievement-oriented features. In digital platforms, incorporating game mechanics has proven effective in driving user engagement and platform loyalty (Nisar & Whitehead, 2016).

In gamified loyalty programs in the hotel industry, gamification increases perceived playfulness and reward satisfaction, thereby increasing hedonic and utilitarian values, ultimately increasing customer engagement behavior (Fayola et al., 2024). In Indonesian e-commerce, the affordance of engaging in gamified quests substantially elevates both the pragmatic and hedonic appraisals of the platform, which serves to drive user satisfaction and sustainable loyalty (Valencia & Layman, 2021).

In the electronic wallet realm, research on DANA users shows that gamification programs foster multifaceted values—hedonic, utilitarian, and social—to amplify customer contentment and brand loyalty. Another study on mobile wallets in developing countries found that the strategic integration of game mechanics significantly shapes the user's perception of operational simplicity and attitudes, which then drive continuance intention (Behl & Pereira, 2021).

In this study, gamification is positioned as an exogenous construct that influences hedonic and utilitarian values, and indirectly influences satisfaction and loyalty.

H1: Gamification demonstrates a substantial positive effect on Hedonic value.

H2: Gamification demonstrates a substantial positive effect on Utilitarian value.

2.2 Affective Experience: The Hedonic Perspective

Essentially, hedonic value is the perceived enjoyment and entertainment that a user derives from engaging with a platform's features, entertainment, positive emotions, and pleasurable sensations when using a service or participating in a particular activity. In the realm of gamification, hedonic value arises from elements such as the excitement of play, challenges, a sense of accomplishment, and a playful atmosphere that make the experience enjoyable (Gandasari & Mauritsius, 2023).

Another study examining hedonic and utilitarian value in gamification found that hedonic value is more powerful in changing customer behavior than utilitarian value, particularly in strengthening brand loyalty and encouraging positive word-of-mouth (Nisar & Whitehead, 2016). Thus, theoretically and empirically, hedonic value is positioned as an important determinant concerning satisfaction levels and brand devotion across gamified service platforms.

H3: Hedonic value exerts a significant positive influence satisfaction.

2.3 Functional Utility: The Utilitarian Perspective

Utilitarian value relates to the functional, practical, and economic benefits gained by users, such as time efficiency, ease of transactions, ease of navigation, and financial benefits (discounts, cashback, prizes). In gamification, utilitarian value emerges when game-like features are not only entertaining but also provide tangible benefits, such as accumulating redeemable points, missions that yield financial rewards, or mechanisms that facilitate the achievement of user goals (Chen et al., 2023).

In financial apps, the utilitarian value of gamified features (point, rewards, leaderboards, and badges) increases confirmation and engagement, resulting in elevated brand loyalty and the synergistic co-creation of value (Singh & Milan, 2025). This suggests that the role of utilitarian value in loyalty is often indirect through satisfaction.

H4: Utilitarian value exerts a significant positive influence satisfaction.

2.4 Analysis of User Satisfaction

In digital technology and service models, satisfaction often acts as a key mediator, bridging the influence of various antecedents (service quality, perceived value, enjoyment, convenience, security, gamification) on loyalty and continuance intention (Ngo et al., 2025).

In broader studies on gamification, satisfaction consistently emerges as a strong predictor of continuance intention, engagement, and loyalty. Similarly, in mobile wallets, the satisfaction construct within the Technology Continuance Theory (TCT) framework has been shown to be a key determinant of attitudes and continuance intentions, while gamification contributes to attitudes and perceived convenience, which drive these intentions (Loh et al., 2022). Based on this, satisfaction in this study is positioned as a central mediator between hedonic and utilitarian values (triggered by gamification) and e-wallet user loyalty.

H5: Satisfaction exerts a significant positive influence loyalty.

2.5 Evaluation of Levels of Patron Loyalty

Loyalty crosses the digital wallet sector represents the conceptual framework of a user's commitment to consistently use a particular digital wallet in the coming years, a preference for that e-wallet over competitors, and a willingness to recommend it to others. Various studies across contexts (e-wallets, e-commerce, hospitality, financial apps, mobile payments) show that loyalty is influenced by a combination of cognitive (trust, service quality, convenience, utilitarian value), affective (hedonic value, enjoyment, brand love), and evaluative (satisfaction, confirmation) factors (Valencia & Layman, 2021).

Research that explicitly examines the gamification pathway, hedonic/utilitarian benefits, indicating that these benefits facilitate the link between gamification and loyalty, with reward satisfaction further intensifying this effect (Fayola et al., 2024). This study highlights that against the backdrop of gamified digital services, loyalty is formed primarily through the gamification → value (hedonic & utilitarian) → satisfaction → loyalty pathway. To provide a clear structural overview, **Figure 1** presents the conceptual model formulated through the integration of previous studies.

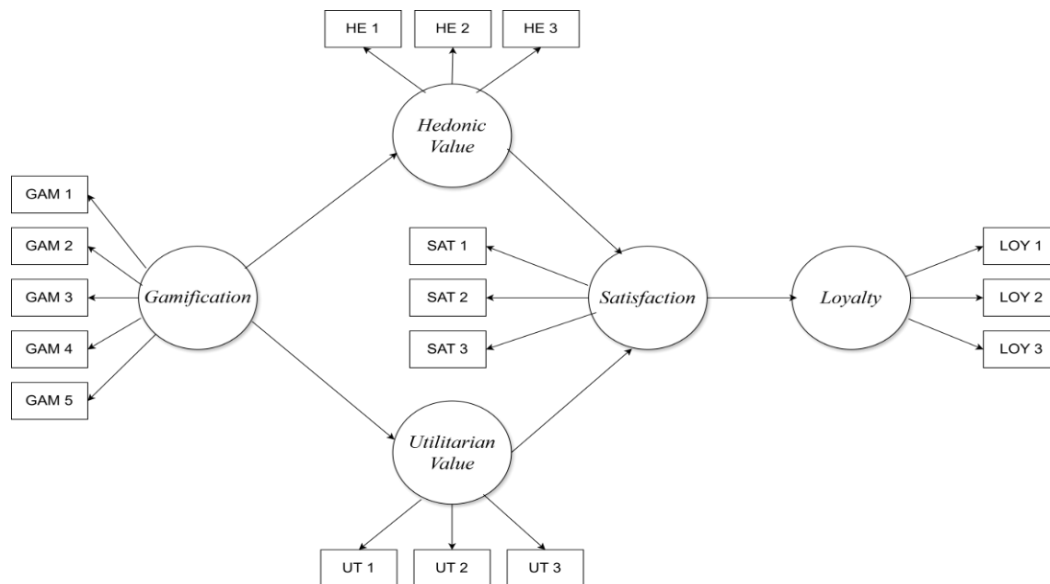


Figure 1. The dual-value mediation model.

3. Methodological Framework

This study utilized a non-probability purposive sampling technique, targeting individuals across Indonesia who have actively interacted with gamified features in major e-wallets (DANA, OVO, GoPay, ShopeePay and LinkAja). The gamification construct in this study specifically focuses on elements prevalent in Indonesian e-wallets, such as daily missions, points accumulation, mystery boxes, and leaderboards. All measurement items were adapted from validated instruments in prior research: Gamification from Bitrián et al. (2021), Perceived value from Nisar & Whitehead (2016), and Satisfaction/Loyalty from Loh et al. (2021). The model consists of 17 indicators; each measured on a five-point Likert scale.

3.1 Research Approach and Design

This research utilizes a quantitative approach design because it focuses on testing the hypothesized links among the latent variables through numerical data processed using inferential statistical techniques (Hasan, 2024). We selected a quantitative approach to objectively test the hypothesized causal relationships within our structural model (Mayukh & Al-Giffari, 2023).

In terms of objectives, this research is explanatory, explaining the causal influence between variables (gamification, hedonic value, utilitarian value, satisfaction, and loyalty) within a single structural model. The gamification construct in this study specifically focuses on elements prevalent in Indonesian e-wallets, such as daily missions, points accumulation, mystery boxes, and leaderboards. These elements are reflected in the measurement items (GAM1-GAM5), which evaluate the users' perception of these specific features.

This study employs a cross-sectional design to capture user perceptions and behavioral data at a single point in time (Mellinger & Hanson, 2021). Survey designs are commonly used in social and business research that seeks to measure latent constructs such as attitudes, perceptions, satisfaction, and loyalty through structured questionnaires. Surveys allow researchers to acquire a statistically significant sample and produce findings that can be generalized to the population, provided the sampling procedure is carried out appropriately (Mweshi & Sakyi, 2020).

3.2 Population and Sample

The target population comprises the entirety of e-wallet users (e.g. DANA, OVO, GoPay, ShopeePay and LinkAja) who have used features or programs containing gamification elements (missions, points, prizes, games, etc.). In SEM research, selecting an adequate sample is crucial for stable and reliable parameter estimates. PLS-SEM is considered more flexible with small to medium sample sizes and is often recommended when the model is complex and the data is potentially non-normal. Following standard PLS-SEM guidelines, the minimum sample size was determined using the "rule of ten" criterion, which suggests a threshold of ten observations for each indicator associated with the most complex construct (Chinnaraju, 2025).

In this research model, there are a total of 17 indicators consisting of (Gamification has five indicators, Utilitarian Value has three indicators, Hedonic Value has three indicators, Satisfaction has three indicators, and Loyalty has three indicators). Using the upper limit assumption (multiplied by 10) to minimize sampling error, the minimum sample calculation is 170 samples (Hair et al., 2021). A standardized survey instrument served as the predominant instrument for empirical data gathering. The questionnaire allowed for the measurement of latent constructs (gamification, hedonic value, utilitarian value, satisfaction, and loyalty) through numerically coded statements based on a five-point Likert interval (Mweshi & Sakyi, 2020). Data collection is conducted online (using Google Forms or similar platforms) to reach a wider geographically dispersed e-wallet user base accustomed to digital transactions.

Online survey methods are becoming increasingly common in social and business research due to their efficiency and relatively rapid data collection (Mellinger & Hanson, 2021).

4. Results and Discussions

4.1 PLS SEM Outer Loadings

The examination of the measurement model, as presented in **Figure 2**, consistent with recommended standards, all item loadings achieved values above 0.70, ensuring the robustness of the measurement model, thereby establishing satisfactory convergent validity. This observation conforms to the recognized empirical benchmarks within the PLS-SEM literature, which posit that loadings above 0.70 demonstrates tight couplings between indicators and their pertinent variables (Okoye et al., 2024).

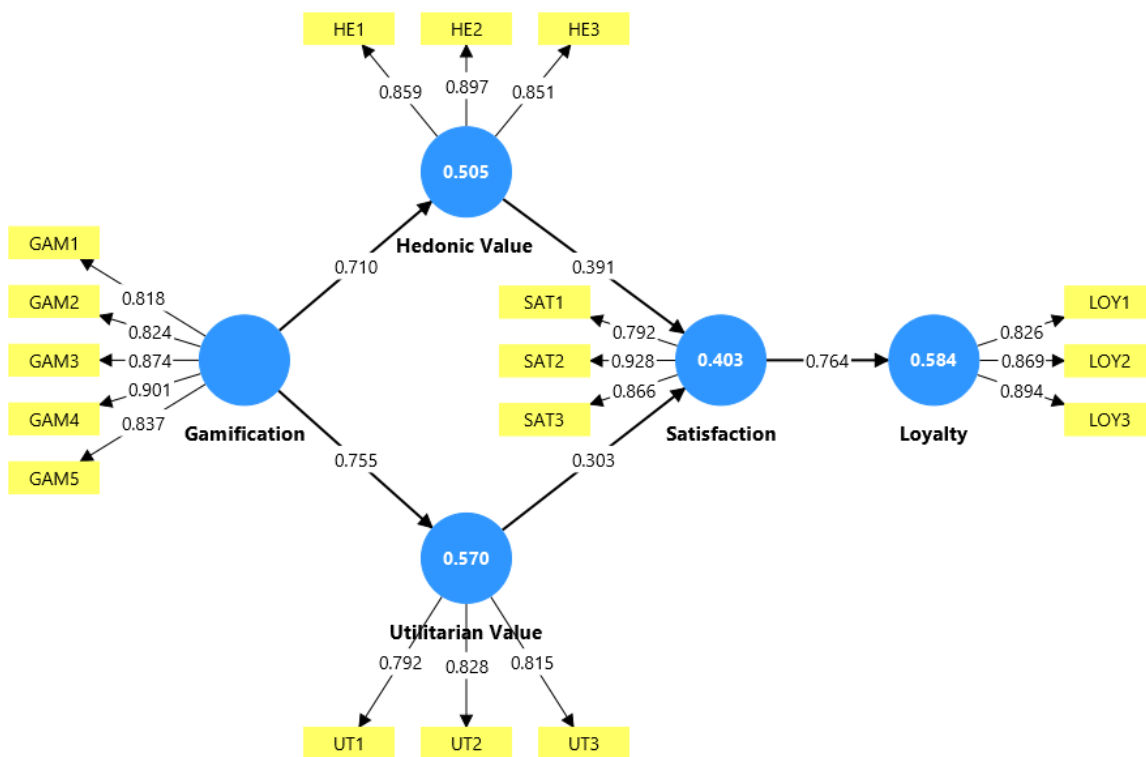


Figure 2. PLS-SEM result.

Furthermore, the robustness of the outer loadings is consistent with prior research in gamified digital services; for instances (Bitrián et al., 2021) reported similarly high loadings for gamification affordance and perceived value constructs in their study of Fitbit app on US users. The robust reliability of the reflective indicators ensures that the chosen measurement items accurately manifest the underlying theoretical constructs, thereby establishing a rigorous basis for the ensuing structural analysis.

4.2 PLS SEM Construct Validity and Reliability

The evaluation of the psychometric properties of the constructs, summarized in **Table 1**, all latent constructs in the current model demonstrate sufficient reliability and validity, fulfilling the necessary empirical benchmarks. Gamification ($\alpha = 0.905$, $CR = 0.929$), Hedonic value ($\alpha = 0.838$, $CR = 0.903$), Utilitarian value ($\alpha = 0.742$, $CR = 0.853$), Satisfaction ($\alpha = 0.827$, $CR = 0.898$), and Loyalty ($\alpha = 0.832$,

$CR = 0.898$), all constructs surpassed the recommended 0.70 threshold, demonstrating robust internal consistency. These outcomes satisfy the standard PLS-SEM benchmarks and mirror recent empirical evaluations of digital services, which have similarly reported robust reliability and validity metrics for constructs related to perceived value, satisfaction, and loyalty (Bitrián et al., 2021; Tabaeian et al., 2024). Having established strong psychometric properties for the measurement parameters, a solid foundation is laid for evaluating and verifying the hypothesized structural paths.

Table 1. Measurement model quality criteria.

Measurement domain	Cronbach's alpha (α)	Composite reliability (CR)	Average variance extracted (AVE)
Gamification	0.905	0.929	0.725
Hedonic Value	0.838	0.903	0.756
Loyalty	0.832	0.898	0.745
Satisfaction	0.827	0.898	0.746
Utilitarian Value	0.742	0.853	0.659

4.3 Explanation of Variance

The examination of the variance explained (R^2) for the endogenous constructs, summarized in **Table 2**, indicates that the exogenous constructs account for a considerable amount of variance in the endogenous factors. The proposed structural model explains 58.4% of the variance in consumer loyalty ($R^2 = 0.584$), illustrating that the predictors possess a moderate to strong explanatory grip, indicating a strong explanatory power for user loyalty within the gamified e-wallet context. This observation mirrors existing literature concerning the impact and application of gamification, such as (Bitrián et al., 2021), which likewise established the strong predictive link the mechanism through which perceived value and satisfaction engender loyalty intentions in mobile-centric settings.

Furthermore, Hedonic Value ($R^2 = 0.505$) and Utilitarian Value ($R^2 = 0.570$) are moderately explained by Gamification, aligning with findings by Al-Okaily (2025) that gamification elements significantly shape both experiential and functional user perceptions. The explained variance of Satisfaction ($R^2 = 0.403$) suggests that while hedonic and utilitarian values are important predictors, other exogenous factors omitted from this model may also exert a substantial influence on influence user satisfaction, a nuance often observed in complex service experience models (Razami & Ibrahim, 2022). Overall, the R^2 values verify the overall model fit and suitability in capturing the key relational pathways and support the theoretical framework linking gamification to loyalty through value creation and satisfaction.

The structural model graph and the R^2 values demonstrate that while utilitarian value provides the baseline functional necessity for retention, it is the hedonic value that serves as the dominant driver in maximizing overall user satisfaction and long-term loyalty.

Table 2. Analysis of variance and model robustness.

Target construct	Variance explained	Predictive accuracy
Hedonic Value	0.505	0.502
Loyalty	0.584	0.581
Satisfaction	0.403	0.396
Utilitarian Value	0.570	0.568

4.4 Multicollinearity and Measurement Integrity

To address potential Common Method Bias (CMB) and multicollinearity, a full collinearity assessment was conducted. As illustrated in **Table 3**, all Variance Inflation Factor (VIF) values range from 1.331 to

3.750. Since these values are well below the threshold of 5.0, it can be concluded that the study is free from critical multicollinearity issues and systematic bias from the single-source instrument.

These results resonate with extant literature at the intersection of digital service delivery and gamified design, which consistently highlights how interactive rewards can significantly bolster the perceived benefits and desirability of a platform. The observed outcomes parallel previous investigations into the dynamics of digital services and gamification, as reported by Chen et al. (2023), where similar VIF values also support the stability of parameter estimates in the PLS-SEM framework. Consequently, the structural analysis exhibits sufficient independence between constructs, as multicollinearity is not an issue, establishing a reliable basis for the subsequent interpretation of the hypothesized structural relationships.

Table 3. Variance inflation factor.

Indicators	VIF	Indicators	VIF
GAM1	2.500	SAT1	1.566
GAM2	2.706	SAT2	3.750
GAM3	2.933	SAT3	2.987
GAM4	3.730	LOY1	1.427
GAM5	2.731	LOY2	3.253
HE1	2.084	LOY3	3.462
HE2	2.352	-	-
HE3	1.747	-	-
UT1	1.331	-	-
UT2	1.700	-	-
UT3	1.583	-	-

4.5 Path Coefficient

The statistical parameters for each structural path, encapsulated in **Table 4** highlight that each hypothesized link is empirically robust and statistically significant ($p < 0.05$). Crucially, gamification significantly improves both hedonic value ($t = 18.214$) and utilitarian value ($t = 19.328$), indicating its dual role in shaping user perception. Furthermore, both hedonic value ($t = 4.701$) and utilitarian value ($t = 3.085$) significantly and positively influence user satisfaction, which in turn exhibits a substantial direct effect on loyalty ($t = 25.130$).

The current outcomes resonate with earlier empirical evidence gamification research in digital services, such as the work of Tabaeian et al. (2024) in e-commerce, which similarly established gamification as a significant antecedent of perceived value, while simultaneously confirming that satisfaction acts as a pivotal outcome that reinforces user commitment within the digital ecosystem as a critical mediator leading to loyalty. The confirmation of all direct paths reinforces the robustness of the proposed value–satisfaction–loyalty framework within the gamified e-wallet context.

Table 4. Path analysis results.

Hypothesis	Relationship	Standard error of mean	T-statistic	P-Value	Decision
H1	Gamification → Hedonic Value	0.039	18.214	0.000	Supported
H2	Gamification → Utilitarian Value	0.039	19.328	0.000	Supported
H3	Hedonic Value → Satisfaction	0.083	4.701	0.000	Supported
H4	Utilitarian Value → Satisfaction	0.098	3.085	0.000	Supported
H5	Satisfaction → Loyalty	0.030	25.130	0.000	Supported

4.6 Discussions

The empirical results provide a deeper interpretation of user behavior in the competitive Indonesian e-wallet market. First, extending the work of Prasetyaningrum et al. (2024), we found that gamification is not merely an entertainment gimmick; users actively calculate the tangible financial utility of game mechanics, aligning with Uses and Gratifications Theory (UGT). Second, contrary to traditional fintech literature emphasizing utilitarian dominance (e.g., Seng & Hee, 2021), our findings indicate a paradigm shift: because basic utilitarian features (e.g., QRIS, fast transfers) are now highly standardized, Hedonic Value has become the primary differentiator elevating user satisfaction. Finally, while satisfaction strongly predicts loyalty (Liao et al., 2009), juxtaposing our model with Tabaeian et al. (2024) reveals that satisfaction mediated by the hedonic joy of gamification builds a far more resilient loyalty against competitors' aggressive promotional strategies than purely utilitarian incentives.

5. Concluding Remarks and Future Perspectives

5.1 Conclusion

This study confirms that gamification serves as a considerable antecedent in molding the nature of dual-value perceptions (hedonic and utilitarian) among e-wallet users in Indonesia. The PLS-SEM analysis reveal that gamification yields strong positive effects on hedonic and utilitarian value, which subsequently serve as catalysts for significantly enhances user satisfaction. The novelty of this study lies in its empirical validation that gamification must concurrently satisfy both hedonic and utilitarian needs to foster true loyalty, moving beyond the traditional view of gamification as merely an entertainment feature.

Furthermore, satisfaction acts as a powerful mediator. It fully mediates the impact of utilitarian value and substantially mediates hedonic value, ultimately driving user loyalty. The empirical evidence authenticates the proposed mechanism through which value–satisfaction–loyalty framework and highlight the dual utility of gamification as a strategic retention mechanism that simultaneously enriches emotional and functional user experiences. The growing body of literature on the intersection of gamified digital services by clarifying the hierarchical pathways through which gamification fosters sustained loyalty, offering both theoretical refinement and actionable insights for practitioners in competitive fintech environments.

5.2 Theoretical Contributions

This study advances the evolving discourse on gamification in digital services by shifting the theoretical focus from initial adoption to post-adoption retention. Unlike prior studies that primarily treat gamification merely as an early engagement tool, this research integrates Uses and Gratifications Theory (UGT) and Technology Continuance Theory (TCT) to empirically validate a dual-value mediation model within the Indonesian e-wallet context. The findings confirm and refine theoretical assertions by Bitrián et al. (2021), proving that gamification serves as a potent antecedent that simultaneously caters to users' intrinsic emotional needs (hedonic) and extrinsic functional needs (utilitarian), thereby significantly enhancing overall service evaluation.

Furthermore, this research uniquely delineates the distinct mediating pathways through which these values operate in a mature fintech market. While prior studies (e.g., Högberg et al., 2019) have often treated hedonic and utilitarian values as parallel drivers, our results reveal a paradigm shift: hedonic value exerts a more pronounced role in fostering loyalty via satisfaction. By situating satisfaction as the central nexus that effectively bridges both perceived values into loyalty, this study clarifies the hierarchical mechanism postulated in value-based loyalty theories (Dzandu et al., 2022) and TCT. Consequently, it offers a more nuanced theoretical model explicating how gamification, as a strategic design intervention,

cascades through experiential and practical valuations to cultivate sustained user allegiance and prevent brand-switching in highly competitive, promotion-driven environments.

5.3 Managerial Implications

From a managerial standpoint, the findings underscore that transcends being a mere superficial engagement tool but a strategic lever capable of simultaneously amplifying both hedonic and utilitarian value perceptions, which in turn foster heightened levels of satisfaction and long-term loyalty among e-wallet users. This aligns with the findings of Bitrián et al. (2021) and Högberg et al. (2019) which similarly highlighted the dual impact of gamification on experiential and functional values.

Specifically, managers should prioritize designing gamified features that balance entertainment elements, such as challenges, surprises, and playful interactions with clear utilitarian rewards like cashback, points, and transaction efficiency. Given the strong mediating role of satisfaction, e-wallet providers should implement 'Progressive Reward Systems' where the difficulty of missions' scales with user expertise, maintaining a flow state that boosts hedonic value. Furthermore, to enhance utilitarian appeal, points earned through games should be seamlessly convertible into direct transaction offsets (cash-back), creating a tangible link between entertainment and financial benefit.

Furthermore, the pronounced effect of hedonic value on loyalty suggests that fostering emotional connection and enjoyment can be more effective in sustaining long-term loyalty than purely incentive-driven campaigns. Therefore, adopting a value-centric gamification framework, one that integrates emotional engagement with tangible benefits, can help e-wallet platforms differentiate themselves in a competitive market, enhance user retention, and transform transactional interactions into immersive, loyalty-building experiences.

5.4 Limitations and Future Directions

While these results provide a solid foundation, several limitations that provide a foundation for further scholarly inquiry. Firstly, as this study employs a cross-sectional approach, any inferences regarding causality must be interpreted with caution, as the temporal order of variables cannot be observed. Consequently, longitudinal approaches are recommended for future research to better capture the dynamic evolution of gamification's impact on user loyalty. Second, the age distribution of the sample is heavily weighted toward younger e-wallet users in Indonesia e-wallet users in Indonesia, shaping the boundaries the external validity of the scope for implementing these results in older demographics or different cultural ecosystems.

Future studies could replicate the model in different geographical territories and generational contexts to enhance external validity. Thirdly, while the model integrates hedonic and utilitarian values as mediators, other potential variables, such as social influence, perceived risk, or specific gamification mechanics (e.g., points, badges, leaderboards), were not examined; Assimilating these constructs could provide a more nuanced insight into the gamification-loyalty pathway.

Furthermore, because our empirical data relies on self-reported surveys, the findings may be subject to common method bias, employing mixed-methods or experimental designs could strengthen the consistency of the results. Finally, the research focused on gamification in general; Subsequent studies might investigate how different gamification designs (e.g., competitive vs. cooperative elements) differentially impact perceived value and loyalty. Addressing these limitations in future work would deepen both theoretical and practical insights into gamified digital services.

Conflicts of Interest

The authors confirm that there is no conflict of interest to declare for this publication.

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AI Disclosure

During the preparation of this manuscript, the authors utilized generative AI technology solely to assist with language translation, proofreading, and improving the readability of the English text. After using the tool, the authors rigorously reviewed, edited, and validated all content. The authors take full and complete responsibility for the final content, original ideas, and findings presented in this publication.

References

- Aydınlıyurt, E.T., Taşkın, N., Scahill, S., & Toker, A. (2021). Continuance intention in gamified mobile applications: a study of behavioral inhibition and activation systems. *International Journal of Information Management*, 61, 102414. <https://doi.org/10.1016/j.ijinfomgt.2021.102414>
- Behl, A., & Pereira, V. (2021). What's behind a scratch card? Designing a mobile application using gamification to study customer loyalty: an experimental approach. *Australasian Journal of Information Systems*, 25, 1-24. <https://doi.org/10.3127/AJIS.V25I0.3203>
- Bhattacharjee, A. (2001). Understanding information systems continuance: an expectation-confirmation model. *MIS Quarterly*, 25(3), 351-370. <https://doi.org/10.2307/3250921>
- Bi, C., Zhang, D., Sun, Z., Jin, Y., & Yang, R. (2024). Gamification effects in green behaviors: a double-edged sword. *Journal of Cleaner Production*, 483, 144312. <https://doi.org/10.1016/j.jclepro.2024.144312>
- Bitrián, P., Buil, I., & Catalán, S. (2021). Enhancing user engagement: the role of gamification in mobile apps. *Journal of Business Research*, 132, 170-185. <https://doi.org/10.1016/j.jbusres.2021.04.028>
- Chen, C.-M., Ming-Chaun, L., & Kuo, C.-P. (2023). A game-based learning system based on octalysis gamification framework to promote employees' Japanese learning. *Computers and Education*, 205, 104899. <https://doi.org/10.1016/j.compedu.2023.104899>
- Chinnaraju, A. (2025). Partial least squares structural equation modeling (PLS-SEM) in the AI Era: innovative methodological guide and framework for business research. *Magna Scientia Advanced Research and Reviews*, 13(02), 062-108. <https://doi.org/10.30574/msarr.2025.13.2.0048>
- Dash, B. (2023). Gamification of e-wallets with the use of DeFi technology-a revisit to digitization in fintech. *International Journal of Engineering, Science, Technology and Innovation*, 3(1). <https://ssrn.com/abstract=4350005>
- Dzandu, M.D., Hanu, C., & Amegbe, H. (2022). Gamification of mobile money payment for generating customer value in emerging economies: the social impact theory perspective. *Technological Forecasting and Social Change*, 185, 122049. <https://doi.org/10.1016/j.techfore.2022.122049>
- Fayola, F., Graciela, V., Chandra, V., & Sukmaningsih, D.W. (2024). Impact of gamification elements on live streaming e-commerce (live commerce). *Procedia Computer Science*, 245, 1065-1074. <https://doi.org/10.1016/j.procs.2024.10.335>
- Gandasari, R.A., & Mauritsius, T. (2023). A study on the effect of gamification components on customer loyalty toward a digital bank. *Journal of Theoretical and Applied Information Technology*, 101(6), 2304-2313.

- Gusmao, M.N.A.P.L., Hidayanto, A.N., Isal, Y.K., & Wibowo, W.C. (2025). Adoption of e-wallets in timor-leste: an extended UTAUT approach. *Jurnal Informatika Ekonomi Bisnis*, 7(2), 304-309. <https://doi.org/10.37034/infv7i2.1191>
- Hair, J.F., Hult, G.T.M., Ringle, C.M., Sarstedt, M., Danks, N.P., & Ray, S. (2021). *Partial least squares structural equation modeling (PLS-SEM) using R*. Springer International Publishing, Cham. ISBN: 978-3-030-80518-0(p), 978-3-030-80519-7(e). <https://doi.org/10.1007/978-3-030-80519-7>
- Hasan, K.M. (2024). Quantitative methods in social science research: systematic review of content analysis, survey and experiment methodologies. *SSRN Electronic Journal*, 1-15. <https://doi.org/10.2139/ssrn.4698175>
- Högborg, J., Ramberg, M.O., Gustafsson, A., & Wästlund, E. (2019). Creating brand engagement through in-store gamified customer experiences. *Journal of Retailing and Consumer Services*, 50, 122-130. <https://doi.org/10.1016/j.jretconser.2019.05.006>
- Katz, E., Blumler, J.G., & Gurevitch, M. (1973). Uses and gratifications research. *Public Opinion Quarterly*, 37(4), 509-523. <https://doi.org/10.1086/268109>
- Liao, C., Palvia, P., & Chen, J.-L. (2009). Information technology adoption behavior life cycle: toward a technology continuance theory (TCT). *International Journal of Information Management*, 29(4), 309-320. <https://doi.org/10.1016/j.ijinfomgt.2009.03.004>
- Loh, X.M., Lee, V.H., & Leong, L.Y. (2022). Mobile-lizing continuance intention with the mobile expectation-confirmation model: an SEM-ANN-NCA approach. *Expert System with Applications*, 205, 117659. <https://doi.org/10.1016/j.eswa.2022.117659>
- Mayukh, N., & Al-Giffari, H.A. (2023). Survey and experimentation: critical review of research design in social sciences. *Jurnal Syntax Transformation*, 4(10), 180-191. <https://doi.org/10.46799/jst.v4i10.842>
- Mellinger, C., & Hanson, T.A. (2021). Methodological considerations for survey research: validity, reliability, and quantitative analysis. *Linguistica Antverpiensia, New Series - Themes in Translation Studies*, 19, 172-190. <https://doi.org/10.52034/lanstts.v19i0.549>
- Misara, R., Verma, D., & Mishra, S. (2025). Gamification and personality : exploring the impact on consumer engagement and purchase intention. *Entertainment Computing*, 55, 101038. <https://doi.org/10.1016/j.entcom.2025.101038>
- Mweshi, G.K., & Sakyi, K. (2020). Application of sampling methods for the research design. *Archives of Business Research*, 8(11), 180-193. <https://doi.org/10.14738/abr.811.9042>
- Ngo, T.T.A., An, G.K., Dao, D.K., Nguyen, N.Q.N., Phong, B.H., & Nguyen, N.Y.V. (2025). Unveiling the nexus between logistics servicequality and customer repurchase intentions in e-commerce sector. *Research in Transportation Business & Management*, 63, 101474. <https://doi.org/10.1016/j.rtbm.2025.101474>
- Nisar, T.M., & Whitehead, C. (2016). Brand interactions and social media: enhancing user loyalty through social networking sites. *Computers in Human Behavior*, 62, 743-753. <https://doi.org/10.1016/j.chb.2016.04.042>
- Okoye, K., Nganji, J.T., Escamilla, J., & Hosseini, S. (2024). Machine learning model (RG-DMML) and ensemble algorithm for prediction of students' retention and graduation in education. *Computers and Education: Artificial Intelligence*, 6, 100205. <https://doi.org/10.1016/j.caeai.2024.100205>
- Prasetyaningrum, P.T., Purwanto, P., & Rochim, A.F. (2024). Enhancing user engagement in mobile banking through personalized gamification: a cognitive evaluation theory approach. *International Journal of Intelligent Engineering and Systems*, 17(4), 788-807. <https://doi.org/10.22266/IJIES2024.0831.60>
- Razami, H.H., & Ibrahim, R. (2022). Models and constructs to predict students' digital educational games acceptance: a systematic literature review. *Telematics and Informatics*, 73, 101874. <https://doi.org/10.1016/j.tele.2022.101874>

- Seng, W.Q., & Hee, O.C. (2021). Factors influencing the intention to use e-wallet: an extended hedonic-motivation system adoption model. *International Journal of Academic Research in Business and Social Sciences*, 11(11), 2265-2278. <https://doi.org/10.6007/ijarbss/v11-i11/11379>.
- Singh, Y., & Milan, R. (2025). Utilitarian and hedonic values of gamification and their influence on brand engagement, loyalty, trust and WoM. *Entertainment Computing*, 52, 100868. <https://doi.org/10.1016/j.entcom.2024.100868>
- Tabaeeian, R.A., Shafiee, M.M., & Ansari, A. (2024). Can gamified e-service quality improve customer value co-creation and relationship quality in e-retailing? *International Journal of Quality and Service Sciences*, 16(2), 145-166. <https://doi.org/10.1108/IJQSS-08-2023-0120>
- Valencia, D., & Layman, C.V. (2021). E-wallet service innovation, service delivery, and customer satisfaction on customer loyalty within shopeepay in Indonesia. *Ultima Management: Jurnal Ilmu Manajemen*, 13(1), 23-46. <https://doi.org/10.31937/manajemen.v13i1.1929>
- Yang, X., Yang, J., Hou, Y., Li, S., & Sun, S. (2023). Gamification of mobile wallet as an unconventional innovation for promoting fintech: an fsQCA approach. *Journal of Business Research*, 155(Part A), 113406. <https://doi.org/10.1016/j.jbusres.2022.113406>

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