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Original Article

The impact of gamification factors on the continuous usage intention of Momo e-wallet users in Hanoi

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Abstract: Gamification is increasingly being applied to mobile applications, including e-wallets, to create a more interactive and engaging user experience. As a growing number of financial applications incorporate gamification elements to encourage customer usage, it becomes essential to understand the impact of gamification features in this domain. To explore this phenomenon, this study draws on the Stimulus-Organism-Response (SOR) framework to investigate how gamification features influence the continuous usage intention of users through enjoyment. An online questionnaire was designed to collect data from 151 Momo e-wallet users who had experience with gamified e-wallet applications. Partial Least Square Structural Equation Modeling (PLS-SEM) was utilized to validate the proposed research model. The results show that Social Interaction, Competition, Ease of Use and Rewards positively affect Enjoyment, which in turn leads to Continuous Usage Intention. The research results are consistent with previous findings and confirm the validity of the SOR framework. Additionally, suggestions for e-wallet service providers and policy makers are given to drive continued e-wallet usage and foster long-term customer relationships.

Keywords: Gamification, SOR, e-wallet, Momo wallet, continuous usage intention.

1. Introduction

Gamification is the application of game elements and principles in non-game contexts, such as business and marketing, to enhance user engagement and interaction. Global enterprises such as Amazon, Baidu, Starbucks, and Tencent have integrated gamification elements into their strategic marketing efforts to enhance user experience and foster customer loyalty (Zhang et al., 2017). The gamification market has grown from US$4.91 billion in 2016 to over US$11.94 billion in 2021, highlighting the significant potential of this practice in mobile applications (Statista, 2021). Gamification is a promising tool for boosting user interaction and increasing brand loyalty (Shankar, 2016).

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In the context of the Fourth Industrial Revolution, mobile devices and e-wallet applications have become prevalent, with apps such as Momo, ViettelPay, and ZaloPay leading the market (Statista, 2024). The growth of the e-wallet market is driven by the demand for cashless payments and the convenience they offer. To attract and retain users, e-wallets have begun incorporating gamification elements. For example, Momo has introduced the Piggy Bank game, attracting millions of interactions each month and aiding charitable fundraising efforts. These initiatives aim to enhance user engagement and loyalty towards e-wallet applications. An effective gamification program can drive user enjoyment and experience, which in turn leads to customer retention. Several researchers have pointed out the benefits of gamification, such as stimulating purchase behavior and customer experience and engagement (Dinh et al., 2023; Raza et al., 2024). However, little is known about the impact of gamification on the continuous usage intention of customers. Although the effect of gamification on user's intention has been verified in some sectors, namely education (Zainuddin et al., 2020), e-commerce (Behl et al., 2020), and banking (Jain et al., 2020), there are few articles examining its application in e-wallet services. In the Vietnam market where the e-wallet adoption rate is growing rapidly, the use of gamification could be an effective method to compete for customer retention.

The research on the impact of gamification of continuous usage intention of e-wallet users contributes significantly to both theoretical understanding and practical applications in user retention strategies. Theoretically, this research expands knowledge on how gamification elements create the continuous usage intention of e-wallet users. Practically, this research offers actionable insights for e-wallet service providers to increase user retention by implementing gamification features effectively. This research chooses Momo, one of the leading e-wallets in Vietnam to investigate the features of gamification, which might affect the continuous usage intention of users. The research objectives are set out as follows: Identifying the features of gamification influencing the continuous usage intention of users; Providing recommendations for e-wallet service providers in Vietnam to enhance the gamification experience for customer retention.

2. Literature review and hypothesis development

2.1. Literature review

The results of recent studies are presented in Table 1. Previous studies have pointed out that gamification is a useful tool in enhancing customer engagement, brand experience, attitude, intention and actual behavior (Nguyen et al., 2024, Raza et al., 2024; Dinh et al., 2023; Lin et al., 2022; Al Zyoud, 2021). However, little attention has been paid to the impact of gamification on continuous usage intention which represents the level of customer retention. Additionally, limited research has been undertaken to shed light on which features of gamification could affect the continuous usage intention of customers. The number of researches in the Vietnam context, especially in electronic payments, is also limited. Due to the above reasons, understanding the features of gamification and their impact on the continuous usage intention of e-wallet users is very important as it provides recommendations for researchers and practitioners to build a successful relationship with customers.

Table 1: Summary table of related studies

Author	Research method	Result
Nguyen et al. (2024)	Experimental method; sample of 386 users on social commerce platforms; used Signaling Theory and Uses and Gratifications Theory (U&G)	Gamification ads positively impact hedonic and utilitarian values, which in turn positively affect attitudes towards these ads; interactivity and personalization enhance experiences and attitudes, while privacy concerns have a negative impact.
Raza et al. (2024)	Survey with 340 m-banking users and experiment with the participation of 161 customers	Gamification elements are positively associated with user experience and engagement, leading to purchase intention.

Dinh et al. (2023)	Survey with 230 youngsters	Favorable circumstances, effort expectations, social influence, and performance expectations affect customer intention and behaviors.
Lin et al (2022)	Survey with 581 customers in Taiwan	Gamification positively influences customer engagement and joyful emotion, which in turn foster attitude and intention.
Al-Zyoud (2021)	Survey with 221 customers who had online transactions on gamified e-commerce websites	The use of gamification leads to customer loyalty, e-WOM sharing and purchase behavior.
Xi et al. (2020)	Survey with 824 respondents from Xiaomi and Huawei online brand communities in China	Gamification features related to achievement and social interaction positively influence emotional, cognitive, and social brand engagement; brand engagement positively correlates with brand equity; gamification is effective in brand management.

Sources: Authors.

2.2. Theoretical framework

The SOR (Stimulus-Organism-Response) model, introduced by Mehrabian and Russell (1974), explains how specific environmental attributes act as stimuli that affect an individual's psychological state, which in turn influences their behavior. In the context of this research, the environmental stimuli are the gamification elements integrated into e-wallet applications. According to the systematic literature of Behl et al. (2020), social interaction, competition, ease of use and rewards are the most common features identified in previous research; thus, they are taken into account in the research model. These elements affect the consumer's internal psychological state, which is represented by perceived enjoyment. According to Lin et al (2022), the interaction with gamified applications results in a joyful emotion, which enhances intention of customers. Perceived enjoyment plays an important role in fostering continuous usage intention within digital platforms and applications. When users find an activity enjoyable, they are more likely to engage repeatedly, as the experience itself provides intrinsic satisfaction beyond functional utility. This enjoyment creates a positive affective response, reinforcing habitual behavior and reducing resistance to future use. Therefore, the model posits that these gamification features can shape consumers' feelings (enjoyment), which ultimately leads to continuous usage intention.

2.3. Hypothesis development

Social interaction is defined by Raman (2020) as the association between different users in gamified platforms. Xi et al. (2020) stated that social interactions facilitate information exchange and cooperation, as well as interactions with others through the features of social networks. Many games on mobile applications utilize social interactions through multiplayer mode and communities or forums. These features help build a sense of community, making participants feel connected and part of a group. Feeling supported and acknowledged by others increases enjoyment of users. The study of Rodrigues et al. (2016) also confirmed the positive impact of social interaction on perceived enjoyment. Therefore, it is hypothesized that:

H1: Social interaction has a positive impact on the enjoyment of Momo e-wallet users.

Competition is the inherent nature of games to thrive in a context where individuals strive to win by achieving the best outcomes (Xu et al., 2020). A benefit of gamification is that it allows users to compete with others or themselves to obtain a particular goal and there are some mechanisms in the game to facilitate competition such as leaderboard or scoreboard (Suh et al., 2016). Competition taps into the natural human desire to win and be the best which results in increased engagement as users strive to outperform others. The study of Hu et al. (2023) showed that competition motivates participants to achieve a higher performance and to obtain a better experience of enjoyment.

H2: Competition has a positive impact on the enjoyment of Momo e-wallet users.

Ease of use refers to the condition where users can utilize technology with less effort by maximizing the features within the application

(Davis, 1989). When technology is perceived as easier to use, it is also considered more useful (e.g., Davis et al., 1989; Venkatesh & Davis, 2000). In gamification, it refers to how effortlessly users can navigate and interact with gamified elements within a system. When users find a gamified system easy to use, they do not have to spend much cognitive effort figuring out how to interact with it. This reduction in cognitive process allows users to focus more on the enjoyable aspects of the experience rather than on overcoming usability challenges. Studies have also found that ease of use significantly influences perceived enjoyment (Rodrigues et al., 2013; Rodrigues et al., 2016). Therefore, it is hypothesized that:

H3: Ease of use has a positive impact on the enjoyment of Momo e-wallet users.

Rewards are defined as benefits granted to users when they finish a task in the designed game (Xu et al., 2020). According to Cognitive Evaluation Theory (CET), gaining tangible rewards can elevate consumer experience and help consumers attain greater satisfaction (Ryan & Deci, 2000). Reward systems in gamification such as points, badges and levels act as positive reinforcement, encouraging repeated behaviours. When users receive rewards for certain actions, they are more likely to repeat those actions, leading to habitual engagement with the system. This repeated positive reinforcement enhances the overall enjoyment as users associate the system with positive experiences. Moreover, rewards often signify the completion of a challenge or the achievement of a goal. This recognition also fosters a sense of accomplishment, which enhances overall enjoyment. Previous studies have also proved that rewards can lead to higher levels of performance and enjoyment (Johnson et al., 2018; Hu et al., 2023). Therefore, it is hypothesized that:

H4: Rewards have a positive impact on the enjoyment of Momo e-wallet users.

Enjoyment is defined as the extent to which users find the game enjoyable (Hamari & Koivisto, 2015). Enjoyment is seen as a key aspect of the gaming experience, and users will not engage in a game if they do not find the experience enjoyable (Högberg et al., 2019). A high level of perceived enjoyment leads to deeper user engagement. Engaged users are more likely to explore different features, participate in various activities, and invest time in the system. Enjoyment sustains interest over time as users are less likely to become bored or disinterested, thus maintaining a continuous intention to use the system. Pereira & Tam (2021) reported a positive relationship between enjoyment and continuous usage intention. Therefore, it is hypothesized that:

H5: Enjoyment has a positive impact on the intention to continue using the Momo e-wallet.

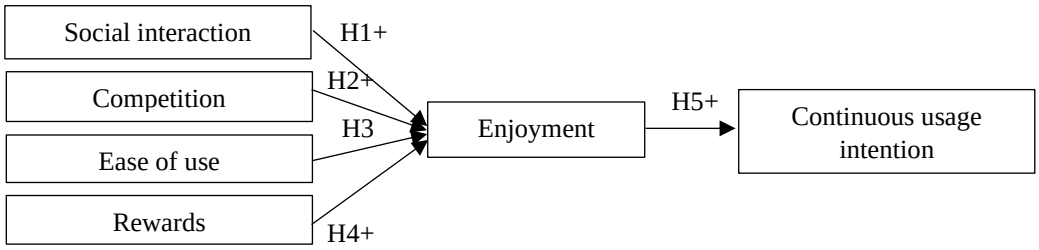

Figure 1: The proposed research model
Source: Authors.

3. Research methodology

Online questionnaires were sent to customers who had experienced the Momo wallet application in the past. Due to time and resources constraints, a non-probability sampling method was used in this research. Particularly, convenience sampling was chosen as it allows researchers to collect data quickly and approach readily available participants. The questionnaire was distributed to online communities of e-wallet users on social media and via personal networks of the authors. A clear introduction of research purposes and filter questions were presented to screen out unqualified respondents. Likert's 5-point scale was used to assess the respondent's opinion (1 - strongly disagree; 5 - strongly agree). 6 constructs

were measured by a total of 20 items adapted from previous research such as Raman (2020), Suh et al. (2016), Xu et al. (2020), Rodrigues et al. (2013), Yang et al. (2017) and Daragmeh et al. (2021). The data used in this research was collected from February to April in 2024.

Since all items were translated from English to Vietnamese, it was important to ensure the readability before data collection. Therefore, the draft questionnaire had been sent to 7 customers in a pre-test to make adjustments if necessary. Based on feedback from the pre-test, some items were rephrased to make them more understandable for respondents. The data collected was analyzed by Smart PLS 4.0. According to Hair et al. (2014), the minimum sample size is estimated based on the "10-times rule" in which the sample should be greater than 10 times the maximum number of arrows pointing to a construct. The number of valid responses is 151 which is greater than the required sample size. The descriptive information of the sample is presented in Table 2.

Table 2: Demographic profile of the sample

Information	Category	Frequency	Percentage (%)
Gender	Male	67	44.4
	Female	84	55.6
Age	Under 18	8	5.3
	18-25	104	68.9
	26-35	22	14.6
	> 35	17	11.3
Job	Student	84	55.6
	Office staff	42	27.8
	Freelancer	8	5.3
	Businessman	13	8.6
	Other	4	2.6
Income	< 10 million VND	89	58.9
	10-20 million VND	34	22.5
	20-30 million VND	14	9.3
	> 30 million VND	14	9.3

Source: Authors.

4. Research results

4.1. Measurement model assessment

The results presented in Table 3 show that the factor loading has the smallest value of 0.714 and the largest is 0.887 which means that the observed variables are of good quality. The Cronbach's alpha and CR values of all constructs are within the acceptable range of 0.7 to 0.95, thus indicating the reliability of the measurement model. The AVE values range from 0.636 to 0.770 which is higher than the cut-off point of 0.5, which confirms the model's convergent validity (Hair et al., 2014).

The results of Table 4 illustrate that the square roots of any constructs' AVE are higher than the correlations to other constructs, which confirms the measurement model's discriminant validity (Hair et al., 2014).

Table 3: Reliability and convergent validity results

Construct	Cronbach's Alpha	Outer loading	CR	AVE
SI	0.846	0.877	0.897	0.687
		0.841		
		0.873		
		0.714		
COM	0.803	0.808	0.883	0.716
		0.858		
		0.871		
EOU	0.828	0.813	0.886	0.660

		0.787		
		0.794		
		0.855		
REW	0.796	0.800	0.880	0.710
		0.872		
		0.854		
ENJ	0.851	0.887	0.910	0.770
		0.887		
		0.859		
CUI	0.714	0.825	0.839	0.636
		0.815		
		0.750		

Source: Authors.

Table 4: Fornell - Larcker analysis results

	COM	**CUI**	**ENJ**	**EOU**	**REW**	**SI**
COM	0.846					
CUI	0.394	0.797				
ENJ	0.564	0.432	0.878			
EOU	0.290	0.576	0.424	0.813		
REW	0.565	0.557	0.696	0.377	0.843	
SI	0.546	0.370	0.533	0.212	0.532	0.829

Source: Authors.

4.2. Structural model assessment

Hair et al. (2014) suggest that before examining relationships, it is essential to test for multicollinearity in the structural model using regression of dependent and mediating variables to estimate path coefficients. Path coefficients may not be valid if multicollinearity occurs among independent or mediating variables. According to Hair et al. (2019), the Variance Inflation Factor (VIF) is used to assess multicollinearity. A VIF value between 3 and 5 indicates potential multicollinearity, while a VIF less than 3 is considered acceptable. The VIF values are within acceptable limits, indicating no multicollinearity issues.

Table 5: Relationship analysis results

	Original Sample (O)	**P-values**	f^2	R^2
COM -> ENJ	0.172	0.033	0.040	0.557
EOU -> ENJ	0.171	0.011	0.057	
REW -> ENJ	0.447	0.000	0.263	
SI -> ENJ	0.165	0.027	0.040	
ENJ -> CUI	0.432	0.000	0.230	0.181

Source: Authors.

The study employed the bootstrapping technique with 5000 sub-samples. The results in Table 5 indicate that Social Interaction (SI) positively affects Enjoyment (ENJ) ($\beta = 0.165$, $p = 0.027$), thus confirming H1. Competition (COM) shows a positive impact on Enjoyment (ENJ) ($\beta = 0.172$, $p = 0.033$), and H2 is accepted. Ease of use (EOU) has a positive impact on Enjoyment (ENJ) ($\beta = 0.171$, $p = 0.011$), which shows support for H3. The relationship between Rewards (REW) and Enjoyment (ENJ) is positive ($\beta = 0.447$, $p = 0.000$), supporting H4. Finally, Enjoyment (ENJ) has a positive impact on Continuous Usage Intention (CUI) ($\beta = 0.432$, $p = 0.000$), therefore H5 is accepted. The validation results of all hypotheses are summarized in Table 6.

Enjoyment (ENJ) could explain 18.1% of the variance in Continuous usage intention (CUI). Meanwhile, 55.7% variance in Enjoyment (ENJ)

is explained by Social Interaction (SI), Competition (COM), Ease of Use (EOU) and Rewards (REW). The effect size values of all constructs are above the minimum value of 0.02 as suggested by Hair et al. (2014).

Table 6: Validation results of all hypotheses

Hypothesis	Statement	Results
H1	Social interaction has a positive impact on the enjoyment of Momo e-wallet users.	Accepted
H2	Competition has a positive impact on the enjoyment of Momo e-wallet users.	Accepted
H3	Ease of use has a positive impact on the enjoyment of Momo e-wallet users.	Accepted
H4	Rewards have a positive impact on the enjoyment of Momo e-wallet users.	Accepted
H5	Enjoyment has a positive impact on the intention to continue using the Momo e-wallet.	Accepted

Source: Authors.

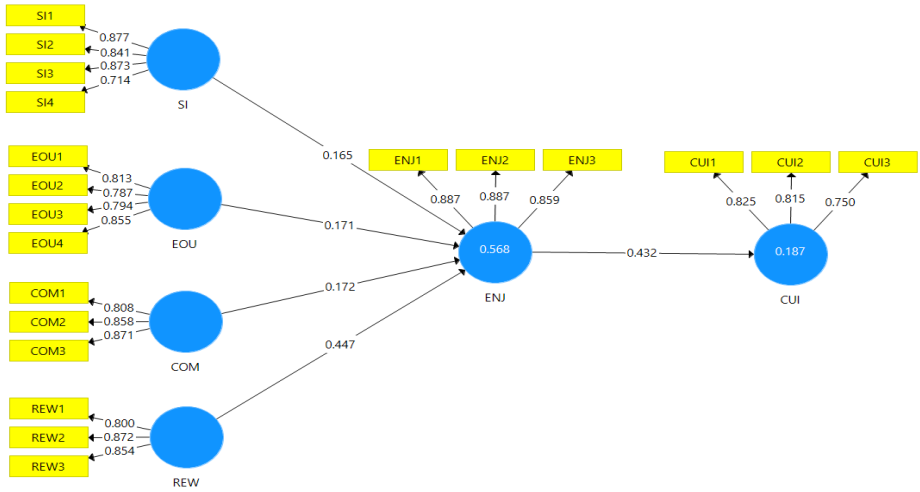

Figure 2: Model structure
Source: Authors.

5. Discussion and implications

Based on the SOR framework, this research illustrates that features of gamification in e-wallet applications act as external stimuli affecting the internal psychological state (enjoyment) of users and result in a favorable response (continuous usage intention). Specifically, this research identifies 4 factors of gamification that have a positive impact on the enjoyment of Momo e-wallet users; namely, social interaction, competition, ease of use, and rewards. The results are consistent with previous works of Raman (2020), Suh et al. (2016), Xu et al. (2020), Rodrigues et al. (2013) and Yang et al. (2017). Although this research was conducted in a different context (e-wallet service in Vietnam), the influence of 4 gamification features on enjoyment remains statistically significant. Among these, rewards have the strongest positive effect on enjoyment (f^2 = 0.263) as they offer users with tangible acknowledgements of their progress, improving their motivation and fostering a sense of achievement. Additionally, ease of use is the second-strongest antecedent of enjoyment (f^2 = 0.057) as it reduces cognitive effort and frustration while interacting with the games. Meanwhile, competition and social interaction show the smallest impact on enjoyment (f^2 = 0.040). Competition creates a sense of excitement when challenges are surpassed, whereas social interaction allows users to connect and share their experiences with others. Moreover, enjoyment is the driver of continuous usage intention. This research has clarified the impact mechanisms of gamification on continuous usage intention. Specifically, gamification features enhance continuous usage intention by creating a joyful psychological state of customers.

Although the scope of this research is limited within Momo wallet users in Hanoi, several real-world implications for other e-wallet service providers can be made in order to improve user experience and continuous usage intention. First of all, the study shows that rewards have the strongest impact on customer enjoyment. Therefore, e-wallet service providers should develop specific strategies to effectively leverage this factor. Rewards can include discounts, gifts, direct money transfers, or online lucky money, encouraging users to experience various services. Integrating cultural elements into games, such as traditional customs, can increase interactivity and user engagement. Moreover, incorporating loyalty points and rewards systems can encourage repeat usage and customer retention.

Secondly, ease of use is crucial for many users. This factor significantly impacts the enjoyment of e-wallets users, so it requires adequate attention. E-wallet providers should develop user-friendly interfaces. Clear instructions for new users, innovative and appealing app layouts, and automated information filling can enhance usability. Promotions for new users and integrating Big Data and AI to store user information can reduce repetitive tasks. Increasing awareness about the app's features and simplifying the registration and transaction process is essential.

Thirdly, the study highlights that the competition aspect of gamification improves users' enjoyment. Thus, e-wallet service providers should incorporate competitive elements in their applications, ensuring tasks gradually increase in difficulty. High-interaction and entertaining games can attract users. Limited-time offers and vouchers can create a competitive environment, driving user engagement. Auctions or reverse auctions for vouchers can also foster competition. Additionally, creating an active community within the app where users can interact and compete for rewards can enhance user experience.

Fourthly, social interaction significantly affects the intention to continue using e-wallets. Building a community and promoting word-of-mouth is crucial. Developing social programs can enhance a brand's positive image. Ensuring system stability and linking with service providers to encourage e-wallet payments can further promote usage.

Finally, user enjoyment strongly impacts the intention to continue using an e-wallet. Ensuring a simple, useful, and enjoyable user interface can enhance user experience. Continuously developing e-wallet services for everyday activities can create a sense of familiarity and convenience. Allowing users to customize the app interface and implementing features like nickname usage can increase enjoyment of users.

For better user experience with e-wallets, policy makers should require e-wallet service providers to enhance their security measures such as: strengthen cybersecurity protocols to protect users' personal and financial data, implement multi-factor authentication, real-time fraud detection, and encryption standards to build trust and ensure safe transactions. Additionally, policy makers should address connectivity issues by improving digital infrastructure, particularly in rural and remote areas, to ensure that users have reliable internet access for using e-wallet services. Last but not least, data privacy and user protection should be prioritised by establishing clear guidelines on data privacy and consumer rights related to e-wallet usage to ensure that users are informed about how their data is being used and to give them control over their personal information.

6. Conclusion

Based on the SOR theory, this study posits that gamification elements, namely social interaction, competition, ease of use and rewards have a positive impact on user enjoyment, which in turn affects the users' continuous usage intention. Based on research findings, several suggestions have been provided to strengthen continuous usage intention by applying gamification in e-wallet applications.

However, it is acknowledged that the study has some limitations in terms of sample size, with only 151 samples from Hanoi, which may not represent the entire market. Future research should expand the sample size and geographical scope to increase representativeness. Cultural differences should be taken into account by conducting research in other foreign markets. Additionally, the study only focuses on 4 gamification elements. Therefore, future studies

should incorporate additional influencing factors and employ alternative analytical models to gain a more comprehensive understanding.

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