

UNLOCKING CUSTOMER ENGAGEMENT VIA GAMIFICATION DYNAMICS IN SRI LANKAN E-TAILING

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ABSTRACT

Gamification, widely adopted in various industries, is recognized as a valuable strategy for enhancing customer engagement. In the Sri Lankan e-tailing context, where online shopping has become integral, gamification can significantly impact customer participation and their behavioral outcomes like satisfaction, loyalty, etc. The study aimed to investigate the influence of gamification on customer engagement within the Sri Lankan e-tailing context, utilizing the Self-Determination Theory as a theoretical framework. Furthermore, the present study explores the moderating roles of perceived usefulness and perceived ease of use in the association between gamification and customer engagement. A comprehensive survey was conducted with 541 participants, and partial least squares (PLS) in the SmartPLS4 were employed to test the formulated hypotheses empirically. The study's findings indicate that gamification, perceived usefulness and perceived ease of use significantly strengthen customer engagement. Moreover, perceived ease of use was observed to enhance the relationship between gamification and customer engagement. This study's conclusions hold significance for theoretical and managerial perspectives. These findings can be valuable for academics in refining theoretical frameworks and for managers seeking practical guidance in optimizing gamification approaches for enhanced customer engagement in relevant contexts.

Keywords: Gamification; Customer engagement; E-tailor; Perceived usefulness; Perceived ease of use

1. Introduction

The utilization of gamification has gained significant traction across a variety of industries as a means to attract and involve customers while improving their overall experience (Milanesi et al., 2023). In the e-tailing context, as online shopping has become an essential aspect of people's everyday routines, gamification can have the capacity to boost customer participation and commitment toward a brand or product (Tanrikulu & Demirel, 2023). As internet technology continues to advance rapidly, e-tailing has become essential to people's lives in Sri Lanka (Indujeeva & Medis, 2021; Sutharsini & Umakanth, 2021). Hence, comprehending the utilization of gamification to augment customer engagement in this setting is imperative for companies striving to thrive in the

fiercely contested digital marketplace. Gamification has increased customer engagement, loyalty, satisfaction and other behavioral outcomes in various industries (Shahisa & Aprilianty, 2022). Therefore, exploring the impact of gamification in e-tailing can provide valuable insights for e-tailers who are seeking to improve their customer experience (Krishna et al., 2023).

Despite the growing importance of e-tailing in Sri Lanka, it is noticeable that insufficient research has been conducted on the impact of gamification on customer engagement in this specific context (Tennakoon & Wanninayake, 2020). Thus, this research can not only help fill the aforementioned gap in the literature but also offer valuable insights for enterprises functioning in Sri Lanka. Besides, prior to 2010, online purchases in Sri Lanka were primarily limited to airline tickets, as airlines were seeking to eliminate the use of traditional general service agents. However, with the widespread adoption of smartphones in Sri Lanka, there has been a notable shift towards e-commerce and m-commerce. This trend is indicative of a growing preference for online shopping, which presents opportunities for businesses to expand their online presence and cater to the needs of customers who are increasingly looking to make purchases through digital channels (Indujeeva & Medis, 2021; Jayasooriya et al., 2020). In Sri Lanka, shoppers are hesitant to engage in online shopping due to their apprehension towards the perceived lack of security and the potentially negative experiences associated with e-tailing compared to offline shopping (Athapaththu et al., 2019). Whilst earlier research has demonstrated the efficacy of gamification in augmenting customer engagement, it is necessary to delve into the fundamental mechanisms of how gamification affects customer engagement within the e-commerce context.

Moreover, in the e-commerce domain, customers' acceptance and usage of technology are determined by critical factors. One such factor is perceived usefulness, which refers to how valuable customers believe the technology is in achieving their goals. Another important factor is the perceived ease of use, which describes how customers believe they can easily use the technology to achieve their objectives (Tahar et al., 2020). By analyzing the intermediate role of two critical factors, namely the usefulness that customers perceive and how easy it is for them to use, this research can offer a comprehensive understanding of how gamification influences customer engagement in the e-tailing context. The problem statement of this research is that there is a noticeable knowledge gap in how gamification impacts customer engagement in the e-tailing context of Sri Lanka, and the underlying mechanisms of this relationship need to be explored to help businesses develop effective marketing strategies and improve customer engagement in this rapidly developing industry.

In this manner, researchers developed three sets of research questions: The first one is, how does gamification affect customer engagement in e-commerce settings in Sri Lanka? Then, how does perceived usefulness moderate the connection between gamification and customer engagement in Sri Lankan e-tailing contexts? And finally, how does perceived ease of use moderate the connection between gamification and customer engagement in

the e-tailing context in Sri Lanka? By addressing these research questions, the study aims to enhance the understanding of how gamification affects buyer engagement in the e-tailing environment in Sri Lanka and the underlying mechanisms of this relationship. This research can help businesses in Sri Lanka's e-tailing industry develop effective marketing strategies that improve customer engagement and ultimately lead to business success.

2. Review of Existing literature and development of hypotheses

2.1 Gamification

Gamification is an approach that has been used to enhance user engagement and motivation in various contexts, including e-tailing (George et al., 2022). This literature survey scrutinizes the available studies on gamification in e-tailing and explores its effectiveness in increasing user engagement and sales. The use of game design components in settings other than games to inspire and engage users is called gamification. This term encompasses gamification definitions and various forms of game-like environments (Deterding et al., 2011). Werbach et al. (2012) identified three principal categories of gamification: points, badges, and leaderboards (PBL); progress and leveling up (PLU); and narrative and theme (NT). Multiple studies have delved into the efficacy of gamification in the context of e-tailing. Incorporating game-like features, such as badges and points through gamification, increased customer engagement and purchase intention in an online shopping context (Insley & Nunan, 2014; Xu et al., 2020). In e-commerce, Abou-Shouk and Soliman (2021) found that gamification increased user engagement and loyalty.

2.2 Customer engagement

Researchers have defined customer engagement in various ways, with some emphasizing the behavioral aspect while others focus on the psychological perspective. Customer engagement encompasses multiple dimensions involving a customer's cognitive, emotional, and behavioral connection with a brand or company, and it has important antecedents and consequences for marketing success (Pansari & Kumar, 2017). The cognitive state of a customer resulting from their experiences with a service provider within a particular relationship is described as a multidimensional concept known as customer engagement (Petzer & van Tonder, 2019). From another point of view, customer engagement pertains to how a customer personally connects with a brand, as expressed through their cognitive, emotional, and behavioral actions beyond the point of purchase (So et al., 2012).

2.3 Gamification and Customer Engagement

The success of a business is heavily influenced by customer engagement, which is a multifaceted and intricate construct. Understanding the antecedents and outcomes of customer engagement can help organizations design effective marketing strategies that foster long-term customer loyalty and advocacy. George et al. (2022) revealed that e-tailers use gamification for promotional purposes to increase customer engagement and encourage repeat business. Currently, gamification is used by e-tailers as a strategy that can enhance sales and improve customer engagement and other customer behavioural

outcomes. Customer engagement can be enhanced through the implementation of gamification, as suggested by Eisingerich et al. (2019). Gamification positively impacts customer engagement, increasing customer motivation and enhancing their enjoyment of the experience that fosters emotional and cognitive connections with a brand (Xi & Hamari, 2020). However, the effectiveness of gamification depends on various factors, such as the context in which it is used, the characteristics of the participants, and the design of the gamified experience (Sailer & Homner, 2020).

The most significant factor influencing users' engagement in gamified applications was identified as fun (Cechetti et al., 2019; Lu & Ho, 2020). However, some studies have reported mixed results. For instance, gamification may not always positively impact learners and, in some cases, can even lead to disengagement and a preference for traditional methods (Adams & Du Preez, 2022). Similarly, Yu and Huang (2022) reported that gamification has the potential to increase product conversion rates and improve user engagement on the platform, leading to a higher purchase intention. However, the research also revealed the level of investment in terms of time and effort in the game did not produce a significant outcome on online platform purchase intention. Gamification's effectiveness in e-tailing can be impacted by several factors, including the context being gamified, user behaviour and personality traits, and user goals, as stated in the literature (Jang & Hsieh, 2021; Tondello et al., 2016). The current study proposes the following hypothesis:
H₁: Gamification has a positive effect on customer engagement.

2.4 Perceived Usefulness

The comprehension of user acceptance is a crucial factor in the adoption of technology, and it depends on the perceived usefulness as a critical aspect. Perceived usefulness pertains to one's perspective of how a system or technology can enhance productivity, performance, or goal attainment (Shiau et al., 2020). The perception of usefulness is influenced by multiple factors, including relative benefit, congruence, experiment ability, enabling factors, perceived pleasure, and social pressure (Al-Rahmi et al., 2019). As per Al-Maroofo et al. (2023) the more a system or technology is perceived as useful, the more likely the user is to adopt and use it. Existing literature has demonstrated a favourable association between perceived usefulness and technology acceptance and adoption by users (Harst et al., 2019). It was observed that perceived usefulness had a promising impact in the context of e-commerce, where it was observed to influence customers' intention to use online shopping platforms (Pham Van Tuan et al., 2022).

2.5 Perceived Usefulness and Customer Engagement

The success of e-tailing platforms is determined by crucial factors such as customer engagement and perceived usefulness. Numerous research studies have investigated the correlation between perception of usefulness and customer engagement in the e-tailing context. Lăzăroiu et al. (2020) posit that perception of usefulness and customer engagement are closely interconnected and can have a mutually reinforcing effect on each other. Consumers who perceive a platform as useful are more likely to engage with it,

while those who are engaged are more likely to perceive it as useful. This, in turn, can lead to increased purchase intentions and ultimately drive the success of social commerce platforms. E-tailers need to focus on creating an engaging and user-friendly platform that offers value to customers to enhance perceived usefulness and increase customer engagement (Arghashi & Yuksel, 2022; Hussein & Hassan, 2017). Companies should design engaging and user-friendly platforms to improve perceived usefulness, enhance customer engagement and offer value to their customers. Owing to this, the following is proposed as a hypothesis:

H2: Perceived usefulness has a positive effect on customer engagement.

2.6 Moderating Effect of Perceived Usefulness

In the new age of business, perceived usefulness has emerged as a key managerial technique for providing value to its customers and their sustainability. The perceived usefulness of gamification refers to the degree to which it aids users in accomplishing their objectives or resolving their issues, as per existing literature. When gamification is perceived as useful, users are likelier to engage with it and continue using it (Kamboj et al., 2020). Users who perceive gamification as useful have more potential to engage with it (Bitrián et al., 2021). Wirani et al. (2022) posit that perception of usefulness and customer engagement are essential factors in assessing the effectiveness of gamification-based learning platforms. By incorporating elements that appeal to students and provide real value, developers can create gamification experiences that keep students engaged and motivated to continue using the platform (Vanduhe et al., 2020). Like in e-tailing context if gamification provides better interface and positive use experiences which may lead to customer engagement on e-tailing platform. Therefore, perceived usefulness may moderate the relationship between gamification and customer engagement in the e-tailing context. Thus, we posit the following hypothesis:

H3: Perceived usefulness moderates the relationship between gamification and customer engagement.

2.7 Perceived Ease of Use

The extent to which users perceive a system to be user-friendly, or the perceived ease of use (PEOU), can impact their adoption of the technology. A technology that is designed with ease of use in mind and requires minimal effort can enhance its adoption (Yuen et al., 2021). As per the Technology Acceptance Model (TAM), PEOU is a crucial construct that refers to the ease or difficulty of using a technology as perceived by the user, and it is known as perceived ease of use (Yuen et al., 2021). The TAM proposes that PEOU defines the ease with which users can achieve their goals using a technology. There have been numerous investigations into how PEOU affects the adoption of technology. Davis (1989) proposed the original TAM model, which found that PEOU was a major driver of user's willingness to adopt technology. Venkatesh and Davis (2000) further expanded this model and discovered that PEOU directly and positively influenced the user's technology preference, which in turn impacted their intention to use it. Several other studies have also confirmed the importance of PEOU in technology adoption. For example, Dewi et al. (2022) found that amidst the COVID-19 pandemic, PEOU has a notable impact on the

repurchase intention of e-commerce customers in Indonesia. Specifically, the easier customers perceive the e-tailing platform to use, the more likely they are to repurchase. Similarly, there is a higher probability for customers to feel competent in using a mobile commerce platform. Perceiving a platform as easy to use can increase users' likelihood to adopt it, which in turn, enhances their engagement with the platform (Japutra et al., 2022)

2.8 Perceived Ease of Use and Customer engagement

The success of e-commerce platforms is influenced significantly by two key factors: PEOU and customer engagement. The ease with which a user perceives a system to be operable is called PEOU. Customer engagement is a measure of how much customers participate and interact with a brand's events. Studies indicate that there is a considerable association between PEOU and customer engagement. McLean and Wilson (2019) found that customer engagement was observed to have a favorable correlation with perceiving ease of use in mobile applications employing augmented reality technology. Participants who found the applications easy to use were more engaged with the brand and had a higher purchase intention. Similarly, Integrating gamification strategies into e-commerce platforms can improve customer engagement levels by amplifying the perceived effortless use. Xu et al. (2021) demonstrated that the extent of user-friendliness is a critical factor in determining customer engagement in virtual gamification platforms. Platforms that are easy to use, have clear rules and provide immediate and personalized feedback can increase intrinsic motivation and customer engagement. Improving the perceived ease of use for e-tailing platforms through gamification strategies, augmented reality mobile applications, and user-friendly designs can improve customer engagement and increase purchase intention and loyalty. In light of this discussion, the following hypotheses have been developed:

H4: Perceived ease of use has a positive effect on customer engagement.

2.9 Moderation Effect of Perceived Ease of Use

By enhancing the ease of use, gamification platforms can improve customer engagement, increasing retention and loyalty. Numerous research has examined the association among gamification, perception of easy usage, and customer engagement. For example, Bitrián et al. (2021) investigate the association between customer engagement and perception of its ease of use in the mobile applications environment. According to Yang et al. (2017), the ease of use of games influences consumers' motives to adopt technology. Perception of its ease of use is a measure of how easily consumers perceive an app to be usable. When an app is perceived as easy to use, customers are more likely to engage with it. Factors that encourage consumer engagement and intention towards the games-like environment of mobile apps (Chadoulos et al., 2020). Gamification with perceived ease of use has a substantial effect on user engagement. Users are more inclined to engage with gamification that is easy to use. This is because they feel that using gamification is not a hassle, and they can easily access the features they need (Vanduhe et al., 2020). Thus, it can be suggested that the perceived ease of use may moderate the association between gamification and customer engagement. Therefore, the following hypothesis is proposed:

H5: Perceived ease of use moderates the relationship between gamification and customer engagement.

2.10 Underpinning Theory

The Self-Determination Theory (SDT) can be an underpinning theory to support the arguments presented in the above sections. SDT is a framework for understanding the motivation behind human behaviour (Japutra et al., 2022). This theory suggests that individuals have inherent psychological requirements for autonomy, competence, and relatedness. Meeting these requirements is crucial in promoting intrinsic motivation and overall well-being (Ng & Abbas, 2020). Qiao et al. (2022) published a study on gamification in the context of the Self-Determination Theory (SDT). In line with SDT, fulfilling the fundamental psychological requirements of autonomy, competence, and relatedness can amplify students' curiosity and involvement levels. For instance, virtual badges can provide a sense of competence and achievement to community members, as they signify mastery of certain skills or contributions to the community (Cavusoglu et al., 2021), while leaderboards can contribute to player enjoyment by increasing their sense of relatedness and competence (Segundo Díaz et al., 2022).

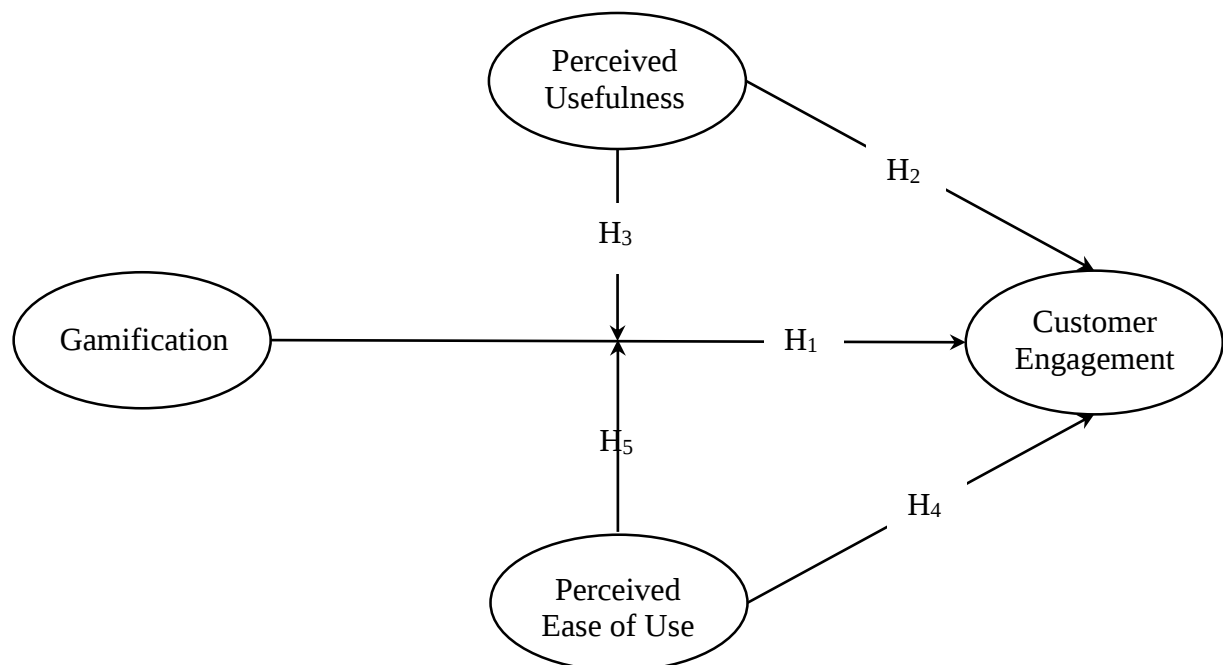


Figure 1: Proposed conceptual model

Additionally, people are motivated to act as they seek to fulfil their fundamental psychological needs for self-determination, mastery, and social connections. Based on SDT, there are three main categories of motivation: intrinsic, extrinsic, and motivation. Intrinsic motivation arises from personal interest, enjoyment, or satisfaction. Conversely, extrinsic motivation is generated by external factors like rewards or social pressure (Skugor et al., 2023). The use of gamification elements can tap into both intrinsic and extrinsic motivation, with intrinsic motivation being fostered through a sense of

competence and mastery derived from playing, and extrinsic motivation is fostered through the grades and badges earned through the game (Leonardou et al., 2020). Therefore, SDT can be a useful theory to support the hypothesis developed.

2.11 Proposed Model of the Study

Based on the literature review and the hypothesised links, this study's conceptual model was constructed (see Figure 1).

3. Methods

In this study, a survey approach is utilized in an explanatory nature to statistically explore the causal relationships between constructs under the hypothetical direction. Further, we opted for a structured self-completion questionnaire to obtain cross-sectional data on gamification, customer engagement, perceived usefulness, and perceived ease of use. Besides, the survey instrument was offered in three different languages. Sinhala and Tamil are the official languages of Sri Lanka and English was designated as the intermediary language. Consequently, individuals were able to choose their preferred language for participation. The survey tool was translated into Tamil and Sinhala and back-translated into English. Following this, two bilingual researchers thoroughly compared and reviewed the questionnaires, ensuring minimal differences and consistent meanings for all respondents. A pilot study was carried out before the main survey to evaluate the reliability and validity of the measures.

The researchers of this study developed an online survey for data collection conducted between August and October 2023. The survey was distributed through emails and various social media platforms, including personal channels like Facebook, WhatsApp, and LinkedIn. A total of 541 responses were gathered, with 118 responses excluded from the analysis due to missing information and failure to complete attention check questions. In particular, 61 responses were incomplete (respondents were given the choice to leave the survey at any point) and 57 did not meet the screening criteria (Have you tried the fun way of shopping on an e-tailer website? i.e. getting badges/collecting coins/getting rewards by watching ads/videos, spin and win, etc.). The remaining 423 responses were utilised for validating study measures and examining hypotheses through the PLS-SEM approach.

Among the retained respondents, 53.9% (228) identified as females, while 46.1% (195) identified as males. In terms of age distribution, 39.7% (168) fell within the 18–30 age group, followed by 30% (127) in the 31–45 age group, 19.4% (82) in the 46–60 age group, and the remainder were above 60 years old. Education-wise, 36.4% (154) held GCE (A/L)s, 26.5% (112) possessed a Bachelor's degree, 16.3% (69) had completed GCE (O/L)s, 13.7% (58) had education below GCE (O/L)s, and the remaining respondents had attained post-graduate levels and above. Occupation-wise, 28.6% (121) were employed in the private sector, 27.9% (118) in the government sector, 20.6% (87) were students, 20.3% (86) were semi-government employees, and the remaining were self-employed. In terms of income, 24.1% (102) fell into the LKR 80,001–LKR 110,000 income group, 20.8% (88) had incomes below LKR 50,000, 15.8% (67) were in the LKR 50,001–LKR 80,000 income

group, 10.4% (44) were in the LKR 140,001–LKR 170,000 income group and the remaining 6.4% (27) belonged to the LKR 170,001–LKR 200,000 income group.

4. Analysis

The hypotheses were examined through partial least squares (PLS), a variance-based structural equation modeling (SEM) technique, using SmartPLS 4.1.0 software (Ringle et al., 2023). The PLS model was examined in a two-phase analysis, encompassing the measurement model (outer model) and the structural model (inner model). Following an assessment of the measurement model for convergent and discriminant validity, the structural model was then applied to scrutinize and test the hypotheses.

Table 01: Summary of the measurement model

Construct	Items	Item No.	FL
Gamification (Aparicio et al., 2021; Conaway & Garay, 2014) $\alpha=.934$, $CR=.935$, AVE=.791	The presence of badges/leaderboards/points system increases my engagement with the e-tailer's website.	GAM1	0.890
	The fact of being able to watch ads/videos and get rewards makes me more engaged on this e-tailer website.	GAM2	0.883
	I can receive some rewards (points, badges, or ranking) whenever I do a review of the e-tailer's website.	GAM3	0.901
	The e-tailer website attracts me because it gives me an opportunity to earn benefits (coins/badges, etc)	GAM4	0.912
	I have fun, and it is enjoyable when I spend time on the e-tailer's website	GAM5	0.859
Perceived Usefulness (Davis, 1989) $\alpha=.809$, $CR=.827$, AVE=.722	The use of this e-tailer website makes me able to shop faster.	PEU1	0.885
	The use of this e-tailer website helps me reduce the time wasted on unnecessary activities/searches.	PEU2	0.803
	The use of this e-tailer website saves my time and effort.	PEU3	0.860
Perceived Ease of Use (Davis, 1989) $\alpha=.936$, $CR=.938$, AVE=.840	The use of the e-tailer website doesn't require a lot of brain effort.	EOU1	0.928
	The interaction with this e-tailor website is clear and understandable.	EOU2	0.921
	It's easy to do what I intend to do through this e-tailer website.	EOU3	0.902
	The e-tailer website's interface is easy to use.	EOU4	0.915
Customer Engagement (García-Jurado et al., 2021) $\alpha=.849$, $CR=.855$, AVE=.623	I consider my shopping experience a success with this e-tailer website.	ENG1	0.800
	Shopping on this e-tailer's website was worthwhile.	ENG2	0.798
	I was so involved in my shopping task with this e-tailer website.	ENG3	0.824
	My shopping experience was rewarding.	ENG4	0.733
	I would recommend shopping on this e-tailer website to my friends and family.	ENG5	0.789

Notes: FL = Factor Loading, α = Cronbach's Alpha, CR = Construct reliability, AVE = Average variance extracted

Source: Authors' own creation

4.1. Measurement Model

The evaluation criteria for the measurement model incorporate a comprehensive examination of various aspects, including reliability, convergent validity, and discriminant validity. Consistent with this, Table 1 provides a succinct summary of the measurement model, the factor loadings and Average Variance Extracted (AVE) values, surpassing 0.5, present robust evidence of convergent validity in the measurement instruments (Hair et al.,

2019). The assessment of reliability involves calculating the squared standardised outer loading for each construct and gauging internal consistency reliability via Cronbach's alpha coefficients and composite reliability (CR) scores that exceed the 0.7 threshold (Hair et al., 2019). The discriminant validity test utilises the Fornell-Larcker criterion and Hensel discriminant analysis techniques. The data presented in Table 2 indicate that the square root of the Average Variance Extracted (AVE) for each construct surpasses the corresponding off-diagonal correlation coefficients. This observation constitutes solid evidence supporting discriminant validity (Fornell & Larcker, 1981).

Table 2: Descriptive Statistics and Correlation matrix for the study constructs

Construct	Mean	SD	1	2	3	4
1. Customer Engagement	3.812	.791	0.790			
2. Gamification	3.815	.782	0.825	0.889		
3. Perceived Ease of Use	3.580	.856	0.820	0.844	0.916	
4. Perceived Usefulness	3.605	.770	0.773	0.777	0.798	0.850

Source: Authors' own creation

Additionally, based on the findings presented in Table 3, it is noteworthy that all the heterotrait–monotrait (HTMT) values were observed to be below the more stringent cutoff of 0.85/0.9 (Henseler et al., 2015). Based on this information, it is reasonable to assume that the participants in the study demonstrated awareness of the distinctions between the constructs utilized. This assumption is supported by the robust evidence of discriminant validity, as indicated by the Fornell-Larcker criterion and Hensel discriminant analysis techniques, along with the HTMT values falling below the stricter cutoff thresholds.

Table 03: Results of HTMT analysis

Construct	Customer Engagement	Gamification	Perceived Ease of Use	Perceived Usefulness
Customer Engagement				
Gamification	0.816			
Perceived Ease of Use	0.708	0.802		
Perceived Usefulness	0.811	0.772	0.857	

Source: Authors' own creation

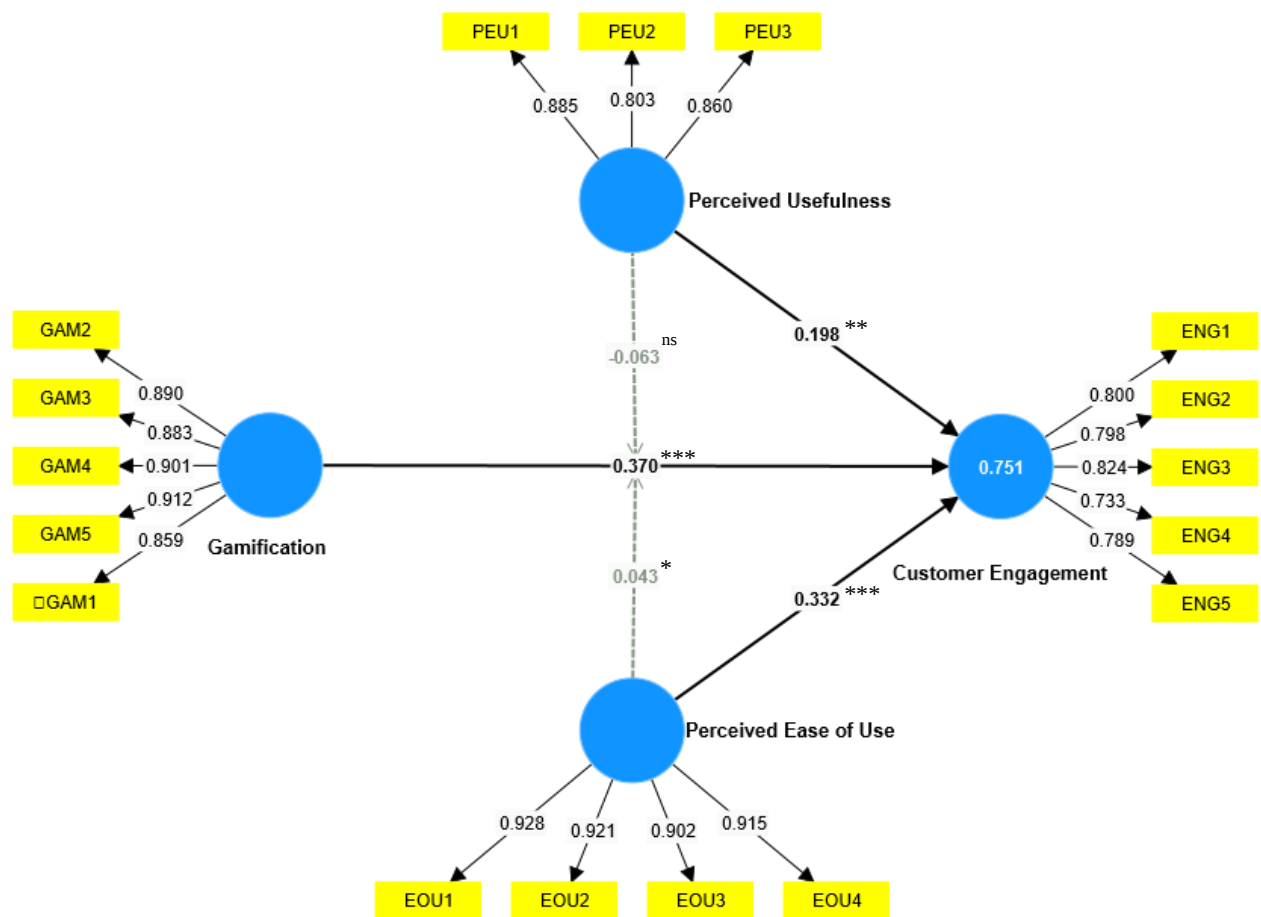
4.2 Common method bias (CMB)

Relying on a single respondent in a study can introduce Common Method Bias (CMB), potentially influencing the relationship between independent and dependent variables (Podsakoff & Organ, 1986). CMB occurs when the measurement method, rather than the actual constructs, affects the observed variables (Bahrami et al., 2022). Researchers commonly use procedural or statistical measures to mitigate CMB and enhance the validity of study results (Zhang et al., 2022). CMB can be assessed by examining the heterotrait–monotrait ratio (HTMT) and conducting a variance inflation factor (inner VIF) test (Ogiemwonyi et al., 2023). As per Nitzl (2016), CMB is indicated by a significant

correlation ($r > 0.90$) among principal constructs. However, in our dataset, all construct correlations are below 0.90, with the highest at 0.857 (see Table 3), suggesting the absence of CMB. In addition to addressing the CMB, the researchers utilized a collinearity test through the VIF (Hair et al., 2020; Ogiemwonyi et al., 2023). As suggested by Kock (2015), VIF exceeding 3.3 is suggested as a signal of pathological collinearity and potential contamination by common method bias in a model. Therefore, if all VIFs in the inner model, following a comprehensive collinearity test, are equal to or below 3.3, it can be concluded that the model is not affected by common method bias.

4.3 Structural model

After completing the initial phase of establishing the reliability and validity of all constructs in the model, the subsequent process comprised reviewing the structural model and testing the hypotheses. The hypothesis was evaluated by the implementation of a bootstrapping process consisting of 5,000 resamples (Hair et al., 2019). The bootstrapping process generates the beta coefficients, standard errors, t-values, p-values, and effect sizes. In addition, R-square (R^2), adjusted R^2 , and Q-square (Q^2) values were employed in this investigation to assess the level of explained variance and effect size (f^2). Figure II depicts the bootstrapping results graphically, whereas Table 4 summarises these results and their interpretation of the study's hypotheses.



Note(s): *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$,

Figure 02: Bootstrapping Results of the Structural Model

Source: Authors' own creation

4.4 Hypothesis testing

In assessing the impact of exogenous constructs, we employed the R^2 value. This metric assesses the variance within each of the endogenous constructs, as outlined in Hair et al. (2019), thereby indicating the model's ability to explain phenomena. Endogenous latent variable R^2 values are typically classified as significant (0.75), moderate (0.50), or weak (0.25) based on guidelines by Henseler (2017) and Hair et al. (2013). Our study's R^2 score for customer engagement was 0.751 (adj. R^2 =.743), indicating substantial support for the research model. This finding surpasses the typical benchmarks and substantially impacts the dependent variable.

Subsequently, the Stone–Geisser Q^2 value estimation method is applied to assess the predictive relevance of the inner model, as outlined by Hair et al. (2019). The findings of our study revealed that the Q^2 values for all dependent variables exceed zero, indicating significant predictive relevance according to (Hair et al., 2019). The f^2 value for gamification was then determined using the Cohen (1992) formula. The obtained result surpassed the predetermined cutoff value of 0.0.

Table 04: Results of the Structural Model

Hypothesis	Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics	P values	Decision
H ₁	Gamification→Customer Engagement	0.37	0.374	0.077	4.789	0.000	Support
H ₂	Perceived Usefulness→Customer Engagement	0.198	0.197	0.064	3.109	0.002	Support
H ₄	Perceived Ease of Use→Customer Engagement	0.332	0.331	0.085	3.911	0.000	Support
Moderation Effect							
H ₃	Perceived Usefulness x Gamification→Customer Engagement	-0.063	-0.055	0.071	0.884	0.377	Not support
H ₅	Perceived Ease of Use x Gamification→Customer Engagement	0.043	0.037	0.019	2.264	0.034	Support

Source: Authors' own creation

Following that, bootstrapping with 5,000 sub-samples was employed by the researcher(s) to assess the significance of path coefficients. In light of the statistical results obtained, except for the H₃ (Perceived Usefulness x Gamification→Customer Engagement) hypothesis, H₁(Gamification→Customer Engagement), H₂ (Perceived Usefulness→Customer Engagement), H₄ (Perceived Ease of Use→Customer Engagement) and H₅ (Perceived Ease of Use x Gamification→Customer Engagement) hypotheses were supported. Table 4 presents a clear and concise representation of the estimated path coefficients.

5. Discussion and Conclusion

This study expands upon prior research on the SDT framework. The primary objective of this piece of work is to examine how gamification features engage customers in the e-tailing context. Additionally, the current study explores how perceived usefulness and perceived ease of use moderate the relationship between gamification and customer engagement. The findings emphasized that four hypotheses were supported, whereas one was not. The results of this study illustrate that gamification enhances customer engagement of e-tailers' websites in Sri Lanka. In line with these findings, the results highlight the positive association between gamification and customer engagement on the e-tailer's website. Rewards, recognition, incentives, and an enjoyable user experience all contribute to a more engaging and interactive platform, fostering customer loyalty and participation. Gamification strategies effectively create a dynamic and rewarding environment that resonates with users, encouraging sustained engagement with the e-tailer's website. This study aligned with the results of previous studies (George et al., 2022; Zheng et al., 2022).

Further, the present study posited that perceived usefulness significantly and positively influences customer engagement. When customers perceive that an e-tailor platform offers valuable and beneficial features, services, or products, it enhances their engagement. This positive perception of usefulness encourages customers to actively interact with the e-tailer, explore offerings, make purchases, and potentially become loyal patrons. The result is consistent with the previous findings (Arghashi & Yuksel, 2022; Hussein & Hassan, 2017; McLean, 2018). Drawing on the present study, the perceived ease of use positively influences customer engagement by ensuring a user-friendly online shopping experience in the e-tailing context. Further, in e-tailing, perceived ease of use fosters customer engagement through intuitive website design, mobile optimization, secure checkouts, transparent product details, efficient support, and personalization. Prioritizing ease of use minimizes barriers, boosts satisfaction, and builds trust. This enhances the overall user experience, encouraging exploration, purchases, and sustained engagement on the e-tailing platform (Arghashi & Yuksel, 2022; McLean & Wilson, 2019; Xu et al., 2021).

This study also revealed that perceived ease of use moderates the relationship between gamification and customer engagement. This study aligned with Tobon, Ruiz-Alba, and García-Madariaga (2020) results. A user-friendly interface and seamless integration of gamified elements enhance the perceived ease of use. When customers find gamification easy to navigate, adapt, and understand, it reduces barriers and encourages active engagement. High perceived ease of use amplifies the positive impact of gamification on user interaction, fostering a more enjoyable and accessible experience. This, in turn, leads to increased customer engagement in the e-tailing platform, as users are motivated to participate in gamified activities. However, the findings revealed that perceived usefulness has not statistically and significantly moderated the relationship between gamification and customer engagement. The impact of gamification on customer engagement may be so pronounced that any moderation effect from perceived usefulness is overshadowed.

Gamification elements might be the primary drivers of engagement, and it may reduce the role of perceived usefulness as a moderator.

6. Implications

This research significantly expands the existing body of literature by providing empirical evidence on the interconnectedness of gamification, perceived usefulness, perceived ease of use, and customer engagement within the specific context of Sri Lankan e-tailing. Moreover, the findings enrich theoretical understanding by successfully validating hypotheses based on established theories like TAM and SDT within the framework of e-tailing and gamification. This research has direct practical implications for businesses in the e-tailing sector, particularly in Sri Lanka, empowering them to develop more effective marketing strategies. By strategically incorporating gamification elements and enhancing perceived usefulness and ease of use, e-tailers can boost customer engagement, ultimately driving sales and loyalty. Additionally, practitioners involved in website and app development will find these results useful in optimising user experience design; a focus on perceived usefulness, ease of use, and integrated gamification can make platforms more attractive and engaging to users. Furthermore, the study emphasizes the importance of fostering customer engagement through gamification and user-centric design, a strategy business can leverage to build stronger customer relationships, leading to increased satisfaction, loyalty, and advocacy. Finally, the findings offer valuable insights for policymakers in Sri Lanka and similar economies; by promoting the adoption of user-friendly e-tailing platforms with well-implemented gamification elements, governments can encourage online commerce and stimulate overall economic growth.

7. Limitations and Future Direction

This study acknowledges several limitations. Firstly, the focus on the Sri Lankan e-tailing context may limit the generalizability of the results. Cultural and contextual factors unique to Sri Lanka could influence consumer behavior differently compared to other regions, potentially restricting the applicability of the findings to other countries. Additionally, the sample size and characteristics potentially limit the broader applicability. The study relied on a convenience sample, which might not represent the entire population of e-tailers in Sri Lanka. Furthermore, while the research employed robust statistical techniques, other methodologies could provide further insights. Qualitative methods like interviews, focus groups, or longitudinal studies could offer a deeper understanding and potentially validate or refine the observed relationships. This research lays the groundwork for further exploration in several key areas. Comparative studies across diverse cultures and countries could shed light on how cultural factors influence the interplay between gamification, perceived usefulness, ease of use, and customer engagement in e-tailing.

Additionally, longitudinal studies tracking changes in consumer behavior over time could offer valuable insights into the dynamic nature of e-tailing engagement. By understanding how these relationships evolve over extended periods, businesses can gain strategic knowledge to adapt their gamification approaches and maintain high levels of customer engagement. Furthermore, combining quantitative analyses with qualitative

research methods like interviews or focus groups could provide deeper and richer insights into consumers' perceptions, motivations, and experiences with gamified platforms. Finally, investigating the influence of socioeconomic factors such as income level, education, and digital literacy on consumer engagement with gamified platforms could provide a more comprehensive and nuanced understanding of user behavior, allowing e-tailers to develop more inclusive and effective gamification strategies.

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