

Gamification aspects affecting mobile app continued use, attitude, and satisfaction

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Abstract

Purpose – The aim of this study is to shed light on the factors influencing continued use, attitude, and satisfaction with gamified mobile app usage. A research model is proposed, featuring achievement, social, confirmation, ease of use, enjoyment, recognition, and social influence as independent variables. Dependent variables encompass continued use, attitude, satisfaction, motivation, and usefulness.

Design/methodology/approach – Data were collected from 1,633 respondents who use gamified shopping apps. Hypothesis testing was conducted using path analysis, and the Bootstrapping method was used to test the significance level of each relationship.

Findings – Results indicate that achievement and social factors have a positive impact on motivation. Motivation, confirmation, and usefulness all positively influence satisfaction. Usefulness is shaped by confirmation and ease of use. Moreover, usefulness, ease of use, and social influence positively correlate with attitude and continued use. Contrarily, neither enjoyment nor recognition appeared to influence attitude or continued use.

Research limitations/implications – This study did not incorporate frequency and personal traits into the model. While the results are particularly relevant to shopping apps, their applicability may extend beyond this context. Future research could consider frequency and personal characteristics as moderating variables and sample objects from varied industries.

Practical implications – When developing gamification strategies, businesses ought to take into account both utilitarian and social aspects of gamification. It's vital to understand user expectations, prioritize user-friendly gamification interfaces, and promote positive word-of-mouth.

Originality/value – This research enriches both the gamification and marketing literature by introducing a model grounded in gamification elements, human motivation theory, and the expectation-confirmation paradigm. It underscores the pivotal role of utilitarian and social facets in shaping usefulness, motivation, satisfaction, attitude, and continued app use. Notably, this work paves the way for further exploration into the roles of enjoyment and recognition.

Keywords: gamification, continued use, satisfaction, attitude, motivation, usefulness

Introduction

Gamification is the process of integrating game experiences into a service to support users' overall value creation (Huotari & Hamari, 2017). The most significant impact of gamification is its ability

to heighten user engagement and motivation. By transforming a task to feel more like a game, users are more likely to engage actively and spend extended periods. Gamification also enhances users' intrinsic motivations, such as the desire for achievement, competition, and social interaction, leading to higher user satisfaction and retention (Takahashi, 2011). Particularly in the online retail industry, as indicated by Raman (2020), gamification has the potential to enrich the shopping experience. It can make shopping experiences more interactive and enjoyable, encouraging users to spend more time on the platform, thereby boosting user engagement. Reward systems, such as points or badges, can drive repeat purchases, enhancing customer loyalty and retention. Furthermore, gamification can help brands distinguish themselves from competitors by providing unique and memorable experiences that resonate with customers (Aydinliyurt et al., 2021).

The utilization of gamification is analogous to the use of coupons and loyalty programs. Today, many businesses use coupons and loyalty programs in their marketing strategies to bolster customer engagement and retention. In years past, coupons played a pivotal role in laying the foundation for gamification before this concept was introduced to online products and services (Aydinliyurt et al., 2021). Yet, the efficacy of these traditional customer engagement methods is on the decline (Yeo, 2020). As a result, businesses are transforming coupons and loyalty programs by incorporating gameplay elements. In many modern gamified shopping apps, gamification techniques are used to enhance the utilization of loyalty points, coupons, and discounts. According to Hwang & Choi (2020), gamifying loyalty programs bolsters users' intentions to participate and download the app. Within these gamified mobile apps, users are typically required to complete tasks or participate in games to earn redeemable points.

Although gamification is widely adopted in marketing, a more comprehensive and in-depth understanding of its implications remains to be delved into (Hamari et al., 2014; Rapp et al., 2019). Much of the current literature zeroes in on the short-term impacts of gamification on user behavior (Fan & Wang, 2020; Li et al., 2021). Furthermore, a significant part of gamification design is predicated on external motivations, such as the accumulation of points and monetary incentives. However, the confluence of game elements and monetary rewards might dilute the efficacy of each strategy (Deci et al., 1999). This is because users might be inclined to abandon the app once the monetary rewards cease. Hence, the sustained impact of gamification on continued usage remains a topic that warrants further investigation.

In general, the primary goal of gamification is to serve utilitarian or practical purposes, such as enhancing user productivity, accumulating points, and receiving rewards. The utilitarian aspects of gamification are typically associated with its usefulness and ease of use. Yet, gamification also encompasses a hedonic dimension as it introduces elements of enjoyment and playful interactions within non-game applications (Hamari & Koivisto, 2015). Moreover, gamification facilitates social interactions between users engaged in the gamified system. These interactions can foster a sense of recognition and relatedness, underpinned by social influence. Thus, Hamari and Koivisto (2015) and Raman (2020) integrated variables from human motivation and technology adoption theories that they believe shape attitudes and ongoing use: usefulness, ease of use, enjoyment, recognition, and social influence.

Furthermore, Rohan et al. (2021) and Aydinliyurt et al. (2021) employed the expectation-confirmation theory, focusing on the interplay between confirmation, usefulness, and satisfaction, which subsequently leads to the continued use of a gamified mobile app. Rohan et al. (2021) incorporated gamification categories—specifically, achievement and social—as predictors of motivation. The integration of game elements, such as badges/trophies, leaderboards, avatars, progress bars, group chats, and more, can influence user motivation and fulfill their desires for achievement, relatedness, and autonomy in self-driven activities. Kim and Ahn (2017) found that gamification enhances users' intrinsic motivation. The components enticing users to engage with gamified shopping apps that meet their needs also bolster the likelihood of their continued engagement.

This study bridges the work of Hamari and Koivisto (2015), Raman (2020), Aydinliyurt et al. (2021), and Rohan et al. (2021). Its objective is to put forth a more holistic model that incorporates motivational factors, game elements, and users' confirmation of their initial gamification expectations

as independent variables: achievement, social aspects, confirmation, ease of use, enjoyment, recognition, and social influence. Additionally, this research scrutinizes how these factors shape users' perceived usefulness, motivation, satisfaction, attitudes, and intentions for continued use.

Literature Review and Hypotheses

Gamification

Gamification refers to the practice of incorporating game experiences into a service to enhance users' overall value creation (Huotari & Hamari, 2017). Gamers often become deeply engrossed in and passionate about the games they play, dedicating a substantial amount of time to them. Recognizing this commitment, marketers started integrating game-like features into non-gaming applications to boost customer engagement (Takahashi, 2011). Koivisto and Hamari (2019) also described gamification as a “motivational information system” since it can stimulate both extrinsic and intrinsic motivations of users, driving them to achieve certain goals in promotional activities and partake in activities beneficial to them. Additionally, gamification is viewed as a “persuasive technology” (Versteeg, 2013) as its mechanisms can shape users' beliefs, attitudes, intentions, and motivations, specifically modifying user behavior by altering their motivation levels.

Continued Use

Continued use pertains to the intent of customers to persistently use an information system, stemming from their satisfaction following the initial adoption (Bhattacharjee, 2001). In information system modeling, “continued use” explains the precursors of post-adoption behavior. This post-adoption phase is as pivotal as the initial adoption. While the initial adoption captures the onboarding of potential users (Aydinliyurt et al., 2021), post-adoption behavior indicates the intent of these actual users to evolve into loyal ones (Zhou, 2011). Bhattacharjee (2001) extended theory of expectation-confirmation posits that post-acceptance behavior, upon validating initial expectations, correlates with users' intent to persist with an information system. Building on this theory, the technology acceptance model leverages perceived usefulness and ease of use to ascertain users' attitudes towards technology. In turn, these attitudes and perceived usefulness influence behavioral intentions, which ultimately dictate actual system usage (Aydinliyurt et al., 2021).

Gamification Categories

According to Xi and Hamari (2019), the distinction of literature related to gamification, games, game design, and gamers, motivation is usually determined by either achievement, social, or immersion. Consequently, Rohan *et al.* (2021) adapted three gamification categories to predict users' motivation. Achievement categories include points/scores, status bars/progress, ranking/leaderboard, and medals/badges/trophies. Social is related to the desire to socialize between the players or users by forming a team within the game or to be part of something. Social categories include group chat, collaboration, and competition. There are also immersion categories that make users immerse and engage in the game. Immersion categories consist of avatars/profiles, narrative, and personalization.

Human Motivation Theory

According to human motivation theory, customer motivation can be categorized into two types: extrinsic and intrinsic (Deci et al., 1999; Hamari & Koivisto, 2015). Specific goals in gameplay serve as extrinsic motivations, which encompass utilitarian benefits derived from accumulating points and completing tasks. Conversely, intrinsic motivation arises from hedonic benefits, which are associated with enjoyment and fun activities. Furthermore, the social dimension is increasingly incorporated into both utilitarian and hedonic systems (Hamari & Koivisto, 2015). Therefore, the research by Hamari and Koivisto (2015) and Raman (2020) identifies three types of benefits as predictors of continued use and attitude: utilitarian, hedonic, and social. Utilitarian benefits are characterized by usefulness and ease of use; hedonic benefits by enjoyment and playfulness; and social benefits by recognition and social influence.

Hypotheses Development

The effect of achievement on motivation

Achievement refers to a user's expected sense of accomplishment after completing tasks in a game (Hsu et al., 2017; Koivisto & Hamari, 2019; Xi & Hamari, 2019). This category encompasses elements like badges, trophies, scores, status bars, and leaderboards. These components provide users with clear objectives and behavioral incentives (Zhou, Mou, and Kim, 2022) and present challenging situations that enhance the pleasure of achieving goals (Xi & Hamari, 2019). In an e-marketplace app, for example, the game enables users to accrue points that can be applied as discounts on subsequent purchases. Leaderboards, as an element of achievement, can further motivate users to complete specific tasks and receive acknowledgment for their accomplishments (Rohan et al., 2021). Ortega-Arranz et al. (2018) posited that leveraging such rewards can amplify user motivation and engagement due to the prospect of attaining greater achievements, which in turn may promote continued use. Rohan et al. (2021) also documented the positive impact of achievement on motivation. Given this background, the following hypothesis is proposed:

H₁: Achievement has a positive influence on motivation.

The effect of social on motivation

Social refers to the networks where users connect and interact with others (Aparicio et al., 2019; H. Liu et al., 2019). Within gamification, the social category encompasses elements like competition, group chats, and collaboration/teamwork. Through interactions in the gamified mobile app, these social elements enable users to acquire skills and foster a sense of connection within the network (Xi & Hamari, 2019). This connection drives users to excel, thereby boosting motivation (Koivisto & Hamari, 2019). Furthermore, Alsawaier (2018) suggested that social connection and relatedness exert a positive influence on intrinsic motivation. Consistent with this, Rohan et al. (2021) identified a positive effect of social elements on motivation. Given these findings, the study posits the following hypothesis:

H₂: Social has a positive impact on motivation.

The effect of motivation on satisfaction

Motivation represents the goals or reasons that drive customers to behave in a particular manner within specific contexts (Cho & Heron, 2015). In the realm of information technology, motivation serves as a key determinant for initiating and maintaining technology use (Rohan et al., 2021). Alsawaier (2018) argued that elements such as autonomy, competence, and relatedness positively shape motivation within a gamified environment. These principles resonate with gamification elements that similarly engender satisfaction. Furthermore, studies by Abeer and Miri (2014) and Rohan et al. (2021) corroborated that motivation positively influences user satisfaction. Building on this, the study proposes the following hypothesis:

H₃: Motivation exerts a positive effect on satisfaction.

The effect of confirmation on satisfaction

Confirmation pertains to customers' assessments of the actual performance of technology relative to their initial expectations prior to adoption (Alraimi et al., 2015). Confirmation influences satisfaction via a rational process, which involves juxtaposing initial expectations against confirmed beliefs (Bhattacharjee, 2001). The degree of confirmation is, however, subjective, as each user holds unique expectations towards technology. While these expectations may evolve, users often harbor either unrealistically diminished or inflated anticipations. The degree of confirmation hinges on these varied expectations, shaping users' resultant satisfaction or dissatisfaction. Positive confirmation, wherein users' expectations align with reality, typically engenders satisfaction. Research by Bhattacharjee (2001), Aydınliyurt et al. (2021), and Rohan et al. (2021) also identified a robust positive relationship between confirmation and satisfaction. Because of this, the study formulates the following hypothesis:

H₄: Confirmation directly enhances satisfaction.

The effect of confirmation on usefulness

Confirmation positively influences usefulness. Before their initial use, users harbor expectations regarding the usefulness of a technology. As per the extended expectation-confirmation theory model, confirmation underpins both satisfaction and perceived usefulness (Aydinliyurt et al., 2021; Bhattacharjee, 2001). When the anticipated utility of technology is validated, it results in a favorable post-adoption perception of usefulness. Prior research by Bhattacharjee (2001), Rohan et al. (2021), and Aydinliyurt et al. (2021) affirms that confirmation enhances perceptions of usefulness. Hence, the study postulates the following hypothesis:

H₅: Confirmation exerts a positive effect on usefulness.

The effect of usefulness on satisfaction

Usefulness denotes the extent to which users believe that utilizing a specific system will bolster task performance (Davis, 1989). In essence, usefulness captures the users' perceived utility, correlating with fundamental technology requirements. As such, technology platforms must inherently boost user task performance, paving the way for heightened satisfaction. For instance, gamified shopping apps ought to feature gamification functionalities that empower users to accrue points and redeem vouchers or discounts. When this utility is tangible, user satisfaction is likely to surge. Research by Rohan et al. (2021) and Aydinliyurt et al. (2021) underscores a positive relationship between usefulness and satisfaction. Consequently, the study proposes the following hypothesis:

H₆: Usefulness directly enhances satisfaction.

The effect of usefulness on attitude

Usefulness has a positive bearing on attitude. Attitude captures the holistic assessment of system usage or can be characterized as a general sentiment—either favorability or unfavorability—toward an entity (Ajzen, 1991; Fishbein & Ajzen, 1975). Within the digital shopping milieu, Van Reijmersdal et al. (2012) illustrated that gamification amplifies customers' attitudes towards technological services. Usefulness, representing the utilitarian facet of gamification, emphasizes user productivity aligned with overarching goals. Grounded in human motivation theory, utilitarian objectives spur users to engage with gamified shopping apps. Positioned as a “persuasive technology,” gamification can recalibrate users' attitudes and behaviors (Hamari and Koivisto, 2015). In this context, the perceived usefulness of an app can recalibrate user attitudes favorably. Hamari and Koivisto (2015) substantiated that usefulness stands out as a pivotal determinant of attitude. Drawing on these insights, this study advances the following hypothesis:

H₇: Usefulness favorably affects attitude.

The effect of usefulness on continued use

Usefulness positively influences continued use. Both the technology acceptance model and human motivation theory regard usefulness as pivotal in predicting users' continued use. Bhattacharjee (2001) asserted that incentives often fall short in driving sustained user engagement. However, within the context of utilitarian considerations, such incentives remain pertinent. When users perceive a technology as beneficial, they're more inclined to persist with its use, given the rewards on offer. Both Aydinliyurt et al. (2021) and Rohan et al. (2021) posited a positive relationship between usefulness and continued use, while Hamari and Koivisto (2015) identified an indirect association between the two. Consequently, the study presents the following hypothesis:

H₈: Usefulness has a direct positive effect on continued use.

The effect of ease of use on usefulness

Ease of use denotes the degree to which users perceive that using a system demands minimal effort (Davis, 1989). It underscores a user experience devoid of challenges and epitomizes efficiency

(Hamari & Koivisto, 2015; Raman, 2020). A user-friendly system reduces the effort users need to spend to accomplish tasks. Those interacting with gamified mobile apps might not necessarily mirror dedicated gamers who thrive in intricate gaming environments. Hence, gamified mobile apps must focus on effortless task completion. Users tend to view apps requiring minimal effort as more useful (Liu et al., 2019). Both Raman (2020) and Liu et al. (2019) discovered that ease of use positively correlates with perceived usefulness. Because of this, the study advances the following hypothesis:

H₉: Ease of use has a direct positive impact on usefulness.

The effect of ease of use on attitude

Ease of use exerts a positive influence on attitude. It's among the paramount determinants in technology acceptance and embodies a utilitarian facet of tech adoption (Yen & Wu, 2016). Systems that are intuitive signal an absence of barriers and often foster feelings of efficiency. Davis (1989) also highlighted ease of use as a key contributor to attitude formation. In the realm of gamification, ease of use has been pinpointed as a determinant of attitude (Hsu & Lu, 2004; Z. Wang & Scheepers, 2012), especially since hedonic systems are crafted for enjoyment. Contrarily, Hamari and Koivisto (2015) reported an inconsequential link between ease of use and attitude. Given the disparate findings from prior studies, the following hypothesis is put forward:

H₁₀: Ease of use exerts a positive influence on attitude.

The effect of ease of use on continued use

Ease of use positively influences continued use. In the realm of hedonic usage, ease of use has been demonstrated to favorably affect continued use intention (Atkinson & Kydd, 1997; van der Heijden, 2004). Studies by Hamari and Koivisto (2015) and Raman (2020) identified a positive and significant relationship between ease of use and continued use. In the e-marketplace context, a gamified shopping app that is intuitive can prompt users to engage further, especially if they don't encounter difficulties in playing or completing tasks to earn points. Therefore, gamification should be user-friendly and easily comprehensible. Building on this, the study posits the following hypothesis:

H₁₁: Ease of use has a direct positive effect on continued use.

The effect of enjoyment on attitude

Enjoyment pertains to the perception that a technology is delightful to engage with (Davis, 1989). It captures the sentiment of users finding pleasure and fun when participating in a gamified mobile app (J. Xu et al., 2014). In the gaming arena, Ghazali et al. (2019) noted that gamers report heightened enjoyment and satisfaction when they are less aware of their surroundings. Hamari and Koivisto (2015) posited that if users perceive a gamification technology as enjoyable, their attitude toward that technology will likely be positive. The positive correlation between enjoyment and attitude was documented in the study of hedonic systems by Ha et al. (2007). Consequently, this study presents the following hypothesis:

H₁₂: Enjoyment exerts a positive influence on attitude.

The effect of enjoyment on continued use

Enjoyment positively affects continued use. In game-inspired systems, enjoyment has emerged as a crucial predictor of continued use intentions (Hamari and Koivisto, 2015). Enjoyment represents the hedonic facet of gamification, dedicated to facilitating pleasurable experiences and activities rooted in fun. When users derive enjoyment from a gamified mobile app, they are inclined to revisit the platform to sustain or elevate that pleasure. As such, studies by Hamari and Koivisto (2015) and Wu et al. (2010) pinpointed enjoyment as a significant determinant of sustained online game engagement. Based on these insights, the study advances the following hypothesis:

H₁₃: Enjoyment directly enhances continued use.

The effect of recognition on attitude

Recognition denotes users' social feedback in response to their actions (Hernandez et al., 2011; Hsu & Lin, 2008). In the social dimension of gamification, recognition often stems from interactions among users (Cheung et al., 2011; Chiu et al., 2006; Hamari & Koivisto, 2015; H.-F. Lin, 2008). Such interactions allow individuals to become part of shared experiences or activities. Engaging in these interactions, users might feel a sense of kinship with like-minded individuals and gain recognition. As a result, users might foster a more positive view of gamification and subsequently form a favorable attitude (Preece, 2001). Hamari and Koivisto (2015) identified recognition as a positive and salient precursor to attitude. Because of this, the study formulates the following hypothesis:

H₁₄: Recognition has a direct positive effect on attitude.

The effect of recognition on continued use

Recognition positively influences continued use. Within the social facet of gamification, social interaction stands as a vital construct, enriching user experience and aiding decision-making (Y. Wang & Yu, 2015; Xu et al., 2017). Moreover, Y. Wang & Yu (2015) highlighted that social interaction serves as a pivotal predictor shaping users' behavioral intentions. The interplay among users fosters a sense of recognition, fueling sustained participation. Consequently, recognition can catalyze the intent for continued use. Building on these insights, the study proposes the following hypothesis:

H₁₅: Recognition directly enhances continued use.

The effect of social influence on attitude

Social influence captures the collective expectations regarding participation in gamified mobile apps (Ajzen, 1991; Fishbein & Ajzen, 1975). Representing a social dimension of gamification, social influence is integral to stimulating user engagement (Raman, 2020). Beyond mere interactions with other users, it encompasses the broader milieu surrounding an individual. Participation in gamified mobile apps might entail recommendations or positive evaluations, molding the perceptions of those in the user's vicinity. Consequently, social influence can recalibrate users' attitudes toward such apps. Research by Hamari and Koivisto (2015) confirmed that social influence exerts a direct, positive impact on attitudes toward gamified apps. Because of these findings, the study postulates the following hypothesis:

H₁₆: Social influence has a direct positive effect on attitude.

The effect of social influence on continued use

Social influence exerts a positive pull on continued use. As previously mentioned, it's expected to shape both users' attitudes and their proclivity for sustained use. Prior work by Hamari and Koivisto (2015) posited that social influence impacts behavioral intentions—this effect being mediated by attitude and directly influencing it. Particularly focusing on female clientele in gamification, Oinas-Kukkonen and Harjumaa (2008) documented that social influence nudges customers towards desired behaviors. Further, Orji (2014) elucidated that endorsements from social networks galvanize users to replicate their actions, thereby bolstering continued engagement with gamified apps. With these observations in mind, the study formulates the following hypothesis:

H₁₇: Social influence directly enhances continued use.

Figure 1 visually represents the research model. This model interweaves insights from Hamari and Koivisto (2015), Raman (2020), Aydinliyurt et al. (2021), and Rohan et al. (2021). The model's independent variables encompass achievement, social, confirmation, ease of use, enjoyment, recognition, and social influence. Conversely, the dependent variables encapsulate usefulness, motivation, satisfaction, attitude, and continued use.

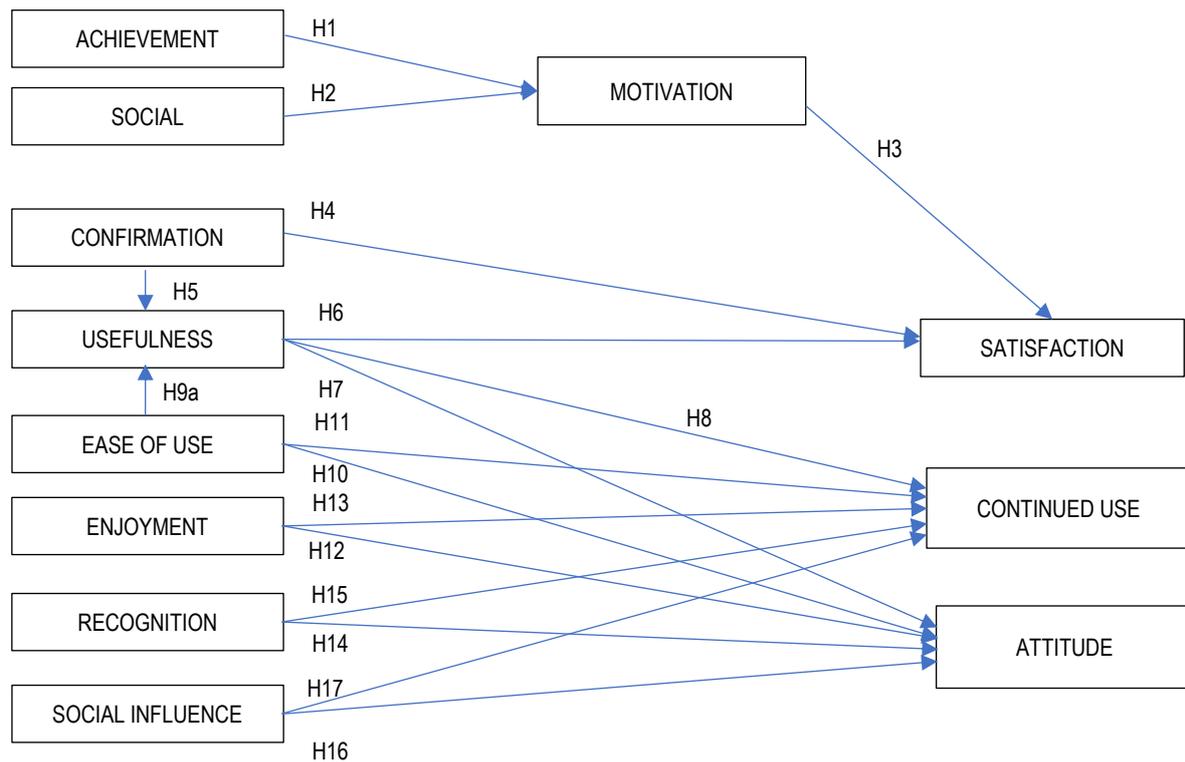


Figure 1. Research Model

Research Methods

This study adopts a quantitative approach, using the survey method. Fourteen variables are assessed, each measured using a five-point likert scale. The measurement items for ‘achievement’ and ‘social’ were sourced from Rohan et al. (2021) and F. Zhou et al. (2022). ‘Confirmation’ was evaluated using items from both Rohan et al. (2021) and Aydınlyurt et al. (2021). ‘Usefulness’ and ‘ease of use’ measurement items were drawn from Hamari and Koivisto (2015) and Raman (2020). Additionally, Hamari and Koivisto (2015) provided items that gauged ‘enjoyment’, ‘recognition’, and ‘social influence’. ‘Motivation’ and ‘satisfaction’ were assessed with items from Rohan et al. (2021), while ‘attitude’ was measured using Hamari and Koivisto (2015). Finally, measurement items for ‘continued use’ were adopted from a combination of sources: Hamari and Koivisto (2015), Rohan et al. (2021), Raman (2020), and Aydınlyurt et al. (2021).

The study’s target population encompasses users of gamified shopping apps. The study determined the criteria for the sample units, namely users of gamified shopping apps who have participated in gamification programs at least once in the past 6 months. Using a purposive sampling method, the online questionnaire was distributed via Google Forms to reach 1,633 respondents engaged in gamification programs. The primary focus of this research encompasses shopping apps with integrated gamification systems, such as Shopee and Tokopedia.

Results and Discussion

Respondents’ Profile

Table 1 illustrates that respondents come from various regions, including Yogyakarta, Central Java, DKI Jakarta, East Java, West Java, Banten, Bali, and other provinces outside Java and Bali. The average age of respondents is 24 years. Regarding occupation, college students constitute 45.0 percent, while operational workers account for 17.9 percent. When queried about their motivation for using gamified shopping apps, the primary reason was to obtain discounts or cashback (26.9 percent), while 25.0 percent did not specify a particular motive. Concerning platform preference, 68.8 percent opted for Shopee, with Tokopedia trailing at 23.4 percent.

Table 1. Respondent Profile

Characteristic	Amount	Percentage
Gender:		
Female	945	57.9
Male	688	42.1
Education		
Junior high school	17	51.8
Senior high school	615	37.7
Diploma	67	5.3
Bachelor degree	846	4.1
Master	87	1.0
Doctor	1	0.1
Occupation		
Student	31	1.9
College student	735	45.0
Operational worker	292	17.9
Entrepreneur	115	7.0
Managerial worker	112	6.9
Professional	62	3.8
Housewife	36	2.2
Others	250	15.3
Residential		
DI Yogyakarta	679	41.6
Jawa Tengah	215	13.3
DKI Jakarta	184	11.3
Jawa Timur	161	9.9
Jawa Barat	95	5.8
Banten	42	2.6
Bali	41	2.5
Other provinces outside Java and Bali	216	13.2
Motives		
Obtaining discount or cash back	437	26.9
No special reason	406	25.0
Obtaining free shipping fee	257	15.8
Entertainment seeking	171	10.5
Spending free time	132	8.1
Looking for gifts	55	3.4
Hobby	47	2.9
Adding experience	43	2.7
Interacting with other users	12	0.7
Others	62	3.8
Preferred e-marketplace		
Shopee	1123	68.8
Tokopedia	382	23.4
Lazada	44	2.7
Bukalapak	29	1.8
Blibli	13	0.8
JD.ID	9	0.6
Others	33	2.0

Measurement and Structural Model

The study employed structural equation modeling partial least square (SEM-PLS) to explore the relationships between variables. Reliability and validity indicators were used to evaluate the measurement model. Construct validity underwent scrutiny through both convergent and discriminant validity. As depicted in Table 2, instrument reliability was assessed using Composite Reliability (CR) criteria, confirming the commendable reliability of each variable, with CR values exceeding 0.7 (X. Lin et al., 2017).

Table 2. Outer Loading, AVE, and Reliability Analysis

Variable	Items	Outer loading	AVE	CR
Attitude	AT1	0.773	0.618	0.866
	AT2	0.800		
	AT3	0.795		
	AT4	0.774		
Achievement	AV1	0.806	0.693	0.900
	AV2	0.864		
	AV3	0.831		
	AV4	0.826		
Confirmation	CF1	0.851	0.719	0.885
	CF2	0.863		
	CF3	0.830		
Continued use	CU1	0.781	0.566	0.893
	CU2	0.721		
	CU3	0.744		
	CU4	0.763		
Enjoyment	EJ1	0.803	0.664	0.887
	EJ2	0.839		
	EJ3	0.795		
	EJ4	0.821		
Ease of use	EU1	0.813	0.715	0.883
	EU2	0.871		
	EU3	0.852		
Motivation	MT1	0.800	0.630	0.872
	MT2	0.823		
	MT3	0.810		
	MT4	0.739		
Recognition	RG1	0.879	0.766	0.908
	RG2	0.886		
	RG3	0.860		
Social	SC1	0.536	0.556	0.783
	SC2	0.768		
	SC3	0.890		
Satisfaction	SF1	0.813	0.631	0.872
	SF2	0.797		
	SF3	0.785		
	SF4	0.781		
Social influence	SI1	0.698	0.603	0.858
	SI2	0.819		
	SI3	0.808		
	SI4	0.776		
Usefulness	UF1	0.806	0.644	0.878
	UF2	0.810		
	UF3	0.832		
	UF4	0.759		

Regarding validity assessment, all variables met the criteria, with the outer loading per questionnaire item of each variable exceeding 0.7, and each variable's average variance extracted (AVE) surpassing 0.5, indicating robust validity (Henseler et al., 2009). Although two items, SC1 and SI1, fell below the 0.7 threshold, they maintained acceptable validity as their variable's AVE score was above 0.5. Discriminant validity was gauged using the Fornell-Larcker criterion. Results in Table 3 indicate that each variable successfully met the discriminant validity criteria, with the square-root AVE values surpassing the correlation values with other variables (Henseler, Ringle, et al., 2016).

Table 3. Forner-Larcker Criteria

	Achievement	Attitude	Confirmation	Continued Use	Ease of Use	Enjoyment	Motivation	Recognition	Satisfaction	Social	Social Influence	Usefulness
Achievement	0.832											
Attitude	0.250	0.786										
Confirmation	0.500	0.346	0.848									
Continued Use	0.289	0.638	0.307	0.752								
Ease of Use	0.239	0.479	0.211	0.438	0.845							
Enjoyment	0.547	0.350	0.543	0.350	0.356	0.815						
Motivation	0.162	0.610	0.238	0.576	0.516	0.281	0.794					
Recognition	0.518	0.196	0.522	0.231	0.043	0.546	0.078	0.875				
Satisfaction	0.309	0.669	0.352	0.626	0.484	0.384	0.604	0.299	0.794			
Social	0.511	0.198	0.372	0.226	0.149	0.409	0.219	0.380	0.222	0.746		
Social Influence	0.368	0.546	0.506	0.506	0.368	0.486	0.468	0.451	0.553	0.281	0.777	
Usefulness	0.247	0.506	0.386	0.441	0.648	0.353	0.558	0.128	0.495	0.179	0.463	0.802

Table 4. R-square Indicators

	R Square	R Square Adjusted
Attitude	0.408	0.406
Continued Use	0.342	0.340
Motivation	0.051	0.050
Satisfaction	0.428	0.427
Usefulness	0.485	0.484

Table 5. F-square Indicators

	Attitude	Continued Use	Motivation	Satisfaction	Usefulness
Achievement			0.004		
Attitude					
Confirmation				0.046	0.126
Continued Use					
Ease of Use	0.038	0.037			0.652
Enjoyment	0.002	0.003			
Motivation				0.266	
Recognition	0.001	0.001			
Satisfaction					
Social			0.026		
Social Influence	0.144	0.100			
Usefulness	0.031	0.013		0.030	

The structural model underwent evaluation using R-square and F-square. Table 4 reveals that the R-square values for attitude, continued use, satisfaction, and usefulness are moderate, surpassing 0.33. However, the R-square of motivation appears weak, falling below 0.19. In Table 5, F-square values between ease of use and usefulness, and between motivation and satisfaction, are considered medium, equal to or exceeding 0.15. F-square values for other relationships are considered weak, with values either below 0.15 or 0.02.

The research model’s fit was further assessed with SRMR and NFI indicators of the saturated model version. An SRMR value of 0.058 is considered a good fit, being below the 0.1 threshold (Henseler, Hubona, et al., 2016). Similarly, the NFI value of 0.771, close to 1, indicates a satisfactory model fit.

Hypothesis Testing

In this study, the hypotheses were analyzed using path coefficient analysis. The bootstrapping method was used to test the significance of each path coefficient, with an accepted p-value ≤ 0.05 . As detailed in Table 6, 13 hypotheses were supported, while the remaining four hypotheses (H12, H13, H14, and H15) were not supported.

Table 6. Path Coefficient and Bootstrapping Result

Hypotheses	Relationships	Estimates	Standard Deviations	T Statistics	P-Values	Conclusions
1	Achievement → Motivation	0.068	0.033	2.079	0.038	Supported
2	Social → Motivation	0.184	0.034	5.381	0.000	Supported
3	Motivation → Satisfaction	0.470	0.026	17.763	0.000	Supported
4	Confirmation → Satisfaction	0.177	0.023	7.848	0.000	Supported
5	Confirmation → Usefulness	0.261	0.022	11.660	0.000	Supported
6	Usefulness → Satisfaction	0.165	0.028	5.853	0.000	Supported
7	Usefulness → Attitude	0.186	0.033	5.698	0.000	Supported
8	Usefulness → Continued Use	0.127	0.032	3.942	0.000	Supported
9	Ease of Use → Usefulness	0.593	0.019	30.515	0.000	Supported
10	Ease of Use → Attitude	0.205	0.029	7.065	0.000	Supported
11	Ease of Use → Continued Use	0.213	0.029	7.389	0.000	Supported
12	Enjoyment → Attitude	0.045	0.028	1.608	0.109	Not Supported
13	Enjoyment → Continued Use	0.054	0.031	1.734	0.084	Not Supported
14	Recognition → Attitude	-0.031	0.027	1.177	0.240	Not Supported
15	Recognition → Continued Use	0.027	0.029	0.920	0.358	Not Supported
16	Social Influence → Attitude	0.377	0.030	12.483	0.000	Supported
17	Social Influence → Continued Use	0.330	0.030	10.932	0.000	Supported

Regarding hypotheses H1 and H2, which are supported. Consistent with previous studies, the research confirmed that both achievement and social elements positively affect motivation. These findings suggest that users become more motivated when engaging with gamified mobile apps, as they can play, socialize, and achieve benefits. In e-marketplace apps, games enable users to accumulate points or gifts. Such achievements are beneficial, as users can use the points for discounts or redeem gifts. Leaderboards, representing an achievement element, can also encourage users to complete tasks, gaining recognition for their efforts. These platforms let users establish clear objectives and foster a sense of mastery. Moreover, the gaming environment offers features that promote social interaction, thereby enhancing motivation.

Concerning hypotheses H3, H4, and H6, which are supported. Satisfaction is influenced by motivation, confirmation, and usefulness. Results showed that motivation stands out as the most significant determinant of satisfaction. Users who are intrinsically or extrinsically motivated by gamified apps tend to be more satisfied. Their engagement is driven by genuine interest rather than merely imitating others. As users have initial expectations when adopting a technology, they seek confirmation that its performance aligns with these expectations. This confirmation is crucial for user satisfaction. Additionally, the app's utility, signifying its ability to enhance users' performance, influences satisfaction. Users feel empowered to engage in more app-based activities beyond mere shopping, enhancing their satisfaction.

Addressing hypotheses H5 and H9, which have found support. It is seen that the confirmation and ease of use significantly affect the usefulness. The results suggest that users' expectations regarding the usefulness of gamified shopping apps have been affirmed. The gamification programs facilitate users in tracking their past shopping transactions effortlessly. Additionally, users receive clear guidance on the necessary shopping transactions to avail benefits like discounts, cashback, or free shipping. Following the technology acceptance model (TAM), the concepts of usefulness and ease of use embody the utilitarian dimension of gamification. It focuses on users' increased productivity through technological engagement. Users perceive participating in gamification programs on a shopping app as not being overly complex; instead, they view it as a valuable tool for accomplishing their shopping objectives. According to Liu et al. (2019), the less effort the technology demands, the more users perceive it as useful.

Continuing with the supported hypotheses H7, H10, and H16, it is evident that usefulness, ease of use, and social influence impact attitude. Hamari and Koivisto (2015) referred to gamification as a persuasive technology due to its ability to influence users' attitudes and behaviors. The usefulness of gamification for users in the utilitarian aspect, offering various incentives like discounts, cashback, and free shipping, can shape a positive attitude toward gamified shopping apps. Similarly, the ease of use aspect in the gamification dashboard serves as the foundation for

the formation of positive user attitudes toward gamified shopping apps. Its user-friendly technology is considered highly beneficial for achieving better outcomes in utilitarian contexts. Nowadays, almost every gamified shopping app incorporates social aspects, such as discussion forums, ratings, and reviews. User satisfaction with social interactions can shape a positive attitude toward gamified shopping apps. Furthermore, social influence extends beyond user interactions to include the people in the users' surroundings. Consequently, the positive perception influenced by users' surroundings contributes to forming a positive attitude toward the gamified app.

Examining supported hypotheses H8, H11, and H17, it becomes evident that the usefulness, ease of use, and social influence impact continued use. Gamification's usefulness, in a utilitarian context, is evident through incentives like discounts, cashback, or free shipping. Users remain motivated to continue using gamified shopping apps due to the numerous benefits received in the form of incentives. The critical role of ease of use in technology acceptance is highlighted, as it helps alleviate the perception of new technology being complicated or inherently complex. A user-friendly dashboard assists users in participating in various gamification programs offered to attain desired incentives. The combination of ease of use with incentives significantly motivates users to persist in using the platform. Social influence also further encourages users to continue using gamified shopping apps. It allows them to learn from others by analyzing reviews, ratings, and comments, transforming them into practical guidelines for participating in gamification programs.

Regarding hypotheses 12, 13, 14, and 15, which are not supported. The hedonic aspect of gamification, represented by enjoyment, appears to have a less conscious impact. While users can easily perceive utility when engaging with the app, the influence of enjoyment is not as noticeable and may depend on usage frequency and intent. In shopping apps, the primary goal revolves around rewards, resulting in gamification that is entertaining but not as immersive as conventional games. The nuanced influence of enjoyment could, therefore, be contingent on how frequently users engage with the game. Recognition was theorized to influence both attitude and continued use. However, despite gamification enabling user interaction and recognition within their social networks, this study observed that, unlike social influence, recognition did not significantly affect attitude or continued use. Due to the less intricate nature of gamified systems compared to traditional games, users might not be as invested in seeking extensive recognition, opting instead for leisurely participation or goal achievement.

Theoretical Implication and Managerial Implication

The findings of this study contribute to the existing literature on gamification studies. Specifically, it offers new insights through a comprehensive model that links gamification elements, human motivation theory, and the expectation-confirmation model. Findings deviating from prior studies can serve as inspiration for future research. The four unsupported hypotheses indicate that enjoyment and recognition of gamification elements do not affect either attitude or continued use. Future studies are suggested to further explore the utilitarian aspects of gamification elements, such as usefulness and ease of use.

In a managerial context, this study provides valuable insights for businesses regarding gamification programs. Companies are advised to focus more on the utilitarian aspects of gamification elements, namely ease of use and usefulness. Maximizing ease of use involves designing a gamification dashboard with a simple, easy-to-learn, and user-friendly interface. Maximizing usefulness entails ensuring that various incentives from gamification programs genuinely provide tangible benefits that support users in meeting their shopping goals. Companies should incorporate impactful achievement and social features, such as leaderboards, points systems, chat functions, and collaboration tools. This makes sure users are motivated and satisfied with the gamified mobile app.

The social influence aspect of gamification elements needs to be facilitated more. The gamification dashboard should be designed with a stronger focus on building a social context through easily accessible forums, ratings, and reviews. Through positive word of mouth, users can help promote a favorable impression to encourage other users to engage with the gamified shopping app.

Conclusion and Future Direction

The study found that the gamification elements of achievement and social engagement exert a significant positive influence on motivation. The utilitarian components, indicated by usefulness and ease of use, positively influence both attitude and continued use. Conversely, the hedonic element of gamification, represented by enjoyment, did not affect attitude or continued use. This variance may arise from the distinct functions of utilitarian and hedonic elements. Furthermore, social influence as the social element of gamification emerged as the most influential factor shaping users' attitudes and intentions toward continued usage of gamified mobile apps. However, recognition, another social element of gamification, did not have a similar impact. The study also discovered that motivation, confirmation, and usefulness were positive predictors of satisfaction, with motivation emerging as the most influential determinant.

This research acknowledges certain limitations. The focus was on gamification within shopping apps, which might cause the results to be context-specific. Future studies could explore gamification across various industries, such as educational and health-related apps. Moreover, users primarily engaged with shopping apps for purchasing, rather than explicitly for gamification. Thus, outcomes might differ for apps that use gamification as a primary motivational tool. Second, this research didn't assess the frequency of user interactions with gamification elements, an aspect that could be included in future investigations. Last, this study did not delve into potential demographic differences, such as gender or generational distinctions. Subsequent research could incorporate these personal characteristics as potential moderating variables.

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