





Trends and Applications of Gamification in E-Commerce: A Systematic Literature Review

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Abstract

Background: Gamification is a trend that has emerged with the growth of e-commerce. Given the wide range of human characteristics, determining which gamification elements perform well and what impact those gamification elements have can be challenging.

Objective: This study aims to conduct a systematic literature review to broadly review the impact that can be caused by the application of gamification elements in e-commerce. This study also attempts to identify the current trends in using gamification elements.

Methods: This study was carried out based on the Kitchenham approach and analyzes 25 research papers extracted from a total of 550 papers. The articles were gathered from ACM, Emerald, ScienceDirect, and Scopus and were published between 2016 and 2021.

Results: This study found that the trend of research in the field of gamification in e-commerce continues to grow every year. Also, this study found that the most frequently used gamification elements are achievement-oriented (such as rewards, points, badges, and leaderboards). Meanwhile, immersion-related gamification elements (such as avatars, fantasy, etc.) are emerging as a new trend for new gamification elements to be incorporated in e-commerce. This study also found three major themes, namely consumer loyalty, consumer engagement, and user behavior, as a result of the application of gamification in e-commerce.

Conclusion: This study helps to improve knowledge of various gamification elements, trends, and impacts on e-commerce. Future studies need to examine the challenges that may arise in the application of gamification elements to the three major themes found in this study and find potential solutions to overcome them.

Keywords: E-Commerce, Gamification, Gamification trends and applications, Kitchenham, Systematic literature review.

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I. INTRODUCTION

Technological advancements and developments have made everything easier and more efficient. One of the benefits of technology is the ease of purchasing online using an e-commerce platform. E-commerce, or electronic commerce, refers to all buying and selling operations undertaken through electronic means. Although television and the telephone are also forms of electronic media, e-commerce is becoming more popular via the internet. E-commerce transactions have the potential to grow in tandem with the growing number of internet users [1].

E-commerce has grown in popularity among consumers in recent years, with a rising number of customers choosing to conduct transactions through this medium. Additionally, e-commerce has turned into a vital supporter of

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the economy of numerous nations [2]. According to Zheng et al. [3], the concept of e-commerce can be expanded into several classifications, one of which is mobile commerce (m-commerce). M-commerce allows users to buy products online conveniently because of its nature that can be accessed easily via mobile devices. With the growing popularity of mobile devices, more and more people are shopping and doing transactions.

The popularity of mobile devices supports the emergence of various innovations. There has been a surge in the number of games offered on m-commerce platforms in recent years. The incorporation of game elements into a non-gaming context to induce certain behaviors is referred to as gamification [4]. Gamification has emerged as an innovative and promising technology that has been rapidly embraced and utilized in a variety of sectors and situations, including health, marketing, and advertising, environment, teamwork, employment, education, and crowdsourcing [2].

The inclusion of various game elements in non-gaming activities has a significant influence on consumer decisions [4]. According to Bittner and Shipper [5], gamification can cause emotional reactions in users, such as a sense of addiction, perceived usefulness, enjoyment, and curiosity. The implementation of gamification consists of several elements. Points, badges, levels, leaderboards, feedback, countdowns, challenges, lotteries, progress bars, and competitive bidding systems are examples of gamification elements [2].

Given the wide range of human characteristics, determining which gamification elements perform well and what impact those gamification elements have can be challenging. These are simply the initial points for the research question, which seeks to investigate and clarify a link between a relatively new topic (gamification) and a well-established theme (e-commerce) [6]. In fact, just a minority (2.9%) of gamification studies have been published in the subject of e-commerce/e-services [2].

Previous study has conducted a literature review discussing gamification in the e-commerce context. Behl et al. (2020) [7] conducted a literature study to understand the motivational factors influencing consumer behavior toward gamification elements used in various online businesses. However, this literature study only focuses on the impact of gamification elements on the consumer engagement sector and does not discuss other impacts that may arise from implementing gamification. Apart from that, it does not explicitly mention which gamification elements can trigger this consumer engagement. In addition, the study also does not explain the trend of implementing gamification elements in e-commerce. Tobon et al. (2020) [4] undertook a similar study to Behl et al. (2020) by examining relevant literature about gamification related to online customer decisions. Azmi et al. (2021) [8] have also carried out a literature study on gamification elements, which examines what gamification elements are relevant for implementation in e-commerce. However, this research also does not discuss the overall impact that can be generated from the implementation of these gamification elements and does not discuss the new trend of gamification elements.

Therefore, this study aims to broadly review the impact that can be caused by the application of gamification elements in e-commerce and what gamification elements trigger these impacts. The motivation for such a broad review was twofold: First, gaining a broad perspective of the developing subject is helpful in understanding how gamification research has progressed; and second, a broad review of gamification can provide valuable information that will direct future research. Furthermore, this study also attempts to identify the current trends in using gamification elements, i.e., to find out which elements are used most often, and which are only used a little but have good potential for further investigations.

This study conducts a systematic literature review using the Kitchenham Systematic Literature Review method. The research questions are organized to serve as a guide for doing the literature review and finding research opportunities. The literature review is prompted by research questions concerning the trend and application of gamification in e-commerce. A systematic literature review (SLR) is carried out by gathering relevant studies from four databases: ACM, Emerald, Scopus, and ScienceDirect.

II. METHODS

Reviewing the past literature is an essential component of every academic area. Findings derived by reviewing empirical studies on specific issues from prior studies are one dependable source of data. A Systematic Literature Review (SLR) is the suggested way of gathering and reviewing these empirical studies [9]. This study used a systematic review to guarantee that both the search and retrieval processes were accurate and unbiased in order to acquire relevant information about gamification. A systematic review is a research approach that aims to collect all empirical data in a certain topic, critically evaluate them, and reach conclusions that synthesize the study [10].

This study refers to the Kitchenham SLR approach. Previous research related to the use of the Kitchenham method has been carried out by Sensuse et al. (2021) [12] in the context of knowledge sharing in organizations and Suryono et al. (2019) [11] in the context of peer to peer lending. The PICOC formula was utilized to define the research question

in this study, as shown in Table 1. This SLR does not aim to make comparisons; therefore, Comparison (C) has a value of n/a.

TABLE 1
 CRITERIA OF RESEARCH QUESTION

Population (P)	E-commerce or Online shopping platform
Intervention (I)	Gamification
Comparison (C)	n/a
Outcomes (O)	Trend and application of gamification elements in E-commerce
Context (C)	Study on gamification elements in E-commerce

By narrowing our focus, we may then determine the research questions that should be discussed in this study:

- RQ1. “What gamification elements are frequently used utilized in its application in e-commerce?”
- RQ2. “How is the trend of gamification elements applied in e-commerce?”
- RQ3. “What are the impacts yielded by the application of gamification elements in e-commerce?”

This literature study's inclusion and exclusion criteria were designed according to research questions and were utilized to guarantee that the data collected were trustworthy. Table 2 shows the two criteria for the selection procedure, which are inclusion and exclusion.

TABLE 2
 CRITERIA OF SELECTION STUDIES PROCESS

Inclusion Criteria	
1.	The paper investigated the use of gamification in e-commerce or online purchasing platforms.
2.	Studies published in the five years, from 2016 to 2021
3.	The paper being analyzed is a research paper or proceeding/conference
Exclusion Criteria	
1.	The paper is not using English
2.	Not full-text paper
3.	Same papers from different database
4.	Paper that discusses gamification not on e-commerce

Search strategies are designed by selecting the key phrases of the research question and alternate words and synonyms into each search query. The search string used in this study was (trend OR application OR implementation) AND gamification AND (commerce OR m-commerce OR e-commerce OR "social commerce" OR "online shopping"). The inclusion and exclusion criteria mentioned in Table 2 are used to keep the search results focused on the desired research question.

The author retrieved publications from electronic databases that were related to the topic, i.e., ScienceDirect, Scopus, Emerald, and ACM, then integrated them into Mendeley. Some irrelevant papers were eliminated at the first stage based on the title and abstract. The second stage of selection, which is content evaluation, was carried out from the relevant papers to establish the final papers. Table 3 lists the questions used to evaluate the papers.

TABLE 3
 QUALITY ASSESSMENT QUESTION

ID	Quality Assessment Question
C1	Does the paper properly outline the goals of the research?
C2	Does the paper provide a literature review, background, and research setting?
C3	Does the paper offer relevant work from past study to demonstrate the research's key contribution?
C4	Does the paper disclose the methods used?
C5	Does the paper clearly describe the trends or applications of gamification elements in e-commerce?
C6	Does the paper contain research results?
C7	Does the paper present a conclusion that addresses the question or issue under study?
C8	Does the paper provide any suggestions for upcoming research?

The author gave papers 0-1 points for each question based on their compliance with the criteria. A score of 1 means that the criteria are explicitly defined in the paper, a score of 0.5 means that the criteria are implicitly defined, and a score of 0 means that the criteria are not defined and cannot be inferred easily [13]. Papers with scores less than five were deemed unsuitable and were removed from the eligibility pool. As of now, 25 papers meet the scoring criteria. Table 4 depicts the score results of each paper that have been evaluated

Initially, the total number of papers received from the four electronic databases was 550. Following the selection procedure, the final article that will be examined is comprised of 25 papers, including two (2) from ACM, seven (7) from Emerald, nine (9) from ScienceDirect, and seven (7) from Scopus. Fig. 1 depicts an explanation of the paper selection procedure.

TABLE 4
 QUALITY ASSESSMENT RESULT

Database	Author	Criteria								Total	
		1	2	3	4	5	6	7	8		
Scopus	Al-Zyoud (2021) [14]	1	1	1	1	1	1	0.5	1	7.5	
	García-Jurado et al. (2021) [2]	1	1	1	1	1	1	1	1	8	
	Hu et al. (2021) [15]	1	1	1	1	1	1	0.5	1	7.5	
	Zhang et al. (2021) [16]	1	1	1	1	1	1	1	1	8	
	Hajarian and Hemmati (2020) [17]	1	1	1	1	1	1	1	1	8	
	Kamboj, Rana, and Drave (2020) [18]	1	1	1	1	1	1	1	1	8	
	Yang, Asaad, and Dwivedi (2017) [19]	1	1	1	1	1	1	1	1	8	
	Aparicio et al. (2021) [6]	1	1	1	1	1	1	1	0.5	7.5	
	Hollebeek, Das, and Shukla (2021) [20]	1	1	1	1	1	1	1	1	8	
ScienceDirect	Hwang and Choi (2020) [21]	1	1	1	1	1	1	0.5	1	7.5	
	Liao et al. (2020) [22]	1	1	1	1	1	1	1	1	8	
	Xi and Hamari (2020) [23]	1	1	1	1	1	1	1	1	8	
	Hsu and Chen (2018) [24]	1	1	1	1	1	1	1	1	8	
	Hsu and Chen (2018) [25]	1	1	1	1	1	1	1	1	8	
	Rodrigues, Oliveira, and Costa (2016) [26]	1	1	1	1	1	1	1	0.5	7.5	
	Poncin et al. (2017) [27]	1	1	1	1	1	1	1	1	8	
	Emerald	De Canio, Fuentes-Blasco, and Martinelli (2021) [28]	1	1	1	1	1	1	1	1	8
		Jami Pour et al. (2021) [29]	1	1	1	1	1	1	1	1	8
		Bauer et al. (2020) [30]	1	1	1	1	1	1	1	1	8
Raman (2020) [31]		1	1	1	1	1	1	1	1	8	
García-Jurado et al. (2019) [32]		1	1	1	1	1	1	1	0.5	7.5	
Tanouri, Mulcahy, and Russell-Bennett (2019) [33]		1	1	1	1	1	1	1	1	8	
Teng (2019) [34]		1	1	1	1	1	1	1	1	8	
ACM	Meder et al. (2018) [35]	1	1	1	1	1	1	1	1	8	
	Adaji and Vassileva (2017) [36]	1	1	1	0.5	1	1	1	0.5	7	

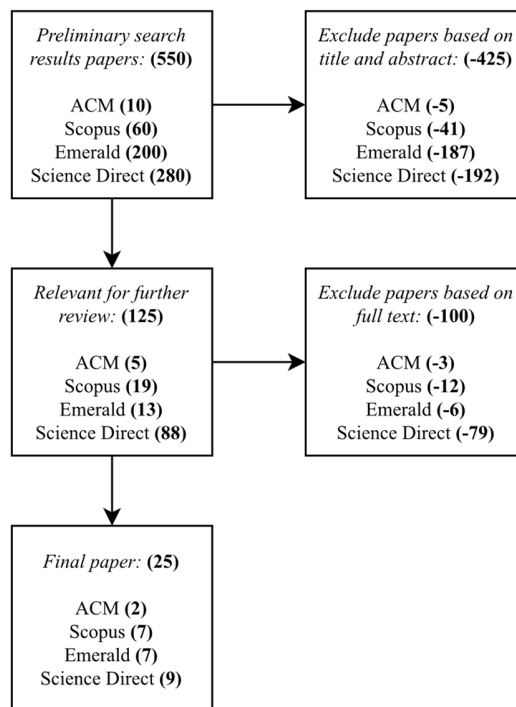


Fig. 1 The selection procedure for final papers

III. RESULTS

Gamification has received a lot of attention recently. As is clear in any invention that has the potential to be immensely useful and has garnered a lot of attention from both industry and academia, the research surrounding the topic has been fast developing and growing out in numerous ways [37]. The findings of the literature review reveal that subjects linked to trends and the application of gamification in e-commerce continue to expand year after year.

Table 5 depicts the year-by-year distribution (2016-2021) of the final papers. It highlights the rise in the number of studies on gamification topics that have been published. As can be seen, the number of papers devoted to gamification

and e-commerce has continuously grown over time, indicating the topic's growing appeal among researchers. While there was just one publication in 2016, the increase has shown that there were eight publications in 2021 related to the gamification in e-commerce.

TABLE 5
 YEAR-BY-YEAR DISTRIBUTION

Year	Number of Publications
2016	1
2017	3
2018	3
2019	3
2020	7
2021	8
Total	25

Gamification is becoming more popular as a marketing tool for enhancing purchases and customer satisfaction. The most likely explanation is that gamification is used on e-commerce sites to help the company grow its reputation and brand image, build customer confidence, learn about its user's experiences, and create online value for its products and services. On the other side, consumers are motivated by the reward points they get for making more product purchases. Gamification is a powerful approach for motivating customers, since it causes them to constantly browse on e-commerce sites, keeping them engaged and informed about the current market trends. It promotes customers to act in a specific manner in exchange for more rewards in e-commerce. This provides customers with a pleasing experience, as though their options are being considered, whether it is informing them about price reduction, special programs, special discounts, or loaded with rewards programs. It indirectly assists in the identification of customer behavior patterns, resulting in simple and straightforward methods of retaining customers engaged with the newest products and services [7]. Table 6 depicts the results of data extraction for the papers used in this study and summarizes the findings of the research on the impact of the application of gamification in e-commerce on customers.

TABLE 6
 EMPIRICAL EVIDENCE OF THE IMPACT OF GAMIFICATION ONLINE CONSUMERS

Author	Gamification Element	Impact
Al-Zyoud [14]	Points	Consumer loyalty
Aparicio et al. [6]	Badges, Leaderboards, Points.	Repurchase intention
De Canio, Fuentes-Blasco, and Martinelli [28]	Tasks, Rewards, Challenges	Shopping engagement
García-Jurado et al. [2]	Points, Badges, Leaderboards	Engagement
Hollebeek, Das, and Shukla [20]	Rewards, Cooperation, Challenge	Customer brand engagement
Hu et al. [15]	Rewards, Points, Badges, Leaderboards, Challenges, Achievements, Avatars, Status, and Roles.	Gifting behavior
Jami Pour et al. [29]	Loyalty Cards, Competition, Badges.	Customer experience
Zhang et al. [16]	Rewards, Badges	Impulse buying
Bauer et al. [30]	Rewards, Challenges	Customer satisfaction and loyalty
Hajarian and Hemmati [17]	Points, Leaderboard	Customer purchase
Hwang and Choi [21]	Reward	Consumer loyalty
Kamboj, Rana, and Drave [18]	Competition	Consumer engagement
Liao et al. [22]	Competition, Task	Loyalty
Raman [31]	Points, Badges, Leaderboards	Intention to buy products
Xi and Hamari [23]	Immersion, Achievement, Social Interaction	Brand engagement
García-Jurado et al. [32]	Points, Badges, Leaderboards	Intention to use e-commerce platform
Tanouri, Mulcahy, and Russell-Bennett [33]	Characters, Competition, Leaderboards, and Points	Social behavior brand equity
Teng [34]	Avatar, Achievement	Loyalty
Hsu and Chen [24]	Reward, Points	User experience
Hsu and Chen [25]	Reward, Points	User satisfaction and brand love
Meder et al. [35]	Tangible, Intangible Rewards	Application user activity
Adaji and Vassileva [36]	Rewards, Personalization, Suggestion,	Intention to buy
Poncin et al. [27]	Challenge, Fantasy	Consumer experience
Yang, Asaad, and Dwivedi [19]	Points, levels or badges	Brand attitude
Rodrigues, Oliveira, and Costa [26]	Avatar	Intention to use application

IV. DISCUSSION

Table 6 shows that there are some major similarities from various previous studies. If we look closely at Fig. 2, the most frequently used gamification elements are rewards, points, badges, and leaderboards. These elements were also known as achievement-oriented elements. Meanwhile, immersion-related of gamification elements (such as avatars, fantasy, etc.) are emerging as a new trend for new gamification elements to be implemented in e-commerce. Further, the gamification impact most widely measured by previous research can be grouped into three major themes: consumer loyalty, consumer engagement, and user behavior (such as gifting behavior, impulse buying, intention to buy, etc.). In its application in e-commerce, gamification has many different types of elements. Fig. 2 displays the amount of use or trend of each gamification element based on previous literature.



Fig. 2 Gamification Element Trend

A. Frequently Used Gamification Elements

Companies implement standardized gamification packages on their websites, which include many elements and concepts. Not all applications of gamification, however, are ideal for e-commerce. The gamification elements, such as points, badges, and leaderboards, have been shown to have high dependability and internal consistency, allowing them to be merged as a construct that may be utilized as a unit in future studies [2].

Points are given to users in e-commerce as a reward for giving a review on products, responding to other users' questions, and determining the most genuine reviews. The creation of new content by commenting on and recommending products can boost the engagement of the individual performing these activities as well as others seeking additional information on the web [38].

Another type of reward is the awarding of badges to users in exchange for their participation on the program. On the majority of gamified platforms, badges are typically recognized as the gamification design and key element [39]. Attractive badges attempt to increase a person's desire to attain the needed goal in order to be recognized [40]. Badges serve as a representation of a user's status or prominence inside a system. As a result, badges may serve a variety of purposes, including the portrayal of accomplishments, the assessment of users' authenticity, and the portrayal of the trustworthiness of the information that users give [2].

Classification tables or leaderboards are lists of people rated based on particular factors (points, utility, etc.), allowing individuals to assess their status to others and so encourage competition. The incorporation of rankings as part of a reward systems promotes user contributions in the setting of online social communities [41].

Points and badges are not only used as rewards or stimulus for customers, but they are also used to urge people to repeat their behavior. It has been discovered that the usage of points, badges, and leaderboards favorably increases individuals' attention and curiosity, making the experience more fascinating and entertaining [2].

According to the findings of the literature review, the rewards program (points, badges, and leaderboards) is the studied gamification element. The extensive use of rewards programs in conventional customer loyalty and engagement strategies used by entrepreneurs explains this [4]. While this strategy has shown to be effective in generating demand in the short term, it has prompted a number of concerns about its long-term utility [42].

B. The New Trend of Gamification Elements

Fig. 2 shows that there is a new trend of gamification elements other than achievement-oriented, which has been examined by previous studies. These gamification elements are referred to as immersion-related elements. Immersion-related elements, such as avatars, narrative patterns, storytelling, roleplay mechanics, and other immersion-related aspects, strive to engage users in self-directed exploratory activity [23].

According to gamification research and brand engagement literature, immersion-related elements are typically associated with the sensation of expressive freedom [43] and optimal experience [44], i.e., more emotional and affective components (e.g., enjoyment, pride, joy, and surprise). Based on research conducted by Xi and Hamari (2020) [23], it is known that immersion-related features have a positive impact on social brand engagement. In

addition, immersion-related features also have an impact on brand awareness. This could be because more contact with immersion-related elements may lead to customers being more inclined to explore the company brand, which eventually makes them more aware of the brand. Immersion-related elements can also be used to achieve specific marketing objectives, such as enhancing social engagement [23].

Avatar is a popular example of an immersion-related gamification element. Avatars are viewed by users as an extension of themselves, resulting in avatar identification [45], or psychological empowerment of a character [46]. Avatar identification and psychological empowerment of a character have the same definition: seeing the avatar as an embodiment of oneself. Avatar identification, in particular, is known to be associated to online user loyalty [46]–[48]. Research conducted by Teng (2019) [34] investigates how avatar attributes affect avatar image, avatar identification, and thus online user loyalty. His study's findings offer unique information for e-commerce managers to improve their avatars and establish loyal consumer bases. The study was able to successfully identify two novel constructs on avatar image, namely positive avatar image and unique avatar image [34]. These two unique constructs have the potential to significantly alter user behavior, providing several research opportunities for future e-commerce studies.

Achievement-oriented elements are definitely the most widely utilized in contemporary gamification research, but immersion-related elements are far less popular [37]. As a result, future research should incorporate various gamification elements and experimentally compare their success in creating relationships with customers over time.

C. Gamification Impacts

This study found that the application of gamification elements in e-commerce has proven to have various impacts, such as consumer loyalty, repurchase intention, shopping engagement, gifting behavior, customer satisfaction, etc. This research then categorizes these impacts into three major themes, i.e., consumer loyalty, consumer engagement, and user behavior. An explanation of each of these three major themes will be discussed in the next section.

1) Consumer Loyalty

Consumer loyalty is beneficial not only for the company, but also for the consumers themselves. Consumer loyalty can reduce the uncertainty that consumers have and can increase the number of sales [14]. This is because loyal consumers purchase more frequently and in larger quantities. They are less price sensitive and sensitive to competition offers, incurring lower company costs than their less loyal peers [49].

The integration of gaming aspects into e-commerce settings has aided business owners and digital marketers in boosting customer loyalty. According to Bauer et al. [30], gamification affects consumers' intrinsic motivation to play the game, which enhances the whole shopping experience and, as a result, boosts customer loyalty. Also, the perceived ease of use of a gamified website encourages customers to shop online more frequently, resulting in customer loyalty and repeat purchases [30].

Customer retention remains one of the most challenging difficulties for e-commerce enterprises. Therefore, they create several well-connected motivational programs such as customer loyalty schemes, which reward customers with points on every transaction that can be redeemed in the future and gifts in exchange for repeated visits and transactions, and social loyalty schemes, which reward consumers with points for posting product reviews and comments as well as engaging in suggestive co-marketing [50]. Successful customer satisfaction management is a significant driver of important business outcomes such as loyalty [30].

2) Consumer Engagement

From the standpoint of the user, user engagement is a component of the user experience characterized by the degree of investment that the individual makes when engaging with a digital system [51]. Whereas, from the standpoint of the consumer, engagement is reflected by behavioral expressions that are fostered by motivational drivers [52].

Engagement is seen as critical in e-commerce in order to increase user interaction on the web and cooperation in online communities [53]. According to García-Jurado et al. [2], the major components that impact user engagement are focused attention and perceived usability; hence, companies should concentrate on these elements. Gamification works successfully when people attain concentration or absorption stages when engaging with the web. Commenting on items and engaging in the product review system enables a user to keep track of his or her status while also focusing on the online purchasing experience. It has been demonstrated that the usage of points, badges, and leaderboard impacts people to be more attentive when surfing the web. Remaining on those sites that use gamification for a longer period of time than on non-gamified sites can assist people purchase items on that sites rather than on rivals' websites [2].

3) User Behavior

As stated by Petkov et al. [54], gamification is one of the most convincing technologies for influencing customer behavior by increasing their motivations through game-design aspects. After conducting a literature review process on various prior research, this study discovered numerous user behaviors that arise as a result of the application of gamification in e-commerce. Some of these user behaviors include giving behavior, impulsive buying, and purchase intention.

Behavioral changes are difficult to achieve because people require time to internalize them [55]. In this way, long-term engagement is critical for success [56]. Real purchases, buy intentions, and even repurchases are seen to be typical behavioral activities of highly devoted and engaged consumers as a result of the gamified platform [14].

In the relationship between gamification and gifting behavior, humans form social bonds through giving and receiving gifts from others. Gifting is a fundamental notion in human social networks and societies. People in the IT-enabled gamified virtual environment play game-like designs, provide comments, advise, and gift digital products to others [15].

The economic mechanism of reward distribution, as well as the achievement-related mechanism of badge upgrading, have significant effects on impulsive purchases. In addition, both perceived enjoyment and social connection have a significant influence on impulse purchases. The association between reward giving and impulsive purchasing is totally mediated by perceived enjoyment, whereas the relationship between badge upgrading and impulse buying is somewhat partially mediated by perceived enjoyment [16].

V. CONCLUSIONS

Gamification is a new concept that is getting a lot of attention in many areas of e-commerce to improve customer loyalty, motivation, purchase intention, engagement, and enjoyment. Gamification is an effective way for e-commerce enterprises to urge consumers to revisit their businesses, thereby increasing profitability. User behavior, such as giving behavior, impulsive buying, and purchase intention, also seems to have a beneficial influence on e-commerce businesses.

This study contributes to a better understanding of numerous gamification elements, as well as their trends and impacts in e-commerce. Gamification helps e-commerce businesses in increasing their profitability while also building customer relationships. Furthermore, reward systems (especially points, badges, and leaderboards) are known to be the most widely used by previous studies. These gamification elements encourage customers to use products more frequently than usual since they perceive gamified elements to be cost-effective. Customers are also exposed to the additional benefits of things purchased online, as e-commerce strives to understand their purchasers' buying intents.

Although rewards, points, badges, leaderboards, and other achievement-oriented elements are perhaps the most commonly used in modern gamification research, immersion-related elements, such as avatars, are less commonly used despite their potentially large impact. Nonetheless, immersion-related gamification elements, such as avatars, are starting to emerge as a new trend of implementing gamification in e-commerce. As a result, future research should conduct more detailed study regarding these gamification elements and combine diverse gamification elements and empirically assess their efficacy in developing consumer relationships over time.

This study also found that the application of gamification elements in e-commerce has proven to have various impacts, such as consumer loyalty, repurchase intention, shopping engagement, gifting behavior, customer satisfaction, etc. This research then categorizes these impacts into three major themes, i.e., consumer loyalty, consumer engagement, and user behavior. Future research is expected to be able to examine the challenges that may arise in the application of gamification elements to the three major themes and find potential solutions to overcome them.

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