INTERNATIONAL REVIEW OF ARTIFICIAL INTELLIGENCE IN MARKETING

NAWALA

Volume 4, Number 1, 2025

Gamification and AI: Personalized Reward Mechanisms in Loyalty Programs

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Abstract

Article history:
Received: January 15, 2025
Revised: February 27, 2025
Accepted: April 3, 2025
Published: June 30, 2025

Keywords:
Artificial Intelligence, Customer Engagement, Gamification, Loyalty Programs, Personalized Rewards.

Identifier:
Nawala
Page: 14-26
https://nawala.io/index.php/iraim

This study investigates how the integration of gamification and artificial intelligence can strengthen the effectiveness of loyalty programs in competitive digital markets. Using a systematic literature review, the study synthesises empirical and conceptual research on game based loyalty mechanics and data driven personalization. The findings show that game elements such as challenges, levels, and progress feedback can transform loyalty schemes from transactional discount tools into experiential systems that enhance enjoyment, perceived value, and behavioural loyalty. However, many programs still rely on static, one size fits all reward structures that limit their capacity to adapt to heterogeneous customer motivations. In parallel, research on artificial intelligence demonstrates strong capabilities for personalizing offers and interactions based on granular behavioural and contextual data, yet these tools are rarely applied to gamified rewards. The review concludes that next generation loyalty systems should employ artificial intelligence to dynamically orchestrate personalized game like reward mechanisms while safeguarding transparency, fairness, and long term relationship quality and trust outcomes.

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1. Introduction

Loyalty programs have become a central instrument for retaining customers in highly competitive and data-rich markets. Yet, as more brands copy similar point systems, tiers, and discounts, many programs struggle to differentiate themselves and sustain engagement over time. Recent studies show that adding gamification elements such as challenges, points, levels, and leaderboards can transform loyalty programs from passive discount schemes into interactive experiences that stimulate intrinsic motivation and strengthen engagement value (Hollebeek et al., 2021). Evidence from e-commerce and small online retailers further indicates that well-designed gamified mechanics can enhance enjoyment, perceived value, and ultimately customer loyalty, although many firms still underutilize these features due to resource and capability constraints (Vilkaite-Vaitone et al., 2024).

Within this stream, gamification is increasingly framed not only as "adding fun" but as a strategic design of motivational architectures inside loyalty ecosystems. Empirical work on loyalty programs in digital commerce finds that game-like elements can strengthen program usage intentions and amplify the effect of traditional incentives, especially among younger, digitally native consumers (Sundjaja et al., 2022). However, most gamified loyalty schemes still rely on relatively static reward structures for example fixed point-to-voucher conversions or generic badges that treat customers as homogeneous segments rather than individuals with distinct preferences and behavioral patterns. This limits the potential of gamification to support long-term relationship quality and behavioral loyalty.

At the same time, artificial intelligence is reshaping contemporary marketing by enabling fine-grained prediction and personalization across the customer journey. Systematic reviews of artificial intelligence in marketing show rapid growth in applications ranging from segmentation and targeting to dynamic pricing, recommendation systems, and real-time content optimization (Chintalapati & Pandey, 2022). In e-commerce, AI-driven recommender systems leverage large-scale transactional and behavioral data to infer preferences and deliver individualized product and offer recommendations, thereby improving decision quality and user experience (Valencia-Arias et al., 2024). These developments suggest that similar techniques could be used to dynamically personalize loyalty rewards such as bonus points, challenges, or in-app missions based on each customer's history, context, and motivational profile.

Research that explicitly connects artificial intelligence to loyalty programs is beginning to emerge. Conceptual and empirical work on AI-enabled loyalty initiatives highlights how data-driven personalization and predictive modelling can be used to tailor offers, communications, and program structures at the individual level, with the potential to increase satisfaction, perceived relevance, and repeat patronage (Kushnarevych & Kollárová, 2024). Nevertheless, current studies largely examine AI usage or gamification in isolation, and there is limited understanding of how AI can orchestrate personalized, game-like reward mechanisms inside loyalty programs. Existing gamification research rarely models algorithmic personalization of rewards, while AI for loyalty studies often treat rewards as traditional economic

incentives rather than motivational game elements (Hollebeek et al., 2021, Sundjaja et al., 2022).

Against this backdrop, the present study seeks to integrate these two streams by examining how artificial intelligence can enable personalized gamified reward mechanisms within loyalty programs. It investigates how artificial intelligence can be leveraged to design and deliver personalized gamified rewards that better align with individual needs and behaviors, and how such mechanisms influence engagement, perceived fairness, and loyalty outcomes over time. By linking insights from gamification, AI-driven personalization, and loyalty program research, this study aims to develop a conceptual and empirical basis for next-generation loyalty systems that are not only more entertaining and interactive, but also more adaptive, customer-centric, and strategically effective (Chintalapati & Pandey, 2022, Vilkaite-Vaitone et al., 2024, Valencia-Arias et al., 2024).

2. Literature Review

Loyalty programs are widely used to retain customers, but many still rely on generic points, tiers, and discounts that are easy for competitors to imitate and often fail to sustain engagement. Recent empirical work shows that introducing game design elements such as challenges, progress feedback, and differentiated rewards into loyalty schemes can increase perceived playfulness and strengthen both attitudinal and behavioral loyalty (Hwang & Choi, 2020; Bravo et al., 2023). Gamified loyalty programs make the reward process more experiential, shifting the focus from purely economic incentives toward hedonic and utilitarian value derived from the

interaction with the program itself, which in turn stimulates program usage and engagement behaviors such as repeat purchases, referrals, and content sharing (Bravo et al., 2023).

Beyond individual studies, a recent bibliometric review of gamification in marketing highlights that most research concentrates on identifying which game mechanics (for example, points, levels, leaderboards, or quests) drive engagement and on measuring their impact on consumer responses, with strong reliance on self-determination theory and survey based experiments (Santos et al., 2024). However, this body of work typically assumes relatively stable reward rules and treats users as segments rather than unique individuals, so that many gamified loyalty schemes still operate with fixed point reward conversions, generic badges, and uniform challenges. Such designs can generate short term excitement but may struggle to adapt to evolving preferences, potentially limiting their ability to support long term relationship quality and sustained participation.

In parallel, literature on artificial intelligence in marketing shows that AI enabled personalization allows firms to tailor offers, content, and interactions across the customer journey by learning from granular behavioral and contextual data (Gao & Liu, 2023). Conceptual analyses of AI-enabled personalization in interactive marketing emphasize that algorithmic systems can dynamically adjust what is offered, when it is offered, and through which touchpoint, thereby enhancing perceived relevance, customer experience, and relationship outcomes when designed responsibly. Empirical evidence from e-commerce further indicates that AI-driven personalization such as individualized product recommendations, targeted offers,

and adaptive messaging can increase satisfaction and loyalty intentions by aligning program benefits with consumers' interests and shopping patterns (Zed et al., 2024).

Despite these advances, the intersection between gamification and AI in the context of loyalty programs remains underexplored. Gamification studies rarely incorporate algorithmic personalization of game-like rewards, focusing instead on static designs that are the same for all or broad segments of members (Hwang & Choi, 2020; Santos et al., 2024). Conversely, AI personalization research typically frames incentives as conventional economic offers (for example, discounts or coupons) rather than as motivational game elements that can deliver both hedonic and instrumental value (Gao & Liu, 2023; Zed et al., 2024). This leaves a conceptual and empirical gap regarding how AI can be used to dynamically configure gamified reward mechanisms such as personalized missions, adaptive challenges, or tailored bonus structures that respond to individual motivational profiles, and how such mechanisms affect engagement, perceived fairness, and loyalty over time.

3. Methods

This study adopts a systematic literature review method to synthesise and integrate existing knowledge on gamification, artificial intelligence, and personalized reward mechanisms in loyalty programs. Relevant studies were identified through structured searches in major academic databases such as Scopus, Web of Science, ScienceDirect, and Google Scholar using combinations of keywords including "gamification," "loyalty program," "artificial intelligence," "personalization," "reward mechanism," and "customer engagement." The search results were first

screened at the title and abstract level to remove clearly irrelevant publications, followed by full-text screening based on predefined inclusion criteria: peer-reviewed journal or conference articles written in English that explicitly address loyalty programs or gamified reward systems and discuss either AI-enabled personalization or data-driven reward design. Editorials, theses, book chapters, non-academic reports, and studies outside marketing and consumer contexts were excluded. For each included article, data were extracted on research objectives, theoretical foundations, methodological approach, context and sample, types of gamification and reward mechanics, AI or data-analytic techniques used, personalization strategies, and key outcomes such as engagement, perceived fairness, and loyalty. Study quality was assessed using a structured checklist covering clarity of research questions, methodological rigor, transparency of data and analysis, and validity of conclusions. The findings were then synthesized through qualitative thematic analysis, grouping the evidence into themes related to gamified loyalty program design, AI-enabled personalization of rewards, outcome effects, and identified gaps and future research directions.

4. Results and Discussion

The systematic review shows consistent evidence that gamification enhances the effectiveness of loyalty programs, but that its impact is strongly contingent on how reward mechanisms are designed. Across multiple studies, game elements such as challenges, progress feedback, and tiered rewards are found to increase perceived playfulness and strengthen both attitudinal and behavioral loyalty, supporting the

argument that gamified programs transform loyalty schemes from purely transactional to more experiential systems (Hwang & Choi, 2020; Hollebeek et al., 2021; Bravo et al., 2023). These findings align with evidence from e-commerce and small online retailers, where well-crafted gamified mechanics are associated with higher enjoyment, perceived value, and repeat patronage, even though many firms still underutilize these features due to resource or capability constraints (Sundjaja et al., 2022; Vilkaite-Vaitone et al., 2024). Together, these studies suggest that gamification is most effective when it is embedded as a coherent motivational architecture rather than as isolated "fun" add ons.

However, the review also highlights structural limitations in how gamification is currently implemented. A large portion of the empirical and bibliometric work documents that many loyalty programs continue to rely on static reward rules fixed point-to-voucher conversions, generic badges, and uniform challenges that treat customers as broad segments rather than individuals with distinct motivational and behavioral profiles (Sundjaja et al., 2022; Santos et al., 2024). Such designs may generate short term engagement spikes but struggle to adapt to evolving preferences and usage patterns, which can erode long term relationship quality. This tension between the dynamic nature of customer behavior and the static character of reward structures emerges as a recurrent theme, indicating that the full potential of gamification for sustainable loyalty is not yet realised.

In contrast, the literature on artificial intelligence and personalization reveals a more advanced use of data-driven adaptivity along the customer journey. Reviews of AI in marketing document rapid growth in applications such as segmentation,

targeting, recommendation systems, and real-time content optimization, all of which rely on learning from granular behavioral and contextual data to tailor interactions at scale (Chintalapati & Pandey, 2022; Gao & Liu, 2023). Studies in e-commerce show that AI-driven recommender systems and personalized offers enhance decision quality, perceived relevance, satisfaction, and loyalty intentions by aligning propositions with individual preferences and shopping histories (Valencia-Arias et al., 2024; Zed et al., 2024). These results indicate that the technical and analytical capabilities needed to individualize value propositions already exist and are being successfully deployed in adjacent areas of digital marketing.

Despite this, the review finds that AI and gamification are rarely integrated within loyalty programs. Research on AI-enabled loyalty initiatives mostly focuses on personalized offers, communications, or program structures in conventional, non-gamified settings, where incentives are still framed as standard economic rewards such as discounts or coupons (Gao & Liu, 2023; Kushnarevych & Kollárová, 2024). Conversely, gamification studies seldom model algorithmic personalization of game-like rewards, even though the evidence on static mechanics points to clear limitations (Hollebeek et al., 2021; Santos et al., 2024). This fragmentation produces a conceptual and empirical gap: AI is used to decide what to offer and to whom, while gamification is used to decide how rewards are staged and experienced, but very few studies consider how AI could dynamically configure gamified elements such as missions, levels, or bonus structures around individual motivational profiles.

Overall, the synthesis suggests that next-generation loyalty systems should move toward AI-orchestrated gamified reward mechanisms that combine the motivational strengths of game design with the adaptive power of data-driven personalization. The reviewed evidence implies that such systems could increase engagement value, perceived relevance, and fairness by ensuring that challenges and rewards are neither too easy nor too difficult, and by aligning them with each customer's history, context, and preferences (Hollebeek et al., 2021; Chintalapati & Pandey, 2022; Vilkaite-Vaitone et al., 2024). At the same time, the absence of robust empirical studies on AI-personalized gamification warns that important questions remain open, including how to balance personalization with transparency, how to prevent perceived manipulation, and how to design metrics that capture both hedonic and relational outcomes over time. These gaps provide a clear agenda for future research on personalized gamified reward mechanisms in loyalty programs.

5. Conclusion

This study concludes that gamification has substantial potential to enhance the effectiveness of loyalty programs, but its impact critically depends on how reward mechanisms are designed and managed over time. Evidence across the reviewed studies shows that game elements such as challenges, progress feedback, levels, and differentiated rewards can transform loyalty schemes from purely transactional instruments into richer, experiential systems that strengthen both attitudinal and behavioral loyalty. At the same time, the dominance of static, one-size-fits-all reward structures fixed point conversions, generic badges, and uniform challenges limits the

capacity of many programs to respond to evolving preferences and heterogeneous motivational profiles. This structural rigidity means that, in practice, many gamified loyalty initiatives generate only short-term excitement rather than sustained, high-quality customer relationships.

The review also shows that artificial intelligence provides precisely the type of data-driven adaptivity that static gamification currently lacks. AI applications in marketing have already demonstrated strong capabilities in learning from granular behavioral and contextual data to personalize offers, content, and interactions at scale, with positive effects on relevance, satisfaction, and loyalty intentions. However, these capabilities are rarely integrated with gamified reward design, creating a clear conceptual and empirical gap. Future loyalty systems should therefore move toward AI-orchestrated gamified rewards that adapt missions, challenges, and bonus structures to individual motivational patterns while safeguarding transparency and perceived fairness. Addressing this agenda will require more empirical research on AI-personalized gamification in real loyalty program settings, including longitudinal designs that capture not only short-term engagement metrics but also longer-term relational outcomes and potential ethical risks.

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