

“Mapping attitude, engagement and purchase behavioral intention through multistage PLS-SEM: Exploration of gamified marketing dynamics”

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MAPPING ATTITUDE, ENGAGEMENT AND PURCHASE BEHAVIORAL INTENTION THROUGH MULTISTAGE PLS-SEM: EXPLORATION OF GAMIFIED MARKETING DYNAMICS

Abstract

Gamified marketing has become an increasingly critical strategy in digital commerce, yet the full pathway from consumer attitude through engagement to purchase behavioral intention remains insufficiently examined, particularly across demographic cohorts in emerging markets. This study investigates how gamification elements shape consumer attitudes, engagement and purchase behavioral intention among digital consumers in the Delhi National Capital Region of India. This quantitative study employs a structured survey administered between July and November 2025, yielding a final usable sample of 643 (56.8% male, 43.2% female). The study integrates the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Technology Acceptance Model (TAM) within a Partial Least Squares Structural Equation Modelling (PLS-SEM) framework. The results demonstrate that perceived agility ($\beta = 0.307, p < 0.001$), perceived ease of use ($\beta = 0.278, p < 0.001$), perceived usefulness ($\beta = 0.259, p < 0.001$), perceived enjoyment ($\beta = 0.248, p < 0.001$) and social influence ($\beta = 0.188, p < 0.001$) are significant drivers of consumer attitude. Consumer attitude strongly predicts consumer engagement ($\beta = 0.550, p < 0.001$) and purchase behavioral intention ($\beta = 0.334, p < 0.001$), with engagement partially mediating the attitude–purchase behavioral intention relationship ($\beta = 0.196, p < 0.001$). Measurement invariance testing followed by multi-group analysis reveals significant generational and gender-based differences in gamification drivers, underscoring the need for demographically tailored strategies. These findings advance theory by confirming the TAM-UTAUT integrated model in a gamified emerging-market context, and offer practitioners a roadmap for designing differentiated gamification campaigns that enhance engagement and drive purchase intention.

Keywords

attitude, consumer behavior, engagement, gamification,
technology acceptance

JEL Classification

M31, O33, D12

INTRODUCTION

The proliferation of digital technologies has fundamentally reconfigured the competitive dynamics of modern marketing. As consumer attention becomes an increasingly scarce resource, brands are compelled to move beyond conventional promotional formats and develop experience-driven approaches that foster active and sustained involvement. Gamification, broadly defined as the application of game-design mechanics such as points, badges, leaderboards, challenges and progress indicators in non-gaming environments, emerged as one of the most widely adopted strategies for this purpose (Deterding et al., 2011; Hamari et al., 2014). Its deployment now spans industries including e-commerce, financial

services, healthcare and education, signaling its perceived capacity to transform otherwise routine commercial interactions into motivationally enriched experiences (Sailer et al., 2017; Tobon et al., 2020).

Despite accelerating industry adoption, the scientific understanding of the psychological mechanisms through which gamification shapes consumer behavior remains fragmented. Prior empirical work has predominantly examined isolated constructs without modelling the full sequential pathway from antecedent perceptions through attitude formation and engagement to actual purchase behavioral intention (Leclercq et al., 2018; Elshoubashy et al., 2023). Furthermore, the extent to which demographic factors such as gender and age moderate these relationships has received insufficient systematic attention (Koivisto & Hamari, 2014; Polo-Peña et al., 2020). Existing studies have disproportionately sampled Western or highly developed digital markets, leaving open the question of whether gamification mechanisms operate similarly in rapidly digitizing emerging economies, where infrastructural constraints, cultural norms and consumer motivations differ substantially from those documented in developed-market literature (Santos et al., 2024; Sharma et al., 2024). This study contributes to closing this gap by examining gamification as a dynamic, multi-stage psychological process rather than a static stimulus-response relationship. It situates this inquiry within a consumer context that has been systematically underrepresented in extant research, while attending explicitly to the demographic and motivational heterogeneity that shapes how individuals respond to gamified experiences.

1. LITERATURE REVIEW AND HYPOTHESES

The study of consumer responses to gamified digital environments draws on a rich, if still evolving, body of theoretical and empirical scholarship. Understanding why and how consumers form attitudes toward gamification engage with it and translate that engagement into purchasing decisions requires integrating insights from technology acceptance theory, hedonic motivation research, social influence literature and consumer behavior scholarship.

The TAM, originally proposed by Davis (1989), established perceived usefulness and perceived ease of use as the two primary determinants of an individual's behavioral intention to adopt a technology. TAM has since been extensively applied to digital consumer contexts, including online shopping, social media and mobile applications, consistently demonstrating that utilitarian assessments shape both affective responses and adoption behavior. The UTAUT, developed by Venkatesh et al. (2003), extended this foundation by incorporating social influence and facilitating conditions as additional adoption antecedents, and introduced gender, age and experience as explicit moderating variables. In gamified contexts, these frameworks offer a productive theoretical lens: they explain not

only whether consumers are likely to engage with gamified systems, but also the attitudinal mechanisms through which that engagement is formed (Venkatesh et al., 2022; Ezeudoka & Fan, 2024).

Perceived enjoyment occupies a central position in the gamification literature as a hedonic driver of consumer attitude and continued engagement. Hsu et al. (2017) demonstrated that enjoyment experienced during gamified interactions produces more favorable assessments of continued system usage and enhances overall platform loyalty. Hamari et al. (2014) confirmed that users who derive intrinsic hedonic value are significantly more likely to sustain engagement with gamified applications over time. The hedonic value of gamification thus functions as a powerful intrinsic motivator that shapes attitudinal formation independently of instrumental or utilitarian considerations (Li et al., 2017).

The instrumental counterpart to enjoyment, perceived usefulness also plays a robust role in determining consumer attitudes toward gamification. Users develop more positive attitudes when gamified features demonstrably facilitate goal achievement, such as obtaining discounts, accumulating loyalty rewards or enabling more informed purchasing decisions (Tobon et al., 2020; Jami Pour et al., 2023). Industry deployments

such as the Starbucks Rewards programmer, in which members accumulate redeemable points through purchases, exemplify how utilitarian value reinforces affective attachment by creating tangible, instrumentally meaningful outcomes for consumers (Al-Zyoud, 2021). Perceived agility, conceptualized as the responsiveness, adaptability and experiential fluency of a gamified platform, has similarly been identified as a significant attitude antecedent, as fluid and rapidly responsive systems reduce cognitive friction and thereby enhance user confidence and engagement (Huang et al., 2021; Li et al., 2021).

Perceived ease of use, though foundational within TAM, demonstrates a more contextually contingent relationship with consumer attitudes in gamified settings. Oliveira et al. (2022) reported that users who find gamified platforms intuitive tend to experience heightened motivation and enjoyment, while Yang et al. (2017) found that accessible interfaces strengthen brand confidence. However, Aparicio et al. (2021) noted that the effect of ease of use on attitude in e-commerce gamification is generally smaller than that of enjoyment or usefulness, suggesting that among digitally proficient consumers, hedonic and utilitarian value perceptions tend to dominate over interface accessibility as attitudinal drivers.

Social influence represents a further critical antecedent of gamification adoption and attitude formation. The propagation of social norms through peer recommendations, influencer endorsements and visible competitive rankings creates conformity pressures that motivate technology adoption (Cialdini, 2009). Raman (2021) demonstrated the particular salience of social contact and peer endorsement among young Indian female internet consumers, where social dynamics substantially amplify gamification effectiveness. This is consistent with UTAUT's prediction that subjective norms positively predict adoption intention, particularly among individuals with lower prior technology experience (Venkatesh et al., 2003). The competitive social features embedded in platforms such as Nike Run Club, which allow users to share progress milestones and challenge peers, illustrate how social gamification translates interpersonal dynamics into measurable brand attachment outcomes (Lopes et al., 2024).

Consumer attitude, positioned as a mediating variable between antecedent perceptions and behavioral outcomes, has been extensively examined in digital and e-commerce contexts. Ghosh (2019) demonstrated that favorable attitudes toward digital platforms elevate engagement in gamified environments, while Jasrotia et al. (2022) found that Generation Z consumers' engagement persistence depends critically on their initial attitudinal evaluations of gamified components. Mishra and Malhotra (2021) further showed that attitudes mediate the effects of psychological ownership and advertising intrusiveness on gamification participation. These findings collectively position consumer attitude as a gateway variable whose valence amplifies or attenuates the downstream influence of gamification on engagement and purchase behavioral intention.

Consumer engagement in gamified contexts is characterized by cognitive absorption, emotional investment and active behavioral participation in the gamified experience. De Canio et al. (2021) demonstrated that gamification links consumer attitudes to purchase through engagement enhancement, effectively confirming the mediating role of engagement in this causal chain. Deterding et al. (2011) and Sailer et al. (2017) established that game-design elements applied in non-gaming environments produce higher click-through rates, extended dwell times and elevated user engagement when aligned with intrinsic user motivations. Conversely, Leclercq et al. (2018) cautioned that poorly designed gamified interfaces can induce frustration and premature disengagement, underscoring the importance of user-centered design. Purchase intention outcomes of gamified engagement have been documented across multiple sectors: Bravo et al. (2023) showed that reward point and badge accumulation directly translates into discount-seeking and repurchase behavior, while Zichermann and Cunningham (2011) reported that elements such as spinning wheels and virtual treasure hunts substantially increase perceived enjoyment and purchase intent in online retail.

Demographic heterogeneity in gamification response has been documented by several scholars. Polo-Peña et al. (2020) demonstrated that age and gender moderate the relationship between gamifi-

cation experience and behavioral outcomes, with greater effect sizes observed among women and older consumers. Koivisto and Hamari (2014) found that women are more responsive to social connectivity and customization features, while men tend to be more motivated by competitive and achievement-oriented gamification mechanics. Tondello et al. (2019) showed that younger consumers prefer challenge-based and socially interactive formats, whereas older consumers place greater value on practical utility and clear reward structures. Yadav and Saini (2024) similarly noted that consumer demographics systematically moderate gamification effectiveness, underscoring the limitations of uniform, one-size-fits-all gamification approaches.

Research on gamification in the Indian digital market context remains nascent. Sharma et al. (2024) noted the accelerating integration of gamified elements across Indian e-commerce platforms, driven by rising Smartphone penetration and expanding digital literacy. Gupta et al. (2024) and Thakur et al. (2024) reported high compound annual growth rates in the Indian gamification market, with retail and financial services among the leading adopters. Naikoo et al. (2025) highlighted the demographic and socio-economic diversity of the Delhi National Capital Region (NCR) as an analytically productive setting for studying consumer responses to digital innovation. Santos et al. (2024) further argued that consumer attitudes, engagement and resulting purchase behavioral intention in gamified settings remain under-explored and warrant rigorous empirical investigation, particularly in markets where digital adoption is evolving at speed.

Taken together, the extant literature establishes a compelling but fragmentary picture of gamification's influence on consumer behavior. Individual antecedents and isolated outcomes have been examined, but few studies have simultaneously modelled the full sequential pathway: from perceived enjoyment, usefulness, agility, ease of use and social influence, through attitude formation and engagement, to purchase behavioral intention, while accounting for demographic moderators in an emerging-market

context. The integration of TAM and UTAUT provides a theoretically coherent basis for such a model by combining explanations of attitude formation with demographic moderation of technology acceptance.

The purpose of this study is therefore to construct and empirically test a theoretical framework (Figure 1) that maps the multistage dynamics of gamified marketing in the Delhi-NCR consumer context.

The study hypotheses are as follows:

- H1: Perceived agility positively influences consumer attitude.*
- H2: Perceived ease of use positively influences consumer attitude.*
- H3: Social influence positively influences consumer attitude.*
- H4: Perceived enjoyment positively influences consumer attitude.*
- H5: Perceived usefulness positively influences consumer attitude.*
- H6: Consumer attitude positively influences consumer engagement.*
- H7: Consumer attitude positively influences purchase behavioral intention.*
- H8: Consumer engagement positively influences purchase behavioral intention.*
- H9: Consumer engagement mediates the relationship between consumer attitude and purchase behavioral intention.*
- H10: Gender significantly moderates the relationships between gamification antecedents and consumer attitude, engagement and purchase behavioral intention.*
- H11: Generational cohort significantly moderates the relationships between gamification antecedents and consumer attitude, engagement and purchase behavioral intention.*

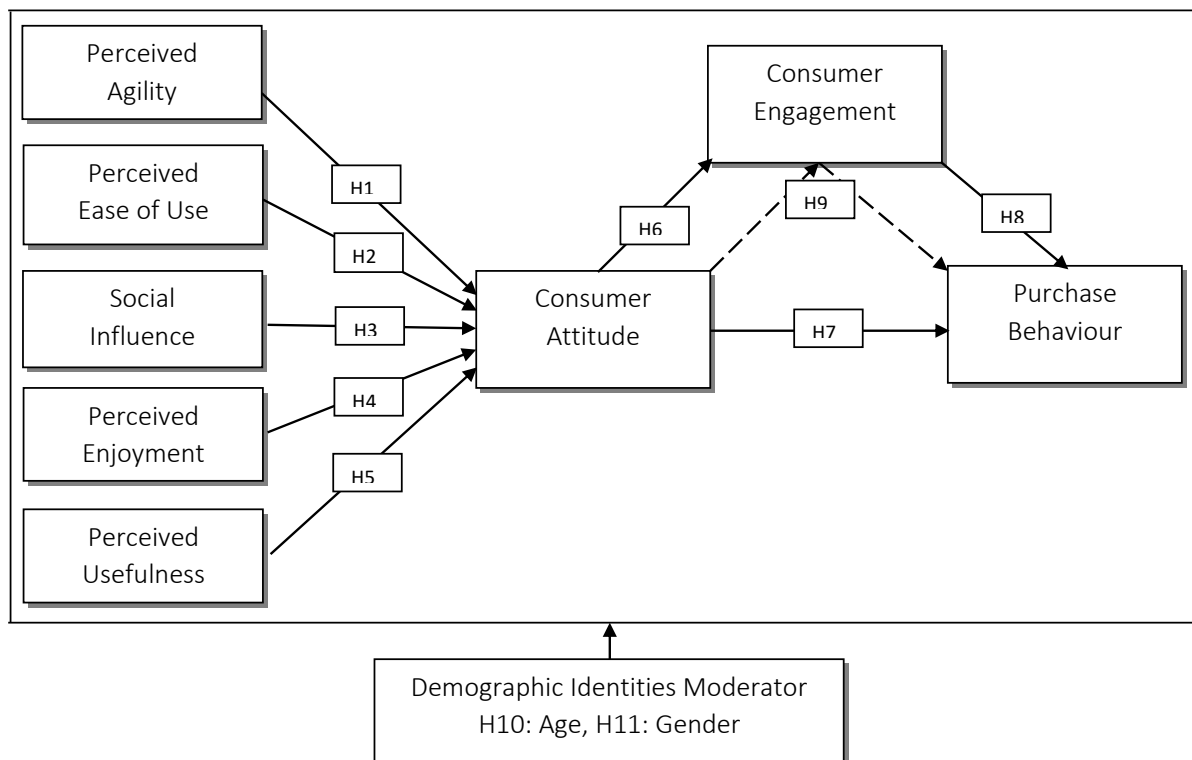


Figure 1. Theoretical framework

2. METHODOLOGY

This study employed a quantitative, cross-sectional research design to evaluate the factors influencing consumer purchase behavioral intention regarding gamified platforms. The target population comprised adult consumers in the Delhi-NCR region of India who had prior first-hand exposure to gamified marketing applications. Delhi-NCR was selected as the research setting because of its pronounced demographic diversity, high Smartphone and internet penetration, and its established status as one of India's most significant hubs for digital commerce activity (Naikoo et al., 2025). Purposive and convenience sampling were employed to recruit respondents who met the eligibility criterion of active, prior gamification exposure, ensuring that survey responses reflected genuine experiential assessments rather than hypothetical attitudes (Silverman & Patterson, 2021). A structured questionnaire was developed using well-established and psychometrically validated scales: Consumer Attitude items were adapted from Ajzen and Fishbein (1977); Consumer Engagement from Vivek et al. (2012); Purchase Behavioral Intention from Ajzen (1991); and Perceived Ease of Use and

Perceived Enjoyment from Davis (1989). Perceived Agility, Social Influence and Perceived Usefulness were operationalized using items adapted from UTAUT literature (Venkatesh et al., 2003). All items were assessed on a five-point Likert scale (1 = strongly disagree; 5 = strongly agree).

A pilot study conducted with 50 participants confirmed the reliability and factorial clarity of all constructs prior to main data collection, with Cronbach's Alpha exceeding 0.70 across all scales. The main survey was administered via offline, self-administered paper questionnaires distributed across multiple sites in Delhi-NCR between July and November 2025. Offline administration was selected to ensure complete participation and to reach respondents across both urban commercial hubs and peri-urban localities, thereby improving geographic representativeness (Gunter et al., 2002). Of 700 questionnaires distributed, 643 were retained for analysis following the exclusion of 57 responses with missing data or systematic response patterns. Data analysis was performed using SmartPLS 4.0, employing PLS-SEM for structural model estimation and bootstrapping with 5,000 subsamples for significance testing of path

coefficients and mediation effects. Measurement Invariance of Composite Models (MICOM) was conducted prior to multi-group analysis (MGA) to ensure comparability across gender and generational subgroups. Participation was voluntary and respondents were informed about the academic purpose of the study. The Institutional Human Ethics Committee of the Central University of Jammu, with the reference number CUJ/IHEC/2025/08, granted ethical approval for the study.

2.1. Demographic profiles

Table 1 presents the demographic profile of the 643 respondents included in the study. The generational cohort distribution indicates that Generation Y constitutes the largest group (44.5%, $n = 286$), followed by Generation X (37.3%, $n = 240$) and Generation Z (18.2%, $n = 117$). Gender distribution shows males accounting for 56.8% ($n = 365$) and females 43.2% ($n = 278$). Regarding marital status, the majority of respondents are married

(74.0%, $n = 476$), while 19.5% ($n = 125$) are unmarried and 6.5% ($n = 42$) are separated or divorced. In terms of education, most respondents possess postgraduate qualifications (39.8%, $n = 256$), followed by undergraduates (21.3%, $n = 137$), indicating a relatively well-educated sample. Income analysis reveals that a substantial proportion earns up to ₹25,000 per month (46.3%, $n = 298$) or between ₹25,001 and ₹40,000 (40.0%, $n = 257$). Occupationally, service employees constitute the largest group (29.1%, $n = 187$), followed by businesspersons (24.6%, $n = 158$), students (19.1%, $n = 123$), professionals (12.9%, $n = 83$), housewives (12.0%, $n = 77$) and others (2.3%, $n = 15$), reflecting a diverse respondent base across socioeconomic categories.

3. RESULTS

The descriptive statistics presented in Table 2 indicate satisfactory measurement properties for all constructs influencing consumer attitude, engage-

Table 1. Demographic characteristics

Characteristics	Description	Frequency	Percent
Age	Generation Z	117	18.2
	Generation Y	286	44.5
	Generation X	240	37.3
Gender	Male	365	56.8
	Female	278	43.2
Marital status	Unmarried	125	19.5
	Married	476	74.0
	Separated/divorced	42	6.5
Education qualification	Up to high school (matric)	45	7.0
	Senior secondary (intermediate)	97	15.1
	Bachelor's degree (undergraduate)	137	21.3
	Master's degree (postgraduate)	256	39.8
	Technical diploma/certificate	80	12.4
	Professional qualifications and others	28	4.4
Income (Per month)	Up to ₹25,000	298	46.3
	₹25,001 – ₹40,000	257	40.0
	₹40,001 – ₹60,000	50	7.8
	₹60,001 – ₹75,000	22	3.4
	₹75,001 – ₹1,00,000	13	2.0
	More than ₹1,00,000	3	0.5
Occupation	Student	123	19.1
	Business	158	24.6
	Service	187	29.1
	Housewives	77	12.0
	Professionals	83	12.9
	Others	15	2.3

ment and purchase behavioral intention toward gamification. All factor loadings ranged from 0.761 to 0.875, exceeding the recommended threshold of 0.70, thereby confirming strong indicator reliability and construct representation (Hair et al., 2021). Among the antecedent constructs, Perceived Enjoyment recorded the highest mean score ($M = 3.49$, $SD = 0.62$), suggesting that respondents generally perceived gamification as enjoyable. This was followed by Perceived Ease of Use ($M = 3.36$, $SD = 0.63$), Consumer Attitude ($M = 3.38$, $SD = 0.51$), Perceived Usefulness ($M = 3.27$, $SD = 0.65$), Perceived Agility ($M = 3.20$, $SD = 0.68$) and Social Influence ($M = 3.08$, $SD = 0.60$). Consumer Engagement ($M = 2.21$, $SD = 0.55$) and Purchase Behavioral Intention ($M = 2.45$, $SD = 0.58$) exhibited comparatively lower mean scores, indicating moderate levels of engagement and purchase intention among respondents. The moderate standard deviation values across all constructs suggest acceptable variability in responses and a reasonable degree of consensus among participants.

Table 2. Descriptive statistics with factor loadings

Construct/item	Factor loading	Mean	Std. deviation	Variance
Perceived Agility		3.202	0.676	0.457
PA1	0.847	3.212	0.763	0.581
PA2	0.875	3.204	0.774	0.599
PA3	0.870	3.193	0.788	0.620
PA4	0.871	3.215	0.794	0.630
PA5	0.863	3.187	0.787	0.619
Perceived Ease of Use		3.365	0.634	0.402
PEOU1	0.844	3.352	0.768	0.590
PEOU2	0.869	3.353	0.748	0.559
PEOU3	0.826	3.362	0.745	0.555
PEOU4	0.826	3.387	0.737	0.543
PEOU5	0.832	3.370	0.777	0.604
Social Influence		3.075	0.604	0.365
SI1	0.812	3.081	0.730	0.532
SI2	0.808	3.047	0.756	0.571
SI3	0.827	3.084	0.748	0.560
SI4	0.836	3.072	0.733	0.537
SI5	0.822	3.093	0.709	0.502
Perceived Enjoyment		3.486	0.616	0.380
PE1	0.864	3.464	0.734	0.539
PE2	0.822	3.481	0.713	0.509
PE3	0.832	3.501	0.748	0.559
PE4	0.835	3.498	0.743	0.553
Perceived Usefulness		3.273	0.647	0.418
PU1	0.850	3.255	0.747	0.558
PU2	0.872	3.300	0.764	0.584
PU3	0.849	3.274	0.747	0.557
PU4	0.852	3.263	0.764	0.583

Construct/item	Factor loading	Mean	Std. deviation	Variance
Consumer Attitude		3.383	0.508	0.258
CA1	0.791	3.400	0.668	0.446
CA2	0.787	3.361	0.647	0.418
CA3	0.761	3.348	0.651	0.424
CA4	0.770	3.384	0.639	0.408
CA5	0.789	3.425	0.652	0.425
CA6	0.782	3.381	0.651	0.423
Consumer Engagement		2.206	0.555	0.308
CE1	0.788	2.188	0.677	0.458
CE2	0.794	2.252	0.694	0.482
CE3	0.825	2.188	0.695	0.483
CE4	0.792	2.163	0.677	0.458
CE5	0.803	2.207	0.690	0.476
CE6	0.798	2.226	0.706	0.499
CE7	0.816	2.230	0.719	0.517
CE8	0.797	2.196	0.676	0.457
Purchase Behavioral Intention		2.452	0.583	0.340
PBI1	0.788	2.429	0.736	0.541
PBI2	0.799	2.474	0.709	0.502
PBI3	0.794	2.456	0.759	0.576
PBI4	0.816	2.448	0.725	0.525
PBI5	0.806	2.479	0.737	0.543
PBI6	0.814	2.425	0.727	0.528
PBI7	0.807	2.456	0.690	0.476

The measurement model exhibited satisfactory reliability and convergent validity across all constructs, as presented in Table 3. Cronbach's Alpha values ranged from 0.860 to 0.921, exceeding the recommended threshold of 0.70, thereby confirming strong internal consistency among the measurement items (Hair et al., 2021; Nalluri et al., 2020). Similarly, rho_a values varied between 0.869 and 0.921, while composite reliability (rho_c) values ranged from 0.903 to 0.937, further supporting the reliability and stability of the constructs. Convergent validity was established as all Average Variance Extracted (AVE) values were above the recommended cut-off of 0.50, ranging from 0.609 to 0.748, indicating that each construct explained a substantial proportion of variance in its indicators. Variance Inflation Factor (VIF) values ranged from 1.000 to 1.433, well below the critical threshold of 5.0, indicating the absence of structural collinearity issues among latent constructs (Kock, 2017). Common method bias was assessed through full collinearity VIF analysis, with all VIF values remaining below the threshold, further supporting the validity of the measurement model. Effect size (f^2) values ranged from 0.092 to 0.433, indicating varying degrees of explanatory contribution among the predictor constructs.

Table 3. Construct reliability and validity

Constructs	Cronbach's α	ρ_a	ρ_c	AVE	VIF	f^2
Consumer Attitude	0.872	0.872	0.903	0.609	–	–
Consumer Engagement	0.921	0.921	0.935	0.643	1.000	0.433
Perceived Agility	0.916	0.919	0.937	0.748	1.433	0.123
Perceived Ease of Use	0.896	0.904	0.923	0.705	1.433	0.140
Perceived Enjoyment	0.860	0.869	0.904	0.703	1.003	0.141
Perceived Usefulness	0.879	0.885	0.916	0.733	1.006	0.115
Purchase Behavioral Intention	0.909	0.910	0.927	0.646	1.002	0.092
Social Influence	0.880	0.888	0.912	0.674	1.007	0.100

Table 4 presents the assessment of discriminant validity using the Fornell–Larcker criterion and the Heterotrait–Monotrait Ratio (HTMT). The square root of the AVE for all constructs ranges from 0.780 to 0.865 and exceeds the corresponding inter-construct correlations (–0.077 to 0.550), thereby satisfying the Fornell–Larcker criterion and confirming that each construct explains more variance in its own indicators than in other constructs. All HTMT values range from 0.031 to 0.614, well below the recommended threshold of 0.85. The highest HTMT value is observed between Consumer Attitude and Consumer Engagement (0.614), indicating acceptable distinctiveness. These findings collectively confirm satisfactory discriminant validity across all constructs.

ties of the structural model. The R-square values indicate that the model explains 33.4% of the variance in Consumer Attitude, 30.2% in Consumer Engagement, and 36.9% in Purchase Behavioral Intention, reflecting a moderate level of explanatory power. The adjusted R-square values (0.329, 0.301, and 0.367, respectively) are very close to the corresponding R-square values, confirming the stability and reliability of the model. The $Q^2_{predict}$ values for Consumer Attitude (0.318), Consumer Engagement (0.158) and Purchase Behavioral Intention (0.119) are all greater than zero, indicating satisfactory predictive relevance. Model-fit indices (SRMR = 0.039; NFI = 0.910) confirm a good overall fit and support the robustness of the proposed structural model.

The model-fit summary presented in Table 5 demonstrates the explanatory and predictive capabilities

of the structural model and hypotheses testing. Among the antecedents

Table 4. Discriminant validity assessment (Fornell–Larcker criterion and HTMT ratio)

Construct	CA	CE	PA	PEOU	PE	PU	PBI	SI
Consumer Attitude (CA)	0.780	0.614	0.350	0.329	0.261	0.286	0.594	0.199
Consumer Engagement (CE)	0.550	0.802	0.221	0.258	0.253	0.130	0.589	0.140
Perceived Agility (PA)	0.314	0.203	0.865	0.049	0.044	0.035	0.203	0.031
Perceived Ease of Use (PEOU)	0.295	0.236	0.046	0.840	0.057	0.045	0.197	0.045
Perceived Enjoyment (PE)	0.229	0.225	–0.022	–0.045	0.838	0.035	0.145	0.034
Perceived Usefulness (PU)	0.253	0.119	–0.005	0.034	0.002	0.856	0.180	0.088
Purchase Behavioral Intention (PBI)	0.530	0.540	0.187	0.179	0.130	0.162	0.804	0.139
Social Influence (SI)	0.177	0.131	0.005	0.030	–0.002	–0.077	0.126	0.821

Table 5. Model-fit summary

Construct	R^2	R^2 adjusted	$Q^2_{predict}$	RMSE	MAE
Consumer Attitude	0.334	0.329	0.318	0.829	0.672
Consumer Engagement	0.302	0.301	0.158	0.922	0.738
Purchase Behavioral Intention	0.369	0.367	0.119	0.942	0.763

Fit index	Saturated model	Estimated model
SRMR	0.035	0.039
NFI	0.911	0.910
Chi-square	1483.911	1502.075
d_ ULS	1.183	1.495
d_ G	0.395	0.402

Table 6. Hypotheses testing results

Hypothesis	Path	β	STDEV	t-stat	p-value
H1	PA $\rightarrow$ CA	0.307	0.031	10.051	< 0.001
H2	PEOU $\rightarrow$ CA	0.278	0.033	8.371	< 0.001
H3	SI $\rightarrow$ CA	0.188	0.032	5.911	< 0.001
H4	PE $\rightarrow$ CA	0.248	0.032	7.865	< 0.001
H5	PU $\rightarrow$ CA	0.259	0.030	8.569	< 0.001
H6	CA $\rightarrow$ CE	0.550	0.027	20.147	< 0.001
H7	CA $\rightarrow$ PBI	0.334	0.037	8.998	< 0.001
H8	CE $\rightarrow$ PBI	0.356	0.036	9.818	< 0.001
H9	CA $\rightarrow$ CE $\rightarrow$ PBI	0.196	0.022	8.739	< 0.001

of Consumer Attitude, Perceived Agility exerts the strongest positive influence (H1: $\beta = 0.307$, $t = 10.051$, $p < 0.001$), followed by Perceived Ease of Use (H2: $\beta = 0.278$, $t = 8.371$, $p < 0.001$), Perceived Usefulness (H5: $\beta = 0.259$, $t = 8.569$, $p < 0.001$), Perceived Enjoyment (H4: $\beta = 0.248$, $t = 7.865$, $p < 0.001$) and Social Influence (H3: $\beta = 0.188$, $t = 5.911$, $p < 0.001$). All five hypotheses (H1–H5) are therefore supported. Consumer Attitude significantly influences both Purchase Behavioral Intention (H7: $\beta = 0.334$, $t = 8.998$, $p < 0.001$) and Consumer Engagement (H6: $\beta = 0.550$, $t = 20.147$, $p < 0.001$), with the latter representing the strongest direct relationship in the model. Consumer Engagement positively affects Purchase Behavioral Intention (H8: $\beta = 0.356$, $t = 9.818$, $p < 0.001$). The indirect effect of Consumer Attitude on Purchase Behavioral Intention through Consumer Engagement is also significant (H9: $\beta = 0.196$, $t = 8.739$, $p < 0.001$), confirming that Consumer Engagement partially mediates the Attitude–Purchase Behavioral Intention relationship.

To examine gender- and generational-based differences in the structural relationships (H10 and H11), Multi-Group Analysis (MGA) was conducted following the Measurement Invariance of Composite Models (MICOM) procedure recommended by Henseler et al. (2016). MICOM is con-

ducted in three steps: (1) configural invariance, (2) compositional invariance, and (3) equality of composite means and variances. Establishing at least partial measurement invariance (compositional invariance) is a prerequisite for meaningful group comparisons.

3.1. Gender-based based Multi-Group Analysis (MGA)

The MICOM procedure for gender revealed that compositional invariance was established for all constructs (p-values ranging from 0.096 to 0.864, all exceeding 0.05), and equality of composite means and variances was confirmed for seven of the eight constructs. For Purchase Behavioral Intention, mean equality was not supported ($p = 0.007$), while variance equality was established ($p = 0.334$). Consequently, full measurement invariance was achieved for seven constructs and partial measurement invariance for Purchase Behavioral Intention. Since compositional invariance was established for all constructs, the prerequisite for conducting MGA was satisfied. The gender MICOM results are summarized in Table 7.

The bootstrapping-based gender MGA results, presented in Table 8, reveal that all hypothesized relationships are positive and statistically signifi-

Table 7. Summary of MICOM results: gender

Construct	Comp. invariance (step 2)	Mean equality (step 3a)	Variance equality (step 3b)	Status
Consumer Attitude	$p = 0.600$	$p = 0.152$	$p = 0.289$	Full invariance
Consumer Engagement	$p = 0.679$	$p = 0.229$	$p = 0.342$	Full invariance
Perceived Agility	$p = 0.096$	$p = 0.865$	$p = 0.336$	Full invariance
Perceived Ease of Use	$p = 0.254$	$p = 0.872$	$p = 0.757$	Full invariance
Perceived Enjoyment	$p = 0.598$	$p = 0.222$	$p = 0.282$	Full invariance
Perceived Usefulness	$p = 0.458$	$p = 0.615$	$p = 0.610$	Full invariance
Purchase Behavioral Intention	$p = 0.864$	$p = 0.007^*$	$p = 0.334$	Partial invariance
Social Influence	$p = 0.657$	$p = 0.975$	$p = 0.500$	Full invariance

Table 8. Gender-based multi-group analysis (MGA) results

Path	β (female)	β (male)	t (female)	t (male)	p (female)	p (male)
CA $\rightarrow$ CE	0.521	0.571	12.013	16.469	< 0.001	< 0.001
CA $\rightarrow$ PBI	0.290	0.366	5.072	7.590	< 0.001	< 0.001
CE $\rightarrow$ PBI	0.378	0.338	7.274	6.966	< 0.001	< 0.001
PA $\rightarrow$ CA	0.211	0.393	4.915	9.784	< 0.001	< 0.001
PEOU $\rightarrow$ CA	0.284	0.272	5.687	6.588	< 0.001	< 0.001
PE $\rightarrow$ CA	0.320	0.192	6.752	4.655	< 0.001	< 0.001
PU $\rightarrow$ CA	0.219	0.306	4.520	8.136	< 0.001	< 0.001
SI $\rightarrow$ CA	0.165	0.212	3.197	5.228	< 0.001	< 0.001

cant for both groups. Consumer Attitude significantly influences Consumer Engagement among females ($\beta = 0.521$, $p < 0.001$) and males ($\beta = 0.571$, $p < 0.001$), with a slightly stronger effect among male respondents. Consumer Attitude also positively affects Purchase Behavioral Intention for females ($\beta = 0.290$) and males ($\beta = 0.366$), indicating a stronger influence among males. Consumer Engagement exerts a stronger positive impact on Purchase Behavioral Intention among females ($\beta = 0.378$) than males ($\beta = 0.338$). Regarding antecedents of Consumer Attitude, Perceived Agility ($\beta = 0.393$ vs. 0.211), Perceived Usefulness ($\beta = 0.306$ vs. 0.219) and Social Influence ($\beta = 0.212$ vs. 0.165) demonstrate stronger effects among males, suggesting that functional and social aspects of gamification are more influential for male consumers. Conversely, Perceived Enjoyment has a stronger effect on Consumer Attitude among females ($\beta = 0.320$) than males ($\beta = 0.192$), indicating that hedonic motivations play a more important role for female consumers. These findings confirm H10 and demonstrate meaningful gender-based moderation of gamification dynamics.

3.2. Generation-based based Multi-Group Analysis (MGA)

The MICOM procedure for generational cohorts (Generation X, Y and Z) confirmed configural invariance through the application of identical model specifications across all groups. Compositional invariance was established for all constructs, with permutation p-values ranging from 0.057 to 0.777, all exceeding the threshold of 0.05. Assessment of equality of means revealed that Consumer Attitude ($p = 0.007$) and Purchase Behavioral Intention ($p < 0.001$) exhibited significant differences across generations, while all other constructs demonstrated equality of means. Variance equali-

ty was satisfied for all constructs (p-values ranging from 0.453 to 0.961). Consequently, full measurement invariance was established for Consumer Engagement, Perceived Agility, Perceived Ease of Use, Perceived Enjoyment, Perceived Usefulness and Social Influence, while Consumer Attitude and Purchase Behavioral Intention achieved partial invariance. Since compositional invariance was established for all constructs, the data satisfy the requirements for MGA across generational groups. The generation MICOM results are summarized in Table 9.

The bootstrapping-based generation MGA results, presented in Table 10, reveal that all hypothesized relationships are positive and statistically significant across Generations X, Y and Z ($p < 0.05$). Consumer Attitude significantly influenced Consumer Engagement in all groups, with the strongest effect observed among Generation X ($\beta = 0.633$), followed by Generation Y ($\beta = 0.582$) and Generation Z ($\beta = 0.461$). Similarly, the impact of Consumer Attitude on Purchase Behavioral Intention was greatest among Generation X ($\beta = 0.391$), compared with Generation Z ($\beta = 0.317$) and Generation Y ($\beta = 0.299$). In contrast, Consumer Engagement exerted the strongest effect on Purchase Behavioral Intention among Generation Z ($\beta = 0.409$), followed by Generation Y ($\beta = 0.377$) and Generation X ($\beta = 0.261$). Perceived Agility showed the greatest influence on Consumer Attitude among Generation Z ($\beta = 0.420$), while Perceived Ease of Use had its strongest effect among Generation X ($\beta = 0.400$). Perceived Enjoyment demonstrated comparable effects for Generations X ($\beta = 0.299$) and Z ($\beta = 0.300$), while Perceived Usefulness was most influential among Generation Y ($\beta = 0.322$). Social Influence exerted the strongest impact among Generation Z ($\beta = 0.237$), highlighting the height-

Table 9. Summary of MICOM results: generational cohorts

Construct	Comp. invariance (step 2)	Mean equality (step 3a)	Variance equality (step 3b)	Status
Consumer Attitude	p = 0.402	p = 0.007	p = 0.961	Partial invariance
Consumer Engagement	p = 0.179	p = 0.215	p = 0.453	Full invariance
Perceived Agility	p = 0.777	p = 0.561	p = 0.746	Full invariance
Perceived Ease of Use	p = 0.057	p = 0.348	p = 0.722	Full invariance
Perceived Enjoyment	p = 0.629	p = 0.505	p = 0.820	Full invariance
Perceived Usefulness	p = 0.723	p = 0.262	p = 0.824	Full invariance
Purchase Behavioral Intention	p = 0.520	p < 0.001	p = 0.915	Partial invariance
Social Influence	p = 0.058	p = 0.783	p = 0.481	Full invariance

Table 10. Generation-based Multi-Group Analysis (MGA) results

Path	β Gen X	β Gen Y	β Gen Z	t Gen X	t Gen Y	t Gen Z	p Gen X	p Gen Y	p Gen Z
CA $\rightarrow$ CE	0.633	0.582	0.461	12.923	14.117	9.641	< 0.001	< 0.001	< 0.001
CA $\rightarrow$ PBI	0.391	0.299	0.317	4.707	4.978	5.403	< 0.001	< 0.001	< 0.001
CE $\rightarrow$ PBI	0.261	0.377	0.409	3.259	6.242	7.794	< 0.001	< 0.001	< 0.001
PA $\rightarrow$ CA	0.291	0.243	0.420	5.185	4.947	8.921	< 0.001	< 0.001	< 0.001
PEOU $\rightarrow$ CA	0.400	0.176	0.277	6.661	3.435	5.512	< 0.001	< 0.001	< 0.001
PE $\rightarrow$ CA	0.299	0.192	0.300	4.696	3.661	6.505	< 0.001	< 0.001	< 0.001
PU $\rightarrow$ CA	0.254	0.322	0.206	4.460	6.787	4.241	< 0.001	< 0.001	< 0.001
SI $\rightarrow$ CA	0.161	0.187	0.237	2.379	3.399	4.934	0.017	< 0.001	< 0.001

ened importance of peer influence for younger consumers. These findings confirm *H11* and demonstrate that generational cohort meaningfully moderates gamification dynamics.

4. DISCUSSION

The finding that Perceived Agility is the strongest driver of Consumer Attitude toward gamification (*H1*: $\beta = 0.307$) is a notable contribution that supplements and extends the work of Huang et al. (2021) and Li et al. (2021), who associated responsive system design with engagement and retention but did not directly test its relationship with attitude formation. By demonstrating that agility is the most substantively important attitudinal antecedent, this study broadens the theoretical scope of the TAM-UTAUT integrated framework in gamified contexts and underscores the importance of designing gamified platforms that are fluid, responsive and dynamically adaptive to user needs. Perceived Enjoyment also exerts a significant and meaningful positive effect on Consumer Attitude (*H4*: $\beta = 0.248$), consistent with the hedonic motivation literature established by Li et al. (2017), who confirmed that experiential enjoyment is a central driver of consumer attitudes toward immersive marketing approaches. The com-

parably strong influence of Perceived Usefulness (*H5*: $\beta = 0.259$) further confirms that instrumental value reinforces attitude formation alongside hedonic motivations, consistent with Tobon et al. (2020) and Jami Pour et al. (2023).

A significant finding of the present study is that Perceived Ease of Use positively and significantly influences Consumer Attitude (*H2*: $\beta = 0.278$, $p < 0.001$), representing one of the most practically important results. While Aparicio et al. (2021) noted that ease of use tends to produce smaller effects than enjoyment in e-commerce gamification contexts, the present findings, drawn from a large and demographically diverse Indian sample, demonstrate that interface accessibility remains a substantive and significant driver of attitudinal formation. This is particularly relevant in the Delhi-NCR context, where digital literacy varies substantially across demographic segments. The gender-based MGA further reveals that Perceived Ease of Use exerts comparable effects among female ($\beta = 0.284$) and male ($\beta = 0.272$) respondents, suggesting that interface simplicity is a cross-gender priority in gamified marketing design.

The partial mediation of Consumer Engagement in the attitude–purchase behavioral intention pathway (*H9*: $\beta = 0.196$, $p < 0.001$) complements

and extends the findings of De Canio et al. (2021), who demonstrated that gamification links consumer attitudes to purchase through engagement enhancement. The present study quantifies this indirect pathway within a rigorous PLS-SEM framework, establishing that while Consumer Attitude exerts a direct positive effect on Purchase Behavioral Intention ($H7: \beta = 0.334$), a meaningful component of its influence operates through the deepened engagement it engenders ($H6: \beta = 0.550$). The particularly strong direct relationship between Consumer Attitude and Consumer Engagement confirms that positive attitudinal evaluations are a robust catalyst for sustained gamified engagement, which in turn drives behavioral intention ($H8: \beta = 0.356$).

The demographic moderation findings provide important insights into how generational and gender differences shape consumer responses toward gamified marketing platforms in the Indian context. Among generational cohorts, Consumer Attitude exerted the strongest influence on both Consumer Engagement ($\beta = 0.633$) and Purchase Behavioral Intention ($\beta = 0.391$) for Generation X, indicating that older consumers rely more heavily on favorable evaluations before engaging with and purchasing through gamified platforms. This is consistent with Tondello et al. (2019), who found that older consumers' priorities practical utility and clear reward structures before committing to engagement. In contrast, Consumer Engagement showed the strongest impact on Purchase Behavioral Intention among Generation Z ($\beta = 0.409$), suggesting that younger consumers are more likely to translate active participation directly into behavioral outcomes. Furthermore, Perceived Agility ($\beta = 0.420$) and Social Influence ($H3: \beta = 0.237$) were most influential for Generation Z, highlighting the heightened importance of interactive, dynamic and socially connected experiences for younger consumers, consistent with Koivisto and Hamari (2014). Perceived Usefulness was strongest among Generation Y ($\beta = 0.322$), reflecting that middle-aged consumers give particular weight to functional value. Gender-based MGA further revealed that Perceived Agility, Perceived Usefulness and Social Influence exerted stronger effects among males, whereas Perceived Enjoyment had a stronger influence among females ($\beta = 0.320$ vs. 0.192), confirming the well-established finding

that hedonic motivations are more salient for female consumers in technology adoption contexts (Polo-Peña et al., 2020). Together, these findings confirm $H10$ and $H11$, establishing what Yadav and Saini (2024) noted at a general level (that gamification effectiveness is systematically moderated by consumer demographics) while extending this insight with rigorous MICOM-validated evidence across both gender and generational dimensions.

Theoretically, this study advances the gamification literature by validating an integrative TAM-UTAUT model that simultaneously accounts for hedonic, utilitarian and social antecedents of consumer attitude, maps the full sequential pathway through engagement to purchase behavioral intention, and documents demographic moderation of this pathway via rigorous MICOM-based multi-group analysis. The identification of Perceived Agility as the dominant driver of Consumer Attitude, alongside the confirmation that Perceived Ease of Use exerts a significant positive effect (contributing to a comprehensive picture in which all five antecedents significantly predict attitude) provides a more nuanced and empirically grounded theoretical account of gamified marketing dynamics than prior single-construct or partial-pathway studies have offered. The MICOM-validated generation and gender MGA results establish that demographic moderation is not merely a contextual caveat but a structural feature of the gamification–attitude–behavioral intention pathway.

For practitioners operating in India's rapidly expanding digital marketplace, the results offer clear strategic guidance. Gamified campaigns should prioritize the design of agile, fluid and responsive platforms that reduce cognitive friction and adapt dynamically to user behavior, as these properties represent the strongest predictor of favorable consumer attitudes. Enjoyable, stimulating and demonstrably useful gamification experiences further reinforce attitudinal formation, while accessible interface design remains important across all demographic segments. Strategies targeting male consumers should additionally emphasize competitive, achievement-oriented and socially visible gamification mechanics that leverage Social Influence and Perceived Agility. Campaigns oriented toward female consumers

should incorporate hedonic and enjoyment-centered design, along with social proof mechanisms and influencer-led challenges. Generation X consumers respond most strongly when well-formed attitudes precede engagement; Generation Z consumers convert participation into purchase intention most readily, underscoring the value of frictionless purchase pathways embedded within gamified experiences; and Generation Y consumers prioritize functional utility. Given the signifi-

cance of India's large rural and peri-urban population (Balachandra, 2011), marketers must also ensure that gamified brand applications are compatible with lower-specification devices and operable over slower internet connections to maximize reach. Policymakers should simultaneously support ethical gamification frameworks that prevent deceptive design, protect consumer privacy and promote transparency in reward-based engagement systems (Oberoi, 2024).

CONCLUSIONS

This study aimed to construct and empirically test an integrative model of gamified marketing dynamics that maps the full sequential pathway from antecedent perceptions through consumer attitude and engagement to purchase behavioral intention, with gender and generational cohort as moderating variables. The results confirm that perceived agility, perceived ease of use, perceived enjoyment, perceived usefulness and social influence are all significant drivers of consumer attitude toward gamification, with perceived agility emerging as the dominant antecedent in the present sample. Consumer attitude strongly predicts both consumer engagement and purchase behavioral intention, with engagement partially mediating the attitude–purchase behavioral intention relationship. Gender and generational cohort significantly moderate these dynamics in theoretically consistent and practically meaningful ways, as confirmed through MICOM-validated Multi-Group Analysis.

These results support the conclusion that effective gamified marketing in emerging digital markets such as India must simultaneously cultivate agile and enjoyable platform experiences, demonstrate tangible utility, ensure interface accessibility and be demographically personalized to maximize consumer engagement and purchase intention. The study's principal theoretical contribution lies in demonstrating, within a single integrative model, that attitude, engagement and purchase behavioral intention are sequentially connected in gamified marketing environments, and that demographic factors meaningfully alter the strength and configuration of these connections. The MICOM-validated MGA approach further establishes a methodological benchmark for demographic moderation testing in gamification research.

LIMITATIONS AND FUTURE DIRECTION OF THE STUDY

This study is not without limitations. The cross-sectional design precludes causal inference and prevents the capture of temporal shifts in gamification attitudes as consumers' digital experience evolves; future research should employ longitudinal designs to address this. The sample is geographically constrained to the Delhi-NCR region of India, which, while analytically productive, limits the generalizability of findings to other emerging markets or cultural contexts. Extending the model to diverse emerging markets would further illuminate the boundary conditions of the TAM-UTAUT framework in gamified settings. Additionally, purchase behavioral intention is operationalized through intention, preference and loyalty items rather than actual transactional records; future research should incorporate objective behavioral data to validate the intention–behavior relationship. Incorporating additional psychological variables (such as intrinsic motivation, flow experience and digital self-efficacy) would further illuminate individual differences in gamification response. Research addressing the ethical dimensions of gamification, including consumer privacy, persuasive design concerns and the long-term sustainability of reward-based engagement models, would also substantially advance the field.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The Institutional Human Ethics Committee of the Central University of Jammu reviewed the study protocol. The Committee approved the protocol and confirmed that informed consent is implied through the voluntary completion of the questionnaire by respondents. All procedures were conducted in compliance with the relevant ethical guidelines and regulations as approved by the Committee.

AUTHOR CONTRIBUTIONS

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APPENDIX A

Table A1. Summary of constructs and measurement items

Constructs	Coding	Measurement items
Perceived Agility	PA 1	I find it easy to adapt to changes in gamified systems.
	PA 2	I quickly understand and utilize new features in gamification platforms.
	PA 3	Gamification encourages me to respond proactively to dynamic challenges.
	PA 4	I feel confident in learning new systems related to gamification.
	PA 5	Gamified experiences improve my flexibility in decision-making processes.
Perceived Ease of Use	PEOU 1	Using gamified systems does not require a lot of mental effort from me.
	PEOU 2	Learning to use gamified applications is straightforward for me.
	PEOU 3	I can easily get gamified applications to do what I want.
	PEOU 4	Interacting with gamified features is simple and clear.
	PEOU 5	Design of gamified systems is user-friendly.
Social Influence	SI 1	My peers think positively about using gamified systems.
	SI 2	I am influenced by others' opinions about gamified systems.
	SI 3	People whose opinions I value encourage me to use gamified applications.
	SI 4	My friends and family influence my decision to adopt gamification features in services/products.
	SI 5	Peer pressure motivates me to engage with gamified platforms.
Perceived Enjoyment	PE 1	I find using gamified systems enjoyable.
	PE 2	Gamified experiences provide me with a sense of fun and excitement.
	PE 3	Enjoyment I experience motivates me to engage with gamified systems.
	PE 4	Gamification adds an entertaining element to my routine activities.
Perceived Usefulness	PU 1	Gamification is most useful in gaining knowledge and understanding of products.
	PU 2	Gamification improves my learning efficiency in achieving goals.
	PU 3	The use of gamification enhances my overall experience.
	PU 4	Gamification influences my decision-making when choosing between competing products or services.
Consumer Attitude	CA 1	I find gamification enjoyable and entertaining.
	CA 2	I have a pleasant feeling towards gamification.
	CA 3	I am enthusiastic about gamification, which adds value to service/product.
	CA 4	Using gamified services/products is a positive experience.
	CA 5	Gamification motivates me to use service/product more frequently.
	CA 6	I believe gamification is an effective tool for learning and improving skills.
Consumer Engagement	CE 1	Gamification encourages me to interact with other users.
	CE 2	I am very motivated and think about benefits of gamified programs.
	CE 3	Gamification makes overall consumer experience more enjoyable.
	CE 4	Gamified elements hold my attention for extended periods.
	CE 5	I feel motivated to interact with product/service when gamified.
	CE 6	I feel emotionally connected to gamified features.
	CE 7	I actively participate in gamified tasks or activities.
	CE 8	Gamification keeps me engaged for longer periods.
Purchase Behavioral Intention	PBI 1	I intend to purchase products or services that incorporate gamified features.
	PBI 2	I plan to choose gamified services over non-gamified alternatives in my next purchase.
	PBI 3	I am likely to spend money on products or services that offer gamification features.
	PBI 4	I will actively seek out gamified products or services when making purchase decisions.
	PBI 5	I expect my purchases of gamified products or services to increase in the coming months.
	PBI 6	I intend to make repeat purchases from brands that use gamification in their services.
	PBI 7	Given a choice, I will select gamified products or services over alternatives in my future purchases.