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THE IMPACT OF GAMIFICATION FEATURES IN DIGITAL PAYMENT APPLICATIONS AND ONLINE SHOPPING ON GREEN CONSUMER BEHAVIOR

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ABSTRACT

This study analyzes the impact of Gamification Features integrated into digital payment applications and online shopping platforms on Green Consumer Behavior among consumers in Vietnam. The theoretical framework combines the Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM), and Uses and Gratification Theory (UGT) to examine the relationships between gamification components - including Reward Affordance (REW), Visual Feedback (VFB), and Social Interaction (SOC) - and Online Shopping Experience (OSE) through two mediating variables: User Green Engagement (UGE) and Perceived Authenticity (PA). Empirical data collected from 103 valid survey responses, predominantly from Generation Z, were analyzed using Stata through Cronbach's alpha, Exploratory Factor Analysis (EFA), correlation analysis, and multiple linear regression. The results indicate that Social Interaction (SOC) and Online Shopping Experience (OSE) play decisive roles in increasing User Green Engagement (UGE) and Perceived Authenticity (PA). At the same time, Visual Feedback (VFB) has a direct, positive, and statistically significant effect on green consumer behavior (). Based on these findings, the study proposes managerial recommendations for platform developers, green product businesses, and government authorities to promote the transition toward sustainable consumption.

KEYWORDS: Gamification, digital payments, online shopping, green consumer behavior, green engagement, perceived authenticity, Stata.

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1.0 INTRODUCTION

Amid global climate change and increasing pressure from environmental degradation, the shift from traditional consumption models toward sustainable consumption (Green Consumption) has become an urgent necessity. At the same time, the rapid expansion of the digital economy, together with

mobile payment infrastructure and e-commerce in Vietnam - represented by platforms such as MoMo, ShopeePay, Shopee, Lazada, and TikTok Shop - has fundamentally changed shopping behavior.

Modern digital platforms are increasingly adopting gamification mechanisms - the integration of game design elements into non-game environments - to improve customer retention rates and stimulate transactions. However, most current applications primarily use gamification for purely commercial demand stimulation. The application of gamification features to community education campaigns and the encouragement of sustainable choices - such as selecting eco-friendly products, reducing plastic packaging, donating to tree-planting initiatives, and optimizing low-emission delivery - has not yet been implemented systematically or evaluated comprehensively from theoretical and empirical perspectives.

This paper aims to evaluate the mechanisms through which gamification features and online shopping experiences influence consumers' green consumer behavior on digital applications. The target respondents are consumers who have used or are currently using e-wallets or e-commerce platforms incorporating environmental gamification features, such as virtual tree planting, green coins, and environmental challenges, in Vietnam. The study provides empirical evidence on the psychological responses of younger consumers (Gen Z) to green gamification features and helps businesses optimize UI/UX design and green marketing policies.

2.0 LITERATURE REVIEW

Putri et al. (2022) applied Uses and Gratification Theory (UGT) to 826 mobile payment application users. The SEM results confirmed that utilitarian benefits, hedonic benefits, and social gratifications derived from gamification significantly increased users' intention to continue using the applications. This study provides an important foundation demonstrating that the integration of game mechanisms into non-game environments, such as finance and digital payments, plays a fundamental role in maintaining user engagement and improving user experience.

Shahzad et al. (2023) investigated the impact of game design elements - including rewards, competition, and challenges - on green consumer behavior among university students. The study found that technology awareness, hedonic motivation, and perceived enjoyment played important mediating roles. In addition, Virtual Corporate Social Responsibility (Virtual CSR) acted as a moderating factor that enhanced environmental awareness.

Hoang & Nguyen (2024) evaluated the factors influencing the intention to continue using the MoMo e-wallet in Hanoi. The study identified *Rewards* and *Ease of Use* as having the strongest effects on *Enjoyment*, which subsequently had an indirect impact on behavior. *Competition* and *Social Interaction* had moderate but still statistically significant effects.

Rerkjirattikal et al. (2025) systematized the effects of e-commerce gamification on user engagement and loyalty, emphasizing that instant reward mechanisms increase intrinsic motivation.

Dao Thi Thu Hien (2025) analyzed the online shopping experience of young consumers and confirmed that convenience, safety, and customer service quality shape shopping attitudes.

3.0 THEORETICAL FOUNDATIONS

3.1. Gamification features in payment:

Similar to the general definition of gamification, gamification in payment refers to the integration of game elements into the payment process (a non-game setting) to encourage customers to use services or change their consumption behavior (Alika Naziera Wardani & Herman, 2025). Some of the most important characteristics of gamification features in payment include:

- Interaction: Users do not simply make payments but can also participate in interactive activities or games for opportunities to receive rewards.
- Instant gratification: Applications provide rewards immediately after a successful transaction, such as discount codes, bonuses, coins, and other incentives, creating a sense of excitement among users.
- Emotional engagement: Gamification stimulates curiosity, healthy competition, and enjoyment when users achieve accomplishments or complete transactions.

3.2. Online shopping and its forms:

Online shopping is a form of e-commerce that allows consumers to pay for, purchase, and sell goods through marketplaces, the Internet, applications, and other digital channels without having to visit a physical store (Andrew Bloomenthal, 2026). Common forms of online shopping include:

- Business to Customer (B2C): Businesses sell directly to consumers without going through a third party.
- Business to Business (B2B): Businesses sell directly to other businesses.
- Consumer to Consumer (C2C): An individual sells products to another individual through a personal website or through platforms that support such transactions.
- Consumer to Business (C2B): Individuals work with businesses through short-term contracts or similar arrangements,...
- Social Commerce: Online shopping integrated into social media platforms, such as TikTok Shop and Facebook Marketplace.

3.3. Green consumption and its characteristics:

Green consumption is generally understood as a form of consumption in which customers choose and prioritize environmentally friendly products, although the specific purposes and meanings may vary (Furqan et al., 2010). In addition, green consumption has the following key characteristics (Phan Thi Le Thuy, 2023):

- Environmentally friendly: Consumers limit their use of products with excessive packaging or products whose production processes cause environmental pollution.
- Safe and economical: Products made from natural and environmentally friendly materials provide greater safety for users while reducing production costs and household spending.
- Protection of natural resources: Recycled products help conserve and protect natural resources in the most effective manner.
- Sustainable consumption: The use of products and services that efficiently meet daily needs while minimizing negative impacts on the environment and natural resources.

3.4. The effects of gamification and online shopping on green consumption

* Positive effects

- Enhancing intrinsic Motivation and Enjoyment: Gamification mechanisms transform otherwise monotonous payment or shopping processes into engaging and entertaining experiences, making users more enthusiastic about participating in environmental protection activities (Muhammad F. et al., 2023).
 - Activating Virtual CSR and Awareness: Through these features, users can develop greater environmental awareness and establish green habits, such as prioritizing recycled products, refusing plastic bags, and using electronic payments instead of paper-based documents (Muhammad F. et al., 2023).
 - Optimizing eco-friendly shopping behavior: Online shopping platforms incorporating gamification can guide consumers toward choosing environmentally certified sellers or products through missions, challenges, or incentive-based rewards.
- * Negative effects and challenges
- Overconsumption: If reward mechanisms are not linked to genuine sustainable development values, they may encourage users to engage in impulsive shopping and accumulate unnecessary products, thereby increasing waste generation (Muhammad F. et al., 2023).
 - Conflicts arising from online logistics infrastructure: Although gamification can create “green habits” within digital interfaces, real-world online shopping activities still depend on packaging systems - including cardboard boxes, adhesive tape, and bubble wrap - and emission-intensive transportation. Without accompanying green logistics solutions, the convenience and stimulation provided by e-commerce may continue to place significant pressure on the environment (Muhammad F. et al., 2023).

4.0 MODEL DEVELOPMENT AND RESEARCH HYPOTHESIS

4.1. Variable descriptions and measurement methods.

Based on the combination of Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM), and Uses and Gratifications Theory (UGT), the research suggests an analysis model consisting of 4 variable groups:

The research model includes independent variables (gamification features and shopping experience), mediators (green engagement and perceived authenticity), dependent variables (green consumption behavior), and control variables. All observed variables (except control variables) are measured using a 5-point Likert scale (ranging from 1-strongly disagree to 5-strongly agree)

a. Independent Variables: Gamification features and Online shopping experience

- Reward Affordance (REW): Measuring the extent to which payment/shopping applications provide rewards (coins, points, vouchers) upon completing the ecology tasks and their impact on users' motivation. Including 3 observed variables from REW1 to REW3, adapted from (Koivisto & Hamari, 2019; Xi & Hamari, 2020).
- Visual Feedback (VFB): Assessing the intuitiveness and vividness of the progress display interface (such as virtual trees, decreased CO2 emissions) to help users perceive the environmental impacts, including 3 observed variables from VFB1 to VFB3 (Werbach & Hunter, 2020).
- Social Interaction (SOC): Reflecting the level of community connection, leaderboards, and group environmental protection challenges. Including 3 observed variables from SOC1 to SOC3 (Xi & Hamari, 2020).

- Online Shopping Experience (OSE): Evaluating habits, convenience, safety, and services when using shopping/mobile payment applications. Comprising 5 observed variables from OSE1 to OSE5 (inherited from *Wolfinbarger & Gilly, 2003*; *Đào Thị Thu Hiền, 2025*).

b. Mediators: Green Engagement and Perceived Authenticity

- User Green Engagement (UGE): Measuring the users' time, attention, and perceived attention toward environmental campaigns on the application. 3 observed variables from UGE1 to UGE3 (*Chen et al., 2020*; *Zhang et al., 2024*).
- Perceived Authenticity (PA): Assessing the users' belief in the transparency and accuracy of green activities (planting real trees, charity), including 3 observed variables, PA1 to PA3 (*Zhang et al., 2019*; *Tan et al., 2023*).

c. Dependent Variables: Green Consumption

- Measuring the priority given to green products, willingness to pay higher prices, reduction of plastic packaging, and promotion of ecological behaviors. 4 observed variables: GCB1 to GCB4 (*Haws et al., 2014*; *Zhao et al., 2021*).

d. Control Variables:

- Including demographic features of respondents to control the impacts on green consumption behaviors: Gender (GEN), Age (AGE), Education Level (EDU), Occupation (OCC), and Average Income/Per Month (INC).

Table 1: Variable Measurement Model

Variable	Content	Sign	Reference
Dependent Variables			
Green Consumption Behavior (GCB)	I prioritize selecting eco-friendly/green products when shopping on the app.	GCB1	Haws et al. (2014); Zhao et al. (2021)
	I am willing to pay a slightly higher price to buy environmentally friendly products or contribute to green funds on the app.	GCB2	
	I actively minimize plastic packaging/request minimal packaging when ordering online.	GCB3	
	I encourage friends and family members to practice green consumption and participate in environmental activities on the app.	GCB4	
Independent Variables			
1. Gamification Features			
a. Reward Affordance	Payment/shopping applications provide various rewards (coins, points, vouchers) when I complete environmental protection tasks.	REW1	Koivisto & Hamari (2019); Xi & Hamari (2020)
	Receiving rewards makes me feel that my efforts are recognized.	REW2	
	Received rewards (coins/green vouchers) encourage	REW3	

	me to complete more tasks on the application.		
b. Visual Feedback	The application interface displays my progress intuitively and vividly (such as virtual trees growing, CO2 emissions decreasing)	VFB1	Werbach & Hunter (2020); Xu et al. (2022)
	Instant responses after each transaction help me acknowledge my positive impacts on the environment.	VFB2	
	Graphics and green progress bars in the application make me feel vivid and interesting.	VFB3	
c. Social Interaction	Interactive features (such as sharing achievements) help me feel more connected to the community on the app.	SOC1	Chen et al. (2024); Xi & Hamari (2020)
	Leaderboards on the app create a positive green competitive drive between me and my friends or other users.	SOC2	
	I enjoy participating in group environmental protection challenges organized by the app.	SOC3	
2. Online Shopping Experience	I often look up product information and conduct transactions through online shopping platforms/e-wallets.	OSE1	Wolfenbarger & Gilly (2003); Đào Thị Thu Hiền (2025)
	Online shopping applications make it easy for me to search for and choose eco-friendly products/services.	OSE2	
	The green payment and transaction process on the app is very convenient and fast.	OSE3	
	The safety and security of online shopping prompt me to conduct transactions through online shopping applications regularly.	OSE4	Lu & Phan (2024)
	Customer service influences my attitude when shopping online.	OSE5	
Mediators			
1. User Green Engagement	Participating in green gamification features attracts much of my time and attention on the app.	UGE1	Chen et al. (2020); Zhang et al. (2024)
	I feel a positive connection with the environmental protection campaigns on the app.	UGE2	
	Green gamification activities make me feel that I am making a meaningful contribution to society.	UGE3	
2. Perceived Authenticity	The green activities (such as planting real trees and donations) on the app are real and transparent.	PA1	Zhang et al. (2019); Tan et al. (2023)
	The app provides accurate information regarding the environmental protection outcomes resulting from users' behavior.	PA2	
	Through the games on the app, I can clearly	PA3	

	visualize the positive impact in the real world.		
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4.2. Research Hypothesis Development

* The impact of gamification features on mediators:

- **Reward Affordance (REW):** Instant rewards (green discount, coins) strengthen customers' external motivation.

H1a: REW has a positive impact on User Green Engagement (UGE).

H1b: REW has a positive impact on Perceived Authenticity (PA).

- **Visual Feedback (VFB):** Illustrative graphics and progress bars clarify the environmental impacts.

H2a: VFB has a positive impact on User Green Engagement (UGE).

H2b: VFB has a positive impact on Perceived Authenticity (PA).

- **Social Interaction (SOC):** Group challenges and leaderboards introduce the demand for connection.

H3a: SOC has a positive impact on User Green Engagement (UGE).

H3b: SOC has a positive impact on Perceived Authenticity (PA).

* The impact of Online Shopping Experience (OSE)

An interface that is easy to use, safe, and offers good service creates a comfortable environment for customers to receive green messages.

H4a: OSE has a positive impact on User Green Engagement (UGE).

H4b: OSE has a positive impact on Perceived Authenticity (PA).

H4c: OSE has a direct positive impact on Green Consumption Behavior (GCB).

* The roles of User Green Engagement (UGE) and Perceived Authenticity (PA)

H5: User Green Engagement (UGE) has a positive impact on Green Consumption Behavior (GCB).

H6: Perceived Authenticity (PA) has a positive impact on Green Consumption Behavior (GCB).

4.3. Research Sample and Data Collection

The research uses convenience sampling and online questionnaires via Google Forms. The surveys concentrate on individuals in Hanoi and large cities who frequently use digital payment and online shopping platforms. The total valid responses were 103.

5.0 RESEARCH RESULTS AND DATA ANALYSIS

5.1. Descriptive statistics: the research sample and variables

Survey data ($N = 103$) were collected to obtain descriptive statistics of the results for the main observed variables:

Table 2: Descriptive statistics of the main variables

Variables	Full-name variables	Observation s (Obs)	Mean Value	Standard Deviation	Mi n	Ma x
UGE	User Green Engagement	103	3.702	0.940	1	5
GCB	Green Consumption Behavior	103	3.903	0.850	1	5
REW	Reward Affordance	103	3.971	1.093	1	5
SOC	Social Interaction	103	3.641	0.994	1	5
PA	Perceived Authenticity	103	3.663	0.967	1	5
VFB	Visual Feedback	103	4.000	0.980	1	5
OSE	Online Shopping Experience	103	4.010	0.751	1	5
GEN	Gender (0: Male, 1: Female)	103	0.330	0.473	0	1
AGE	Age	103	2.515	1.065	1	5
EDU	Education Level	103	3.447	1.460	1	5
INC	Average Income	103	2.437	1.519	1	5

Source: Results of data run analysis

The mean values of both independent variables and dependent variables are relatively high (3.64 – 4.01). This finding shows that the respondents had a relatively positive evaluation towards the gamification features and shopping experience on digital platforms.

5.2. Scale reliability assessment (Cronbach's Alpha)

The internal consistency reliability of the scales was tested using Cronbach's Alpha in Stata:

- **GCB (Green Consumption Behavior):** $\alpha = 0.8442$. All observed variables (GCB1-GCB4) held a corrected item-rest correlation > 0.61 .
- **REW (Reward Affordance):** $\alpha = 0.8340$. Observed variables REW1-REW3 achieved item-rest correlation > 0.56 .
- **VFB (Visual Feedback):** $\alpha = 0.8038$. Item-rest correlation of VFB1-VFB3 > 0.64 .
- **SOC (Social Interaction):** $\alpha = 0.8332$. Item-rest correlation of SOC1-SOC3 > 0.62 .
- **OSE (Online Shopping Experience):** $\alpha = 0.8299$. Item-rest correlation of OSE1-OSE5 > 0.52 .
- **UGE (User Green Engagement):** $\alpha = 0.8829$. Item-rest correlation UGE1-UGE3 > 0.72 .
- **PA (Perceived Authenticity):** $\alpha = 0.8941$. Item-rest correlation PA1-PA3 > 0.76 .

The results show that all scales meet the requirements of high reliability ($\alpha > 0.80$, Item-rest correlation > 0.30) and are ready for factor analysis.

5.3. Exploratory Factor Analysis (EFA)

Rotated factor loading results for independent variable groups and dependent variables/mediators display the convergent and discriminant validity:

- **EFA Independent Variables Group:**

The observed variables of the PA group (PA1, PA2, PA3) converge strongly on Factor 1 with the Factor Loading > 0.73.

The OSE observed variables (OSE1-OSE4) converge on Factor 2 with a factor loading of > 0.58.

The REW variables (REW2, REW3) load onto Factor 3 with coefficient > 0.74.

The SOC variables (SOC1, SOC2) và VFB3 load onto Factor 4 (> 0.50).

VFB2 variable loads onto Factor 5 with coefficient 0.6093.

• **EFA Dependent Variables and Mediator Group:**

Completely separated into two main components: **Factor 1** includes UGE1, UGE2, UGE3 (Factor Loading > 0.74) representing *Green Engagement*; **Factor 2** comprises GCB1, GCB2, GCB3, GCB4 (Factor Loading > 0.57) standing for cho *Green Consumption Behavior*.

5.4. Multiple linear regression analysis:

Three regression models using Robust OLS are established to evaluate the hypothesis set.

Model 1: The impact on User Green Engagement (UGE)

$$UGE = \beta_0 + \beta_1 REW + \beta_2 VFB + \beta_3 SOC + \beta_4 OSE + \epsilon$$

Table 3: Regression results of Model 1 (Dependent Variable: UGE)

UGE	Coefficient	Robust Std. Err.	t Value	$P > t $	[95% Conf. Interval]
REW	0.1659	0.0846	1.96	0.053*	[-0.0019, 0.3338]
VFB	-0.0849	0.0888	-0.96	0.341	[-0.2610, 0.0913]
SOC	0.5623	0.0890	6.32	0.000***	[0.3857, 0.7389]
OSE	0.3194	0.0862	3.70	0.000***	[0.1483, 0.4905]
_cons	0.0551	0.2288	0.24	0.810	[-0.3990, 0.5092]

Note: $N = 103, F(4,98) = 89.76, p = 0.000, R^2 = 0.7182$. (***) $p < 0.01$, * $p < 0.1$).

Source: Results of data run analysis

The model explains 71.82% of the variance in the *User Green Engagement* (UGE) variable. *Social Interaction* (SOC) ($\beta = 0.5623, p < 0.001$) and *Online Shopping Experience* ($\beta = 0.3194, p < 0.001$) exert a strong, positive impact. *Reward Affordance* has a positive impact at the 10% significance level ($\beta = 0.1659, p = 0.053$).

Model 2: The impact on Perceived Authenticity (PA)

$$PA = \beta_0 + \beta_1 REW + \beta_2 VFB + \beta_3 SOC + \beta_4 OSE + \epsilon$$

Table 4: Regression results of Model 2 (Dependent Variable: PA)

PA	Coefficient	Robust Standard Error	t Value	$P > t $	[95% Conf. Interval]
REW	0.0950	0.1291	0.74	0.463	[-0.1612, 0.3513]
VFB	0.0447	0.0931	0.48	0.632	[-0.1399, 0.2294]
SOC	0.4077	0.1089	3.74	0.000***	[0.1916, 0.6239]
OSE	0.2510	0.1296	1.94	0.056*	[-0.0060, 0.5081]
_cons	0.6160	0.3239	1.90	0.060	[-0.0268, 1.2588]

Note: $N = 103, F(4,98) = 26.58, p = 0.000, R^2 = 0.4200$. (***) $p < 0.01$, * $p < 0.1$).

Source: Results of data run analysis

- **Assessment:** The model explains **42.00%** of the variance in Perceived Authenticity. *Social Interaction (SOC)* consistently shows the highest positive impact ($\beta = 0.4077, p < 0.001$), followed by *Online Shopping Experience (OSE)* ($\beta = 0.2510, p = 0.056$).

Model 3: The combined impact on Green Consumption Behavior (GCB)

$$\text{GCB} = \beta_0 + \beta_1 * \text{REW} + \beta_2 * \text{VFB} + \beta_3 * \text{SOC} + \beta_4 * \text{OSE} + \beta_5 * \text{UGE} + \beta_6 * \text{PA} + \beta_7 * \text{AGE} + \beta_8 * \text{GEN} + \beta_9 * \text{EDU} + \beta_{10} * \text{INC}$$

Table 5: Regression results of Model 3 (Dependent Variable: GCB)

GCB	Coefficient	Robust Standard Error	t Value	$P > t $	[95% Conf. Interval]
REW	-0.1666	0.0946	-1.76	0.082*	[-0.3546, 0.0215]
VFB	0.1906	0.0892	2.14	**0.036**	[0.0132, 0.3680]
SOC	0.0397	0.1037	0.38	0.703	[-0.1665, 0.2459]
OSE	0.0807	0.1313	0.62	0.540	[-0.1803, 0.3418]
UGE	0.2565	0.1344	1.91	0.060*	[-0.0108, 0.5237]
PA	0.1678	0.1038	1.62	0.110	[-0.0385, 0.3742]
GEN	-0.2597	0.1705	-1.52	0.131	[-0.5987, 0.0794]
AGE	-0.9292	0.5416	-1.72	0.090*	[-2.0064, 0.1479]
_cons	1.7824	0.3967	4.49	0.000***	[0.9936, 2.5713]

Note: ($p < 0.05$, * $p < 0.1$).

Source: Results of data run analysis

6.0 DISCUSSIONS

The impact of Visual Feedback (VFB) on Green Consumption Behavior (GCB):

The results of Model 3 demonstrate that Visual Feedback (VFB) has a direct, positive, and statistically significant impact ($\beta = 0.1906, p = 0.036$). This finding is consistent with user experience design theory (Werbach & Hunter, 2020): vivid visual cues (such as the growth of a virtual tree or reduced CO2 emissions) create a sense of immediate achievement, thereby directly triggering actual eco-shopping behaviors.

The mediated role of User Green Engagement (UGE):

Green Engagement (UGE) plays a crucial bridging role. Gamification factors such as *Social Interaction (SOC)* ($\beta = 0.5623$) and *Online Shopping Experience (OSE)* ($\beta = 0.3194$) do not directly impact GCB; instead, they operate by engaging users' attention and time on the app (UGE, $\beta = 0.2565, p = 0.060$), driving their transformation into green consumer behavior.

The paradox of Reward (REW):

In Model 3, the *RewardAffordance (REW)* variable shows a slightly negative coefficient ($\beta = -0.1666, p = 0.082$). This phenomenon can be explained by the Overjustification Effect / Crowding-out Effect in consumer psychology: When users engage in environmental protection

behaviors primarily for rewards/coins, excessive extrinsic rewards may undermine their perception of the core meaning of green behaviors, leading them to fail to maintain these behaviors when rewards are absent.

7.0 RECOMMENDATIONS AND POLICY IMPLICATIONS

7.1. Implications for App Developers and Digital Platforms (Digital Wallets, Online Shopping Platforms)

- **Shift from Reward-based Gaming to Community-interactive Gaming:** Reduce over-reliance on simple coin-reward mechanisms. Instead, prioritize social interaction features, such as group challenges (e.g., "Reduce 100kg of plastic packaging with friends"), team-based leaderboards, and social media achievement-sharing capabilities.
- **Optimize Visual Feedback:** Invest in vivid graphical interfaces that provide real-time updates of environmental metrics (e.g., the amount of CO₂ reduced corresponding to each order choosing eco-friendly shipping or green products) to enhance the emotional value of the experience.
- **Ensure Data Transparency (Perceived Authenticity):** To strengthen Perceived Authenticity (PA), platforms should publish photographic evidence, GPS coordinates, or independent audit reports regarding real-world green projects (e.g., the physical forests planted as a result of virtual campaigns).

7.2. Implications for Manufacturers and Green Product Brands

- **Integrate Green Storefronts into Gamification Ecosystems:** Businesses providing eco-friendly products should proactively collaborate with e-commerce platforms to incorporate green vouchers or product samples into the app's reward systems.
- **Optimize Packaging and Logistics Processes:** Integrate green choices directly into the checkout interface, such as options for "No plastic utensils" or "Minimalist packaging", to synchronize the user's green consumption experience.

7.3. Recommendations for State Management Agencies and Social Organizations

- **Establish a Digital Green Labeling Verification Framework:** Issue regulations to censor green information on e-commerce platforms in order to prevent "greenwashing."
- **Public-Private Partnerships (PPPs) in Green Transformation:** Environmental management agencies can cooperate with Big Tech companies to launch large-scale, gamified national campaigns on sustainable consumption.

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