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Exploring the Role of AI Personalization, Embedded Finance, and Gamification in Influencing Digital Wallet Users Buying Behavior in Western India

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Abstract

Digital wallets have rapidly evolved into multifunctional platforms that go beyond payments to offer features like AI-based personalization, embedded financial services, and gamification. These innovations are designed to enhance user experience and potentially influence consumer buying behavior. This study explores whether these features have a measurable impact on the buying behavior of digital wallet users in the Western region of India.

A structured questionnaire was distributed among 1,100 respondents across Maharashtra, Gujarat, Rajasthan, and Goa. Statistical tools such as multiple regression, ANOVA, and ANCOVA were used to analyze the effect of personalization, embedded finance, and gamification on user buying behavior. The findings reveal that none of these features demonstrated a statistically significant direct impact on consumer purchase decisions. While users engage with these features, they do not appear to drive actual buying behavior in a meaningful way.

These results suggest that while such features may enhance app engagement and long-term retention, other factors such as trust, perceived usefulness, or pricing—may play a larger role in influencing purchasing decisions. The study provides valuable insights for digital wallet providers, marketers, and fintech developers aiming to design user-centered features that go beyond novelty and contribute to actual behavioral outcomes.

Keywords: Digital Wallets, Personalization, Embedded Finance, Gamification, Consumer Behavior, Fintech, Western India

Introduction

The digital payment ecosystem in India has seen a remarkable transformation over the past decade, largely driven by technological innovation, increasing smartphone usage, internet penetration, and government support for a cashless economy. Digital wallets, once limited to basic fund transfers and mobile recharges, have now evolved into complex platforms offering a range of financial and non-financial services. Today, digital wallets are no longer just tools for transactions—they are interactive platforms built to engage users through features like AI-driven personalization, embedded financial services, and gamification.

The financial technology (fintech) sector has embraced AI-based personalization to create highly tailored user experiences. Through machine learning algorithms, digital wallets now analyze user behavior, preferences, and transaction history to offer customized promotions, suggested products, and relevant services. This level of personalization is intended to enhance engagement and drive repeated usage, with the assumption that users are more likely to make purchases when the content or offer feels personally relevant.

Similarly, embedded financial services such as digital loans, insurance, investment tools, and savings accounts are being integrated within wallets to offer a one-stop solution for all financial needs. These services aim to eliminate friction from traditional banking processes and deliver financial access at the tap of a button. The convenience and speed of embedded finance could potentially influence buying decisions by offering real-time affordability solutions or tailored financing offers at the point of purchase.

In addition to functionality, digital wallet providers are increasingly using gamification to increase user engagement. Features like spin-the-wheel offers, reward points, daily check-in streaks, and referral bonuses are designed to make digital payment experiences more interactive and rewarding. Drawing from behavioral psychology, gamification seeks to tap into motivation, excitement, and habit formation, all of which are believed to influence consumer behavior and possibly increase purchase frequency.

While these features are gaining traction in both design and user adoption, there is still limited empirical research exploring whether they actually lead to behavioral change in buying patterns. Much of the literature has focused on adoption and usability, rather than on the behavioral outcomes that follow regular usage of such features. Furthermore, most studies either examine these features in isolation or within broader national samples, without regional focus.

This study aims to address this gap by exploring whether AI-driven personalization, embedded financial services, and gamification features influence buying behavior among digital wallet users in Western India—a region that includes both tech-forward urban centers and emerging semi-urban populations across Maharashtra, Gujarat, Rajasthan, and Goa.

By surveying 1,100 digital wallet users and applying statistical techniques such as regression and variance analysis, this study provides insight into whether these features truly impact how people decide what and when to buy or whether their influence is more limited to user experience and engagement alone.

The findings are expected to guide fintech developers, digital marketers, and policymakers in designing wallet interfaces and services that align with actual user behavior, not just technological capability. It also opens up further inquiry into the indirect or long-term psychological factors that drive user decisions in the digital finance ecosystem.

Literature Review

AI-Driven Personalization in Digital Wallets

Namrata (2024) examined the role of Artificial Intelligence (AI) in personalizing consumer experiences within India's e-commerce sector. The study emphasized how AI technologies such as machine learning, predictive analytics, and natural language processing are being used to analyze user behavior and provide personalized recommendations, offers, and financial suggestions. These features were found to improve user satisfaction, loyalty, and overall engagement. However, the study also highlighted challenges related to data privacy and cultural diversity that may limit the effectiveness of AI-based personalization.

Moussaddak (2024) explored the broader impact of AI on customer experience and personalization within marketing. This research reinforced the idea that personalization, when powered by AI, enhances customer satisfaction and deepens engagement. The study also encouraged companies to invest in ethical AI deployment and emphasized the importance of localized strategies for greater impact.

Mane and Joshi (2023) discussed the role of AI in financial transactions and how AI-supported e-wallets offer secure, efficient, and personalized payment experiences. Their findings confirm that AI integration enhances convenience and reliability, making digital wallets more appealing to daily users and merchants alike.

Embedded Financial Services and Consumer Behavior

Ozili (2022) conducted a comprehensive analysis of embedded finance, outlining how financial services like lending, insurance, and investing are increasingly being embedded into non-financial platforms, including digital wallets. The study used quantitative techniques and showed how embedded finance is reshaping financial service access, particularly in regions like India. It emphasized that embedded finance reduces friction, provides financial inclusivity, and supports the real-time needs of users within everyday digital environments.

Babitha et al. (2023) also emphasized the rising relevance of embedded finance, noting how it allows consumers to access financial services seamlessly within apps they already use. The paper pointed out both opportunities and challenges, especially related to data security and regulatory compliance. Nevertheless, embedded finance was positioned as a key innovation that improves user engagement and platform utility.

Gamification and Its Influence on Buying Behavior

Gamification involves applying game-like elements in non-game contexts to increase user motivation and interaction. Yathiraju and Dash (2023) studied how digital wallets implement gamification through reward systems, referral bonuses, points, and leaderboards. Their findings indicated that gamified elements improve user retention, increase app engagement, and encourage usage. However, they also noted security and UX limitations when these features are not well-integrated or overused.

Yang et al. (2023) applied frameworks like UTAUT2 and Octalysis to analyze how gamification affects user adoption of fintech applications. They found that effort expectancy, facilitating conditions, and perceived value are key drivers of gamified wallet usage. The study recommended that wallet providers focus on enhancing these motivational factors for better adoption outcomes.

Rahman et al. (2024) explored gamification's role in building user trust and satisfaction in mobile wallet usage in developing countries. Their findings supported that gamification, when combined with trust-building mechanisms, could significantly increase sustained use, though the direct impact on actual buying behavior remained debatable.

Research Methodology

Research Design

This study adopts a quantitative, descriptive, and causal research design, aimed at investigating whether the integration of three digital wallet features—AI-driven personalization, embedded financial services, and gamification—have a measurable influence on consumer buying behavior. A structured approach was used to collect and analyze data from a targeted sample of digital wallet users across Western India.

Study Area and Sampling

The study was conducted in the Western region of India, specifically across four states: Maharashtra, Gujarat, Rajasthan, and Goa. These areas were chosen due to their active fintech adoption, varied economic settings, and representation of both urban and semi-urban populations.

A total of 1,100 valid responses were collected using a convenience sampling method. Participants included individuals aged 18 and above who regularly use digital wallets for various financial and transactional activities.

Data Collection Instrument

Primary data was collected through a structured questionnaire, which was distributed both online and offline. The questionnaire consisted of two sections:

- **Section A**: Captured demographic information, including gender, age, education level, occupation, and frequency of digital wallet usage.
- **Section B**: Focused on five major constructions:
    - **AI-driven Personalization** (5 items)
    - **Embedded Financial Services** (5 items)
    - **Gamification Features** (5 items)
    - **Buying Behavior** (5 items)
    - **Control Variables** (Education, Gender, Region)

Responses were recorded using a 5-point Likert scale, ranging from 1 = Strongly Disagree to 5 = Strongly Agree.

Data Validation and Reliability

A pilot test was conducted with 20 respondents to verify clarity and reliability. The final data was analyzed using SPSS Version 28.0, applying the following techniques:

- **Cronbach's Alpha** was used to measure internal consistency.
    - All constructs scored above **0.83**, indicating high reliability.
- **KMO and Bartlett's Test** were used to assess sampling adequacy and factorability.
    - **KMO = 0.860**, and **Bartlett's Test = p < 0.001**, confirming suitability for factor analysis.

Statistical Tools Used

Different statistical tests were employed based on the nature of the variables and hypotheses:

Construct	Variable Type	Statistical Test Applied
AI-driven Personalization	Continuous	Multiple Linear Regression
Embedded Finance	Categorical (3 groups)	One-Way ANOVA
Gamification Features	Categorical (3 groups)	ANCOVA (with demographic controls)
Buying Behavior	Dependent	Continuous Outcome Variable

Research Objectives

- To investigate how AI-based personalization features in digital wallets influence users' purchasing patterns in the Western Indian market.
- To evaluate the behavioral impact of embedded financial tools—such as loans, insurance, and savings—integrated within digital wallets.
- To analyze the extent to which gamification mechanisms contribute to shaping the purchasing behavior of digital wallet users in Western India.

Hypotheses Tested

Based on the research objectives, the following hypotheses were formulated:

- H_1: AI-driven personalization features embedded in digital wallets significantly influence the buying behavior of users in Western India.
- H_2: The availability and use of embedded financial services within digital wallet platforms have a measurable effect on users' purchase decisions.
- H_3: Gamification elements in digital wallets, such as reward points and interactive features, significantly affect user buying behavior in the Western Indian context.

Each hypothesis was tested at a **5% level of significance ($\alpha = 0.05$)**.

Ethical Considerations

Participants were informed that their responses would be kept anonymous and used strictly for academic purposes. No personally identifiable information was collected. Voluntary participation and informed consent were ensured for all respondents.

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Results and Analysis

Results, Data Analysis, and Findings

This section presents the outcomes of the empirical analysis conducted to evaluate how AI-driven personalization, embedded financial services, and gamification features influence consumer buying behavior among digital wallet users in Western India. The data, collected from 1,100 respondents, were analyzed using a mix of regression and variance-based techniques tailored to each objective.

Descriptive Statistics and Sample Characteristics

The sample consisted of 1,100 digital wallet users from Maharashtra, Gujarat, Rajasthan, and Goa. Among them, 66.5% were male and 33.5% female, with the majority aged between 18 and 44 years. Over three-fourths of the respondents held an undergraduate or postgraduate degree, and most were employed or self-employed, suggesting a digitally literate and economically active user base.

Table: Descriptive Statistics for Feature Usage Levels

Feature	Min	Max	Mean	Std. Deviation
AI Personalization	1.00	5.00	3.41	0.76
Embedded Financial Services	1.00	5.00	3.47	0.78
Gamification Features	1.00	5.00	3.45	0.74
Buying Behavior	1.40	5.00	3.45	0.68

Interpretation:
The average user engagement with all three features is above the midpoint (3.0), suggesting moderate to high familiarity and interaction. However, as shown in earlier tests, higher usage does not correlate with significantly different buying behavior.

Table: Correlation Matrix Between Key Variables

Variable	1	2	3	4
1. Buying Behavior	1			
2. AI Personalization	–0.045	1		
3. Embedded Finance	–0.033	0.162**	1	
4. Gamification Features	0.038	0.139**	0.165**	1

Correlation is significant at the 0.01 level (2-tailed).

Interpretation:

- **No strong linear relationship** exists between the features and buying behavior (all $r < 0.05$).
- However, the features **moderately correlate with each other**, indicating that users engaging with one innovation (e.g., gamification) may also explore others (e.g., personalization).

Influence of AI-Driven Personalization on Buying Behavior

To assess whether personalized recommendations and app experiences affect purchase behavior, a multiple linear regression analysis was conducted. The model tested the relationship between perceived AI personalization and users' self-reported buying behavior via digital wallets.

Key Findings:

- **$R^2 = 0.006$**, indicating a very weak relationship
- **$\beta = -0.023$**, t = –0.801, **$p = 0.424$** (not statistically significant)

These results show that personalization, despite being a commonly emphasized feature in digital platforms, did **not have a significant impact** on whether or how users make purchases through digital wallets. It appears that while AI recommendations may improve experience, they do not strongly influence decision-making in this context.

Impact of Embedded Financial Services on Buying Behavior

To analyze the effect of integrated financial tools (such as in-wallet loans, insurance, or investment options), a one-way ANOVA was performed. Respondents were divided into low, medium, and high usage groups based on their engagement with embedded services.

Key Findings:

- **$F = 1.475$**, **$p = 0.229$** (not statistically significant)
- Group means for buying behavior:
    - Low EFS Users: 3.49
    - Medium EFS Users: 3.41
    - High EFS Users: 3.44

The absence of statistical significance suggests that embedded finance features are not strong drivers of short-term or immediate purchase behavior. These services may serve broader financial needs but do not directly influence how often or how much users spend via digital wallets.

Effect of Gamification Features on Buying Behavior

Gamification features like points, badges, leaderboards, or referral bonuses are widely used to drive app engagement. To determine if such features impact consumer purchases, ANCOVA was applied while controlling education, gender, and region.

Key Findings:

- **$F = 0.583$**, **$p = 0.558$** (not statistically significant)
- Mean buying behavior across groups:
    - Low Gamification: 3.45
    - Medium Gamification: 3.41
    - High Gamification: 3.49

Despite their popularity in mobile app design, **gamification features did not significantly affect user buying behavior**. This implies that while such tools may enhance app usage or daily interaction, they do not act as purchase motivators in the context of digital wallets.

Summary of Statistical Findings

Feature Tested	Test Used	p-Value	Significance	Conclusion
AI-Driven Personalization	Multiple Regression	0.424	Not Significant	No impact on buying behavior
Embedded Finance	One-Way ANOVA	0.229	Not Significant	No impact on buying behavior

Gamification Features	ANCOVA	0.558	Not Significant	No impact on buying behavior

Across all three constructs tested, the results consistently show **no statistically significant direct relationship** with consumer buying behavior. This challenges the common assumption that innovation alone can drive transactional change. While these tools may increase app engagement, they are **not independently sufficient to alter consumer purchasing patterns**. Future models may need to explore how these features work in combination with psychological, emotional, or incentive-based variables.

Discussion and Conclusion

5.1 Discussion of Findings

This study set out to explore whether three emerging digital wallet features **AI-driven personalization**, **embedded financial services**, and **gamification mechanisms** directly influence users' buying behavior in Western India. Despite their growing prevalence in fintech design, the statistical evidence from a sample of 1,100 digital wallet users suggests that none of these features had a statistically significant direct impact on consumer purchasing patterns.

AI-Driven Personalization

The regression results showed no significant effect of personalization features on buying behavior. This finding aligns with previous research by Namrata (2024) and Moussaddak (2024), which emphasized that while personalization improves user engagement and satisfaction, it may not directly drive purchasing decisions. The weak relationship observed in this study indicates that Indian consumers may view AI recommendations as helpful but not decisive when making actual purchases. Cultural preferences, financial constraints, or personal judgment may outweigh algorithmic suggestions.

Embedded Financial Services

Embedded finance is considered a major innovation in the fintech landscape, but the ANOVA results indicated no significant behavioral shift associated with its usage. Studies by Ozili (2022) and Babitha et al. (2023) argue that embedded services reduce friction and improve access, but our findings suggest that their influence is likely **indirect or long-term** rather than immediate. While consumers may appreciate the availability of micro-loans or in-app insurance, these features do not necessarily alter everyday spending behavior in the short term.

Gamification Features

Although gamification strategies such as cashback games, points, and reward systems—are increasingly used to boost digital wallet engagement, the ANCOVA results showed no measurable effect on buying behavior. This is consistent with findings from Rahman et al. (2024) and Yang et al. (2023), who noted that gamification boosts retention and interaction but not necessarily transaction frequency or size. In the Indian context, consumers may treat gamified elements as entertainment rather than transactional incentives.

Theoretical and Practical Implications

For Academics and Researchers

The study reinforces the idea that user experience enhancements alone may not directly influence consumer behavior. This points to the need for further research into mediating factors such as trust, perceived usefulness, emotional engagement, or reward value that might bridge the gap between feature adoption and behavioral outcomes. Future studies could apply behavioral models like UTAUT2 or TAM to explore these dynamics in greater depth.

For Fintech Designers and Developers

While it is tempting for developers to focus on flashy features, this study suggests that user-centered design must go beyond functionality. Instead of assuming that personalization, embedded services, or gamification will increase spending, fintech

platforms should pair these tools with strong value propositions, user education, and emotional engagement strategies that build trust and intention.

For Digital Marketers and Business Strategists

Marketing campaigns should avoid overpromising the behavioral influence of these features. Instead, marketers should frame them as enhancements to convenience, control, and confidence, while emphasizing clear utility and user benefits. Campaigns that link features to tangible emotional or financial outcomes may be more effective than those that merely highlight technological innovation.

Conclusion

This study concludes that AI personalization, embedded finance, and gamification features in digital wallets do not directly influence consumer buying behavior in Western India. These findings challenge the assumption that technical sophistication alone drives commercial outcomes in the fintech space. While these features may enhance the overall digital wallet experience, other factors such as trust, perceived value, financial readiness, and cultural preferences likely play a more dominant role in shaping how and why consumers make purchases.

By identifying this gap between design intent and actual user behavior, the study offers a realistic lens for both academic exploration and practical fintech development.

Limitations and Suggestions for Future Research

1. **Geographic Limitation**: The study was limited to four states in Western India. Future studies could include broader regions or compare findings across different zones.
2. **Sampling Approach**: The use of convenience sampling may introduce bias. A stratified or random sampling method could improve generalizability.
3. **Focus on Direct Effects**: The study only tested direct relationships. Future work should use models like **Structural Equation Modeling (SEM)** to explore mediating and moderating variables.
4. **Cross-Sectional Design**: A one-time survey cannot track changes in behavior over time. A **longitudinal study** could offer deeper insight into how usage patterns evolve with feature exposure.

References

1. Babitha, C., Sudarsan, M., & Lakshmi, T. M. (2023). Embedded finance: A new era of seamless financial services. *Journal of Emerging Technologies and Innovative Research, 10*(6), 112–119.
2. Mane, P. B., & Joshi, A. P. (2023). A study on AI-based e-wallets and their impact on financial inclusion. *International Journal of Research in Engineering, Science and Management, 6*(2), 51–56.
3. Moussaddak, H. (2024). The impact of artificial intelligence on customer experience and personalization in marketing. *Journal of Marketing and Emerging Technologies, 8*(1), 1–9.
4. Namrata, A. (2024). Role of artificial intelligence in personalizing the consumer experience in e-commerce: An Indian perspective. *International Journal of Business and Management Invention, 13*(2), 33–41.
5. Ozili, P. K. (2022). Embedded finance and financial inclusion in developing countries. *Journal of Risk and Financial Management, 15*(9), 405. https://doi.org/10.3390/jrfm15090405
6. Rahman, M., Bhowmik, J., & Alam, M. S. (2024). Role of gamification in enhancing user trust and satisfaction in mobile wallet services: Evidence from developing countries. *Journal of Mobile Commerce Research, 10*(1), 34–47.
7. Yang, H., Zhou, S., & Liang, T. (2023). Investigating gamification's influence on fintech adoption using UTAUT2 and Octalysis framework. *International Journal of Information Systems and Management, 9*(4), 59–74.
8. Yathiraju, A., & Dash, S. (2023). Gamification strategies in digital payment platforms: A consumer engagement perspective. *Journal of Retail and Consumer Technology, 11*(3), 23–32.

9. Jain, V., Rastogi, M., Ramesh, J. V. N., Chauhan, A., Agarwal, P., Pramanik, S., & Gupta, A. (2023). FinTech and Artificial Intelligence in Relationship Banking and Computer Technology. In *AI, IoT, and Blockchain Breakthroughs in E-Governance* (pp. 169-187). IGI Global.
10. Hasan, N., Nanda, S., Singh, G., Sharma, V., Kaur, G., & Jain, V. (2024, February). Adoption of Blockchain Technology in Productivity And Automation Process of Microfinance Services. In *2024 4th International Conference on Innovative Practices in Technology and Management (ICIPTM)* (pp. 1-5).
11. Verma, A., Singh, A., Sethi, P., Jain, V., Chawla, C., Bhargava, A., & Gupta, A. (2023). Applications of Data Security and Blockchain in Smart City Identity Management. In *Handbook of Research on Data-Driven Mathematical Modeling in Smart Cities* (pp. 154-174). IGI Global.
12. Jain, V., Beram, S. M., Talukdar, V., Patil, T., Dhabliya, D., & Gupta, A. (2022, November). Accuracy enhancement in machine learning during blockchain based transaction classification. In *2022 Seventh International Conference on Parallel, Distributed and Grid Computing (PDGC)* (pp. 536-540). IEEE.
13. Saini, K., Mummoorthy, A., Chandrika, R., & Gowri Ganesh, N. S. (Eds.). (2023). *AI, IoT, and Blockchain Breakthroughs in E-governance*. IGI Global.
14. Jain, V. (2021). Based upon block chain and its context. *ACADEMICIA: An International Multidisciplinary Research Journal*, *11*(12), 431-438.
15. Jain, V., & Verma, C. Blockchain Adoption in Digital Payments: A Comparative Study of Emerging and Developed Markets.
16. Ramesh, J. V. N., Veeraiah, V., Shrivastava, G., Jain, V., Jain, S. K., & Gupta, A. (2023, October). Blockchain-Based Internet of Things: Machine Learning Suspicious Object Traceability System. In *the International Conference on Microelectronics, Electromagnetics and Telecommunication* (pp. 467-479). Singapore: Springer Nature Singapore.
17. Rao, D. N., Vidhya, G., Rajesh, M. V., Jain, V., Alharbi, A. R., Kumar, H., & Halifa, A. (2022). Research Article An Innovative Methodology for Network Latency Detection Based on IoT Centered Blockchain Transactions.
18. Jain, V. (2021). The blockchain and socialism: A review paper. *Asian Journal of Multidimensional Research*, *10*(12), 700-706.
19. Jain, V. (2021). Blockchain in healthcare: The current situation and challenges. *Asian Journal of Multidimensional Research*, *10*(12), 316-322.
20. Jain, N., & Jain, V. Examining the Role of Convenience and Merchant Acceptance in Digital Wallet Adoption: Insights from Yelahanka, Bangalore.