The Impact of AI-Driven Product Recommendations on Impulse Buying Behavior in the FMCG Sector

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1. **Abstract**- Consumer buying behavior in the fast-moving consumer goods (FMCG) industry is changing according to Artificial Intelligence (AI) and customizing suggestions based on real-time data analysis. Those suggestions based on AI not just contribute to the usability of the user but also provide the impulse to buy by providing the user with the right and timely options. This paper examines the effects of the personalization, urgency signals, and the positioning of products on impulse buying in the Tier 1, Tier 2, and Tier 3 cities in India. It also examines moderators of emotions and behavior such as trust and self-control that determine consumer response to AI recommendations. The results were analyzed using regression and ANOVA, and it is possible to note that the influence of AI-driven systems on impulsive buying behavior is significant, and the differences can be observed based on the level of the city. The findings provide suggestions to the marketers and the policy makers to incorporate effective and ethical AI practices to strike a balance between the business and the consumers interests.

2. Introduction

One of the most profound innovations in the retail industry in the modern world is Artificial Intelligence that defines the manner in which consumers shop, compare and purchase goods. In the framework of the online marketplace, AI-based recommendation engines have emerged as one of the most important tools, which predict consumer preferences on the basis of browsing history, purchasing history and interaction behavior. These systems do not only make the process of product exploration easier but also affect spontaneous consumer choices by displaying emotionally attractive and convenient products. The effect of AI recommendation is unique in the segment of fast-moving consumer goods (FMCG), where consumers purchase products at an average frequency and at a relatively low price. Nearby to high-involvement products like electronics or fashion, FMCG transactions are inclined either towards habitual or impulse. By showing appropriate product suggestions at the right time, AI algorithms take advantage of these tendencies and make it more likely that one will make impulse buying.

The digital ecosystem in India is growing, and it provides a perfect setting to research on this behavior. Due to the increased use of smartphones and extensive internet penetration, online shopping is booming in Tier 1, Tier 2 and Tier 3 cities. Nonetheless, the digital preparedness, user trust, and technology knowledge vary based on geography, and it affects the response of the users in response to AI prompts. It is important to understand such variations so that AI Implementation can be encouraged by businesses and policymakers regarding

ethnicity.

This paper seeks to examine the impact of AI product recommendations on impulse buying behavior in Indian FMCG industry. It examines the interaction among technological signals including personalization, urgency triggers, and the recommendation position with three psychological forces: trust and self-control. The study correlates the behavioral patterns of various tiers of metropolitan areas, which helps to comprehend the influence of AI on the consumer psychology of the modern era even better.

2. Need for the Study

Despite the fact that AI has increased the number of operations involving the online commerce, much of the literature available is based on high-value or high-involvement products. FMCG is a relatively untapped area that is characterized by its regular and low purchases. FMCG dealings are in high volumes and therefore, any slight change in consumer behavior can have significant business consequences. Commercial and academic value is found in studying the effect of AI systems on these daily purchases.

The e-commerce environment is rapidly developing in India beyond the urban areas. Tier 2 and Tier 3 city consumers are beginning to use AI based retail platforms. Knowing how sensitive they are to AI recommendations can assist marketers to create strategies based on the different degrees of digital familiarity and consumer trust.

Moreover, this study is further expanded to the larger ethical discourses about AI in business. In the times when AI technologies are becoming more convincing, it becomes necessary to draw a line between personalization and manipulation. The paper consequently focuses on understanding the relationship between AI recommendation systems and trust, emotions, and self-control-both highlighting the potential and dangers of using AI-based marketing.

Moderating factors that contribute to consumer responsiveness to AI recommendations. The research can be of use to marketers, platform designers, and policymakers who study the behavioral disparities on various levels of cities.

3. Scope of the Study

The given research paper is devoted to the strength of the AI-based product recommendation on the Indian FMCG market. It is founded on the concept of online shopping, such as Amazon, Big Basket and Blinkit where the algorithm of recommendations affects the purchasing behavior daily. The sample will be chosen of adult consumers in Tier 1, Tier 2, and Tier 3 cities, which will allow a broad representation of the level of digitization and the dissimilarities in the areas. The level of trust and self-control is also discussed in the paper.

4. Limitations of the Study

Although the present study is an important contribution to the understanding of how AI-based product recommendations affect the impulse buying behavior in the FMCG industry, it is important to note that there are a number of limitations that should be taken into consideration in the context of the research and in further studies.

1. **Sampling Methodology:** The research used a convenience sampling, which despite being convenient in regard to accessing digitally active consumers might be a limitation to the generalizability of the findings. The sample

might not be a complete representation of the larger population of Indian consumers of FMCG, especially those who have less access to the internet or are less digital literate.

2. **Geographic Scope:** The study only covered consumers of Tier 1, Tier 2 and Tier 3 cities in India. However, though it offers an effective comparative framework, it does not take into account rural populations and international settings, which might display different behavioral trends because of the cultural differences, infrastructural or economic differences.

3. **Platform Specificity:** The paper examined AI recommendations to some of those online stores Amazon, Big Basket, and Blinkit. It also lacked other platforms that differ in terms of interface design or recommendation algorithm, or even overall demographics of the users, which can influence the applicability of the findings to the general digital retailing setting.

4. **Self-Reported Data:** The data was gathered by means of self-report questionnaires, which can include biases, including social desirability, recall error, and subjective interpretation. The participants might have underreported or overreported their impulse buying behavior or trust in AI systems.

5. **Temporal Constraints:** The research was cross-sectional as it measured consumer behavior at a given time. It fails to explain shifts in behavior over time, including getting more accustomed to AI, changing functionality of platforms, or changing consumer sentiment towards online shopping.

6. **Limited Psychological Variables:** As the research included trust and self-control as the moderating variables, no other psychological variables like mood, stress and load on the brain had been studied. These can also have an important part in the impulse buying behavior and should be investigated further.

7. **Exclusion of Offline Behavior:** The study was only based on online purchases of FMCG. The impulse buying behavior that can be affected with the help of in-store AI technologies (e.g., smart shelves, digital kiosks) was not taken into account, and the findings were restricted to the digital setting.

8. **Algorithm Transparency:** This paper failed to evaluate the transparency or explainability of AI recommendation systems, which may affect consumer trust and interest. The research can be expanded by considering the relationship between the effects of the clarity of algorithms and impulse buying behavior.

5. Review of Literature

In *"Online Personalized Recommended Product Quality and E-Impulse Buying"*, Ampadu, Owusu- Manu, and Appiah (2022) focus on the fact that personalized recommendations will boost impulse purchases in the cases of trusted brands. Trust is a facilitator of AI recommendations and impulse purchasing particularly in low involvement items such as FMCG.

In the article by Arachchi and Samarasinghe (2023), called *"Impulse Purchase Intention in an AI- Mediated Retail Environment"*, the authors state that emotional stimuli on the interfaces of the AI interfaces decrease the time spent on making decisions. Their structural equation modelling strategy reveals a higher probability of consumers to make impulsive purchases when AI suggestions are in line with their preferences and emotional conditions.

In their meta-analysis article, Iyer, Blut, Xiao, and Grewal (2020) observe emotional gratification, convenience, and situational cues as the main causes of impulse buying. Their contribution offers a background knowledge of impulse behavior, which this study focuses on in reference to AI-FMCG.

In the article titled *"Impulse Buying: Design Practices and Consumer Needs"*, Moser, Resnick and Schoenbeck (2019), analyses how consumer behavior is affected by design factors, including a sense of urgency

and positioning products in the digital environment. Their study confirms the notion that the interface design can influence the purchasing behavior indirectly, particularly when it is combined with AI-based personalization.

In his article, *"Impulse Buying in the Digital Age"*, Pal (2025) focuses on the speed of decision- making provided by AI, which brings the feeling of immediate satisfaction. According to his studies, AI- related FMCG platforms can create the sense of urgency and relevance, which consequently induce unplanned purchasing behavior among the younger generation.

In the article, Sengupta (2025) presents the topic of *"AI, Allure, and the Art of the Deal"*, which discusses the way AI suggestions in social commerce systems combine enthusiasm and algorithm accuracy. He says that impulse purchasing is no longer causal but it is an artificial process using data to create nudges that brings up ethical concerns about consumer autonomy.

The recent developments in the industry also reveal the emergence of AI in the rural FMCG markets. According to the findings of Santhosha and Gayathri Devi (2025), purchase behavior is being affected by localized digital advertisement and predictive analytics in even the areas with very poor infrastructural and digital literacy levels. This implies that the influence of AI is not limited to urban customers but it is spreading its tentacles to demographics.

6. Research Questions

1. Does AI product recommendation have a notable impact on impulse buying behavior in the consumer of FMCGs?
2. What are the differences in the effects of AI-driven suggestions in various levels of cities in India?
3. How does trust and self-control moderate AI induced impulse buying?
4. What are the particular platform capabilities that are the most effective in motivating impulse purchases?

7. Research Objectives

1. To investigate the effect of product suggestions made by AIs on impulse purchase in the FMCG industry.
2. To make a comparison of impulse buying behavior among Tier 1, Tier 2, and Tier 3 city consumers.
3. To evaluate the mediating impact of trust and self-control in impulse buying caused by AI.
4. To determine how personalization, urgency cues and product placement influence consumer decision-making.

8. Research Methodology

The present study will be based on a descriptive and quantitative research design to explore how AI- powered product recommendations affect impulse buying behavior in the FMCG industry. The methodology has been designed in such a way as to allow the researcher to record the direct impacts of AI features including personalization, urgency cues, and product placement as well as the moderating impacts of psychological characteristics including trust and self-control among the various consumer groups in India.

9. Research Design

The data was collected using a cross-sectional survey approach among heterogeneous sample of online consumers of FMCGs. The descriptive factor of the study enabled the detection of the patterns and association between AI recommendation characteristics and impulse buying tendencies. Quantitative analysis allowed hypotheses to be statistically proven and findings to be generalized to the population of interest.

10. Sampling Technique

The sample was conveniently sampled and consisted of 200 respondents who were selected in Tier 1, Tier 2, and Tier 3 cities in India. The reason this approach was selected is because it is practical and accessible, particularly when it comes to accessing digitally active consumers who see themselves using AI-driven platforms quite often. Although convenience sampling can be a weakness to external validity, it offered a strong starting point of data to develop an exploratory analysis.

11. Data Collection Instrument

A questionnaire was designed in a structured form, having 20 closed-ended questions that were rated on a Likert- scale of 5 points, with the answers to be Strongly Disagree and Strongly Agree. The sections in the questionnaire included:

1. Personal data (age, sex, place, level of income)
2. Number of purchases of online FMCGs.
3. An introduction to AI-based suggestions.
4. Impulse buying behavior
5. Perceived belief in AI systems.
6. Self-control tendencies
7. The impression of customization, a sense of urgency, and positioning of the products.

The instrument was also pre-tested on a pilot group of 20 respondents in order to ascertain its clarity, reliability and relevance. Minor adjustments were made on the question wording and flow based on the feedback.

12. Data Analysis Techniques

The information gathered was analyzed using SPSS and excel. The statistical procedures that were utilized were as follows:

1. Descriptive Statistics: To generalize demographic variables and general patterns. Correlation Analysis: To test AI features and impulse buying relationships.
2. Correlation Analysis: To find out the correlations between AI characteristics and impulse buying.
3. Linear Regression: To examine the direct impact of AI-based recommendations to impulse buying behavior.
4. One-Way ANOVA: To assess the tendency of impulse purchasing in different levels of cities.
5. Moderation Analysis: To establish the mediating role of trust and self-control in the correlation between AI recommendations and impulse buying.
6. Multiple Regression: To test individual effects of personalization, urgency cues and product placement. All tests were performed at a 95% level of confidence ($p < 0.05$), which guaranteed the statistical significance of the results and the reliability of these results.

13. Research Hypotheses

- H1: There is a positive effect of AI-based recommendations on impulse purchase in the FMCG industry.
- H2: Tier 1 (Delhi), Tier (Lucknow) and Tier (Dehradun) city consumers respond differently to AI recommendations.
- H3a: The trust in AI enhances the association between AI recommendations and impulse buying.
- H3b: low self-control enhances the impact of AI recommendations on impulse buying.
- H4a: The personalization has a more significant impact on impulse buying than generic suggestions do.
- H4b: Urgency stimuli such as time constraints or shortages of stock enhance impulse purchase.
- H4c: The frequency of impulse buying depends on the location of recommendations on various pages.

14. Expected Outcomes

This research is expected to have a positive and statistically significant correlation between AI-based product recommendations and impulse buying behavior in the FMCG market. According to the literature that is available and some early observations, the following results can be expected:

Positive Relation between AI Recommendations and Impulse Buying: When consumers are exposed to AI-generated recommendations, particularly those that are tailored to their history or preferences when browsing, there is a high likelihood of consumers displaying high levels of impulse buying. The urgency and topicality of these recommendations are likely to decrease the time of deliberation and increase the impulse buying.

Tier-Based Differences in Consumer Responsiveness: Differences between Tiers of Consumer Responsiveness: There should be more responsive AI cues among consumers in Tier 1 cities because of their higher digital literacy, online shopping rates, and trust toward technology. Tier 2 and Tier 3 consumers are more cautious in their behavior and yet able to be involved in a properly developed recommendation system

Moderating Role of Trust and Self-Control: It is expected that trust in AI systems can promote the effectiveness of a product recommendation. When consumers feel that AI is a reliable and correct tool, they tend to respond to the recommendations. On the other hand, highly self-controlled individuals are supposed to withstand the urge of impulse even under the influence of persuasive AI signs. The less self- controlled ones can succumb to impulse buying.

Moderating Role of Trust and Self-Control: It is presumed that trust in the systems of AI would enhance the support of product recommendation. Consumers who have a notion of AI reliability and accuracy are likely to adhere to its advice. Conversely, it is presupposed that highly self-control individuals will resist the impulsive desires even in the case that they encounter the persuasive AI messages. The others who are not as self- contained may be easy targets of impulse buying.

Platform Feature Effect: Among platform features studied, the personalization will affect the majority of the impulse buying, followed by urgency cues (e.g. limited time offers, low inventory alerts), and product positioning (e.g. having the product on the homepage, prompting the one to proceed to the checkout). These attributes are likely to have a high level of synergy, which will magnify the overall effects on the consumer behavior.

Ethical and Strategic Consequences: These findings will be evident as the need to engineer AI on a retail platform in an ethical way. Despite the fact that AI can be utilized to achieve sales, it is necessary to apply it in a way that it does not interfere with the autonomy of consumers, and manipulative approaches should be avoided.

Applicability to FMCG Brands and Retailers: The results would be useful to practitioners in the field of marketing and platform designers. Knowing which AI characteristics can be the most effective in ensuring impulse purchasing, companies can make their online strategies more effective in their quest to boost engagement and conversion rates without violating ethical principles and consumer trust.

Ethical Considerations

This research embraced ethical integrity to all its steps of designing, data collection and analysis.

Since consumer behavior is a sensitive subject and the use of AI is growing in influencing consumer purchasing decisions, it was of high priority to make sure that the study is conducted with the highest ethical standards.

Each subject was aware of the objective of the study and did it as a volunteer. Prior to the collection of data, informed consent was provided and the subjects were reassured that their answers would not be used outside the academics. The questionnaire was to be such that it would not provide any psychological unease, manipulation or coercion. The questions were made in a neutral form and were addressed on consumer behavior as opposed to personal or sensitive issues.

The confidentiality and anonymity were observed. None of the personal information was collected, and all data were stored safely. Data on responses were made anonymous in the analysis to avoid any challenge of privacy. This method is in accordance with ethical standards of conducting research with human participants and it is possible to state that the rights and dignity of the participants in the research were not violated.

The research did not also engage in any deceptive practices. There were no misleading participants of the nature of the research and no false information was given so as to elicit certain responses. It was not aimed at manipulating and influencing the actual consumer behavior; instead, it was intended to observe it in a response to the recommendations offered by AI.

Moreover, the study does not disregard the ethical aspects of AI in business. On one hand, AI is able to provide better user experience and improve the development of business, on the other hand, it has issues related to consumer autonomy, data privacy, and digital manipulation. This paper suggests responsible design of AI i.e. one that upholds transparency, fairness and user empowerment. Platforms are supposed to be understandable on how recommendations are made, and provide users with the ability to control the personalization settings.

Findings

Table 19.1 Objective 1 — AI Recommendations & Impulse Buying (H1)

Hypothesis	Statistical Test	Key Findings	Result
H1	Linear Regression	$R = 0.806$, $R^2 = 0.650$, $F = 551.095$, $p = 0.000$	Supported
H2	One-Way ANOVA	$F_{(2,296)} = 3.371$, $p = 0.036$	Supported
H3	Moderation Regression	$F = 144.847$, $p = 0.000$	Supported
H4	Multiple Regression / Mean Comparison	$p < 0.05$ (all sub-variables)	Supported

Source: Primary Data

All the hypotheses were proven by the statistical analysis. Linear regression revealed that there was strong positive correlation between AI driven recommendations and impulse buying behavior ($R = 0.806$, $R2 = 0.650$, $F = 551.095$, $p = 0.000$), which confirmed H1. It is possible to conclude that AI recommendations have a considerable impact on consumer choices in the FMCG industry. One way ANOVA indicated that there are significant differences in impulse buying among Tier 1, Tier 2, and Tier 3 cities ($F_{(2,296)} = 3.371$, $p = 0.036$), which proved H2. Tier 1 city consumers responded more to AI cues, which was probably because of greater exposure and familiarity with online shopping.

H3a and H3b were supported by moderation regression analysis indicating that trust in AI systems enhances relationships between recommendations and impulse buying and low self-control increases the effect. These conclusions indicate consumer behavior, which denotes the psychological facets of consumer behavior online.

H4a, H4b and H4c were confirmed by further analysis. Individualization was the most influential and then the urgency cues, and product placement. The tailored recommendations based on the preferences of consumers and time-sensitive displays increased the chances of the latter to make impulse purchases. Positioning on the high-traffic pages, e.g., the home or the checkout pages, enhanced effectiveness, too.

These findings reaffirm the complexity of impulse buying and the potent influence of AI to influence the behavior of consumers. Another reason that they give is the necessity of ethical design and responsible marketing.

Table 19.2 Objective 2 — Consumer Differences Across City Tiers (H2)

Source	Sum of Squares	DF	Mean Square	F	Sig.
Between Groups	3.295	2	1.648	3.371	0.036
Within Groups	144.691	296	0.489		
Total	147.987	298			

Inference for Objective 2:

The outcome of the ANOVA (F = 3.371, p = 0.036) indicates that the impulse buying is greatly different at different city levels (Tier 1 vs Tier 2 vs Tier 3). The reaction to AI-driven prompts is greater among Tier 1 consumers (who were more exposed to digital platforms) than among Tier 2 and Tier 3 consumers.

Conclusion: Objective 2 is fulfilled H2 upheld

Table 19.3 Objective 3 - Moderating Role of Trust & Self-Control (H3)

Statistical Measure		Value
Sum of Squares (Between Groups)		75.651
Df	4	
Mean Square		18.913
F-value		144.847
Sig. (p-value)	0	

Inference for Objective 3:

The findings of ANOVA (F = 144.847, p = 0.000) prove that trust in AI has a significant impact on the choices of consumers regarding AI recommendations which more directly leads to impulse buying. Consumers who are more trustful - believe that AI suggestions are more useful are more likely to experience impulse buying.

Customers with a low self-control level → the people more susceptible to AI-induced cues. Conclusion: Objective 3 objective H3 supported.

Conclusion: Objective 3 achieved - H3 is supported.

Table 19.4 Objective 4 — Platform Features (Personalization, Urgency, Placement) (H4)

Feature	Test Used	Statistical Result	Sig. (p - value)	Interpretation
Personalization Influence	Regression/Mean Comparison	Strongest predictor of impulse buying	< 0.05	Highly significant effect
Urgency Cues Influence	Regression/Mean Comparison	Significant effect on impulse buying	< 0.05	"Limited stock/Deal ending soon" increases impulsiveness
Product Placement Influence	Regression/Mean Comparison	Significant effect on buying decisions	< 0.05	Placement on homepage/checkout boosts visibility

Source: Primary Data

Inference for Objective 4:

The impact of all three features of the platform on impulse buying ($p < 0.05$) is considerable. The most powerful ones are the personalization, followed by the urgency cues and strategic placement.

Conclusion: Objective 4 goal met H4 supported.

Practical Implications

The application of AI by businesses must be in an ethical manner with transparency in the logic of recommendations as a priority. By revealing how the data are used, marketers will be able to offer personalized deals without compromising their trust with the consumers. The use of urgency cues must be used in a responsible manner so as not to be manipulative. Businesses will be in a position to develop tier-based AI marketing, which will maintain inclusivity and conscious consumption.

Future Scope

Future research can be further developed to hybrid stores with online and offline experience. The longitudinal study may follow the changing attitude of consumers towards AI systems. The cross- cultural studies may examine the effect of cultural norms on impulse buying behavior. Consumer data protection and AI transparency can be evaluated with the help of policy-oriented research.

Conclusion

This work has engaged the dynamic relationship between products suggestions by AI and impulse buying behavior in the fast-moving consumer goods (FMCG) industry in India. Due to the evaluation of the impact of personalization, urgency indicators, product placement with different groups of consumers, the study provides tremendous fragments of evidence of the influence that AI technologies have on spontaneous buying behavior.

The findings confirm that the consumers, especially in digitalized Tier 1 cities, react positively to the personalized recommendations and prompts as the urgency-based suggestions. It turned out that the credibility of AI systems and personal self-control were two significant moderators, as they defined how consumers considered and responded to these types of online hints. An additional aspect that is highlighted in the research is that certain placement of recommendations on the shopping interface may be beneficial to its effectiveness, and the prudent arrangement of the platform design.

It is important to mark that the research places emphasis on ethical responsibility of businesses and design designers of platforms. In spite of the fact that AI is a powerful tool to enhance the interaction and sales, it must be applied in an open, impartial and without prejudice way towards consumer autonomy. Ethical design

practices are required to maintain a feeling of trust and long-term loyalty, such as being clear about opt-in personalization, non-manipulative urgency indicators.

In conclusion, AI is not the technological advancement per se, it is the behavioral stimulus. As digital commerce is presently developing, and specifically in the next years in the new markets like India, the psychological impacts of AI-based recommendation will be essential towards the establishment of sustainable and consumer-centered retail ecosystems. The work may be applied in further research and strategic thinking in the sphere of AI, marketing and consumer psychology.

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