Impact of Artificial Intelligence on Rural Buying Behaviour of FMCG Products: A Study with Special Reference to Siddharth Nagar District (Uttar Pradesh, India)

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Abstract: In recent years, Artificial Intelligence (AI) has become a transformative force in marketing and consumer behaviour. AI technologies such as recommendation systems, predictive analytics, voice assistants, and chatbot services are increasingly embedded in retail platforms. These technologies not only change how information is delivered but also influence how customers make purchase decisions.
While research on AI's influence in urban contexts is extensive, studies focusing on rural markets especially regarding FMCG products are limited. FMCG products include essential daily-use items such as soaps, toothpaste, packaged foods, detergents, and personal care items. In rural areas like Siddharth Nagar District, where digital adoption is accelerating, AI-driven interactions (through mobile apps, WhatsApp businesses, and e-commerce platforms) are shaping consumer behaviour.

Keywords: Artificial Intelligence (AI), Rural Buying Behaviour, FMCG Products, Rural Consumers, Digital Marketing, E-Commerce Adoption, Smart Retailing.

I. RESEARCH PROBLEM:

Despite rapid digital adoption, it remains unclear how AI-driven marketing and predictive systems influence rural consumers' buying behaviours particularly for FMCG products, which are frequently purchased and often involve habitual decision-making.

The key questions this study addresses are:
i.To what extent do rural consumers in Siddharth Nagar recognize and interact with AI-driven tools when buying FMCG products?
ii.How does AI influence their buying preferences, product evaluation, and purchase decisions?
iii.What demographic factors (age, education, income) moderate the impact of AI on buying behaviour?

II. OBJECTIVES OF THE STUDY

i.To measure the level of awareness of AI-related technologies among rural FMCG buyers.
ii.To analyze the impact of AI on buying behaviour related to FMCG products.
iii.To identify the relationship between demographic factors and AI influence on rural buying patterns.
iv.To offer practical recommendations for FMCG marketers targeting rural consumers.

III. LITERATURE REVIEW

3.1 Artificial Intelligence in Consumer Marketing
AI is the simulation of human intelligence in machines programmed to think like humans and mimic decision-making. In marketing, AI tools such as recommendation engines and chatbots help customize product offerings and improve user engagement.

3.2 Rural Consumer Buying Behaviour
Rural consumer behaviour differs from urban behaviour due to social, economic, and technological factors. Rural buyers are influenced by community norms, trust networks, and perceived usefulness of technology in their daily shopping.

3.3 AI's Potential Impact on FMCG Buying Patterns

FMCG products are typically low-value but high-frequency purchases. AI-based suggestions, virtual assistants, and personalized outreach could change how rural consumers discover, compare, and choose FMCG products.

IV. HYPOTHESES

Based on literature and research objectives:
H1: There is a positive relationship between awareness of AI technologies and rural consumers' acceptance of AI-driven recommendations.
H2: AI technologies significantly influence rural consumers' buying behaviour for FMCG products.
H3: Demographic factors (age, education, income) moderate the effect of AI on buying behaviour.

V. RESEARCH METHODOLOGY

5.1 Research Design
Descriptive and analytical research design was adopted to assess the influence of AI on rural FMCG buying behaviour.

5.2 Area of Study
The study was conducted in Siddharth Nagar District, Uttar Pradesh—a predominantly rural district with increasing digital connectivity.

5.3 Sampling
Sample Size: 350 respondents
Sampling Method: Stratified random sampling from 12 villages across major blocks
Respondents: Rural consumers above 18 years of age who purchase FMCG products

5.4 Data Collection
Primary Data: Collected through structured questionnaires with a five-point Likert scale.
Secondary Data: Academic journals, government reports, FMCG industry reports, and e-commerce analytics.

5.5 Variables
Independent Variable: Awareness and usage of AI technologies
Dependent Variable: Rural buying behaviour related to FMCG products

Moderating Variables: Age, education, income, mobile/digital usage

VI. DATA ANALYSIS TECHNIQUES

Collected data was analyzed using:
Descriptive Analysis (percentages, mean scores)
Correlation Analysis
Multiple Regression Analysis
ANOVA to test moderating effects of demographics
Statistical tools used: SPSS version 26.

VII. RESULTS AND FINDINGS

7.1 Demographic Profile

Demographic Variable	Category	Percentage
Age Group	18–30	34%
	31–45	41%
	46+	25%
Education	Primary	28%
	Secondary	42%
	Graduate	30%
Income (Monthly)	<10,000	36%
	10,001–20,000	45%
	>20,000	19%

7.2 Awareness of AI in FMCG Purchase
58% of respondents were aware of AI-enabled suggestions (e.g., search recommendations on apps or WhatsApp alerts).
35% used digital tools (voice search, auto-suggest) when looking for FMCG products.

7.3 Influence of AI on Buying Behaviour
42% indicated that AI-based product recommendations influenced their FMCG choices.
29% reported trying new FMCG brands following AI-driven promotional alerts.
17% used chatbot assistance (e.g., on retailer apps) to clarify doubts before purchase.

7.4 Demographic Moderators
Education: Higher education correlated with higher use of AI tools ($p < 0.05$).

Age: Younger consumers (18–30) showed greater AI influence.

Income: Respondents with higher income levels showed increased acceptance of AI-based suggestions.

7.5 Hypothesis Testing

Hypothesis	Result
H1	Supported
H2	Supported
H3	Partially Supported

VIII. DISCUSSION

The findings indicate:

AI tools are increasingly relevant even in rural purchasing contexts.

AI drives product discovery and brand experimentation in FMCG purchases.

Digital literacy and mobile usage are key facilitators of AI adoption.

However, traditional factors (price sensitivity, brand loyalty, word-of-mouth) remain strong determinants of buying behaviour.

These suggest a hybrid model: AI enhances accessibility and choices, but deep-rooted social and economic norms continue to shape actual purchase decisions.

IX. CONCLUSION

AI plays a significant and growing role in shaping rural buying behaviour for FMCG products in Siddharth Nagar District. While not yet fully pervasive, AI-driven tools influence purchase decisions—especially among younger and educated rural consumers. Marketers targeting rural markets should recognize AI as a complementary tool rather than a standalone solution.

X. RECOMMENDATIONS

1. Mobile-Based Localized AI Tools: Use regional language interfaces for AI-driven FMCG recommendations.
2. Awareness & Training: Conduct rural marketing campaigns that educate consumers about AI benefits.
3. Tie-Up with Local Retailers: Integrate AI insights into local points of sale via digital kiosks, SMS alerts, and WhatsApp.
4. Culturally Sensitive Messaging: Combine AI-based outreach with culturally relevant content.

XI. LIMITATIONS

Geographically limited to one district.
Self-reported data may have response biases.
Rapid tech changes may outdate some findings.

XII. SCOPE FOR FUTURE RESEARCH

Comparative studies between rural and urban districts.
Longitudinal studies on AI's impact over time.
Role of AI in credit/financing decisions for FMCG purchases.

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