

AI-Driven Consumer Behaviour Analytics: Transforming Retail and Marketing Practices in Tamil Nadu, India

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Abstract

Artificial Intelligence (AI) is revolutionising the realms of retailing and marketing through the use of analytics which help businesses understand consumer behaviour and predict purchase decisions as well as offer consumers a personalised experience. With the increasing prevalence of e-commerce, digital payment systems, apps and social media channels in use, vast amounts of consumer data have been generated. The possibilities offered by AI analytics are therefore many in emerging retail environments such as that in Tamil Nadu. The paper will investigate the use of consumer behaviour analytics driven by artificial intelligence as a means of revolutionising retail and marketing processes focusing on aspects such as personalisation, predictive analytics, recommendation systems, customer segmentation, sentiment analysis and AI-based customer engagement. The research will be based on consumer behaviour, marketing, analytics and digital transformation perspectives in order to illustrate how AI analytics could assist in purchase prediction, targeted communications, customer satisfaction, loyalty and decision-making in retail. According to the available literature, AI can be helpful in increasing the accuracy in marketing, engagement of customers, demand prediction, and operations efficiency; nevertheless, the role of AI in this respect depends on data quality, technological maturity, trust of consumers, and proper data handling practices. The issues of privacy, algorithmic bias, cost of implementation, digital maturity, and transparency continue to play an important role among limitations, especially for small retailers.

Keywords: Artificial Intelligence, Consumer Behaviour Analytics, Retail Marketing, Personalisation, Digital Transformation.

Introduction

Artificial intelligence has become a vital factor in the evolution of modern-day retail and marketing practices. The fast development of e-commerce, mobile apps, electronic payment systems, social networking sites, and customer relationship management technologies allows businesses to collect large amounts of consumer data. AI-based consumer behavior analytics transforms the gathered data into useful insights via detecting the patterns of purchases, predicting preferences of consumers, and making better marketing decisions. Machine learning, natural language processing, recommendation engines, prediction, and conversation AI tools are becoming popular at each stage of the customer journey. In the field of retail marketing, artificial intelligence has moved away from the decision-making based on broad demographic segmentation and sales history to data-driven and personalized approaches. Retailers can utilize the information about consumer online activity, past purchases, searches, consumer feedback, and other digital interaction for product recommendation, consumer segmentation, demand forecasting, promotion planning, and better customer service. Hence, AI-enabled

analytics not only has repercussions in terms of marketing efficiency but also in terms of consumer engagement, purchasing intentions, consumer satisfaction, consumer loyalty, and overall retail success. Existing literature reveals that the application of AI is also changing consumer behavior and marketing theories.

It is also relevant that India becomes the subject of analysis as it has coexistence of organized retail, e-commerce, digital platforms, and traditional retail formats in the context of evolving digital economy. Specifically, from within India, Tamil Nadu stands out as a particularly suitable case since it has highly urbanized markets, growing digital infrastructure, technologically savvy consumers, and diversified retail environment. It includes metropolitan and urbanizing markets, as well as semi-urban markets, and therefore there is significant variability in preferences of the consumers, extent of digital adoption, and purchasing behavior. Yet, alongside with the opportunities available, there are challenges related to adoption and application of AI-enabled analytics. These challenges could include cost implications, technological infrastructure, skilled labor, and quality of the consumer data. From the consumers' point of view, issues of privacy, trust, and intrusiveness could affect their attitude toward such technologies. There has been little effort in the available literature from Tamil Nadu to empirically explore the AI-based analysis of consumer behavior and prediction marketing, as they have focused primarily on the traditional consumer behavior, online shopping, store visits, and digital marketing. In light of this, this paper addresses AI-based consumer behavior analysis and its impact on retailing and marketing in Tamil Nadu. This research aims to analyze the process of customer-centric marketing through AI-based analysis of consumer behavior.

Review of Literature

Petrescu et al. (2024) studied the impact of artificial intelligence on consumer behavior within consumer-oriented retail interactions using systematic review, bibliometric analysis, and conceptual mapping. It was identified that the application of AI is transforming retail interactions through personalization and value co-creation, as well as affecting consumers' well-being, social interaction, and the benefits of other stakeholders. The researchers underlined the necessity to evaluate AI in retail not only from a technical perspective but also from a value creation perspective for both consumers and other stakeholders.

Dai and Liu (2024) studied the effect of artificial intelligence on consumer purchase decisions in online retail. Survey data obtained from 760 respondents were used to analyze the impact of AI applications like personalized recommendations, chatbots, predictive analysis, and social media interactions. The results showed that AI applications in retail affect consumers' purchase behavior in online environment.

Jith et al. (2025) studied the effect of personalization through AI on consumers' intention to buy products and their trust in e-commerce sites. In this research, a mixed method was used where 847 survey participants and 32 qualitative interviews were held. It is evident from the study findings that personalization through AI significantly improves the consumers' purchasing intention, where transparency in the use of data and control by the consumers over personalization improve their trust. Moreover, privacy issues affect the consumers' trust because the perception of intrusion affects it.

Sasikala, Shobhana and Kamaladevi (2026) studied the effect of AI-based personalized product recommendation systems on consumers' intention to buy in the Indian e-commerce context. In this study, which was conducted using 160 samples of online buyers, the perceptions of relevance and consumers' trust were considered to explain consumers' reactions to AI recommendation.

Kujur (2026) explored the effect of AI-based personalization on the purchase intention and satisfaction of consumers in e-commerce environments in India. Employing a survey conducted among active online shoppers and using PLS-SEM, the study concluded that AI-based personalization has a positive effect on perceived usefulness, consumer trust, and customer satisfaction. It was also concluded that these factors have a mediating effect between personalization and purchase intention. It is thus evident that the behavioral impact of AI is highly contingent on perceived value and trust.

Statement of the Problem and Research Gap

The area of Artificial Intelligence is gaining prominence in the field of retail and marketing due to personalized recommendations, predictive analysis, consumer segmentation, chatbots and data-driven promotions. With the use of these tools, retailers can gauge the preferences of consumers and make purchase predictions to engage better with consumers. Yet, the success of these depends on

technological readiness, quality of data, consumer trust, privacy issues and the ability of the retailer to leverage consumer data into marketing decisions.

While recent literature has looked at the areas of AI personalization, online consumer purchase behavior, consumer satisfaction and consumer trust, there has been no study which has focused on AI consumer behavior analytics in the realm of retail and marketing in Tamil Nadu. The current studies conducted in Tamil Nadu have mostly focused on online shopping, digital marketing, store patronage and traditional consumer purchase behavior, with not much focus on AI analytics and its implication for retail marketing. Hence, the purpose of this study is to fill this gap in literature by looking at how AI consumer behavior analytics is transforming retail and marketing in Tamil Nadu.

Objectives of the Study

The study is undertaken with the following objectives:

- To examine the application of AI-driven consumer behaviour analytics in retail and marketing practices in Tamil Nadu.
- To analyse the influence of AI-driven analytics on consumer engagement, purchase intention, and customer satisfaction.
- To assess the role of AI-driven consumer analytics in improving marketing effectiveness and retail decision-making.

Conceptual Framework

The proposed conceptual framework indicates that consumer behavior analysis through AI would allow for understanding consumer preferences and behavioral patterns which would help achieve marketing and retail goals. Through AI tools such as personalized recommendations, predictive analytics, customer segmentation, sentiment analysis, and chatbots, consumer insights can be developed that would help engage customers and impact their purchase decisions. The conceptual framework acknowledges the fact that proper usage of these insights can lead to better marketing performance.

Linkage of the Conceptual Framework

- **Conceptual Framework**

The Conceptual framework identifies the sequence in the relationship between AI consumer behaviour analytics, consumer behaviour outcome, and retail & marketing outcome. Various applications of AI such as personalization, recommendation system, predictive analytics, customer segmentation, sentiment analysis, and chatbot lead to insights into consumer preferences and behavior. These insights improve consumer engagement, purchase intent, and customer satisfaction, which, in turn, lead to better marketing performance and retail decisions.

PROPOSED CONCEPTUAL FRAMEWORK



Research Methodology

The current research study utilizes a descriptive and analytical approach to investigate the importance of consumer behavior analytics by using AI in the transformation of retailing and marketing operations in Tamil Nadu. The current study is conducted based on both primary and secondary data

sources. The primary data has been collected from 150 consumers who have been chosen from five major cities of Tamil Nadu, including Vellore, Chennai, Madurai, Tiruchirappalli, and Coimbatore. Thirty consumers were chosen from each of the cities, who have used AI based retailing and e-commerce platforms before, using a structured questionnaire. Secondary data has been collected from research articles, books, industry reports, and other relevant published sources. Convenience sampling has been used for selecting the respondents for the research as they were accessible and had experience in AI based retail services. The study variables were measured by a five-point Likert Scale which ranged from Strongly Disagree (1) to Strongly Agree (5). The data collected were coded and analysed using IBM SPSS Statistics. Percentage analysis and descriptive statistics were used to interpret the respondent's profile and the study variables. Cronbach's Alpha method was used to check for the reliability of the scales used. Correlation and regression analysis were used to determine the relationships among the study constructs.

Analysis and Results

Analysis of the data from 150 respondents was conducted through percentage analysis, descriptive statistics, reliability analysis, correlation, and regression analysis. The analysis was done based on the research conceptual framework and objectives.

Table 1: Demographic Profile of the Respondents

Demographic Variable	Category	Frequency	Percentage
Gender	Male	82	54.67
	Female	68	45.33
	Total	150	100.00
Age	Below 25 years	32	21.33
	25–35 years	51	34.00
	36–45 years	37	24.67
	46–55 years	20	13.33
	Above 55 years	10	6.67
	Total	150	100.00
Educational Qualification	Higher Secondary	18	12.00
	Undergraduate	56	37.33
	Postgraduate	48	32.00
	Professional / Others	28	18.67
	Total	150	100.00
Occupation	Student	29	19.33
	Salaried Employee	54	36.00
	Business / Self-employed	31	20.67
	Professional	23	15.33
	Others	13	8.67
	Total	150	100.00
Area of Residence	Urban	96	64.00
	Semi-Urban	54	36.00
	Total	150	100.00
Frequency of Online Shopping	Occasionally	27	18.00
	Monthly	43	28.67
	Weekly	51	34.00
	Frequently	29	19.33
Total		150	100.00

From the demographic analysis, we see that the percentage of male respondents is 54.67 per cent, whereas females are 45.33 per cent. The major age group among the respondents is 25-35 years (34.00 per cent), thereby showing the significant presence of young consumers. With respect to education, 37.33 per cent of the respondents are undergraduates, while 32.00 per cent are postgraduates. Salaried employees form the majority of the occupation group with 36.00 per cent. Additionally, 64.00 per cent of respondents belong to urban areas, and 34.00 per cent purchase products online every week.

Table 2: Mean and Rank Analysis of AI-Driven Consumer Behaviour Analytics Dimensions

S. No.	AI-Driven Consumer Behaviour Analytics Dimensions	Mean	S.D.	Rank
1	Personalised Recommendations	4.32	0.68	I
2	Recommendation Systems	4.18	0.72	II
3	Predictive Analytics	4.05	0.76	III
4	Customer Segmentation	3.94	0.81	IV
5	AI Chatbots and Virtual Assistants	3.86	0.84	V
6	Sentiment Analysis	3.72	0.88	VI
	Overall Mean	4.01	—	—

Analysis reveals that Personalised Recommendations emerged as the leading application with the highest mean of 4.32, reflecting that personalization is seen as the most important use case of AI-based consumer behaviour analytics by consumers. Recommendation Systems emerged as the second most important application with the mean of 4.18, followed by Predictive Analytics (4.05). Lower means were observed for Customer Segmentation, AI Chatbots and Sentiment Analysis applications. Overall, the mean of 4.01 suggests high levels of perceived importance of AI-based analytics.

Table 3: Reliability Analysis of Major Constructs

S. No.	Constructs	No. of Items	Cronbach's Alpha	Reliability
1	AI-Driven Consumer Behaviour Analytics	6	0.872	High
2	Consumer Engagement	4	0.834	High
3	Purchase Intention	4	0.816	High
4	Customer Satisfaction	4	0.851	High
5	Marketing Effectiveness	4	0.827	High
6	Retail Decision-Making	4	0.809	High
	Overall Scale	26	0.901	Excellent

The internal consistency value of Cronbach's Alpha of each construct ranges between 0.809 to 0.872, signifying a very strong internal consistency among the variables used in measurement. The reliability coefficient of the research instrument ranges between 0.901 which denotes an excellent reliability of the research instrument. Therefore, the measurement scales are reliable enough for further analysis.

Table 4: Correlation between AI-Driven Consumer Behaviour Analytics and Consumer, Retail and Marketing Outcomes

Variables	AICBA	CE	PI	CS	ME	RDM
AI-Driven Consumer Behaviour Analytics (AICBA)	1.000					
Consumer Engagement (CE)	0.724**	1.000				
Purchase Intention (PI)	0.681**	0.646**	1.000			
Customer Satisfaction (CS)	0.703**	0.692**	0.638**	1.000		
Marketing Effectiveness (ME)	0.756**	0.671**	0.654**	0.719**	1.000	
Retail Decision-Making (RDM)	0.738**	0.628**	0.611**	0.674**	0.742**	1.000

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

According to the correlation analysis, the variable AI-Driven Consumer Behavior Analytics is positively and significantly correlated with all consumer, retail, and marketing results. The highest correlation is established between the variable AI-driven analytics and Marketing Effectiveness ($r = 0.756$, $p < 0.01$), followed by Retail Decision-Making ($r = 0.738$) and Consumer Engagement ($r = 0.724$). Additionally, there is a positive correlation between AI-driven analytics and Customer Satisfaction ($r = 0.703$) and Purchase Intention ($r = 0.681$). The findings suggest that increased use of AI-driven consumer analytics corresponds to better consumer reactions and outcomes in retail and marketing.

Table 5: Regression Analysis – Impact of AI-Driven Analytics on Consumer and Retail/Marketing Outcomes

Dependent Variable	R	R ²	Adjusted R ²	Beta (β)	t-value	Sig.
Consumer Engagement	0.724	0.524	0.521	0.724	12.77	0.000
Purchase Intention	0.681	0.464	0.460	0.681	11.32	0.000
Customer Satisfaction	0.703	0.494	0.491	0.703	12.02	0.000
Marketing Effectiveness	0.756	0.572	0.569	0.756	14.06	0.000
Retail Decision-Making	0.738	0.545	0.542	0.738	13.31	0.000

As shown in the regression results, the use of AI-based consumer behavior analytics is an extremely strong predictor of all five of the dependent variables, with $p < 0.001$. Marketing Effectiveness ($\beta = 0.756$, $R^2 = 0.572$) exhibits the strongest correlation, which means that 57.2 per cent of the variation in marketing effectiveness is explained by the use of AI-based analytics. Next come Retail Decision Making ($\beta = 0.738$, $R^2 = 0.545$) and Consumer Engagement ($\beta = 0.724$, $R^2 = 0.524$). Finally, there are strong correlations between AI-based analytics and Customer Satisfaction ($\beta = 0.703$) and Purchase Intention ($\beta = 0.681$).

Major Findings and Discussion

The research reveals the emerging role of consumer behaviour analytics enabled through AI technology in the retail industry in Tamil Nadu. The main results of the study are presented below:

- Demographic analysis shows that the majority of the respondents are young, educated, urban and tech-savvy people. Such demographics provide an adequate consumer sample for assessing the impact of AI in retail industry. Many respondents purchase products via the Internet, which means that they have some experience with AI applications in retail.
- From the aspects of AI consumer behaviour analytics, Personalized Recommendations received the highest mean score (4.32), followed by Recommendation Systems (4.18) and Predictive Analytics (4.05). This means that customers perceive AI mainly through personalized recommendations on products based on their needs and past digital activity.
- The test for reliability revealed good internal consistency among all study variables as demonstrated by the Cronbach's Alpha coefficients from 0.809 to 0.872. Generally, the reliability coefficient of 0.901 shows that the measurement tool has strong internal consistency.
- The results of the correlation analysis have shown significant positive connections between AI-enabled consumer behavior analytics and all consumer and business outcomes. The strongest connection was discovered with Marketing Effectiveness ($r = 0.756$), followed by Retail Decision-Making ($r = 0.738$) and Consumer Engagement ($r = 0.724$). It means that the increase in the use of AI analytics leads to better marketing and retail outcomes.
- Additionally, the regression analysis has demonstrated that AI-enabled analytics is an important predictor of the outcome variables. The strongest predictive connection was established with Marketing Effectiveness ($R^2 = 0.572$), followed by Retail Decision-Making ($R^2 = 0.545$) and Consumer Engagement ($R^2 = 0.524$). Positive correlations have been found for Customer Satisfaction and Purchase Intention.
- All in all, the results obtained from the research have proven the conceptually suggested connections between AI-driven consumer behavior analytics, favorable consumer outcomes and their contribution to marketing and retail performance. Personalization seems to be a critical aspect of AI application in consumers' interactions. At the same time, it is necessary to take into account that these results represent only associations and predictive connections.

Suggestions and Managerial Implications

Given the results obtained from the study, the following suggestions and managerial implications may be made:

- Developing the use of AI for personalization: Retail companies can use the information about customers' navigation, purchases and preferences for personalized products recommendation and offers in order to enhance the personalization that proved to be the most salient AI-based dimension.

- Using AI for marketing decisions: Managers of the marketing department need to employ predictive analytics and segmentation techniques in order to learn about customers' needs and behavior and create more targeted marketing campaigns rather than resort to traditional mass marketing methods.
- Improving customer engagement using AI: Customer interaction can be improved by using chatbots, virtual assistants, personalized communication and other means of AI. All this should supplement the human service especially when customers need more complicated help.
- Making retail decisions based on AI-generated consumer insights: AI consumer insights need to be used in decisions related to assortment planning, demand forecasting, pricing, inventory management and promotion.
- Consumer trust and privacy protection: The retailers must inform their consumers about data collection and usage, seek valid consent, and ensure that proper data security is maintained. It is imperative for them to be transparent and accountable in the usage of AI technology in order to build and maintain consumer trust.
- Developing AI competence in SMEs and traditional retail outlets in Tamil Nadu: The SMEs and traditional retailers in Tamil Nadu must use AI technologies gradually using affordable digital platforms and developing data analytics and digital marketing skills amongst the employees.

Ethical Considerations

The study adhered to ethical considerations during the entire research process. The research was conducted on a voluntary basis and participants were made aware of the reason for the study before the data collection process started. Consent, confidentiality and anonymity of participants were ensured and the information gathered was only used for academic purposes. Any personal details of participants were not revealed.

Conclusion

The advent of Artificial Intelligence has impacted retailing and marketing since it helps firms to get a better understanding of consumer behavior and make data-based decisions. The research study shows the significance of consumer behavior analysis using AI in improving personalization, consumer engagement, purchase intention, customer satisfaction, marketing efficiency, and decision making in the field of retailing. There are several uses of AI among which personalized recommendations and recommendation systems are quite significant in influencing consumer behavior. Another important finding is that effective usage of AI analytics is significantly related to improved marketing efficiency and decision making in the field of retailing. This study has been conducted using 150 consumers selected equally from the five major cities of Tamil Nadu like Vellore, Chennai, Madurai, Tiruchirappalli, and Coimbatore (30 consumers from each city). These results show that retailers within urban areas in Tamil Nadu may be able to create a competitive advantage by leveraging AI-powered consumer intelligence in their marketing efforts and business operations. The successful deployment of this strategy, however, needs appropriate technological and human capacity, availability of consumer information, transparency, and good data governance practices. This implies that AI should be considered a strategic tool rather than just an automation tool.

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