

AI-Driven Customer Segmentation and Personalized Targeting Strategies Using Machine Learning Techniques

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Abstract—This research looks at how AI and ML are influencing modern marketing tactics including consumer segmentation and targeted personalisation. The study draws on secondary material gathered from scholarly publications, books, reports, and websites to provide a descriptive and conceptual analysis. Organisations may analyse customer behaviour, boost customer engagement, and enhance marketing performance with the use of artificial intelligence technology including neural networks, recommendation systems, machine learning algorithms, and predictive analytics. Personalisation in marketing relies heavily on data like demographics, social media engagement, past purchases, and web browsing habits. Problems highlighted in the research include insufficient technical knowledge, significant implementation costs, and worries about data protection. In sum, the research shows that personalised targeting methods powered by AI greatly aid in expanding businesses' reach, delighting customers, and gaining an edge in the online marketplace.

Index Terms—Artificial Intelligence, Machine Learning, Customer Segmentation, Personalized Targeting, Predictive Analytics, Digital Marketing.

I. INTRODUCTION

Businesses in today's digital marketplace are putting more and more faith in cutting-edge tech to help them better understand client behaviour and boost the efficacy of their marketing campaigns. Big data, e-commerce, social media, and online consumer behaviours have all grown rapidly in recent years, leading to an explosion of consumer-related data. In many cases, complicated consumer preferences and buying habits are hard for traditional customer segmentation methods—which mostly use demographic and geographical variables—to capture. In this light, ML and AI methods have developed into potent resources for efficiently and accurately sifting through massive information in search of relevant consumer groups.

Businesses can divide their clientele into several categories according to predictive, transactional, psychographic, and behavioural traits with the use of AI-powered customer segmentation. Automated pattern identification and predictive analytics are made possible by machine learning techniques like K-Means Clustering, Decision Trees, Random Forest,

Neural Networks, and Support Vector Machines. Personalised targeting methods, enhanced client engagement, higher customer retention rates, and maximum profitability can all be achieved with the help of these technologies. Businesses may cater their suggestions, ads, and promotional efforts to each customer's unique tastes and demands with the use of personalised marketing strategies powered by AI analytics.

Retail, finance, healthcare, telecom, and e-commerce are just a few of the industries that have seen a dramatic shift in their marketing strategies due to the introduction of AI and ML into customer relationship management systems. Intelligent systems are becoming more important for organisations as a means to improve decision-making, increase customer happiness, and gain a competitive edge. But there are still problems with data privacy, algorithmic bias, interpretability, and implementation difficulty, even though AI is becoming more and more popular. Consequently, the purpose of this research is to assess the efficacy of AI-driven consumer segmentation and tailored targeting approaches that employ machine learning techniques in enhancing marketing results and consumer experiences.

1.1. Role of Machine Learning in Customer Segmentation and Personalized Marketing

The ability to automate data processing, create predictive models, and make smart decisions in marketing is where machine learning really shines in today's customer analytics. Online transactions, social media interactions, e-commerce platforms, mobile applications, and customer feedback systems provide enormous amounts of customer data in today's digital business world. When dealing with datasets of this size and complexity, traditional analytical methods frequently fall short. By quickly and accurately revealing previously unseen patterns, trends, and consumer preferences, machine learning techniques greatly improve the efficiency with which firms process and analyse this data.

Accurate customer segments are generated by machine learning algorithms by analysis of consumer behaviour patterns, purchase history, browsing preferences, demographic data, and engagement indicators. A variety of algorithms, including Decision Trees, K-Means Clustering, Random Forest, Support Vector Machines, and Neural Networks, allow

businesses to divide their clients into distinct categories according to their interests, purchasing patterns, and trends in behaviour. Organisations can have a better grasp of client expectations and make more accurate predictions of future purchasing behaviour with the help of this classification.

Businesses are able to create more focused advertising, product suggestions, personalised promotional methods, and personalised marketing campaigns with the help of machine learning insights. Organisations may improve customer happiness and overall experience through personalised targeting, which helps them send relevant content and offers to customers based on their unique requirements and interests. One example of a machine learning application that increases client engagement and encourages repeat purchases is the recommendation system employed by major e-commerce and streaming platforms.

1.2. Objectives of the Study

- To examine the significance of AI-driven customer segmentation in modern marketing strategies.
- To analyse the application of machine learning techniques in identifying customer behaviour and purchasing patterns.
- To evaluate the effectiveness of personalized targeting strategies in improving customer engagement and satisfaction.
- To identify the challenges and opportunities associated with implementing AI and machine learning techniques in customer relationship management.

II. REVIEW OF LITERATURE

Nallamala et al. (2023) looked at how retail marketing uses AI-powered personalisation engines and highlighted how machine learning models play a key role in dynamic content development, customer segmentation, and targeted advertising. According to the research, AI helps businesses sift through mountains of consumer data in order to make more informed preference predictions. The authors found that machine learning algorithms boost marketing efficiency, customer engagement, and company

performance through personalised recommendations and customised promotional techniques.

Hemalatha et al. (2024) investigated the potential of using AI to segment customers for targeted advertising. This research looked at how machine learning algorithms may be used to categorise consumers according to their internet activity, demographics, and buying habits. The study's authors draw the conclusion that AI-powered segmentation methods enhance digital marketing decision-making by helping businesses better pinpoint their target demographics. The study further emphasized that personalized marketing strategies increase customer satisfaction and strengthen long-term customer relationships.

Alijoyo et al. (2025) examined culturally sensitive segmentation and targeting with the use of artificial intelligence as a means of personalised marketing. More efficient marketing efforts may be created with the help of artificial intelligence, according to the study, which can identify cultural preferences, geographical buying behaviour, and consumer variety. According to the authors, AI-driven targeting helps companies create customer-centric marketing strategies and makes communication more successful. Ethical AI practices and data protection considerations are crucial when developing intelligent marketing systems, according to the report.

Bhardwaj et al. (2024) examined how e-commerce and digital marketing client targeting is affected by AI-driven personalisation tactics. The study found that automated advertising, predictive analytics, and recommendation systems are some of the AI technologies that greatly improve marketing performance and consumer engagement. The study's authors found that companies may learn more about their customers' tastes, enhance their promotional efforts, and keep more of their customers with the help of AI-powered personalisation. The research found that companies doing business online can gain an edge with AI-driven marketing techniques.

III. METHODOLOGY

Study methodology is the set of steps taken to systematically gather, analyse, and interpret data pertaining to a certain study issue. It lays out the groundwork for carrying out the research in a methodical and scientific way. This research used a

machine learning approach to analyse the function of AI-driven consumer segmentation and targeted personalisation. The study's primary goal is to shed light on how machine learning algorithms, predictive analytics, and artificial intelligence may enhance marketing efficiency and customer engagement. The research methodology utilised in this study allows for the analysis of both conceptual and literature-based data using descriptive statistics, including percentage and frequency analysis.

3.1. Research Design

Customer segmentation powered by AI and personalised targeting tactics utilising machine learning are the focus of this descriptive and analytical study. Understanding the usage of AI, ML algorithms, predictive analytics, and consumer behavioural analysis in contemporary marketing strategies is the primary goal of the study. The current ideas, technical frameworks, and marketing uses of AI-driven consumer segmentation can be better understood with the use of a descriptive method.

3.2. Nature of the Study

This research is secondary in character and based on concepts. This is based on a review of the current literature on the topics of AI, ML, customer analytics, and tailored marketing tactics that has been published in journals, books, industry publications, and internet databases. A thorough comprehension of the role that machine learning plays in efficient consumer segmentation and focused marketing is the overarching goal of the project.

3.3. Data Collection Method

The necessary information for the study was gathered by thoroughly reviewing and analysing existing secondary sources on marketing strategies driven by artificial intelligence and machine learning. For the purpose of analytical interpretation, data pertaining to client segmentation methods, recommendation systems, predictive analytics, customer behaviour analysis, and implementation difficulties was organised in a systematic manner.

3.4. Sample Size

A descriptive analysis was conducted using a sample size of 120 observations. The purpose was to identify and evaluate the conceptual and literature-based

findings on AI-driven customer segmentation and personalised targeting techniques.

3.5. Tools and Techniques of Analysis

The collected secondary data were analyzed using descriptive statistical tools such as frequency distribution and percentage analysis. Tables were prepared to present the classification of:

- AI techniques used in customer segmentation
- Factors influencing personalized targeting strategies
- Applications of machine learning in marketing
- Challenges in implementing AI-driven customer segmentation

The frequency and percentage method was used to simplify data interpretation and identify major trends and patterns associated with AI-based marketing strategies.

IV. RESULTS AND DISCUSSION

Customer segmentation and personalised targeting methods driven by artificial intelligence (AI) and utilising machine learning techniques form the basis of this study. Improving company performance and consumer engagement is the primary emphasis of the analysis, which aims to identify the role of personalised marketing tactics, machine learning algorithms, and artificial intelligence. Descriptive analysis is used to understand the data, with frequency and percentage tables generated from conceptual classifications and observations in the literature about AI marketing applications.

Table 1: Common AI Techniques Used in Customer Segmentation

AI Techniques	Frequency	Percentage
Machine Learning Algorithms	40	33.3%
Predictive Analytics	30	25.0%
Neural Networks	28	23.3%
Natural Language Processing	22	18.4%
Total	120	100%

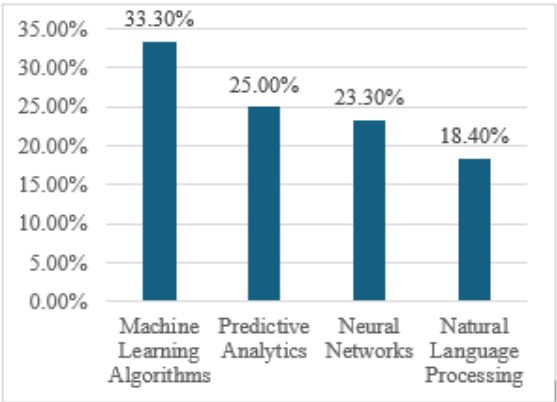


Figure 1: Graphical presentation of Common AI Techniques Used in Customer Segmentation

Table 1 depicts the primary AI methods employed in the processes of customer segmentation. Machine learning algorithms dominate the analysis of consumer behaviour and the identification of significant customer segments, accounting for 33.3% of all methodologies. With a contribution of 25%, Predictive Analytics demonstrates its significance in predicting consumer tastes and spending habits. With a contribution of 23.3%, Neural Networks demonstrate their efficacy in enhancing segmentation accuracy and managing complicated consumer datasets. At 18.4%, Natural Language Processing stands out for its function in evaluating communication data, reviews, and customer feedback. The table shows that marketing decision-making and consumer segmentation are both greatly enhanced by machine learning-based technology.

Table 2: Major Factors Influencing Personalized Targeting Strategies

Factors	Frequency	Percentage
Customer Purchase History	36	30.0%
Browsing Behaviour	32	26.7%
Demographic Information	28	23.3%
Social Media Interaction	24	20.0%
Total	120	100%

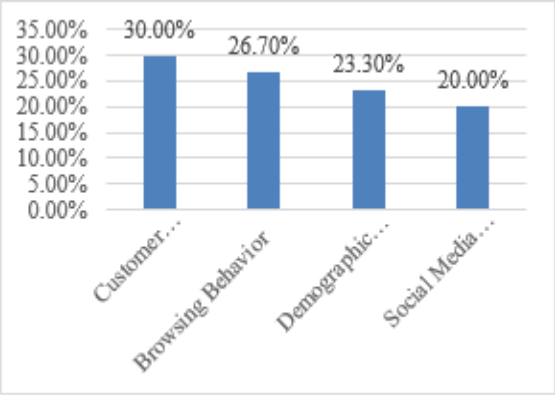


Figure 2: Graphical presentation of Major Factors Influencing Personalized Targeting Strategies

Table 2 explains the key aspects of AI-driven marketing that impact targeted marketing campaigns. With a whopping 30.0%, customer purchase history is the kingpin when it comes to crafting targeted marketing campaigns based on past purchases. With 26.7% coming from Browsing Behaviour, it's clear that customers' interests can be understood by observing their online activity and search trends. Age, gender, income, and geography are relevant demographic factors in consumer targeting methods, as seen by the 23.3% contribution of demographic information. Twenty percent of all interactions take place on social media, highlighting the significance of consumer participation on digital platforms for targeted advertising. According to the results, companies use demographic and behavioural data extensively to create tailored marketing campaigns.

Table 3: Applications of Machine Learning in Marketing

Applications	Frequency	Percentage
Product Recommendation Systems	38	31.7%
Customer Retention Analysis	30	25.0%
Predictive Consumer Analytics	28	23.3%
Automated Advertising Campaigns	24	20.0%
Total	120	100%

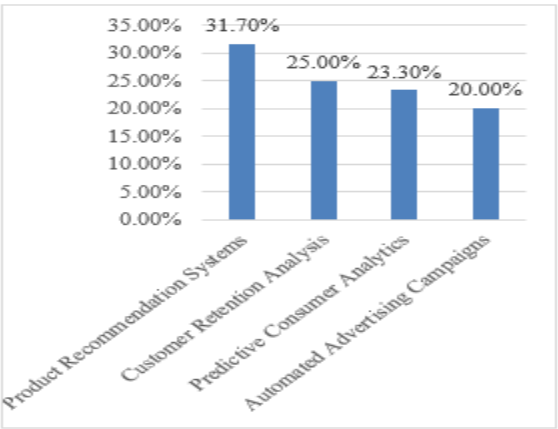


Figure 3: Graphical presentation of Applications of Machine Learning in Marketing

Table 3 draws attention to the most important uses of ML in advertising. The largest share, 31.7 percent, is attributable to product recommendation systems, suggesting that recommendation technologies are extensively employed to offer users tailored product recommendations. With a percentage of 25%, Customer Retention Analysis demonstrates how important machine learning is for retaining loyal customers and decreasing customer turnover. The contribution of 23.3% is attributable to Predictive Consumer Analytics, which is responsible for predicting the demands and buying habits of future customers. Twenty percent come from automated advertising campaigns, showing how AI is being used more and more to deliver customised ads and promotional content. Machine learning applications greatly enhance marketing efficiency and client engagement, as seen in the table.

Table 4: Challenges in Implementing AI-Driven Customer Segmentation

Challenges	Frequency	Percentage
Data Privacy and Security Issues	42	35.0%
High Implementation Cost	30	25.0%
Lack of Skilled Professionals	26	21.7%
Algorithm Bias and Complexity	22	18.3%
Total	120	100%

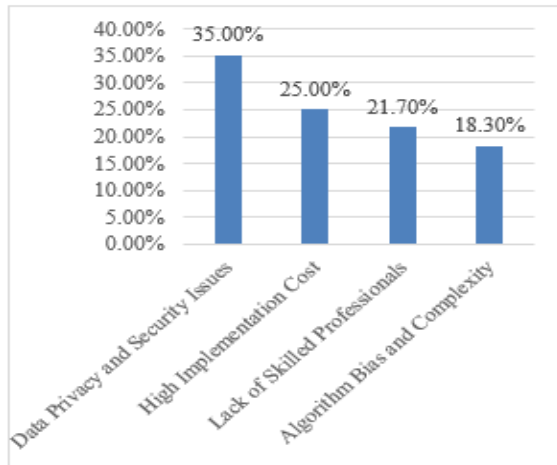


Figure 4: Graphical presentation of Challenges in Implementing AI-Driven Customer Segmentation

Table 4 reveals the key obstacles connected with introducing consumer segmentation systems powered by AI. The most important issue with AI-based marketing strategies is the protection of consumer data, as indicated by the highest proportion of 35.0% for data privacy and security issues. The high implementation cost of AI technology is a major obstacle for many organisations, since it accounts for 25.0% of the total. One reason AI systems aren't well-managed is because there aren't enough technically-inclined individuals to do the job (21.7%). Concerns about the complexity, bias, and fairness of algorithmic models in machine learning account for 18.3%. Although AI technologies have many advantages, the results show that organisations still encounter ethical, financial, and technical hurdles when trying to use them.

V. CONCLUSION

Artificial intelligence (AI) and machine learning (ML) have revolutionised client segmentation and personalised targeting tactics in modern marketing, according to this report. The research shows that AI-powered tools are crucial for figuring out consumer habits, finding trends in purchases, and enhancing the efficiency of marketing campaigns. These tools include machine learning algorithms, predictive analytics, neural networks, and natural language processing. Personalised targeting strategies allow organisations to deliver customised products, services, and promotional campaigns based on individual

customer preferences. Some factors that greatly impact these strategies include customer purchase history, browsing behaviour, demographic information, and social media interactions. Product recommendation systems, automated advertising campaigns, predictive consumer analytics, and customer retention analysis are some of the applications that were found to improve corporate performance, customer engagement, and satisfaction. Data privacy and security worries, high implementation costs, a shortage of trained specialists, and algorithmic complexity are some of the ongoing obstacles to the widespread use of AI-driven systems. Regardless of these caveats, the study stresses that machine learning and artificial intelligence give organisations a leg up in the fast-paced digital marketplace by improving decision-making, streamlining operations, and fostering long-term growth.

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