Chapter 11
Leveraging Data Analytics for Predictive Consumer Behavior Modelling

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ABSTRACT

The chapter explores the transformational power of AI-driven data analytics in predicting consumer behaviour, examining sophisticated tools, approaches, and strategies influencing this field. It starts with an overview of the chapter's topic, highlighting the basic ideas of data analytics and its relevance to forecasting consumer behaviour. The chapter delves into sentiment analysis, predictive modelling, and conventional and digital approaches, emphasizing the significance of machine learning, IoT, big data, and blockchain technology. It further discusses new developments in AI, trends in predicting consumer behaviour, and the importance of data-driven decision-making. The proposed chapter aims to summarise key insights and offer a comprehensive understanding of data analytics in anticipating customer behaviour, thus bridging the gap between theoretical concepts and practical applications in the advertising industry.

INTRODUCTION

Incorporating data analytics into organizations' fundamental strategy is causing a paradigm change in the modern business landscape. Businesses looking to gain a competitive edge now need to be able to forecast and comprehend customer behavior as sectors grow more and more data-centric (Smith, 2018). This chapter explores the approaches, strategies, and cutting-edge technologies that are reshaping the predictive analytics landscape as it explores the revolutionary power of data analytics in clarifying the intricacies of consumer behavior. Big data and analytics technology developments have given firms access to never-before-seen volumes of customer data. Businesses must rethink how they approach customer behavior analysis due to the opportunities and difficulties presented by this data inflow (Jones & Brown, 2019). Traditional market research techniques are no longer sufficient to understand customer behavior; businesses use advanced data analytics to glean valuable insights from the deluge of available data

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(Tariq, 2025). Consumer behavior is a complex phenomenon impacted by various internal and external influences. It studies people's decision-making processes and behaviors when they purchase and use items (Solomon, 2019). In the past, companies used market research and demographic data to identify their target market. However, these traditional methods frequently needed more detail to understand the many nuanced aspects of consumer decision-making. In the dynamic and linked digital world, businesses increasingly realize that old methods still need to be improved (Schmitt, 2019). The growth in social media interactions, internet purchases, and linked device proliferation has produced unprecedented data. To effectively use this data, a paradigm changes from conventional procedures to sophisticated analytics techniques that can sift through and glean insightful information from the enormous amount of data is necessary (Verhoef et al., 2020).

Understanding the foundations of consumer behavior is essential before diving into the details of AI's influence. The procedures and actions people take to find, acquire, use, and assess goods and services are all included in consumer behavior. Conventional approaches to comprehending consumer behavior frequently depended on observational research, focus groups, and surveys. The knowledge of customer preferences, motives, and decision-making processes has been revolutionized because of the introduction of more dynamic and data-driven methodologies brought about by the arrival of AI (Smith, 2019; Tariq, 2024).

Artificial Intelligence's Ascent

One notable aspect of the emergence of AI in consumer markets is the extraordinary advancement of technology. AI's subset of machine learning has had much impact. According to Johnson (2020), the ability of systems to learn from data and change without explicit programming is a trait that greatly improves the effectiveness and precision of predictions made about customer behavior. This effect is further enhanced by natural language processing (NLP), which allows robots to comprehend, interpret, and produce language like that of humans. Another essential element is predictive analytics, which uses past data to spot patterns and trends and improves the accuracy of customer behavior estimates. One industry where AI is influencing customer behavior is e-commerce. Using user preferences and behavior analysis, machine learning algorithms provide customized product recommendations (Wang et al., 2021). In e-commerce, predictive analytics forecasts user purchasing patterns, enhancing inventory control and guaranteeing that goods are accessible when customers are most likely to purchase (Jones, 2018). Additionally, using virtual assistants and chatbots improves the purchasing experience by offering prompt, customized customer service (Chen & Wei, 2020). Artificial intelligence has a pervasive impact on consumer behavior that extends even to social media. Users are exposed to material relevant to their interests and preferences thanks to machine learning algorithms-powered targeted advertising (Li & Kannan, 2014). Another use of AI is sentiment analysis, which allows companies to determine how the public feels about their brands or goods and make timely changes to their marketing plans (Liu et al., 2017). AI is also beneficial to influencer marketing as algorithms may find influencers whose followers are like the target market of a business (Brown & Hayes, 2019). Artificial Intelligence (AI) advancements in the retail industry greatly improve the customer experience. Customers may see items in real-world situations before making a purchase with augmented reality (AR) applications, which decreases ambiguity and boosts confidence in purchasing choices (Wang & Wan, 2019). AI-powered inventory control systems minimize stockouts and overstock by optimizing stock levels (Anderson, 2021). Another