Chapter 18
The Role of Big Data in Predictive Analytics for E-Commerce:
Examine How Big Data Contributes to Better Predictions in Online Shopping

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ABSTRACT

The demand for sophisticated predictive technology to accurately assess and anticipate client behaviour has increased due to the rapid expansion of e-commerce. This study examines the influence of big data on enhancing predictive analytics for online consumers. The objective of the study is to analyse how the vast data generated by e-commerce platforms, social media, and user interactions improves the precision of predictions regarding purchasing habits. Predictive algorithms can identify patterns and trends in large datasets, enabling e-commerce platforms to enhance customer loyalty, optimise pricing strategies, and provide personalised recommendations.

1) INTRODUCTION

Several great things have been achieved with Big Data. Predictive analytics has come a long way with Big Data. E-commerce companies make use of predictive analytics to recommend products, prices to be offered, and also do a macro-level customization to get through numerous customers globally. Big Data analytics can predict demands or can just tell the particular customer demand that too within a fraction of a second, which will increase the profit ratio. Nagpur, also known as the Orange City of India, is evolving in terms of e-commerce store and application development and consumption. However,

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e-commerce companies deal in a variety of geographical areas, so predicting customers' choices and market trends accurately is challenging and quite complex. Precise forecasts of consumer requirements and efficient distribution of products are crucial for minimising expenses (Cai et al., 2021).The success of a machine learning model is contingent upon Data quality and algorithm performance. Advanced learning algorithms require training with real-world Data and domain-specific knowledge prior to making informed decisions (Sarker, 2021) and Big Data and predictive analytics utilized together can reap high benefits. Big Data makes use of Data, so predictive analytics makes use of the available Data. No new or different Data is generated, but internal tools, models, and algorithms harness the attributes of Data, whether older or recently generated. Big Data enables real-time processing that allows a business to see a changing world as it unfolds and to react to it. The new insights mean that a business is equipped to execute the present trend and influence it as it unfolds. The enormous amount of Data for enterprises becomes insight by which businesses make smarter decisions and optimize their operations. The Data is used to predict item preferences, customer behavior, and information about products and brands. The better the prediction, the better the customer experience and the resulting growth in revenue. In retail and e-commerce, effective demand models and predictive analytic techniques are needed because of rapid growth, more Data, and new technologies that can be modelled automatically. The analysis of extensive Data sets enables the recognition of characteristics that have a direct impact on purchasing intentions (Guo et al., 2020). A variety of machine learning methods, including linear regression, decision trees, and clustering algorithms, are employed to enhance prediction accuracy. The capability of these models to manage large Datasets effectively leads to improved precision in predictions (Yao, 2021) & (Alghanam et al., 2022). The Comprehensive detailed Data holds the promise of enhancing predictive models, suggesting that large Datasets can advance predictive analytics (Junqué De Fortuny et al., 2013). Large Datasets empower online retail platforms to execute targeted marketing strategies through the examination of consumer behaviour and preferences. This results in tailored suggestions and focused marketing approaches, enhancing customer satisfaction and boosting conversion rates (Luo, 2021). Because Precision marketing, customer perceived value, and e-commerce customer resources are enhanced through the utilisation of Big Data, insights into consumer behaviour, and advancements in predictive science (Liu et al., 2021). Big Data and predictive analytics utilized together can reap high benefits. Big Data makes use of Data, so predictive analytics makes use of the available Data. No new or different Data is generated, but internal tools, models, and algorithms harness the attributes of Data, whether older or recently generated. Big Data enables real-time processing that allows a business to see a changing world as it unfolds and to react to it. The new insights mean that a business is equipped to execute the present trend and influence it as it unfolds. And Big Data and Machine learning models can predict consumer purchase intentions in e-commerce, improving customer satisfaction and boosting sales by providing personalised experiences and a competitive edge (Prof. Vrushali Paithankar et al., 2023). The enormous amount of Data for enterprises becomes insight by which businesses make smarter decisions and optimize their operations. The Data is used to predict item preferences, customer behavior, and information about products and brands. Because Models for predicting online purchasing utilise indicators derived from clickstream behaviour, transactional history, and consumer demographics (Van Den Poel & Buckinx, 2005). The combination of clickstream Data with session-based attributes improves the accuracy of forecasting online customers' purchase intentions (Sakar et al., 2019). And Deep learning algorithms have the capability to forecast online purchasing behaviour and improve the targeting of marketing campaigns by utilising clickstream Data (Koehn et al., 2020). Because Clickstream Data captures shopping funnel dynamics and product and campaign variations to improve flash sales