


Chapter 4

Predictive Analytics

Starbucks use of AI to Predict Customer Behaviour and Enhance Personalization

Joshua Salvation Ikede

 <https://orcid.org/0009-0000-9963-0413>

The University of Benin, Nigeria

ABSTRACT

Starbucks deploys artificial intelligence to understand customer preferences which allows them to deliver custom product suggestions and appropriate promotions such as a recommended iced beverage when the weather is warm. The data-driven method enhances customer satisfaction and loyalty by ensuring every interaction holds more relevance for customers. Real-time optimization of inventory management and marketing strategies as well as staffing decisions is enabled by predictive analytics. The Starbucks mobile application and rewards system deliver personalized experiences that work seamlessly across different platforms. The transition towards hyper-personalization has yielded improved customer retention rates and higher revenue figures. Starbucks' strategic application of predictive analytics is examined through its technology usage and conceptual models which lead to observable performance outcomes. The conceptual model demonstrates AI's method for processing customer data to enable personalized experiences and generate feedback.

DOI: 10.4018/979-8-3373-6582-4.ch004

BACKGROUND

The application of artificial intelligence (AI) and data-driven technologies has transformed customer engagement practices with predictive analytics becoming essential. Starbucks drives industry transformation with its proprietary AI platform Deep Brew which enhances customer experiences through personalization while streamlining operations (Matharoo, 2024). The Deep Brew system from Starbucks examines large data collections that span transaction records, time elements, geographical positions, weather details, and behavioral trends to produce actionable insights (Cherian et al., 2025). Through its mobile app and loyalty platform Starbucks utilizes AI to collect behavioral insights including customer purchase patterns and seasonal shopping trends (Kamaruzzaman, 2022). The application of machine learning models enables businesses to predict customer actions so they can send individualized messages and make real-time product recommendations according to Gungunawat et al. (2024). Starbucks utilizes this system for delivering targeted promotions through push notifications, emails, and in-app messages which leads to higher conversion rates and stronger brand connections (Islam et al., 2024; Adeoye et al., 2024). The field of predictive analytics plays a crucial role in inventory and workforce planning. Starbucks combines past sales data with weather patterns and local events to create precise demand forecasts for individual store locations which allows them to maintain ideal inventory levels and staff numbers (Boinapalli et al., 2023). The adoption of these strategies produces waste reduction and operational efficiency gains. The company uses predictive tools to determine best store locations through geospatial and demographic analysis according to Gajjar's 2024 study and Babadoğan's 2024 research. Starbucks uses algorithmic reward systems within Starbucks Rewards to personalize incentives which help retain customers and maximize their lifetime value (Ng et al., 2022; Kholifah et al., 2024; Kotha, 2020). Amazon Alexa's voice-activated ordering system improves customer convenience through analysis of past data to refine preferences (Rengasamy, 2025). Starbucks leverages predictive analytics similar to successful practices in retail and insurance sectors through behavioral modeling and targeted content delivery (Adanyin, 2024; Okeke et al., 2024; Delliana & Arisandi, 2020). However, ethical issues remain. The need for governance arises because data privacy issues alongside bias and transparency concerns require attention. The authors Fedosova and Katunian (2024) emphasize the importance of ethical frameworks but note that Starbucks' policies lack complete transparency despite their data anonymization practices. Despite these concerns, the benefits are clear. According to Dutta's 2024 findings and research by Suhono et al., from 2020 AI technology enhances both customer retention rates and omnichannel operational effectiveness. Starbucks demonstrates the powerful transformational capabilities of AI in business models with its strategic deployment of predictive

26 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/predictive-analytics-starbucks-use-of-ai-to-predict-customer-behaviour-and-enhance-personalization/388519

Related Content

Taijiquan Auxiliary Training and Scoring Based on Motion Capture Technology and DTW Algorithm

Xia Feng, Xin Luand Xingwei Si (2023). *International Journal of Ambient Computing and Intelligence* (pp. 1-15).

www.irma-international.org/article/taijiquan-auxiliary-training-and-scoring-based-on-motion-capture-technology-and-dtw-algorithm/330539

Evolutionary Game Model of Information Sharing Behavior in Supply Chain Network With Agent-Based Simulation

Jian Tan, Guoqiang Jiangand Zuogong Wang (2019). *International Journal of Intelligent Information Technologies* (pp. 54-68).

www.irma-international.org/article/evolutionary-game-model-of-information-sharing-behavior-in-supply-chain-network-with-agent-based-simulation/225069

FPGA on Cyber-Physical Systems for the Implementation of Internet of Things

Rajit Nair, Preeti Nairand Vidya Kant Dwivedi (2020). *FPGA Algorithms and Applications for the Internet of Things* (pp. 82-96).

www.irma-international.org/chapter/fpga-on-cyber-physical-systems-for-the-implementation-of-internet-of-things/257556

Appraise the Economic Values of Logistic Handling System under Mixed Information

Anoop Kumar Sahu, Nitin Kumar Sahuand Atul Kumar Sahu (2017). *Theoretical and Practical Advancements for Fuzzy System Integration* (pp. 278-308).

www.irma-international.org/chapter/appraise-the-economic-values-of-logistic-handling-system-under-mixed-information/174738

Smart Prediction Farming Using Deep Learning and AI Techniques

Ashok Singh Gaur, C. S. Raghuvanshi and Hari Om Sharan (2024). *Sustainable Development in AI, Blockchain, and E-Governance Applications* (pp. 152-170).

www.irma-international.org/chapter/smart-prediction-farming-using-deep-learning-and-ai-techniques/338958