Chapter 3
Application of Artificial Intelligence to Enhance Business Intelligence for Increasing Customer Involvement in FMCG Industry

P. S. Venkateswaran
https://orcid.org/0000-0001-8958-103X
PSNA College of Engineering and Technology, India

S. Manimaran
PSNA College of Engineering and Technology, India

M. Sriramkumar
PSNA College of Engineering and Technology, India

Latha Thamma Reddi
https://orcid.org/0009-0005-6338-7972
DXC Technology, USA

Sandeep Rangineni
https://orcid.org/0009-0003-9623-4062
Pluto TV, USA

Divya Marupaka
https://orcid.org/0009-0005-1893-4842
Unikon IT Inc., USA

ABSTRACT

Artificial intelligence (AI) has emerged as a transformative force across various industries, revolutionising how we live, work, and interact with technology. Its impact is profound, and its applications are multifaceted, garnering a spectrum of reviews – from enthusiastic acclaim to cautious apprehension. One of AI's most lauded strengths is its ability to enhance efficiency and productivity. In the business world, AI streamlines processes and tasks and delivers data-driven insights, thereby reducing operational costs and improving decision-making. The applications of AI in data analysis and predictive modelling have garnered widespread praise. From financial institutions using AI to detect fraudulent transactions to healthcare organisations utilising it for early disease diagnosis, the capacity of AI to process vast amounts of data quickly and accurately is undeniable. The reviews here are glowing, emphasising AI's ability to save time, reduce errors, and improve the quality of outcomes.

DOI: 10.4018/979-8-3693-5951-8.ch003

INTRODUCTION

In today's hyper-connected and data-driven world, businesses are constantly inundated with vast volumes of information. This avalanche of data holds the potential to provide invaluable insights, but without the right tools and methodologies, it can be overwhelming (Alayli, 2023). This is where Artificial Intelligence (AI) steps in as a game-changer, revolutionising the field of Business Intelligence (BI) (Eulogio et al., 2023). By harnessing the power of AI, organisations can streamline their operations and decision-making processes and gain a competitive edge in an increasingly dynamic and competitive marketplace (Jasper et al., 2023).

The concept of Business Intelligence itself has evolved significantly over the years. Initially, BI primarily involved collecting and analysing historical data to generate reports and dashboards, which helped understand past performance (Atasever, 2023). However, in the age of AI, BI has taken a quantum leap, transitioning from a rear-view mirror approach to a predictive and prescriptive one. It now empowers businesses to anticipate trends and make real-time data-driven decisions (Ashraf, 2023).

AI, a branch of computer science dedicated to creating intelligent machines capable of mimicking human cognitive functions, has emerged as a formidable tool for enhancing Business Intelligence (Geethanjali et al., 2023). It has significantly expanded the horizons of BI, offering new and innovative ways to collect, process, analyse, and interpret data. This combination of BI and AI, often called AI-driven BI, can unlock valuable insights previously hidden within the labyrinth of data (Janabayevich, 2023).

One of the most compelling applications of AI in BI is the automation of data analysis. Traditional BI tools require manual data entry, and the analysis often depends on predefined rules and queries (Pandit, 2023). Conversely, AI can automate the process of data cleansing, normalisation, and analysis, saving time and reducing the risk of human error. Machine learning algorithms can identify patterns and anomalies in data that might be overlooked by human analysts, leading to more accurate and actionable insights (Kolachina et al., 2023).

AI-driven BI also empowers businesses to perform advanced predictive analytics. By leveraging machine learning models, organisations can accurately forecast future trends, customer behaviours, and market fluctuations (Lavanya et al., 2023). This predictive capability allows businesses to proactively adjust their strategies, optimise inventory, and enhance customer experiences (Singh et al., 2023). For example, in the retail industry, AI can analyse historical sales data, seasonality, and external factors like weather to predict demand for specific products. This ensures optimised stocking and reduces losses due to overstocking or understocking.

AI can provide a deeper understanding of customer preferences and behaviours. Natural Language Processing (NLP) algorithms can analyse customer reviews, comments, and social media interactions to extract sentiment analysis (Lishmah Dominic et al., 2023). This insight enables organisations to fine-tune their marketing strategies and improve product offerings based on real-time customer feedback (Singh et al., 2023a). AI-powered chatbots and virtual assistants can also enhance customer service by responding to customer inquiries and resolving issues 24/7, improving customer satisfaction and reducing response times (Sabarirajan et al., 2023).

Moreover, AI enhances data visualisation and reporting. Traditional BI tools often provide static reports and dashboards, limiting the depth of analysis and interactivity (Singh et al., 2023b). AI-infused BI solutions can create dynamic and interactive visualisations, allowing users to explore data from different perspectives, uncovering hidden trends and insights. These visualisations provide a more intuitive way for decision-makers to grasp complex information quickly and make informed choices (Ramos et al., 2023).