Chapter 1
AI and Machine Learning Integration in Modern Business Intelligence

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ABSTRACT

In this chapter, the author goes on to describe how artificial intelligence (AI) and machine learning (ML) technologies are integrated into current business intelligence (BI) architectures to improve their operational efficiency. As business intelligence systems become more and more widely recognized for their strategic value of making decisions based on data, those systems are evolving to add in the advanced analytical capabilities. This chapter discusses such architectural concerns, implementation challenges and emerging best practices to be thought about while embedding AI and ML effectively into BI ecosystems. Focusing on the empirical research and industry case studies, we analyze how those technologies change the instance of operational intelligence by making it possible to predict, automate and discover of new underlying patterns by complex business data.

DOI: 10.4018/979-8-3373-6801-6.ch001

INTRODUCTION

In recent years, business intelligence has seen a drastic change in the way it affects support in the form of reporting, dashboard centric approaches to smart analytical system that has the ability to bring in predictive insights and prescriptive recommendations. The Manufacturers have used primarily the advancement of the artificial intelligence and machine technologies that expands the potential of the traditional BI systems capabilities (Davenport & Ronanki, 2018). Demand for operational efficiency—which can be described as the optimization of business processes to extract the maximum value possible while expending the least amount of resources possible—is increasing across almost all industries, as organizations of all kinds are realizing that business process optimization requires more than just descriptive analytics that explain what has already happened (Chen et al., 2012).

The merging of BI and AI/ML technologies is phenomenon when compared to how organizations use to approach operational intelligence. With the integration of the text into the traditional BI, it subsequently could convert the traditional BI from a retrospective posting tool into a prospective web aiding decision supervising program that is learnable and adjustable (Wang et al., 2018). Organizations that effectively integrate AI in its analytical practices enjoy the huge competitive advantages in terms of increased operational efficiency, increased decision quality, and shortened innovation cycles as hinted by Davenport (2018).

This chapter analyzes architectural frameworks, methodological approaches, as well as organizational aspects related to adopting of AI and ML capabilities in modern BI systems. We examine how these technologies boost operational efficiency by automated pattern detection, anomaly identification as well as intelligent decision supports. We additionally talk about how organizations are confronting difficulties in actualizing AI driven BI arrangements and the manner by which they can tend to issues, for example, low data quality, inability to assemble abilities and administration.

This chapter hopes to build on the work of recent papers that frame business intelligence as an essential contribution to improving business performance and operations efficiency and provides a comprehensive analysis of the scope of current research and industry practices so that BI practitioners, IT leaders and business stakeholders can develop robust and AI-enhanced business intelligence architecture that leads to measurable improvement on business performance and operations efficiency.