

An Intelligent Approach to Data Quality Management AI-Powered Quality Monitoring in Analytics

Kevin N. Shah¹, Sandip J. Gami², Abhishek Trehan³

Independent Researcher, Comcast Corp, Ashburn, United States¹

Independent Researcher, Marriott, Ashburn, United States²

Independent Researcher, Middletown, DE, United States³

Abstract: *This study explores an intelligent approach to data quality management using AI-powered quality monitoring systems. Traditional data quality processes often rely on manual interventions, which are time-consuming, error-prone, and incapable of handling the increasing volume and complexity of modern datasets. AI-driven solutions address these limitations by leveraging machine learning, automation, and anomaly detection to continuously monitor, detect inconsistencies, inaccuracies, and missing values across data pipelines. AI-powered systems not only ensure data integrity but also optimize data processing workflows, reducing the need for human oversight. Additionally, automated monitoring provides actionable insights for proactive issue resolution, thereby improving overall data governance and analytical outcomes. This paper highlights the benefits of implementing AI-based quality monitoring, including improved accuracy, scalability, and efficiency in data management processes. The study concludes that AI-powered data quality management is a transformative solution for businesses seeking to maintain high-quality data in a dynamic and complex analytics landscape. Accurate analytics and successful decision-making in today's data-driven economy depend on ensuring data quality. An insightful method for managing data quality using quality monitoring systems driven by AI is presented in this paper. Automated statistics cleansing, anomaly detection, and real-time consistency assurance are three ways in which AI-driven solutions tackle these problems. A.I. improves data correctness, finds mistakes, gets rid of duplicates, and fills in gaps in datasets by using machine learning algorithms, predictive analytics, and anomaly detection methods. In addition, AI systems keep a close eye on data pipelines, offering insights and solutions to prevent data breaches in real time. Data management scalability, efficiency, and dependability are all enhanced by this method, which also decreases the need for human involvement. The results show that analytics systems are much improved with AI-powered data quality management, which helps businesses get better insights and make better choices. We can get high-quality data, optimised processes, and enhanced analytical findings by incorporating AI into data quality frameworks, according to this research*

Keywords: Data Quality Management, Artificial Intelligence (AI), Quality Monitoring, Machine Learning, Anomaly Detection