## **Title:**  Integrating Big Data and Traditional Data Warehousing: Enhancing Business Intelligence **Author:** Balarama Raju Saripalli **Course:** MSDS655: Business Intelligence **Instructor:** Dr. Jelena Vucetic

# **Integrating Big Data and Traditional Data Warehousing: Enhancing Business Intelligence**

## **Abstract:**

This paper examines the integration of Big Data technologies with traditional data warehousing to improve business decision-making capabilities. It reviews recent advancements and explores how these integrations enhance analytical capabilities and solve complex business challenges. Through a survey of current literature, the paper discusses technological synergies and potential business impacts.

## **Introduction:**

In the realm of business intelligence, integrating Big Data with traditional data warehousing has become increasingly crucial. Traditional data warehouses excel in handling structured data, providing depth through detailed, cleansed, and structured information optimized for accurate and consistent querying. This makes them ideal for analyses where historical data accuracy is critical, such as financial reporting and trend analysis. On the other hand, Big Data technologies specialize in managing a broad array of data types: structured, semi-structured, and unstructured—at high velocities. Systems like Hadoop and NoSQL databases are designed to handle vast volumes of data that traditional systems cannot, enabling real-time processing and insights from diverse data sources such as social media feeds and IoT devices.the integration of these two data systems fosters a comprehensive business intelligence framework that leverages both the precision of data warehousing and the agility of Big Data. This is often achieved through modern data architectures that include data lakes and hybrid data warehousing models.

## **Literature Review:**

## **Big Data Characteristics and Advantages:**

Big Data is characterized by its volume, velocity, and variety, offering unprecedented analytics capabilities that traditional data warehouses cannot match. It supports complex predictive models and real-time analytics, enabling businesses to respond quickly to changing conditions.

## **Traditional Data Warehousing:**

Traditional data warehouses provide structured data storage, optimized for quick retrieval and consistent performance over time. They excel in handling well-defined, structured data and are essential for historical data analysis and reporting.

## **Trends in Integration:**

Recent literature, including articles from Springer and Gale, highlights an increasing trend towards integrating Big Data frameworks like Hadoop with traditional data warehouses. This integration allows businesses to leverage real-time data processing with robust data storage and querying capabilities.

## **Methodology:**

This study employs a comprehensive literature review, focusing on articles published in the last six months to capture the most recent developments. Research was conducted using academic databases, with keywords such as "Big Data", "Data Warehousing", and "Business Intelligence".

## **Findings:**

The research indicates significant benefits from integrating Big Data with traditional data warehouses. For example, companies have improved their analytics capabilities, enabling more accurate forecasting and better strategic decisions. Technologies such as data lakes and hybrid data warehousing models have been crucial in these integrations.

## **Discussion:**

The integration of Big Data technologies and traditional data warehouses presents both opportunities and challenges. While it enhances data processing capabilities and supports more complex analyses, it also requires significant investments in technology and expertise. Businesses must carefully plan these integrations to overcome challenges such as data quality issues and system complexity.

## **Conclusion:**

Integrating Big Data with traditional data warehousing is proving to be a valuable strategy for enhancing business intelligence. As technologies continue to evolve, businesses that successfully manage this integration will gain a competitive edge by making more informed decisions faster. Future research should focus on developing cost-effective integration strategies and exploring the impact of emerging technologies such as AI and machine learning on data warehousing.

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