Utilizing Big Data Analytics and Business Intelligence for Improved Decision-Making at Leading Fortune Company

Abstract

The present study evaluates Walmart's existing big data analytics with business intelligence techniques, accentuating their strengths and weaknesses, and suggests improvements for implementation and maintenance through the literature review of the scholarly journals addressing similar topics.Big data analytics is receiving loads of attention globally in the business environment within every sector of the economy. Incorporating the job plan as an additional input component in their models would be beneficial for Walmart to improve the precision and appropriateness of their data analysis and decision-making procedures. Walmart is a company that heavily invests in utilizing big data to improve its operations; this includes optimizing in-store experiences and predicting product trends. Walmart's success in big data analytics is due to a data-driven culture and advanced infrastructure, including the Data Café

Keywords: big data analytics, information technology, business intelligence, Walmart

Introduction

Big data analyticsis receiving loads of attention globally in the business environment within every sector of the economy (Bogdan & Borza, 2019). The analytical methods for solving critical business problems link business intelligence and big data for organizations (Mariani et al.,

2018). However, considerable investments in money, time, and human resources have been made in big data analytics to foster ongoing advancement and progress in this field (Bogdan & Borza, 2019).Olaniyi et al. (2017) accentuated the considerable expectation of information technology (IT) in the 21stcentury for retail businesses, considering the amount of data available for analysis as the conventional method no longer serves the purpose. Although, despite the success many business enterprises have experienced with big data analytics, the investigation into these assertions is neither there nor here (Bogdan & Borza, 2019). What specific circumstances are required to guarantee favorable outcomes from embracing big data and business intelligence strategy remains to be determined (Bogdan & Borza, 2019). This paper aims to dissect the literature on big data analytics and business intelligence, specifically concerning Walmart.; the number one ranked Fortune 1000 company in the year 2023 (Fortune, 2023). Evaluate Walmart's existing big data analytics with business intelligence techniques, accentuating their strengths and weaknesses, and suggest improvements for implementation and maintenance through the literature review of the scholarly journals addressing similar topics.

Brief History of Walmart

Established on July 2, 1962, Walmart opened its first store in Rogers, Arkansas, on the same day (ProjectPro, 2023). The retail giant has more than 10,900 stores, ten active websites, and a customer base of over 245 million (ProjectPro, 2023). The company is top-rated on social media, resulting in significant data gathering for business insights (ProjectPro, 2023). Walmart's daily revenue is over $36 million, receiving over 45,000 social media mentions daily (ProjectPro, 2023). The company's focus on business intelligence and big data analytics helps to improve the emotional intelligence quotient (EIQ) of both customers and employees, leading to an excellent customer and employee experience (CEIQ) and business sustainability (ProjectPro, 2023).

Walmart's Approach to Big Data Analytics With Business Intelligence

To compete, the company employs big data analytics and business intelligence to enhance various aspects of its business, such as in-store optimization, demand forecasting, market analysis, and product predictions (ProjectPro, 2023). Hence, by collecting 2.5 petabytes of unstructured data from one million customers every sixty minutes, the company can increase its operational efficiency and provide value to customers and shareholders (ProjectPro, 2023).However, to better understand its customers, Walmart's data analytics culture uses business intelligence and big data to analyze customer sentiments, behavior, preferences, emotions, and feelings, and craft its offerings to meet their needs, resulting in an enhanced customer experience (ProjectPro, 2023). Further, Walmart uses big data analytics to examine employee data, including engagement levels, skills, performance metrics, and feedback, to identify areas where extra training, assistance, support, or recognition may be needed, fostering a learning and growth culture among staff (ProjectPro, 2023). In 2012, Walmart upgraded to a 250-node Hadoop cluster and acquired Inkiru Inc. to enhance targeted marketing, customer insight, merchandising, promotions, and fraud deterrence (ProjectPro, 2023).

What Walmart is Doing Right

Walmart has constructed its Data Café – a state-of-the-art analytics center in Bentonville, Arkansas (Marr, 2021); this sophisticated system allows the company to collect, analyze, and interpret large amounts of big data to improve customers' shopping experiences (Marr, 2021). The company uses big data analytics and solid business intelligence tools to enhance its customers' shopping experiences (ProjectPro, 2023). Walmart has developed several applications and tools to help customers save and shop better, such as Savings Catcher, eReceipts, and a mapping app using Hadoop (ProjectPro, 2023). The company also uses Mupd8 to collect data

from social media channels to determine what products to promote in physical stores or online (ProjectPro, 2023). For personalized insights, Walmart uses advanced technology to gather data from point-of-sale transactions, in-store Wi-Fi tracking, and Walmart.com clicks (ProjectPro, 2023). Through algorithms and data mining, Walmart can identify trends in point of sales (POS) data to improve the shopping experience for customers (ProjectPro, 2023).

What Walmart is Doing Wrong

According to Reed (2023), Walmart had experienced several data breaches, with the latest in January 2021, when the company underwent a data breach due to a security susceptibility on their Canada website, which granted unauthorized entrance to customer data. Hence, inadequate security protocols harm big data analytics, leading to data inaccuracy and reputational damage, and may lead to regulatory sanctions (Mühlhoff, 2021).

Suggestions for Improving Big Data Analytics and Business Intelligence Implementation and Maintenance

To achieve more effective decision-making, enhanced customer experiences, and sustainable growth, Walmart can make the most of its big data by concentrating on these improvement areas:

- To stay competitive, Walmart must embrace new technologies and continue investing considerable resources in a big data strategy to maintain its market leader status and yield benefits (Bogdan & Borza, 2019).
- To build trust among stakeholders, monitor data ethics, and gain valuable insights, Walmart should prioritize transparency in its information governance tactics for managing big data and reporting (Mühlhoff, 2021).

- To efficiently handle and evaluate vast quantities of data, Walmart should consider using reliable cloud computing services, allowing faster analysis and decision-making in their business operations(Mariani et al., 2018).
- To ensure fair and unbiased practices, Walmart must address involuntary decision-making biases that negatively impact business performance and decision-making processes (Sen et al., 2020).
- Incorporating the job plan as an additional input component in their models would be beneficial for Walmart to improve the precision and appropriateness of their data analysis and decision-making procedures (Bogdan & Borza, 2019).
- To handle data responsibly and ethically. Walmart must adopt ethical AI practices that meet the standards set by laws and ensure that its data ethics align with data privacy regulations (Mühlhoff, 2021).

Literature Review

The literature review analyzes Walmart's successful integration of Big Data Analytics with its Business Intelligence which has gained dominance within its industry. Additionally, the review combines insights from 9 peer-reviewed scholarly articles on integrating Big Data Analytics and business intelligence, highlighting gaps and problems identified in the literature. The review also explores the broader issue and sheds light on other companies, such as Twitter, Walmart, Toyota, Facebook, Netflix, Microsoft, Nike, and Meta, which have attempted to address this issue using scholarly research.

Customer Insights, Understanding, and Satisfaction for Business Success

The problem is that Walmart Stores encounter problems gathering and handling relevant insights using suitable data analytics and business intelligence tools for their operations for

consumers satisfaction and stock management; hence, they seek a 360-degree holistic view of their consumers to compete and make a profit (Singh et al., 2017). The company employed big data tools such as Hadoop MapReduce, Apache Spark, and other appropriate tools for data analysis and visualization to examine historical data and boost business forecasts for subsequent years to gain invaluable insights and comprehend what consumers want at different contact points (Singh et al., 2017).The research question was not specified; however, the methodology quantitatively analyzes a three-year dataset from 45 outlets in various locations containing weekly sales data and other variables like temperature, fuel price, unemployment rate, and holidays that impact sales (Singh et al., 2017).In the data analysis, Apache Spark and its diverse libraries served as a tool to analyze the dataset and pinpoint correlations between sales and the influencing factors specified. Also, Scala and Python APIs of Spark SQL assisted in gaining new insights into consumer behavior and a better understanding of Walmart's marketing efforts and data-driven approach, thanks to the framework (Singh et al., 2017). The outcome shows multiple factors to consider in developing compelling big data strategies, such as temperature, unemployment rates, fuel prices, and holidays. Also, to sustain a competitive edge, advanced data analytics tools like MapReduce and Apache Spark will help derive relevant insights from big data (Singh et al., 2017).

Business Intelligence and Big Data AnalyticsImprove Large Data Analysis

Mariani et al. (2018) studied the influence of business intelligence and big data in academic research related to hospitality and tourism published in 2016 to recognize research gaps and future developments and create room for further research. Thus, the analytical methods for solving critical business problems link business intelligence and big data for organizations (Mariani et al., 2018). The author did not specify a particular research question. The method is a

thorough review of academic articles that concentrates on various analyses of business intelligence and big data (Mariani et al., 2018). However, data analytics used a systematic quantitative approach to analyze these articles, research topics, data sources, collection, and visualization (Mariani et al., 2018). The research outcome showed that hospitality and tourism management had witnessed an increase in analytical techniques for handling large amounts of data (Mariani et al., 2018).

Impact of Big Data and Business Intelligence Techniques for Social Media Marketing

Chun et al. (2021) research explored the impact of social media fan-page posting kinds and content topics on subscribers' interactions to resolve if there are any palpable contrasts among content topics on the Toyota Facebook page. The company has problems with appropriate big data analytics and business intelligence to convert social media leads to sales; thus, it is seeking to select the proper business intelligence technique for social media marketing and engagement and using appropriate big data analysis to evaluate the weight of social media marketing (Chun et al., 2021). The authors did not construct research questions but developed three hypotheses to examine if higher posting activities on a fan page lead to increased engagement and are influenced by sentiment polarity (Chun et al., 2021). The methodology to test the hypothesis is a quantitative analysis of social media data gathered on Facebook (Chun et al., 2021). The authors used R and SAS in their data analysis to model the topics of subscribers' fan-page postings; thus, they employed a negative binomial regression model to analyze reactions and interaction as exploratory variables to define the significance of social media marketing (Chun et al., 2021). The outcome shows that the kind of post is the most significant stimulating element for content topics, posts sentiments, social-media engagement, and comments (Chun et al., 2021).

Effect of Big Data Analytics on Organizational Management

Said et al. (2023) explored the effect of big data analytics capacities on Facebook sustainability reporting disclosure. It also examined how specific characteristics of Facebook's leadership can moderate the relationship between big data analytics and sustainability reporting disclosure (Said et al., 2023). The company needs help ensuring transparency across all aspects of information governance and big data analytics management (Said et al., 2023). The abundance of data generated from social network activities has caused an information overload, making it challenging for subscribers to make informed decisions (Said et al., 2023). The researchers did not mention what their specific questions were for the study. However, The methodology applies a combination of quantitative feedback from a questionnaire answered by 320 companies listed on Bursa Malaysia and quantitative analysis of CEOs' assertions in 2019 sustainability reports (Said et al., 2023). The authors used structural equation modeling for data analysis of the questionnaire and DICTION software devised by Hart (2000; Said et al., 2023) to analyze CEOs' assertions in 2019 sustainability reports (Said et al., 2023). The outcome of the analysis revealed that big data analytics capacities strongly influence Facebook sustainability reporting disclosure (Said et al., 2023).

Impact of Big Data Mining and Analyticson Business Intelligence

Rodrigues et al. (2021) described the essence of Twitter's big data mining impact on social networks worldwide. The problem is that Twitter needs help tracking subscribers' numerous activities to flag undue postings that infringe on its data policies; thus, the company conducts real-time analysis for governance and trend detection utilizing artificial intelligence (AI) and machine learning algorithms (Rodrigues et al., 2021). Twitter needs big data mechanisms and procedures to extract applicable data from the endless stream of information

from various activities on the platform (Rodrigues et al., 2021). The authors did not build research questions. The quantitative method employs lexicon-based techniques and polarity multiplication to recognize emotions in tweets and Machine learning algorithms like Naïve Bayes, SVM, and KNN for emotions analysis (Rodrigues et al., 2021). The data analysis gathered static and real-time data on Twitter using distinct methods and algorithms with a deep analysis of the efficiency and exactness of the various techniques (Rodrigues et al., 2021). The outcome shows that Twitter is a diverse platform with a global user base that requires robust analysis (Rodrigues et al., 2021). Hence, the Big Data Apache SPARK tool analyzes real-time tweets more efficiently with 83% efficiency. Also, LDA and Jaccard are practical procedures for scrutinizing static data with 74% efficiency (Rodrigues et al., 2021).

Leveraging Big Data for Accurate Sales Forecasting

Boldt et al. (2016) examined the accuracy of sales forecasts for Nike using social media data generated from social media. Nike encounters the challenge of inaccurate sales predictions (Boldt et al., 2016). To combat this, they use a sales framework incorporating the AIDA framework into their marketing strategies, allowing Nike to leverage digital platforms to make informed decisions, maximize marketing efforts, and boost customer engagement, ultimately leading to improved sales and profitability (Boldt et al., 2016). The authors developed five research questions on how analyzing social media data can enhance Nike's sales forecasting exactness, including single and multiple variable studies, data from multiple pages, and search query data (Boldt et al., 2016). The methodology is quantitative data from Nike's Facebook pages, including the daily likes, comments, and posts recorded and a review of historical data of Nike's financial reports using its quarterly sales figure (Boldt et al., 2016). The data analysis employed the Social Set Visualizer (SoSeVi) to analyze the business's quantitative and historical

secondary data using simple regression and multiple regression models (Boldt et al., 2016). The outcome of the analysis shows that social network data does have edifying value for sales forecasts.

Big Data Mining and Organizational Performance

Bogdan and Borza (2019) performed an exhaustive meta-analysis examination of practical papers concentrating on big data mining and organizational performance. The objective is to check that numerous investments in money, time, and human resources in big data analytics and business intelligence to foster ongoing advancement and progress in this field yield results (Bogdan & Borza, 2019). The is no research question. The methodology analyzed case studies from 2010 to 2019 to determine the benefits of big data analytics in businesses; the authors employed a meta-analysis procedure to integrate data and pinpoint substantial outcome dissimilarities (Bogdan & Borza, 2019). Data analytics is an empirical study that reviewed 37 scholarly articles on meta-analysis (Bogdan & Borza, 2019). The research outcome corroborates that utilizing big data analytics is essential for improving organizational performance (Bogdan & Borza, 2019).

Big Data Analytics Enhances Consumer Experience and Grows Subscriber Base

According to Maddodi and Krishna (2019), Netflix began in 1997 as a DVD-by-mail service. However, it has since evolved into a streaming organization that provides a wide range of movies, television shows, and original content (Maddodi & Krishna, 2019). The company has over 32.5 million subscribers (Maddodi & Krishna, 2019). Netflix utilizes big data analytics to comprehend its business environment, gain consumer insights and offer improved customer service (Maddodi & Krishna, 2019). Thus, The company collects a large amount of data from its subscribers, including information about their location, the content they engage with, their

interests, their search history, and when and what they watch through using an algorithm that aligns with the user's distinctive appeals (Maddodi & Krishna, 2019). The problem is using big data and business intelligence to increase its customer base (Maddodi & Krishna, 2019). The author did not state the research question. The methodology is a qualitative analysis using the SWOT and PESTLE to establish that big data analytics can increase consumer engagement (Maddodi & Krishna, 2019). There is no stated data analysis; however, the conclusion reveals that big data analytics boosts consumer experience and increases the subscriber base (Maddodi & Krishna, 2019).

Big Data Analytics for Predictive Analysis

According to Sen et al. (2020), Microsoft recommends allotting sufficient resources for big-data queries to guarantee maximum performance in serverless business ecosystems, optimizing operational efficiency, capacity availability, and query predictability while minimizing unnecessary wait times. The problem is that insufficient resources to handle big-data queries in serverless business ecosystems are causing poor performance; the authors investigated the efficiency of AutoToken as a predictor for estimating resource usage of recurring big-data queries by employing plan identifiers, learning models to reduce over-allocation (Sen et al., 2020). The authors did not mention the research questions. The method utilizes learning models to minimize over-allocation and smoothly integrates with Microsoft's Peregrine workload optimization infrastructure (Sen et al., 2020). The data analysis assessed AutoToken on SCOPE jobs in the production clusters and proved that it outperforms other sophisticated solutions for peak resource estimation (Sen et al., 2020). The study's outcome reveals that AutoToken is effective on a large scale, lightweight, and easy to execute (Sen et al., 2020).

Research Questions

Scholarly works by Singh et al. (2017), Rodrigues et al. (2021), Chun et al. (2021), Said et al. (2023), Maddodi and Krishna (2019), Sen et al. (2020), Bogdan and Borza (2019), and Mariani et al. (2018) lacked research questions. In contrast, Boldt et al. (2016) presented a series of research questions focused onNike's sales forecasting using big data analytics as listed below:

1) How much can the performance of a single variable on a Facebook page predict Nike's sales with accuracy?
2) How effective is using multiple variables from a single Facebook page in generating accurate forecasts of Nike's sales?
3) How much can the combination of multiple Facebook pages enhance the accuracy of sales forecasting?
4) In what ways can search query data enhance the accuracy of sales forecasting?
5) Does Nike's real-world events influence social media activity, specifically on Facebook?

Methodology

The authors employed various techniques to investigate the integration of big data analytics with business intelligence; likewise, they employed several methodologies in the studies conducted by different researchers. Singh et al. (2017) utilized a quantitative analysis approach, gathering a three-year dataset from 45 outlets to examine the impact of variables like temperature, fuel price, unemployment rate, and holidays on sales. Rodrigues et al. (2021) also adopted a quantitative method, employing lexicon-based techniques and polarity multiplication to recognize tweet emotions. They used machine learning algorithms for emotion analysis, including Naïve Bayes, SVM, and KNN. Chun et al. (2021) focused on testing their hypothesis through a quantitative analysis of social media data collected from Facebook.

Further, Said et al. (2023) combined quantitative feedback from a questionnaire with a quantitative analysis of CEOs' assertions in 2019 sustainability reports. Boldt et al. (2016) utilized quantitative data from Nike's Facebook pages, encompassing daily likes, comments, and posts, and a review of historical data from Nike's financial reports. Bogdan & Borza (2019) performed a methodology that involved analyzing case studies from 2010 to 2019, employing a meta-analysis to integrate data and identify significant outcome dissimilarities. Maddodi & Krishna (2019) employed qualitative analysis techniques, such as SWOT and PESTLE, to establish the potential increase in consumer engagement through big data analytics. Sen et al. (2020) utilized learning models that minimize over-allocation and smoothly integrate with Microsoft's Peregrine workload optimization infrastructure. Lastly, Mariani et al. (2018) conducted a comprehensive review of academic articles, focusing on various analyses of business intelligence and big data.

Data Analysis

The authors used different approaches for data analysis. Apache Spark and its diverse libraries served as a tool to analyze the dataset and pinpoint correlations between sales and the influencing factors specified. At the same time, the Scala and Python APIs of Spark SQL assisted in gaining new insights into consumer behavior and a better understanding of Walmart's marketing efforts and data-driven approach, thanks to the framework (Singh et al., 2017). The analysis also gathered static and real-time data on Twitter using distinct methods and algorithms, with a deep analysis of the efficiency and exactness of the various techniques (Rodrigues et al., 2021). Additionally, R and SAS were used in the data analysis to model the topics of subscribers' fan-page postings, employing a negative binomial regression model to analyze reactions and

interaction as exploratory variables to define the significance of social media marketing (Chun et al., 2021).

Furthermore, the empirical study of data analytics reviewed 37 scholarly articles on meta-analysis (Bogdan & Borza, 2019). Structural equation modeling and DICTION software devised by Hart (2000; Said et al., 2023) analyzed CEOs' assertions in 2019 sustainability reports (Said et al., 2023). The analysis also involved using the Social Set Visualizer (SoSeVi) to analyze the business's quantitative and historical secondary data (Boldt et al., 2016). Additionally, AutoToken was assessed in the data analysis on SCOPE jobs in the production clusters, proving its superiority over other sophisticated solutions for peak resource estimation (Sen et al., 2020). The data analytics approach adopted a systematic quantitative approach to analyze articles, research topics, data sources, collection, and visualization (Mariani et al., 2018).

Conclusion

The outcomes of various scholarly articles reviewed highlight several factors to consider when developing compelling big data strategies and maintaining a competitive edge; it is crucial to leverage advanced data analytics tools such as MapReduce and Apache Spark and many more, as they enable extracting relevant insights from large datasets (Singh et al., 2017). Likewise, the type of social media posts plays a significant role in influencing content topics, sentiment, social media engagement, and comments (Chun et al., 2021). While social network data can furnish valuable insights for sales forecasts, it also offers challenges related to multiple regressions and perfect multicollinearity, particularly when analyzing specific events related to brands like Nike (Boldt et al., 2016).

Big data analytics with business intelligence can improve organizations' performance, consumer experiences, and subscriber numbers (Bogdan & Borza, 2019); studies emphasize its

importance for growth, insights, and informed decision-making for an organization (Maddodi & Krishna, 2019). Walmart is a company that heavily invests in utilizing big data to improve its operations; this includes optimizing in-store experiences and predicting product trends. Walmart's success in big data analytics is due to a data-driven culture and advanced infrastructure, including the Data Café (Marr, 2021). However, maintaining data security and privacy is challenging, as seen in Walmart's data breaches (Reed, 2023). Inadequate security protocols can harm analytics accuracy, causing negative consequences like damage to reputation and regulatory action (Mühlhoff, 2021).

Big data analytics and business intelligence are crucial for success and innovation in business to sustain a competitive edge, and integrating big data analytics with business intelligence has revolutionized decision-making for many organizations (Mariani et al., 2018). Many Fortune 1000 companies have implemented unique techniques and platforms to tackle their big data challenges by adopting best practices and exploring innovative solutions; therefore, businesses can improve performance, enhance customer experiences, and achieve sustainable growth (Rodrigues et al., 2021). Big data poses several challenges, especially when storing and analyzing unstructured data, and managing these large amounts of complex data is challenging, requiring much effort to mine through the data (Bogdan & Borza, 2019). Organizations must adapt to emerging technologies to reap the full benefits of big data; however, the process will consume massive resources (Bogdan & Borza, 2019), particularly for larger entities like Fortune 1000 companies if they are willing to keep the market leadership they enjoy; embracing big data analytics with business intelligence remains an attractive investment (Bogdan & Borza, 2019).

References

Bogdan, M., & Borza, A. (2019). Big data analytics and organizational performance: meta-

Analysis study. *Management and economics review*, 4(2), 147–162. https://doi.org/10.24818/mer/2019.12-06

Boldt, L.C., Vinayagamoorthy, V., Winder, F., Schnittger, M., Ekran, M., Mukkamala, R. R., Lassen, N. B., Flesch, B., Hussain, A., & Vatrapu, R. (2016). Forecasting Nike's sales using Facebook data. *2016 IEEE International Conference on Big Data (Big Data)*, 2447–2456. https://doi.org/10.1109/BigData.2016.7840881

Chun, H., Leem, B-H., & Suh H. (2021). Using text analytics to measure the effect of topics and Sentiments on social-media engagement: Focusing on the Facebook fan page of Toyota. *International Journal of Engineering Business Management*. 13. https://doi.org/10.1177/18479790211016268

Fortune. (2023, March 26). Fortune 500. https://fortune.com/ranking/fortune500/

Maddodi, S., & Krishna, P.K. (2019). Netflix big data analytics- the emergence of data-driven Recommendation. *International Journal of Case Studies in Business, IT, and Education (IJCSBE)*, 3(2), 41-51. https://doi.org/10.5281/zenodo.3510316

Mariani, M., Baggio, R., Fuchs, M., & Höepken, W. (2018). Business intelligence and big data in hospitality and tourism: a systematic literature review. *International Journal of Contemporary Hospitality Management*, 30(12), 3514-3554. https://doi.org/10.1108/IJCHM-07-2017-0461

Marr, B. (2021, July 23). Walmart: big data analytics at the world's biggest retailer. *Bernard Marr & Co*. https://bernardmarr.com/walmart-big-data-analytics-at-the-worlds-biggest-retailer/

Mühlhoff, R. (2021). Predictive privacy: Towards applied ethics of data analytics. *Ethics and Information Technology*, 23(4), 675-690. https://doi.org/10.1007/s10676-021-09606-x

Olagbaju, O. O., Babalola R.O., & Olaniyi, O. O. (2023). Code Alternation in English as a Second Language Classroom: A Communication and Learning Strategy. *Nova Science*. https://doi.org/10.52305/YLHJ5878

Olagbaju, O. O., & Olaniyi, O. O. (2023). Explicit and Differentiated Phonics Instruction on Pupils' Literacy Skills in Gambian Lower Basic Schools. Asian Journal of Education and Social Studies, 44(2), 20–30. https://doi.org/10.9734/ajess/2023/v44i2958

Olaniyi, O.O., Okunleye, O.J., & Olabanji, S.O. (2023). Advancing Data-Driven Decision-Making in Smart Cities through Big Data Analytics: A Comprehensive Review of Existing Literature. *Current Journal of Applied Science and Technology*, 42(25), 10–18. https://doi.org/10.9734/cjast/2023/v42i254181

Olaniyi, O.O., Olaoye O.O., & Okunleye, O.J. (2023). Effects of Information Governance (IG) on profitability in the Nigerian banking sector. *Asian Journal of Economics, Business and Accounting*. 2023;23(18):22–35. https://doi.org/10.9734/ajeba/2023/v23i181055

Olaniyi, O.O. & Omubo, D.S. (2023). The Importance of COSO Framework Compliance in Information Technology Auditing and Enterprise Resource Management. *The International Journal of Innovative Research & Development*. https://doi.org/10.24940/ijird/2023/v12/i5/MAY23001

Olaniyi, O.O. & Omubo, D.S. (2023). WhatsApp Data Policy, Data Security, And Users' Vulnerability. *The International Journal of Innovative Research & Development*. https://doi.org/10.24940/ijird/2023/v12/i4/APR23021

ProjectPro. (2023, April 23). How has big data analysis helped increase Walmart's sales turnover? *Iconiq Inc*. https://www.projectpro.io/article/how-big-data-analysis-helped-increase-walmarts-sales-turnover/109

Reed, C. (2023, April 17). Walmart data breaches: full timeline through 2023. *Firewall Times*. https://firewalltimes.com/walmart-data-breaches/

Rodrigues, A. P., Fernandes, R., Bhandary, A., Shenoy, A. C., Shetty, A., & Anisha, M. (2021). Real-time Twitter trend analysis using big data analytics and machine learning techniques. *Wireless Communications & Mobile Computing (Online)*, 2021 https://doi.org/10.1155/2021/3920325

Said, F., Zainal, D., & Azlina, A. J. (2023). Big data analytics capabilities (BDAC) and Sustainability reporting on Facebook: Does tone at the top matter? *Cogent Business & Management*, 10(1). https://doi.org/10.1080/23311975.2023.2186745

Sen, R., Jindal, A., Patel, H., & Qiao, S. (2020). AutoToken: predicting peak parallelism for big data analytics at Microsoft. *Proceedings of the VLDB Endowment*, 13(12), 3326–3339. https://doi.org/10.14778/3415478.3415554

Singh, M., Ghutla, B., Lilo Jnr, R., Mohammed, A. F. S., & Rashid, M. A. (2017). Walmart's Sales Data Analysis - A Big Data Analytics Perspective. *2017 4th Asia-Pacific World Congress on Computer Science and Engineering (APWC on CSE)*, 114–119. https://doi.org/10.1109/APWConCSE.2017.00028