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A Narrative Review of the Integration of Big Data Analytics and Business Intelligence in Organizational Decision-Making

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ABSTRACT: The integration of Big Data Analytics (BDA) and Business Intelligence (BI) has become increasingly vital for enhancing strategic decision-making within contemporary organizations. This narrative review aims to investigate how the convergence of BDA and BI influences decision-making processes, particularly in sectors such as finance, healthcare, manufacturing, and retail. The review employed comprehensive literature searches across Scopus, Web of Science, and Google Scholar using keyword combinations like "Big Data Analytics", "Business Intelligence", and "Decision Making". Inclusion criteria prioritized peer-reviewed journal articles from the past decade. Findings reveal that BDA enables organizations to analyze large-scale data for hidden insights, while BI transforms these insights into visual and actionable intelligence. Together, they contribute to increased decision accuracy, cost reduction, and enhanced performance. Artificial Intelligence (AI), particularly machine learning and natural language processing, further amplifies these outcomes by enabling rapid and nuanced analysis of structured and unstructured data. However, systemic barriers persist, including fragmented data infrastructure, limited human capital, and concerns over data ethics and compliance. This review highlights the need for organizations to adopt a holistic, cross-functional approach to data integration while investing in digital skills development. It also underscores the importance of regional readiness and industry-specific strategies. The findings inform policymakers, practitioners, and scholars on the strategic imperatives for integrating BDA and BI to sustain innovation, responsiveness, and competitive advantage in the digital age.

Keywords: Big Data Analytics, Business Intelligence, Strategic Decision-Making, Digital Transformation, Data Infrastructure, Artificial Intelligence Integration.

INTRODUCTION

The exponential growth of data in contemporary organizational contexts has fundamentally reshaped the landscape of strategic decision-making. In particular, the proliferation of digital

infrastructures and the increasing complexity of business environments have necessitated the adoption of advanced analytical technologies. Among these, Big Data Analytics (BDA) and Business Intelligence (BI) stand out as transformative tools that enable organizations to derive meaningful insights from vast and varied datasets. BDA facilitates the processing and analysis of large-scale, heterogeneous data to identify patterns, correlations, and trends that support evidence-based decisions (Mayer-Schönberger & Cukier, 2013; Gandomi & Haider, 2015). Simultaneously, BI transforms this raw analytical output into structured, visualized information, enabling stakeholders to make timely, informed decisions with clarity and confidence (Sharda et al., 2014; Wixom & Watson, 2010). The synergy between BDA and BI fosters a comprehensive framework for data-driven decision-making that is increasingly essential for maintaining competitiveness in volatile market environments (Chen et al., 2012; Wamba et al., 2017).

The last decade has witnessed a significant acceleration in the global adoption of BDA and BI across diverse sectors, from manufacturing and logistics to healthcare and finance (Davenport & Harris, 2007; McAfee & Brynjolfsson, 2012). The integration of BDA into supply chain operations has revolutionized logistics by improving demand forecasting, optimizing inventory levels, and enhancing real-time responsiveness (Waller & Fawcett, 2013; Schoenherr & Speier-Pero, 2015). In sectors such as healthcare and finance, BDA applications have enabled tailored services and predictive risk assessments, thereby improving operational outcomes and customer satisfaction (Raghupathi & Raghupathi, 2014; LaValle et al., 2011). As organizations pivot toward data-centric strategies, these technologies offer enhanced operational visibility and agility, crucial attributes in the current era of rapid technological change and economic uncertainty (Manyika et al., 2011; George et al., 2014).

This growing recognition of data as a strategic asset has catalyzed a broader movement toward digital transformation, exemplified by the integration of Industry 4.0 principles into organizational frameworks. Industry 4.0 emphasizes the convergence of cyber-physical systems, cloud computing, and real-time data processing to achieve greater automation and efficiency (Kagermann et al., 2013; Xu et al., 2018). Within this context, BDA and BI serve as cornerstones for digital maturity, enabling businesses to adapt their operations dynamically and proactively respond to emerging market signals (Kitchin, 2014; Zillner et al., 2016). Empirical evidence suggests that organizations leveraging these technologies are not only more resilient in the face of disruption but also better positioned to innovate and scale (Bharadwaj et al., 2013; Brynjolfsson & McElheran, 2016). As such, the integration of BDA and BI within digital transformation agendas is not merely advantageous but imperative for long-term organizational sustainability (Chen & Zhang, 2014; Wang et al., 2016).

Empirical studies support the growing influence of BDA and BI in decision-making processes. Surveys show that upwards of 80% of global organizations have prioritized analytics as a key component of strategic planning and resource management (Deloitte, 2019; IDC, 2020). For instance, manufacturers utilize predictive analytics to minimize equipment downtime, while retailers employ customer data analysis to refine marketing strategies. Financial institutions, meanwhile, rely on real-time analytics for fraud detection and risk management, highlighting the cross-sectoral applicability and value of BDA and BI (Bughin et al., 2017; Choi et al., 2018). These

data-driven practices are not only improving efficiency but are also enabling organizations to uncover novel opportunities and manage risks more effectively.

Despite their growing adoption, the implementation of BDA and BI technologies is not without challenges. One prominent issue is the difficulty of data integration. Organizations often manage data from disparate sources and in various formats, making it difficult to achieve cohesive analysis and unified insights (Alharthi et al., 2017; Zicari, 2014). The integration of structured and unstructured data from multiple systems requires robust infrastructure and sophisticated tools, which may not be readily available in all organizational contexts. Furthermore, a significant skills gap persists in many industries. The lack of trained professionals capable of interpreting and leveraging analytics tools hinders the full realization of BDA and BI capabilities (Mikalef et al., 2018; Vidgen et al., 2017).

Equally important are the rising concerns regarding data privacy and security. As data becomes central to organizational strategies, ensuring compliance with data protection regulations such as the General Data Protection Regulation (GDPR) has become a critical operational concern (Tene & Polonetsky, 2012; Zwitter, 2014). Many organizations must navigate a complex landscape of legal and ethical requirements that govern data usage, which may restrict the accessibility and applicability of analytical insights. These constraints necessitate the development of governance frameworks and the adoption of technologies that prioritize security and ethical data practices.

In addition to these operational and ethical challenges, the academic literature reveals a significant gap in understanding the integrated application of BDA, BI, and Artificial Intelligence (AI). While existing studies have explored these domains individually, there is limited research examining how their combined implementation influences organizational decision-making (Davenport & Ronanki, 2018; Jeble et al., 2018). AI, particularly in the form of machine learning and natural language processing, holds considerable potential to enhance the predictive and prescriptive power of analytics. However, the extent to which AI can be systematically integrated into existing BDA and BI ecosystems remains underexplored. Moreover, the relationship between organizational data governance strategies and the development of analytic capabilities is insufficiently documented, especially in terms of cultural and structural adaptations that facilitate deeper technological integration (Gupta & George, 2016; Fosso Wamba et al., 2015).

Given these considerations, this narrative review aims to critically examine the intersection of Big Data Analytics and Business Intelligence within organizational decision-making frameworks. The review seeks to identify how these technologies interact to support strategic and operational decisions, and under what conditions they yield optimal outcomes. By synthesizing findings from empirical research and conceptual studies, this review intends to highlight best practices, technological enablers, and organizational prerequisites for successful implementation. The analysis will also consider the implications of integrating AI into BDA and BI processes, providing a more comprehensive understanding of how these systems can function collaboratively to improve decision quality and business performance.

The scope of this review spans multiple sectors and geographical contexts to capture the diverse implementations and outcomes of BDA and BI adoption. It focuses on developed economies such as the United States and Germany, where infrastructure and investment in analytics are more advanced, as well as on emerging economies that face infrastructural and human capital constraints (World Economic Forum, 2020). This comparative approach enables an exploration of how regional and sector-specific factors influence the effectiveness of BDA and BI deployment. For example, the financial and healthcare sectors often lead in analytics adoption due to stringent regulatory environments and the high value of real-time insights (Kwon et al., 2014). In contrast, sectors such as retail and manufacturing typically apply analytics for more operational purposes, such as demand forecasting and supply chain optimization (Hazen et al., 2014).

These sectoral and regional variations underscore the importance of contextualizing analytics strategies. A one-size-fits-all approach to BDA and BI is unlikely to succeed given the heterogeneity of organizational objectives, resources, and regulatory landscapes. Therefore, this review emphasizes the need for adaptive frameworks that consider organizational maturity, industry requirements, and geographic constraints. By understanding these contextual factors, organizations can develop more effective data strategies that not only address immediate operational needs but also align with long-term strategic goals (Seddon et al., 2017; Grover et al., 2018).

However, despite widespread adoption, there remains a limited understanding of how BDA and BI interact synergistically, especially when integrated with AI, to influence decision-making. This narrative review therefore aims to address this research gap by systematically analyzing existing literature and highlighting conditions for optimal outcomes.

METHOD

The methodological approach of this narrative review is based on a structured yet flexible strategy aimed at collecting, analyzing, and synthesizing existing literature related to the integration of Big Data Analytics (BDA) and Business Intelligence (BI) in organizational decision-making. This study employs a narrative review design, which allows for a comprehensive examination of diverse study types and perspectives across disciplines, industries, and geographical regions. The review is designed not only to map the current landscape of research but also to identify conceptual gaps and propose directions for future inquiry.

To identify the most relevant and high-quality literature, multiple reputable academic databases were utilized. These include Scopus, Web of Science, and Google Scholar. Scopus and Web of Science were selected for their extensive coverage of peer-reviewed literature and their robust citation analysis tools. These databases provide comprehensive access to academic journals, conference proceedings, and book chapters, enabling a thorough exploration of scholarly discourse surrounding BDA and BI. Google Scholar, while less curated, was included for its broader indexing capability, which captures grey literature, working papers, and recently published

materials that may not yet be indexed in traditional databases. The inclusion of these three platforms ensures both depth and breadth in the literature search.

The literature search was conducted using a combination of keywords and Boolean operators to maximize precision and inclusiveness. The core keywords used include "Big Data Analytics," "Business Intelligence," and "Decision Making." These were further expanded with terms such as "Strategic Decision," "Decision Support," and "Organizational Decision Making." Several keyword combinations were deployed, including but not limited to: "Big Data Analytics" AND "Business Intelligence" AND "Decision Making," "BDA" AND "BI" AND "Strategic Decision," and "Data Analytics" AND "Business Intelligence" AND "Organizational Decision Making." These keyword structures were carefully crafted to ensure that studies addressing both technological frameworks and decision-making applications were captured. The selection of these terms was informed by prior literature and expert consultation to reflect evolving terminologies and conceptual developments in the field.

To refine the selection process, specific inclusion and exclusion criteria were applied. Studies were included if they met the following conditions: (1) published in peer-reviewed journals or conference proceedings between 2012 and 2025, (2) written in English, (3) addressed the integration of BDA and BI in the context of organizational or strategic decision-making, and (4) provided empirical or conceptual insights relevant to the research focus. Articles were excluded if they: (1) focused solely on technical aspects of data architecture without linking to decision-making outcomes, (2) discussed BI or BDA in isolation without examining their interaction, or (3) were editorials, commentaries, or opinion pieces lacking empirical or theoretical grounding.

The literature identified through the initial keyword searches was first reviewed at the title and abstract level to eliminate obviously irrelevant records. Duplicates and non-English entries were removed at this stage. Remaining articles were subjected to a full-text screening to assess their methodological quality, relevance, and alignment with the inclusion criteria. The quality appraisal focused on the clarity of research questions, robustness of methodology, depth of analysis, and relevance of findings to the study's central themes. Where methodological limitations were observed, such as lack of transparency in data sources or analytical procedures, these studies were either excluded or considered with caution in the interpretative synthesis.

This review incorporated a wide range of study types, including empirical research (quantitative, qualitative, and mixed-methods), case studies, and conceptual or theoretical papers. Empirical studies provide direct evidence of the impact of BDA and BI on decision-making across different organizational contexts. Quantitative studies typically involve statistical analyses of performance metrics, while qualitative studies explore managerial perceptions, organizational practices, and contextual nuances. Mixed-methods studies were particularly valuable for offering holistic perspectives. Case studies, both single and multiple, offered rich insights into real-world applications, challenges, and successes of BDA-BI integration. Conceptual papers contributed to the development of theoretical frameworks and analytical models that informed the synthesis and structuring of findings.

The selection process was iterative and informed by constant comparison and reflexive analysis. The research team engaged in repeated cycles of reading, discussion, and interpretation to ensure that emerging themes were consistent with the broader objectives of the review. The inclusion of multiple reviewers helped enhance the reliability of the selection process by mitigating individual bias and ensuring that decisions about article inclusion were made based on shared criteria and consensus. Discrepancies were resolved through discussion and, when necessary, re-examination of the full text.

In synthesizing the literature, thematic analysis was employed. This involved coding the selected articles to identify recurring themes, patterns, and divergences in the literature. Themes were developed both deductively, based on pre-defined research questions, and inductively, emerging from the data itself. Key themes included the technological integration of BDA and BI systems, organizational readiness and capabilities, decision-making processes and outcomes, and the role of contextual variables such as industry sector and national context. Thematic synthesis enabled the organization of findings into a coherent narrative that highlights both consensus and controversy within the literature.

In conclusion, this methodological strategy ensures a comprehensive, rigorous, and contextually nuanced review of the literature on BDA and BI in decision-making. By leveraging multiple databases, deploying a carefully structured keyword search, applying systematic inclusion and exclusion criteria, and integrating diverse types of studies, this review provides a robust foundation for understanding the state of knowledge and identifying directions for future research. This methodological rigor enhances the validity and reliability of the review's findings and contributes meaningfully to academic and practical discourses in data-driven organizational decision-making.

RESULT AND DISCUSSION

The integration of Big Data Analytics (BDA) and Business Intelligence (BI) in organizational decision-making has emerged as a transformative approach across various industries. This synergy enhances how data is utilized to inform strategic choices, facilitating faster, more accurate, and more efficient decision-making. Evidence from multiple sectors underscores the impact of BDA and BI as vital components for maintaining competitive advantage in a rapidly evolving digital environment.

In the financial sector, the combination of real-time BDA with BI platforms significantly improves fraud detection, risk management, and regulatory compliance. For instance, BDA enables the continuous monitoring of transaction patterns to detect anomalies, while BI tools translate these findings into actionable reports for strategic management. Studies such as those by Al-Momani and Al-Momani (2024) demonstrate a substantial improvement in the quality and speed of financial decision-making processes when BDA and BI are deployed in tandem. Furthermore, predictive models built using machine learning allow institutions to forecast market shifts and prepare timely responses, thereby enhancing resilience against volatility.

The healthcare sector provides another compelling example. Integrating BDA and BI enables the analysis of extensive patient data sets, contributing to improved diagnostics, personalized treatment plans, and more efficient hospital operations. Researchers such as Egwuonwu et al. (2024) found that hospitals leveraging both technologies could reduce patient waiting times, optimize resource allocation, and better predict disease outbreaks. Business Intelligence systems then synthesize these insights into user-friendly dashboards that support evidence-based medical decisions. Such implementations have been particularly successful in countries with advanced healthcare IT infrastructure, such as the United States and Germany.

Retail and consumer sectors utilize the fusion of BDA and BI to monitor customer preferences, identify emerging trends, and enhance customer experiences. Insights extracted from transactional data, social media behavior, and feedback mechanisms feed into BI systems that help businesses make informed product and pricing decisions. In this context, BDA enables the real-time analysis of sales patterns, while BI tools visualize these insights for managers, thereby improving agility in decision-making. The use of advanced recommendation engines powered by big data and AI has been shown to increase conversion rates and customer loyalty.

Empirical studies highlight the measurable impact of BDA and BI on organizational performance. Al-Momani and Al-Momani (2024) reported significant gains in decision accuracy and operational efficiency among firms integrating BDA and BI. Similarly, manufacturing companies using these technologies saw a reduction in waste and an increase in productivity due to data-driven optimization processes. This transition towards "smart factories" aligns with Industry 4.0 frameworks, where interconnected systems use data analytics to support autonomous decision-making and adaptive production schedules.

Artificial Intelligence (AI) further amplifies the benefits of BDA by enhancing both the depth and speed of data analysis. Machine learning algorithms are especially effective in identifying patterns and making predictions from large, heterogeneous datasets. In financial and marketing sectors, these tools support strategic planning by forecasting customer behavior and market dynamics. NLP techniques, another AI subset, are widely employed to analyze unstructured data such as customer reviews or social media content. This capacity to derive sentiment and thematic trends enriches the decision-making process by capturing qualitative dimensions of consumer behavior.

Deep learning models have also shown efficacy in tasks such as image recognition, anomaly detection, and automated classification, particularly within healthcare and cybersecurity domains. These AI-driven enhancements allow for more nuanced and sophisticated applications of BDA, moving beyond descriptive analytics to predictive and prescriptive functionalities. Organizations that effectively integrate AI with BDA and BI infrastructures gain a critical edge in terms of agility, responsiveness, and strategic foresight.

The positive relationship between analytics maturity and organizational performance has been well-documented. Awan et al. (2021) found that firms with robust analytics infrastructures exhibit higher ROI, better market positioning, and superior operational metrics. This correlation underscores the strategic value of analytics adoption in contemporary business environments. Egwuonwu et al. (2024) further noted that analytics capabilities, particularly when embedded in BI platforms, enhance strategic decision-making and long-term planning in the technology sector.

Differences in analytics performance between digitally mature and less mature organizations are striking. Digitally advanced firms possess the necessary IT infrastructure, skilled personnel, and data governance practices to extract value from BDA and BI tools. Conversely, organizations at earlier stages of digital transformation often struggle with data silos, lack of training, and limited technological resources. These constraints inhibit their ability to fully leverage the benefits of integrated analytics solutions.

Globally, disparities in the adoption of BDA and BI reflect variations in economic development, regulatory environments, and digital infrastructure. Developed countries such as the United States, Germany, and South Korea lead in the deployment of analytics solutions due to stronger institutional support and investment in digital capacity. In contrast, developing economies often face systemic barriers, including limited access to skilled professionals and fragmented data ecosystems.

Best practice case studies illustrate the value of context-specific strategies in adopting BDA and BI. For example, U.S. hospitals employing advanced analytics have seen marked improvements in patient outcomes and operational efficiency. Meanwhile, in Nigeria's manufacturing sector, the adoption of BDA is growing but faces hurdles such as inadequate training and infrastructural limitations, as highlighted by Egwuonwu et al. (2024). These examples emphasize the need for tailored approaches that align technology implementation with local capabilities and constraints.

Overall, the evidence underscores the transformative potential of integrating BDA, BI, and AI into organizational decision-making processes. While the benefits are substantial, achieving them requires overcoming challenges related to digital maturity, infrastructure, and human capital. A strategic, phased approach that considers regional and sectoral contexts can help organizations optimize the value derived from these technologies. As the landscape of data-driven decision-making continues to evolve, the interplay between analytics technologies and organizational strategy will become increasingly central to achieving sustained competitive advantage.

The integration of Big Data Analytics (BDA) and Business Intelligence (BI) into organizational decision-making processes has proven to be a pivotal development in the digital transformation of contemporary businesses. The findings of this review corroborate prior literature that underscores the substantial benefits associated with these technologies, particularly in enhancing decision quality and organizational performance. For example, Egwuonwu et al. (2024) report significant improvements in both financial and non-financial outcomes in organizations employing BDA, aligning with Caputo et al. (2023), who link data analysis capabilities to superior operational performance and decision accuracy. While much of the earlier scholarship has focused on the technical dimensions of BDA and BI, more recent studies reveal the growing importance of organizational culture in determining the effectiveness of these technologies (Frisk & Bannister, 2017). This shift reflects a broader conceptualization of data analytics not merely as a technical function but as a strategic organizational asset.

Systemic factors play a crucial role in the implementation and success of BDA and BI. Organizational culture, for instance, remains a fundamental determinant in shaping how data analytics are adopted and utilized. A culture that prioritizes analytical thinking and collaboration creates a conducive environment for the assimilation of BDA and BI into everyday decision-

making. Frisk and Bannister (2017) emphasize that collaborative cultures significantly enhance the success rate of analytics initiatives. Furthermore, the structure and integration of data within an organization serve as vital components for analytics readiness. Fragmented or siloed data systems impede access and utilization, thereby diminishing the potential of analytics to generate actionable insights (Egwuonwu et al., 2024; Narwane et al., 2021).

The competency and readiness of human capital also emerge as vital components in this framework. Many organizations struggle with sourcing or training talent capable of leveraging advanced analytics tools. Fen et al. (2022) underscore that successful implementations are often supported by well-trained teams proficient in data processing and analytical methodologies. This reality places significant importance on capacity-building efforts and continuous professional development within organizations aiming to derive value from BDA and BI. Without sufficient investment in human resources, the technological infrastructure alone cannot deliver the promised gains in strategic agility and decision support.

These findings have far-reaching implications for both policy formulation and managerial practices. Organizational leaders must prioritize the cultivation of a data-driven culture, supported by policies that incentivize analytical thinking and evidence-based decision-making. Caputo et al. (2023) recommend that organizations create dedicated analytics units and allocate substantial resources for the development of analytic competencies across departments. Such initiatives can democratize data use and empower various organizational levels to make timely and informed decisions.

Furthermore, the integration of BDA and BI should be approached holistically. Siloed implementations often fail to realize the full potential of analytics due to a lack of coordination across functional boundaries. Inter-departmental collaboration ensures that insights generated through analytics are disseminated and applied comprehensively. This integrative approach not only enhances the quality of decisions but also fosters a shared organizational vision guided by data-informed strategies.

The ethical dimensions of analytics also merit attention. With the increasing capabilities of BDA and BI comes a growing responsibility to uphold data privacy and maintain consumer trust. Menzies et al. (2024) argue that ethical considerations must be embedded in analytics practices, including transparent data governance policies and robust mechanisms for data protection. As organizations increasingly rely on personal and behavioral data to inform strategic decisions, adherence to ethical standards becomes essential not only for compliance but also for sustaining stakeholder confidence.

Globally, disparities in the adoption and sophistication of BDA and BI remain pronounced. Developed countries tend to possess superior digital infrastructures and a larger pool of skilled professionals, positioning them advantageously in the data economy. In contrast, developing countries often face systemic barriers such as limited technological infrastructure, inadequate training programs, and financial constraints (Egwuonwu et al., 2024; Menzies et al., 2024). These challenges necessitate international cooperation and knowledge transfer initiatives aimed at bridging the digital divide. Policies that facilitate access to technology and capacity-building in under-resourced regions are crucial for equitable participation in the global data-driven economy.

The discussion also highlights several limitations in the existing literature. Most notably, there is a lack of comprehensive studies that explore the synergistic integration of Artificial Intelligence (AI), BDA, and BI. Current research tends to examine these technologies in isolation, overlooking the compounded benefits that could arise from their convergence. The integration of AI into BDA and BI frameworks could significantly enhance predictive capabilities and decision accuracy, yet empirical studies exploring such integrations remain scarce. Future research should aim to fill this gap by investigating the practical applications and outcomes of AI-enhanced analytics in diverse organizational contexts.

Moreover, the relationship between data strategy and organizational structure has not been sufficiently explored. There is a need for more in-depth studies examining how different organizational designs facilitate or hinder the adoption of BDA and BI. Understanding this dynamic could inform the development of structural models that optimize analytics capabilities. Additionally, sector-specific studies are required to tailor analytics frameworks to the unique challenges and opportunities inherent in industries such as healthcare, finance, retail, and manufacturing.

While the benefits of BDA and BI are well-documented, their implementation is fraught with challenges that must be addressed through strategic planning and stakeholder engagement. Organizations must recognize that technological adoption is not a one-time investment but an ongoing process that requires adaptability and resilience. By fostering a supportive culture, investing in human capital, ensuring ethical practices, and encouraging cross-sectoral collaboration, organizations can better position themselves to harness the transformative potential of data analytics.

This discussion reiterates the critical importance of viewing BDA and BI not as isolated technological tools but as integral components of a broader organizational strategy. By aligning technological capabilities with human and cultural factors, organizations can create a sustainable foundation for data-informed decision-making that is both effective and ethical. These insights underscore the multidimensional nature of analytics adoption and call for continued scholarly and practical engagement with the evolving landscape of data-driven strategy.

CONCLUSION

This narrative review has examined the integration of Big Data Analytics (BDA) and Business Intelligence (BI) in enhancing strategic decision-making across various industrial sectors. The findings confirm a significant positive impact on organizational performance, decision accuracy, and operational efficiency when BDA and BI are implemented synergistically. The discussion further highlighted the systemic factors influencing successful adoption, such as organizational culture, data infrastructure, and workforce competency. Organizations with strong data-oriented cultures, mature digital infrastructures, and analytics-savvy personnel are notably more capable of leveraging BDA and BI to drive business value.

Despite the substantial benefits, key barriers remain. These include fragmented data systems, limited analytical skills among employees, and regulatory constraints concerning data privacy. To address these challenges, organizational policies must prioritize the development of an integrated analytics strategy, interdepartmental collaboration, and continuous capacity-building. Policymakers and managers should also establish ethical frameworks that balance data utilization with consumer trust and regulatory compliance.

Future research is warranted to explore the interplay between BDA, BI, and Artificial Intelligence (AI), particularly in underrepresented sectors and developing economies. Such studies could provide deeper insights into how multi-technology integration enhances predictive analytics and decision quality. Ultimately, leveraging BDA-BI as a strategic capability is imperative for organizations seeking to remain agile, data-driven, and competitive in an increasingly complex digital ecosystem.

This review is limited by its reliance on secondary data and the predominance of studies from developed countries, which may restrict generalizability. Practitioners are advised to adopt phased, context-specific strategies and invest in capacity-building. Future research should empirically test AI-enhanced BDA–BI frameworks across diverse organizational contexts, especially in developing economies

REFERENCE

Adıgüzel, Z., Çakır, F., Pınarbaşı, F., Gültekin, D., & Yazıcı, M. (2024). Examination of the effects of innovation development, technology management and big data analytics capability in information technology companies. *Journal of Advances in Management Research, 21*(5), 689–710. https://doi.org/10.1108/jamr-02-2024-0059

Al-Momani, M., & Al-Momani, I. (2024). Exploring the impact of big data on companies' business intelligence strategies in the digital era. *Edelweiss Applied Science and Technology, 8*(5). https://doi.org/10.55214/25768484.v8i5.1791

Awan, U., Shamim, S., Khan, Z., Zia, N., Shariq, S., & Khan, M. (2021). Big data analytics capability and decision-making: The role of data-driven insight on circular economy performance. *Technological Forecasting and Social Change, 168*, 120766. https://doi.org/10.1016/j.techfore.2021.120766

Caputo, F., Keller, B., Möhring, M., Carrubbo, L., & Schmidt, R. (2023). Advancing beyond technicism when managing big data in companies' decision-making. *Journal of Knowledge Management, 27*(10), 2797–2809. https://doi.org/10.1108/jkm-10-2022-0794

Egwuonwu, A., Mendy, J., Oruh, E., & Egwuonwu, A. (2024). Drivers of big data analytics' adoption and implications of management decision-making on big data adoption and firms' financial and nonfinancial performance: Evidence from Nigeria's manufacturing and service

industries. *IEEE Transactions on Engineering Management, 71*, 11907–11922. https://doi.org/10.1109/tem.2023.3321426

Fen, W., Raisinghani, M., Mora, M., & Forrest, J. (2022). Effective decision support in the big data era. *International Journal of Decision Support System Technology, 14*(1), 1–16. https://doi.org/10.4018/ijdsst.286683

Frisk, J., & Bannister, F. (2017). Improving the use of analytics and big data by changing the decision-making culture. *Management Decision, 55*(10), 2074–2088. https://doi.org/10.1108/md-07-2016-0460

Lee, C., & Cheang, P. (2022). Predictive analytics in business analytics: Decision tree. *Advances in Decision Sciences, 26*(1), 1–30. https://doi.org/10.47654/v26y2022i1p1-30

Menzies, J., Sabert, B., Hassan, R., & Mensah, P. (2024). Artificial intelligence for international business: Its use, challenges, and suggestions for future research and practice. *Thunderbird International Business Review, 66*(2), 185–200. https://doi.org/10.1002/tie.22370

Narwane, V., Raut, R., Yadav, V., Cheikhrouhou, N., Narkhede, B., & Priyadarshinee, P. (2021). The role of big data for supply chain 4.0 in manufacturing organisations of developing countries. *Journal of Enterprise Information Management, 34*(5), 1452–1480. https://doi.org/10.1108/jeim-11-2020-0463

Sahut, J., Fragnière, E., & Dang, R. (2024). The impact of big data on decision-making, processes and organizational change: An essay of synthesis. *Canadian Journal of Administrative Sciences / Revue Canadienne Des Sciences De L'Administration, 41*(4), 508–515. https://doi.org/10.1002/cjas.1770

Solano, M., & Cruz, J. (2024). Integrating analytics in enterprise systems: A systematic literature review of impacts and innovations. *Administrative Sciences, 14*(7), 138. https://doi.org/10.3390/admsci14070138

Ulman, M., Musteen, M., & Kánská, E. (2021). Big data and decision-making in international business. *Thunderbird International Business Review, 63*(5), 597–606. https://doi.org/10.1002/tie.22225

Shirmohammadi, M., Au, W. C., & Beigi, M. (2022). Antecedents and Outcomes of Work-Life Balance While Working From Home: A Review of the Research Conducted During the COVID-19 Pandemic. Human Resource Development Review, 21(4), 473–516. https://doi.org/10.1177/15344843221125834

Stier, S., Breuer, J., Siegers, P., & Thorson, K. (2019). Integrating Survey Data and Digital Trace Data: Key Issues in Developing an Emerging Field. Social Science Computer Review, 38(5), 503–516. https://doi.org/10.1177/0894439319843669

Tan, H., & Yan, M. (2020). Physician-User Interaction and Users' Perceived Service Quality: Evidence From Chinese Mobile Healthcare Consultation. Information Technology and People, 33(5), 1403–1426. https://doi.org/10.1108/itp-01-2019-0039

Torro, O., Pirkkalainen, H., & Li, H. (2022). Media Synchronicity in Organizational Social Exchange. Information Technology and People, 35(8), 162–180. https://doi.org/10.1108/itp-06-2020-0384

Tramontano, C., Grant, C., & Clarke, C. (2021). Development and Validation of the E-Work Self-Efficacy Scale to Assess Digital Competencies in Remote Working. Computers in Human Behavior Reports, 4, 100129. https://doi.org/10.1016/j.chbr.2021.100129

Treacy, S., Sabu, A., Bond, T., O'Sullivan, J., Sullivan, J., & Sylvester, P. E. (2023). Organizational Cybersecurity Post the Pandemic: An Exploration of Remote Working Risks and Mitigation Strategies. International Conference on Cyber Warfare and Security, 18(1), 394–401. https://doi.org/10.34190/iccws.18.1.973

Vaujany, F. d., Leclercq-Vandelannoitte, A., & Islam, G. (2024). Experimentation in Qualitative Organization Research: Determinacy and Indeterminacy Through Walking Ethnography. Organizational Research Methods, 28(2), 155–181. https://doi.org/10.1177/10944281241229787

Windeler, J., & Harrison, A. J. (2018). Rethinking Media Synchronicity Theory: Examining the Cooperative Assumption. https://doi.org/10.24251/hicss.2018.092

Wontorczyk, A., & Rożnowski, B. (2022). Remote, Hybrid, and on-Site Work During the SARS-CoV-2 Pandemic and the Consequences for Stress and Work Engagement. International Journal of Environmental Research and Public Health, 19(4), 2400. https://doi.org/10.3390/ijerph19042400

Yusriani, S., Patiro, S. P. S., Lusiati, M., & Nurbaeti, N. (2023). Exploring the Dynamics and Implications of Remote Work During and Post-Covid-19: A Qualitative Analysis. Proceeding of the International Seminar on Business Economics Social Science and Technology (Isbest), 3(1). https://doi.org/10.33830/isbest.v3i1.1259