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ARTIFICIAL INTELLIGENCE AND BIG DATA IN ENHANCING DECISION-MAKING EFFECTIVENESS: A SYSTEMATIC LITERATURE REVIEW

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Abstract

Advances in digital technology have transformed the way organizations make decisions. Artificial Intelligence (AI) and Big Data Analytics (BDA) are now key foundations for improving the effectiveness of strategic and operational decisions. This study examines the contribution of AI and BDA to the effectiveness of organizational decision-making through a Systematic Literature Review approach with the PRISM protocol. A total of 20 articles from Scopus published in 2020–2025 were analyzed descriptively, thematically, and through content analysis. The results show that AI accelerates, directs, and improves decision fairness, while BDA strengthens data-driven accuracy and prediction. The integration of the two forms an adaptive and intelligent decision-making system. These findings emphasize the relevance of dynamic capability and absorptive capacity theories, as well as the importance of infrastructure readiness, analytical competency, and technology governance within organizations. This study contributes theoretically and provides strategic direction for organizations in the digital transformation process of their decision-making.

Keywords: artificial intelligence, big data, decision making, organizational effectiveness, systematic literature.

INTRODUCTION

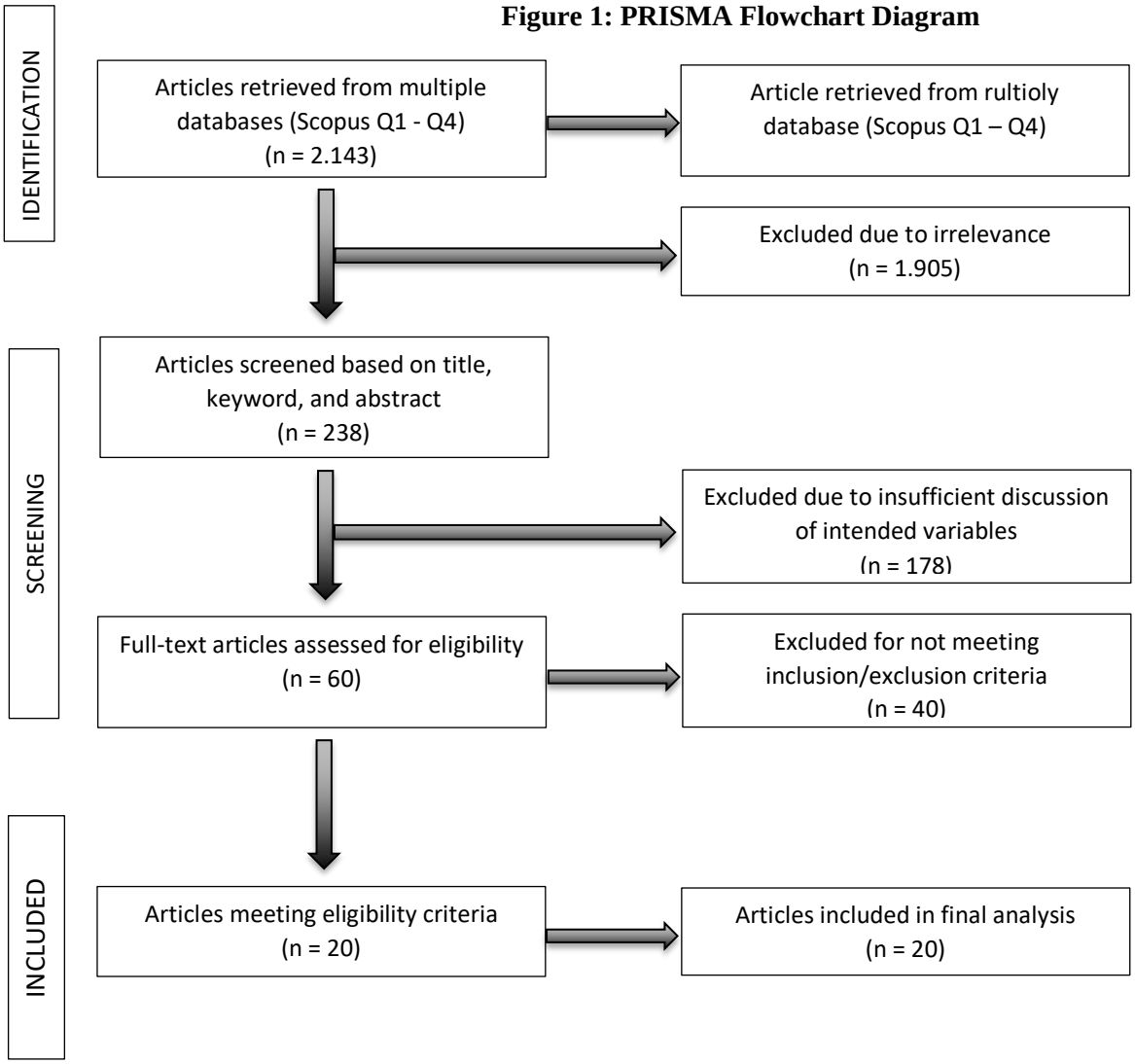
Over the past decade, digital transformation has ushered organizations into an era defined by data-driven disruption and cognitive automation. Artificial Intelligence (AI) and Big Data Analytics (BDA) have emerged as key catalysts in strategic and operational decision-making. In an increasingly complex, uncertain, and data-intensive business ecosystem, the collaboration between AI and BDA has become a prerequisite for generating decisions that are rapid, accurate, and objective (Shrestha & Ben-Menahem, 2019; Niu et al., 2021). These technologies have seen widespread adoption across sectors, including public administration (Di Vaio et al., 2022), finance (Hargyatni & Purnama, 2024), healthcare (Wang & Byrd, 2021), and human resources (Khair et al., 2020). As the urgency of digital transformation intensifies, research on the synergy between AI and BDA in enhancing organizational decision-making effectiveness is gaining momentum. AI contributes through automation and predictive modeling, while BDA provides a quantitative evidence base for informational decision-making (Sadeghi, 2024). Previous studies have shown that big data improves the quality and speed of decision-making (Li et al., 2022; Nisar et al., 2021), while AI supports organizations in transcending the limits of human rationality (Shick et al., 2024; Carter & Wynne, 2021) and in generating long-term strategic value (Tummalapalli et al., 2025). Nevertheless, the literature continues to reveal several critical gaps. A number of studies examine AI and BDA separately (Carter & Wynne, 2021; Adrian et al., 2023), and many rely on narrow methodological approaches such as single case studies or basic regression analysis (Sadeghi, 2024; Marimira & Gumel, 2025; Hargyatni & Purnama, 2024). Thematic and bibliometric reviews tend to remain sector-specific (Di Vaio et al., 2022). Research on organizational capabilities (Wang & Byrd, 2021), the role of AI in data-driven prediction (Farhi et al., 2024), social and ethical considerations (Khair et al., 2020), AI-intuition integration (Vincent, 2021), and the systemic relationship between BDA and dynamic organizational capabilities (Shamim et al., 2024; Karagozlu et al., 2024) remains limited. Comparative studies between human and AI decision-making (Rajagopal et al., 2022), conceptual-empirical integration, algorithmic bias, and decision-making structures across sectors are also underexplored (Shrestha & Ben-Menahem, 2019).

Therefore, a systematic review is needed to consolidate fragmented knowledge, identify trends and research gaps, and develop an integrated conceptual framework that explains how AI and BDA contribute to improving the effectiveness of organizational decision-making. This study is designed to address three main research questions: (1) How do AI and BDA contribute to the effectiveness of organizational decision-making? (2) What are the dominant themes and methodological trends in the current literature? and (3) What are the identifiable research gaps and future directions?

METHOD

This study employed a Systematic Literature Review (SLR) approach to identify, evaluate, and synthesize literature on the contributions of Artificial Intelligence (AI) and Big Data Analytics (BDA) to organizational decision-making effectiveness. The review process adhered to the PRISMA 2020 (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines as a systematic and transparent methodological framework (Page et al., 2021). Data sources were obtained from the Scopus database, selected for its global coverage and verified journal classification by quartile (Q1–Q4). Priority was given to Q1 and Q2 journals to ensure quality. Articles were selected based on the following inclusion criteria: full-text availability, written in English, published between 2020–2025, and explicitly addressing the linkage between AI, BDA, and decision-making effectiveness. Editorials, non-peer-reviewed proceedings, non-managerial technical publications, as well as duplicates or unavailable full-texts were excluded from the review. The literature search was conducted in March 2025 using Boolean search techniques with keyword combinations such as: “artificial intelligence” OR “machine learning” AND “decision making” OR “decision effectiveness”; “big data” OR “data analytics” AND “decision making” OR “decision effectiveness.” The search results were exported in CSV format for selection purposes. The selection process followed four PRISMA stages: initial identification (n=2,143), title and abstract screening (n=238), full-text assessment (n=62), and final inclusion (n=20). The entire process was visualized using a PRISMA flow diagram to ensure traceability and transparency (Page et al., 2021).

Figure 1: PRISMA Flowchart Diagram



Three analytical techniques were applied: (1) descriptive analysis to map publication trends, regions, and methodologies; (2) thematic analysis to cluster key findings based on issues and contributions; and (3) content analysis to examine theoretical depth, empirical validity, and managerial implications. The analysis results were used to develop a conceptual taxonomy as the foundation for discussion.

RESULTS AND DISCUSSION

General Description of the Literature

This analysis covered 20 scholarly articles that met the inclusion and exclusion criteria, comprising 10 articles discussing the contributions of Artificial Intelligence (AI) and 10 focusing on the role of Big Data Analytics (BDA) in enhancing organizational decision-making effectiveness. All publications were issued between 2020 and 2025, in accordance with the PRISMA 2020 protocol (Page et al., 2021). Temporally, the publications were evenly distributed, with a noticeable intensification occurring between 2024 and 2025. Notably, five studies from 2024 were authored by Shick et al. (2024), Sadeghi (2024), Hargyatni & Purnama (2024), Shamim et al. (2024), and Farhi et al. (2024). The 2025 contributions include works by Marimira & Gumel (2025), Tummalapalli et al. (2025), and Cao et al. (2025). This surge reflects an increased academic focus on AI and BDA integration in decision-making contexts. Geographically, the studies represent a global spectrum: Asia (Khair et al., 2020; Shamim et al., 2024; Sadeghi, 2024), Europe (Di Vaio et al., 2022; Vincent, 2021; Carter & Wynne, 2021), North America, and Africa (Wang & Byrd, 2021; Marimira & Gumel, 2025). This contextual diversity reinforces the thematic relevance of the topic across sectors and cultures. Methodologically, quantitative approaches dominate, with 10 studies utilizing regression, structural equation modeling (SEM), or path analysis (Nisar et al., 2021; Li et al., 2022; Ghaleb & Mirzaliev, 2024; Karagozlu et al., 2024). Seven studies were conceptual-theoretical (Carter & Wynne, 2021; Vincent, 2021;

Ghasemaghaei et al., 2023), and the remaining three adopted qualitative methods (Marimira & Gumel, 2025; Sadeghi, 2024). This variety reflects epistemological diversity in understanding the integration of technology in decision-making processes. The topics fall into two main domains: (1) AI—explored in terms of efficiency, objectivity, human-machine integration, strategic forecasting, and decision rationality (Khair et al., 2020; Carter & Wynne, 2021; Marimira & Gumel, 2025; Shick et al., 2024); and (2) BDA—related to predictive capabilities, data quality, and strategic decision effectiveness (Nisar et al., 2021; Shamim et al., 2024; Farhi et al., 2024). Studies such as Di Vaio et al. (2022) and Tummalapalli et al. (2025) explored the simultaneous integration of both technologies, highlighting their synergistic power in accelerating and validating decision-making processes. Regarding scientific credibility, all articles were sourced from Scopus-indexed journals with a relatively balanced quartile distribution. Approximately 12 articles were published in Q1 and Q2 journals, such as Technological Forecasting and Social Change (Di Vaio et al., 2022; Li et al., 2022), European Management Review (Carter & Wynne, 2021), and the International Journal of Information Management (Ghasemaghaei et al., 2023). Articles from Q3–Q4 journals remained relevant due to rigorous peer-review processes (Hargyatni & Purnama, 2024; Adrian et al., 2023), ensuring the academic validity of the literature analyzed.

Thematic Analysis of the Literature

Theme 1: The Contribution of Artificial Intelligence to Decision-Making Effectiveness

The evolution of Artificial Intelligence (AI) over the past five years has demonstrated a significant shift from a complementary technology to a strategic element within organizational decision-making processes. The reviewed studies highlight that AI's role in decision-making extends beyond technical functions to encompass structural, strategic, and even cognitive dimensions. In this review, ten articles explicitly examine the relationship between AI and organizational decision-making effectiveness. The findings consistently show that AI enhances efficiency, objectivity, predictive accuracy, and cross-functional collaboration in decision-making. One of the key insights is AI's contribution to accelerating and simplifying the decision-making process. Kumar et al. (2024) found that the adoption of AI in organizational decision systems positively correlates with faster processes and improved accuracy. Similarly, Sadeghi (2024), through a case study approach, demonstrated that AI not only speeds up day-to-day decision-making but also significantly reduces operational errors. This is echoed by Tummalapalli et al. (2025), who argue that the use of AI in managerial processes improves operational efficiency and strengthens stakeholder engagement, leading to enhanced organizational performance.

Beyond efficiency, AI's role in reinforcing objectivity and fairness in decision-making also emerges as a critical theme. Khair et al. (2020), in the context of human resource management, emphasized AI's potential to reduce individual bias, particularly in recruitment and performance evaluation processes. This research brings to light the often-overlooked ethical and social dimensions of AI, which substantially influence perceptions of fairness and the legitimacy of decisions within the workplace. The capacity of AI to support predictive strategic decision-making is also a major point of focus. Marimira and Gumel (2025) assert that AI significantly improves the accuracy and relevance of strategic decisions, especially in risk management and business direction setting. Empirical evidence from Hargyatni and Purnama (2024) in the financial sector demonstrates that AI enhances analytical quality, reduces information ambiguity, and increases accuracy in navigating volatile market conditions. These findings suggest that AI serves not only as a technical tool but also as a strategic partner in data-driven decision-making processes.

Furthermore, the integration of AI with human elements such as intuition and collaboration is increasingly recognized. Vincent (2021) points out that in complex situations, AI complements human intuition by offering data-driven insights beyond the reach of intuitive judgment. In the context of teamwork, Carter and Wynne (2021) argue that AI strengthens collaborative processes among decision-makers, enhances decision quality, and fosters a more adaptive environment responsive to real-time information changes. At its core, AI's most fundamental contribution lies in its ability to transform organizational rationality paradigms in decision-making. Shick et al. (2024) assert that AI challenges the limits of bounded rationality—a longstanding foundation of classical decision theory. Through advanced computational and large-scale data processing capabilities, AI enables organizations to transcend human cognitive limitations and respond to complex information with greater speed, accuracy, and empirical grounding.

Meanwhile, Di Vaio et al. (2022) offer a distinct perspective by examining AI's contribution in the context of public sector organizations. Using a bibliometric approach, their study reveals that the integration of AI with data intelligence accelerates decision-making while enhancing the validity and legitimacy of decisions in data-driven public service delivery. These findings underscore that AI's application is not confined to the private sector but plays a critical role in enabling efficient and transparent public governance. Collectively, the studies in this theme consistently indicate that AI has evolved from a mere technological instrument to a strategic entity shaping how organizations interpret data, manage uncertainty, and formulate decisions. Nonetheless, the effectiveness of AI

remains highly contextual, dependent on organizational structures, human integration, and awareness of social and ethical implications. Therefore, the adoption of AI in decision-making cannot be separated from institutional context, organizational culture, and accompanying technological governance frameworks.

Theme 2: The Role of Big Data Analytics in Supporting Organizational Decision-Making

Big Data Analytics (BDA) has radically transformed how organizations access, process, and convert data into the foundation for strategic decision-making. Amid the complexity of digital business environments that demand speed and accuracy in every decision, BDA has evolved from a technical support tool into a strategic capability essential for building competitive advantage. The literature over the past five years reveals that BDA significantly contributes to organizational decision-making by reinforcing data-driven foundations, improving accuracy, integrating analytics performance with business strategy, and fostering deep analytical competencies. Several studies confirm BDA as a vital element in strengthening data-based decision-making capabilities. Nisar et al. (2021) emphasized that large-scale data management is not merely a technical matter but a crucial foundation for enhancing decision quality across both internal and external organizational contexts. Supporting this view, Shamim et al. (2024), drawing on the dynamic capabilities theory, demonstrate that organizations capable of strategically managing big data tend to exhibit higher decision-making accuracy and capability.

Furthermore, BDA has been proven to enhance the quality, speed, and precision of the decision-making process. Li et al. (2022) showed that organizations adopting BDA approaches experience accelerated decision-making and greater responsiveness to market dynamics. In operational contexts, Ghaleb and Mirzaliev (2024) found that big data serves as a key enabler in production-related decisions, particularly in resource management and manufacturing efficiency. The relationship between BDA implementation and improved organizational performance is also explored through more complex analytical models. Cao et al. (2025) developed a model linking business analytics to decision-making effectiveness and found a significant relationship between the two. Similarly, Wang and Byrd (2021), using the knowledge absorptive capacity perspective, demonstrated that an organization's ability to absorb and internalize data into strategic knowledge is a prerequisite for supporting analytical decision-making.

In the context of strategic decisions, BDA not only enhances accuracy but also bolsters the confidence and satisfaction of decision-makers. Farhi et al. (2024) emphasized that comprehensive and predictive data support enriches long-term decision-making processes, including resource planning, risk mitigation, and market expansion. This reinforces the narrative that BDA has become a critical instrument in enhancing the reliability of strategic-level decisions. Moreover, the quality of decision-making is highly dependent on the organization's analytical competencies. Ghasemaghaei et al. (2023) developed an analytical competence index, which was found to correlate positively with decision-making performance, suggesting that the effectiveness of BDA depends not only on technological tools but also on the readiness and skills of the human resources managing them. This perspective is further extended by Adrian et al. (2023), who developed a conceptual model on BDA implementation effectiveness, highlighting that adoption level, systemic integration, and strategic-technology alignment are key determinants of successful BDA implementation.

Overall, the ten studies analyzed under this theme reinforce the understanding that BDA is not merely a collection of algorithms and data-processing tools, but has become a strategic framework underpinning the quality and accuracy of decision-making across sectors. However, the success of its implementation is highly contingent on human resource readiness, managerial capabilities, and contextual alignment with each organization's sectoral environment. Therefore, approaches to BDA must be strategically and holistically designed, integrated with organizational culture, and embedded in dynamic decision-making systems.

Theme 3: The Synergistic Integration of AI and BDA in Organizational Decision-Making Systems

Digital transformation has opened strategic opportunities for organizations to revolutionize their approaches to decision-making. Within this landscape, the integration of Artificial Intelligence (AI) and Big Data Analytics (BDA) has emerged as a promising new approach for shaping algorithm-driven decision systems, underpinned by machine learning and large-scale data. Recent literature suggests that when AI and BDA are not used in isolation but are instead combined within an integrated system, organizations can achieve competitive advantage through more precise, faster, adaptive, and pattern-based decisions. The study by Di Vaio et al. (2022) offers one of the clearest representations of this synergy. It demonstrates that the integration of AI with data intelligence results in higher levels of efficiency and decision validity, particularly in the public sector, where data credibility and timeliness are critical. This paradigm reflects a shift from intuition-based decision-making toward systems of large-scale, data- and machine-based decision-making.

Additional empirical contributions are seen in the work of Tummalapalli et al. (2025), which examined the impact of AI-based management systems integrated with BDA infrastructure on organizational efficiency. The study found that such integration not only enhances decision quality but also encourages greater stakeholder participation and engagement in a more evidence-based decision-making process. Conceptually, Carter and Wynne (2021) developed a theory of human–AI team effectiveness, wherein AI acts as a collaborative partner empowered by big data. Although focused on team dynamics, the study implies that the incorporation of BDA into team decision-making enriches collective intelligence through more rational and data-driven consensus-building. Hargyatni and Purnama (2024), in their study of the financial sector, add that financial decisions supported by AI reach their full potential when paired with a BDA system capable of delivering real-time analysis, data visualization, and market trend mapping. Without BDA, AI lacks access to the raw data essential for optimal pattern learning.

Both Ghasemaghaei et al. (2023) and Shamim et al. (2024) emphasize that the effectiveness of AI-BDA integration hinges on internal organizational capabilities, including analytical competence and dynamic capabilities. The analytical competence index developed by Ghasemaghaei et al. (2023) reveals that the quality of decision outcomes is significantly influenced by an organization's readiness to interpret and apply data within its decision-making processes. Shamim et al. (2024) reinforce this finding by demonstrating that successful technology integration depends on managerial preparedness to manage and translate data into valuable decisions. From an epistemological perspective, Vincent (2021) underscores that AI can complement human intuition, particularly when BDA is employed to uncover nonlinear patterns beyond human perception. Wang and Byrd (2021) highlight the role of organizational absorptive capacity as the mediating mechanism between BDA and more informed, strategic decision-making.

Adrian et al. (2023) conclude the stream of findings by stressing the importance of organizational readiness to integrate AI-BDA systems into existing structures, strategies, and workflows. Successful integration depends not only on technological sophistication but also on the cohesion between organizational structures and the responsiveness of implementation to environmental changes. All studies within this theme suggest that the integration of AI and BDA is not merely a convergence of two technologies, but a reconstruction of organizational decision-making logic. When AI is empowered by big data, decision systems shift from rule-based approaches to pattern-based learning; from intuition to prediction; and from manual to intelligent automation. However, the effectiveness of such systems is heavily influenced by structural context, organizational culture, and human readiness to adopt technology-based approaches in a reflective and strategic manner.

Synthesis of Findings and Critical Discussion

An analysis of the 20 reviewed articles indicates that Artificial Intelligence (AI) and Big Data Analytics (BDA) are consistently positioned as key catalysts in enhancing the effectiveness of organizational decision-making. Although many studies examine these technologies separately, there is an emerging trend toward epistemological and methodological integration, which illustrates how AI and BDA reinforce each other in developing data-driven decision systems that are responsive to environmental complexity. Most studies reach a consensus that both AI and BDA play critical roles in increasing the speed, accuracy, and objectivity of decision-making processes. The application of AI and BDA has been shown to support automation, improve predictive accuracy, and enrich the information base used in decision-making. Kumar et al. (2024) and Li et al. (2022) affirm that the integration of these technologies directly accelerates decision workflows, while Tummalapalli et al. (2025) and Farhi et al. (2024) demonstrate that the combination of AI and BDA enhances decision validity in both strategic and operational contexts.

Nonetheless, approaches to this technological integration remain varied. Studies such as Di Vaio et al. (2022) and Carter & Wynne (2021) highlight the synergy between AI and BDA in building intelligent and collaborative decision systems. Conversely, Khair et al. (2020) and Nisar et al. (2021) continue to explore them within their respective domains. This heterogeneity reflects the absence of a unified paradigm in integrative approaches and opens the door for deeper conceptual exploration in future research. The consistency between theoretical frameworks and empirical findings is evident in several studies employing theory-based approaches. The use of dynamic capabilities theory by Shamim et al. (2024) convincingly explains the link between big data management and decision-making capabilities. A similar alignment is seen in Ghasemaghaei et al. (2023), who developed and tested an analytical competence index using a quantitative approach. However, conceptual contributions, such as those by Vincent (2021) and Adrian et al. (2023), still require further empirical validation to enable broader cross-sectoral generalization. Several articles also make substantial contributions in constructing new conceptual models. Cao et al. (2025), through the development of a path model, demonstrate a significant relationship between business analytics and decision-making effectiveness. Di Vaio et al. (2022), through bibliometric analysis, identify thematic clusters that expand the

understanding of the current literature's structural composition. These contributions enrich discourse on the interplay between humans, technology, and data contexts within increasingly complex and dynamic organizational decision systems. A critical review of the literature also reveals several limitations. A predominant focus on the business and financial sectors has resulted in the underrepresentation of other sectors such as education, social services, and the environment (Hargyatni & Purnama, 2024; Marimira & Gumel, 2025). The reliance on quantitative approaches has also led to a scarcity of longitudinal studies, which are essential for evaluating the long-term impacts of technology adoption. Additionally, many studies have not explicitly accounted for contextual variables such as organizational culture or data literacy levels, potentially introducing bias in result interpretation (Shick et al., 2024; Karagozlu et al., 2024). Some theoretical approaches also remain normative and lack robust measurement instruments.

Despite these limitations, the synthesized literature contributes significantly to strengthening the scientific foundation of this field. This review consolidates previously fragmented findings and develops an integrative conceptual framework that views AI and BDA as a unified system within contemporary decision-making. Moreover, it clarifies the critical role of organizational readiness, human resource competence, and implementation strategies as key success factors. Theoretically, this study reinforces the relevance of the resource-based view and dynamic capabilities framework within the context of digital transformation. Empirically, it supports the need for cross-methodological, cross-sectoral, and longitudinal approaches in future research.

Theoretical and Practical Implications

The findings of this study offer meaningful contributions to both theoretical development and managerial practice in the context of technology-based decision-making. Artificial Intelligence (AI) and Big Data Analytics (BDA), initially regarded as purely technological entities, now demonstrate their potential as strategic components that enhance organizational competitiveness in dynamic business environments. Theoretically, this study reinforces the explanatory power of the dynamic capabilities theory (Teece, 2007) in illustrating how organizations manage and adapt digital resources to swiftly and accurately respond to external complexities. This is evident in the findings of Shamim et al. (2024), which show that big data management, as a dynamic capability, directly contributes to an organization's ability to make effective decisions. This perspective positions AI and BDA not merely as supporting technologies but as integral elements of modern organizational structure and culture.

Furthermore, this review provides empirical validation for the knowledge-based view and the concept of absorptive capacity (Cohen & Levinthal, 1990). The study by Wang and Byrd (2021) highlights the importance of an organization's ability to absorb and internalize data as knowledge to support analytical decision-making. Data literacy and managerial capacity are shown to be critical mediating variables in the implementation of technology-based decision systems. These findings also open the door for the development of more integrative conceptual models. Carter and Wynne (2021) propose a synergistic approach between humans and AI, which can be enriched by the analytical dimensions of big data to create decision-making models that incorporate rule-based logic, learning-based mechanisms, and data-driven reasoning. Such a model reflects a spectrum of decision-making adaptable to various digital organizational contexts.

From a practical standpoint, this study provides several strategic implications for organizational leaders. First, the development of accurate, fast, and easily accessible data infrastructure is a fundamental prerequisite for creating robust decision-making systems. This aligns with findings from Nisar et al. (2021) and Karagozlu et al. (2024), which stress the importance of data management quality in supporting decision validity. Second, organizations must anticipate the risks of algorithmic bias in AI implementation by establishing ethical policies and accountable governance systems. As shown by Khair et al. (2020) and Vincent (2021), while AI holds the potential to enhance objectivity, without ethical oversight, algorithms may also produce harmful distortions. Hence, human-in-the-loop approaches and transparency principles should be integrated into organizational technology systems.

Third, strengthening data literacy and analytical competencies across all organizational levels is imperative. Ghasemaghaei et al. (2023) state that such competencies are not only essential for technical roles but must also be embedded within strategic leadership to effectively manage data-driven organizations. Continuous training and the adoption of data visualization platforms can be part of a long-term strategy. Fourth, the integration of AI and BDA should not be treated merely as a technology project but as a strategic transformation process that encompasses structure, culture, and human resource management. Adrian et al. (2023) emphasize that the success of such systems depends on an organization's overall readiness. Therefore, technology adoption in decision-making should be managed as a process of strategic renewal, not just a short-term digital innovation.

CONCLUSION

Based on the analysis of the 20 reviewed articles, several key findings have been identified that collectively and systematically address the research questions. The first finding reveals that Artificial Intelligence (AI) has played a transformative role in decision-making at both managerial and strategic levels. AI has been shown to improve efficiency through process automation, enhance accuracy through algorithmic prediction, and expand organizational capacity in addressing human cognitive limitations. Furthermore, AI contributes to accelerating deliberation, supporting human–machine collaboration, and promoting fairness in decision-making, particularly in human resources and finance. AI has evolved beyond its function as a technical system to become a strategic partner in shaping intelligent and data-driven decisions. The second finding affirms the significant contribution of Big Data Analytics (BDA) to the effectiveness of decision-making. BDA provides a foundation for organizations to extract meaning from vast volumes of data and integrate it into strategy formulation, risk evaluation, and responses to market dynamics. In addition to enhancing accuracy and speed, BDA enriches the informational base for decision-making, resulting in higher satisfaction among decision-makers due to its reliance on factual and real-time data.

The analysis also revealed three main themes in the literature regarding the role of AI and BDA in organizational decision-making contexts. First, AI is understood as a strategic entity that transcends automation and becomes embedded in collaborative, data-based decision structures. Second, BDA is identified as the foundation of analytical capabilities that reinforce an organization's dynamic capacity to navigate decision-making complexity. Third, the synergistic integration of AI and BDA results in intelligent decision systems that unify predictive, adaptive, and data-driven logic within a single integrated framework. From a methodological standpoint, current research trends show a dominance of quantitative approaches such as structural equation modeling (SEM), regression, and path analysis to test variable relationships. Conceptual frameworks and narrative studies remain relatively limited, while longitudinal and cross-sectoral research designs are still underexplored. This underscores the need for methodological diversification in future research to achieve a more comprehensive understanding.

Based on these findings, several strategic recommendations can be made. First, organizations should pursue strategic integration between AI and BDA in their decision-making systems—not only at the technical level but also as part of managerial capabilities and organizational architecture. Second, strengthening analytical competence and data literacy among decision-makers should be prioritized to ensure that technology is utilized optimally, ethically, and inclusively. Third, policymakers should give serious attention to data governance and algorithmic ethics, particularly in the context of public and social sector regulations that are more vulnerable to ethical implications of intelligent technologies. For future research development, this study encourages broader exploration of AI and BDA integration in non-business sectors such as education, healthcare, and the environment—areas that have been underrepresented in the literature. Additionally, there is a need to advance longitudinal designs, adopt mixed-methods approaches, and explore organizational aspects such as data culture, resistance to change, and digital leadership, to achieve a more holistic and practical understanding of the effectiveness of technology in decision-making.

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