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Improving decision-making using big data for sustainable development: a systematic literature review

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Abstract:

The rapid evolution of new technologies has revolutionized management practices in organizations. Decision-making, once based on traditional methods such as intuition and experience, has shifted towards more modern methods grounded in big data analytics (BDA). This study is part of a systematic review of research. By consolidating recent literature, particularly from 2021 to 2025, the study aims to highlight the strategic role played by big data (BD) and BDA in decision-making (D-M) and business performance. Following a meticulous methodological search, articles were extracted from three databases: Google Scholar, DOAJ, Scopus and Web of Science. Applying the PRISMA 2020 methodology yielded 35 articles based on exclusion and inclusion criteria. Reviewing the selected articles highlighted the importance of Big Data-driven D-M across six domains: finance, accounting, supply chain, marketing, human resources, and the environment. The study shows that the integration of big data is not limited to business growth but also contributes to sustainable development. The results demonstrate the undeniable advantage of D-M and improving organizational performance. However, addressing challenges such as cultural and ethical barriers, data privacy and security, algorithmic bias, infrastructure complexity, and resource constraints would lead to the effective and efficient use of this tool. Furthermore, future research should focus on integrating AI into analytical D-M processes and exploring mechanisms for improving real-time D-M.

Keywords:

Big Data, Big Data Analytics, Decision-Making, Decision-Making Process, Organizations Performance, Sustainable Development

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Introduction

The business environment today is increasingly geared towards modernization. The increase in data on individuals and customers has led to the use of new technologies to manage the analysis of large datasets and make informed decisions (Lutfi, 2023). Traditional D-M, often based on opinions, has been transformed into modern D-M, centered on new technologies such as BD, AI, and the Cloud. These technological innovations have enabled the implementation of new and disruptive strategies to break with old methods in order to redefine competition, productivity, and organizational performance (Mazzei & Nobles, 2017). Advances in machine learning, Cloud computing, and distributed data systems have increased managers' ability to react quickly to emerging trends. Furthermore, the information generated by these new tools has become a key factor in organizational success (Tripathi, 2024). They transform the decision-making process, enabling rapid and collaborative analysis of large amounts of data, contributing to more informed D-M. According to Rajkumar et al. (2025) Industry 4.0 technologies supports better strategic and practical choices as well as operational decisions to improve business results.

Indeed, BD refers to vast datasets characterized by the "5Vs": Volume, Velocity, Variety, Veracity, and Value (Mo & Li, 2015). BD analytics is a phenomenon that analyses large volumes of data using sophisticated toools and techniques to extract valuable insignts and to solve business use-cases (Sivarajah et al., 2017). It enables the extraction of relevant information from large volumes of complex data and its transformation into a competitive advantage. BDA helps organizations use new technologies to manage and leverage data to improve executive decisions (Nisar et al., 2021). Furthermore, platforms for autonomously collecting, storing, and processing data also allow executives to make fact-based decisions with a strategic orientation (Marr, 2015). Unlike decisions based on intuition, data-driven decisions allow for stakeholder involvement and improve the level of transparency in organizations (Manyika et al., 2011).

One of the distinctive features of big data-based D-M lies in its ability to analyze large volume of data and highlight results in real time. For example, implementing a product or service requires feedback from consumers and stakeholders. To this end, information from multiple sources (social networks, email, etc.) helps manage customer preferences and specific needs in real time. Garmaki et al. (2023) highlight organizational learning capabilities, which they argue facilitate the creation and systematic sharing of knowledge, enabling organizations to track evolving analytical behaviors and capitalize on emerging insights. BD is transforming not only management practices but also the competence of managers and decision-makers in general.

Furthermore, the integration of digital tools within a company contributes to environmental protection. Modern technology now impacts not only the growth and performance of organizations but also

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sustainable development. Accounting procedures that were once managed using ledgers, invoices, and other paperwork are disappearing. Task automation, digital invoices, and cloud storage reduce paper consumption. The transition to digital advertising also reduces deforestation. These technologies contribute not only to environmental protection but also to sustainable economic development. However, the impact of these new technologies on energy consumption must be considered. Indeed, political and economic recommendations stemming from the principle of sustainable development have promoted research and development of new technologies that benefit the environment: new processes and new green products.

Studies by Wamba et al. (2016) showed that organizations implementing BDA experience significant improvements in operational efficiency and product innovation. The work of Tiwari et al. (2024) on manufacturing supply chains suggests that BDA can optimize inventory and risk management, thereby simultaneously improving performance and sustainability. However, managing large datasets relies on advanced analytics software. It therefore requires more complex methods to guarantee data quality, integration, governance, and security (Bena et al., 2025). Similarly, BD management relies on specific skills, resources, and diverse technologies, intervening in various organizational processes such as decision-making. Nevertheless, companies that successfully meet these challenges are likely to see improvements in their organizational, financial, and commercial performance.

This study aims to highlight a literature review on the contribution of BD and BDA to improving D-M in businesses. To that end, two questions were raised:

1. What is the current state of recent research on big data and decision-making?
2. How does big data analysis improve decision-making and business performance?

By consolidating recent literature on the application of this technology in the D-M process, the study seeks to illuminate the strategic role played by BD tools in the quality of D-M and business performance. It offers a critical analysis of recent transformations in management practices and the D-M process and proposes avenues for future research. The remainder of this work includes the methodology, results and discussion, and finally, recommendations and directions for future research.

Methods

Following a systematic literature review methodology, academic data was collected from recognized databases, including Google Scholar, DOAJ, Scopus and Research Gate. Inclusion and exclusion criteria were clearly defined to ensure rigor, transparency, and the extraction of a relevant database. To this end, the PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analysis) 2020 flowchart was used to document the inclusion and exclusion selection processes (Page et al., 2021). The table below presents the selection criteria.

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Aspect	Inclusion Criteria	Exclusion Criteria
Document	Peer review journal articles	Book chapter, conference proceeding, Editorial
Title	Articles content key words of study	Articles not related with key words of the study
Methodology	Empirical review or case studies articles	Literature review articles
Language	Articles published in English	Other language
Access	Articles that give whole access	Articles that give only title and abstract
Fields	Articles related to business, Management	Other fields (heath, Space…)
Publication year	From 2021-2025	Older than 2020

Table 1: Presentation of inclusion and exclusion criteria

To conduct this study, several steps were followed to determine which articles would be included in the search.

The first step consisted of defining keywords and performing a search in the selected databases. The terms “big data,” “big data analytics,” “decision making,” “decision making process,” “strategic decision,” and “operational decision” were used in the search query. At this stage, exclusion criteria such as language, document type, and publication year were included to limit the extraction process to articles meeting the search objectives and criteria. This step resulted in the selection of 352 articles, including 239 from Google Scholar, 45 from DOAJ, 27 from Scopus, and 41 from Web of Science. After removing duplicates, 284 articles were retained.

The second step consisted of reading the titles and abstracts to determine the relevance of the information contained in the article, as well as its correspondence with the previously defined keywords. At this stage, 237 articles were excluded because they did not define the inclusion criteria based on the field of study, accessibility, methodology, and keywords.

The third step consisted of selecting the articles eligible for the study. Thus, all the selected articles were fully accessible for careful reading in light of the objectives, methodology, and results. The objective here was to identify articles likely to contribute to achieving the established objective. At this stage, 47 articles were eligible for the study.

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The final step allowed for the selection of the articles to be included in the study. After excluding irrelevant articles, 35 articles were ultimately selected for the study. The figure below highlights the PRISMA diagram used in this study.

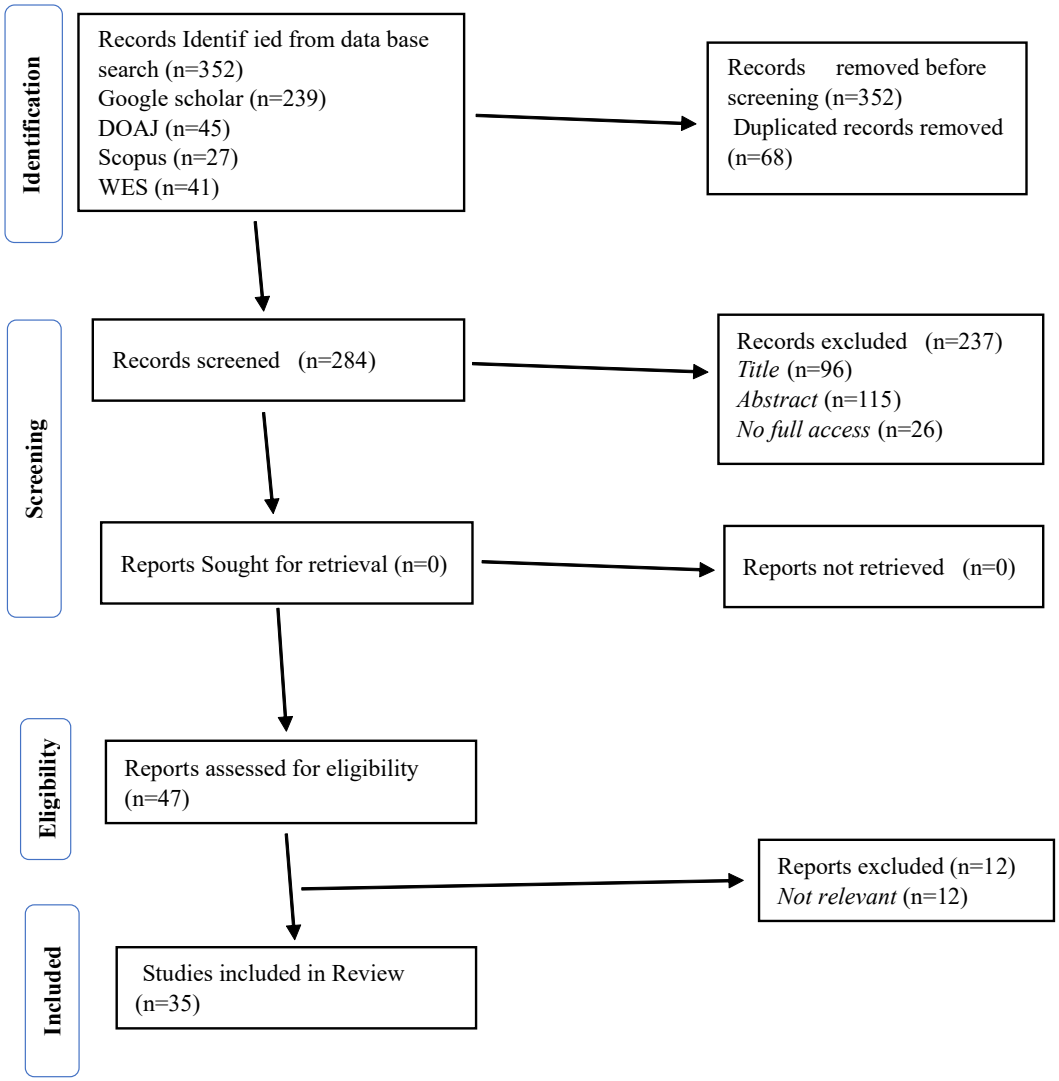

Figure 1: PRISMA 2020 flow diagram for the systematic review methodology

Results and Discussion

Through the various articles presented in the table (Appendices 1&2), we have identified recent studies on the application of BD to D-M and its impact on business performance. Authors such as Kannan et al. (2022); Octiva et al. (2024); Lei et al. (2022) and Elragal et al. (2024) focused on the application of data analysis to improve the quality of organizational management. Kannan et al. (2022) demonstrated the extent to which data analysis and machine learning can predict production delays in a materials

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extraction company. Their results show that multilayer neural networks and logistic regression accurately predict these delays, with an F-score of 0.973. This improves the company's time management and reduces potential delays in the production chain. Octiva et al. (2024) focused on the application of artificial intelligence (AI) to anomaly detection in BD systems to improve turnaround time management in terms of speed, accuracy, and efficiency. Their results suggest that the application of AI can significantly improve anomaly detection capabilities compared to conventional methods, with an average accuracy of 92%. Furthermore, Lei et al. (2022) found that the use of BDA has a positive impact on the quality of D-M and that BDA capabilities mediate the relationship between BDA use and D-M quality. However Elragal et al. (2024) after proposing a model to assess the level of readiness of organizations for data-driven decision making (DDDM), concluded that organizations are not yet ready to integrate analytical data into their decision-making process. This could be one cause of the gap observed by Turner & Atkinson (2021), between those who adopted large datasets and those who did not.

Moreover, reading the selected articles led to a classification by field: finance, human resource (HR) supply chain (SC), accounting and marketing, and sustainable development.

Big Data and Improved Decision-Making in Finance

It was noted that the authors Babar (2025); Jaja & Obikoya. (2023), and Kadjiha (2024) focused on the banking sector. Kadjiha (2024), after analyzing BD on financial D-M in Malaysian companies, concluded that BDA improves financial D-M by extracting relevant information from large datasets. It also improves risk management and the operational efficiency of financial institutions, and strengthens fraud detection capabilities. Babar (2025) after using machine learning (an ensemble method), to process large-scale financial data with an emphasis on efficiency and accuracy, came to a conclusion that: the proposed architecture improves the accuracy of predicting customer behavior, such as loan underwriting decisions, and promotes robust, scalable, and real-time financial D-M.

Jaja & Obikoya. (2023) focused on the relationship between database management systems and the D-M processes of commercial banks. Their results demonstrate a positive and significant correlation between database management systems and the strategic and tactical D-M of commercial banks. Similarly, Xiong's work (2025) has shown that BD in finance significantly strengthens companies' real-time internal control capabilities, financial forecasting, improves the quality of financial information and reduces the risk of financial fraud.

The above studies highlight the role of BDA in D-M and operational efficiency within financial institutions. Big data-driven D-M contributes significantly to improving financial practices. Its ability to extract relevant information in real time, detect fraud, and predict customer behavior helps strengthen existing governance mechanisms. Furthermore, BDA helps assess credit risk. Analyzing data sources such as

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social media and online activity allows for evaluating creditworthiness and improving the accuracy of credit rating models (Kshetri, 2014).

However, implementing an effective data management and analysis mechanism involves several parameters to consider, including: recruiting competent personnel with the required qualifications, providing ongoing staff training on the evolution of financial technologies, establishing a robust financial system capable of preventing bias, and protecting private data. Indeed, the financial sector is a high-risk sector, fraught with numerous challenges. Faced with technological advancements, the effective integration of BD requires the implementation of well-established security measures. A mediocre financial system could not only generate bias in the analysis process but also affect the quality of D-M.

The Integration of Big Data Into Marketing Strategies

Cristescu et al. (2023) and Burga & Ridwan (2025) focused on the integration of BD into marketing D-M. Burga and Ridwan (2025) sought to explore the impact of BDA on business D-M and business performance at PT XYZ, a leading e-commerce company in Indonesia. Their results suggested a 12% increase in revenue, a 15% improvement in customer satisfaction, and an 8% reduction in operating costs following the adoption of big data-based D-M processes. Cristescu et al. (2023), after exploring the Customer Relationship Management (CRM) software for increasing revenue generation, identified a positive correlation between the use of BD and increased online sales.

The above work on big data-driven marketing D-M highlights key terms such as revenue, customer relationship and satisfaction, and operational costs. Indeed, the implementation of a more customer-centric communication system, using digital tools, has led to the collection of large quantities of data. Thus, processing massive datasets from various sources (social networks, emails, etc.) not only leads to increased market share but also to addressing specific customer needs by offering on-demand services and products. Furthermore, companies use clustering algorithms to group customers based on their preferences, facilitating targeted marketing and customer loyalty (Davenport, 2014). BDA therefore contributes to D-M focused on customer satisfaction, improving production and distribution systems, and optimizing costs. However, like any other function within the company, managing these tools requires well-structured and trained organizational leadership. The mechanisms put in place must also take into account the protection of customer data.

Improving the Supply Chain With Big Data

Lawal & Ajayi. (2025) examined the implementation of BD in US SC, evaluating its impact on operational efficiency, cost reduction, and strategic positioning. Their results showed that organizations integrating BD achieved improvements of 15–25% in forecast accuracy, reductions of 20–30% in storage costs, and optimization of their procurement spending by 10–15%. Hsu et al. (2021) proposed an integrated,

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multi-criteria D-M framework, using the example of China's largest relay manufacturer, to identify key BD levers for improving SC agility and mitigating the bullwhip effect. Applying the proposed methods enabled the identification of key efficiency factors (KEFs) and key performance indicators (KPIs). It is observed that the MCDM-QFD method provides decision support for improving the manufacturing of electronic equipment. Barhmi & Laghzaoui. (2025) sought to understand the mechanisms by which SC data analytics capabilities (ADCA) influence SC agility performance (PACA), either directly or through other capabilities. They concluded that ADCA capabilities strengthen GRCA, RCA, and RCA capabilities. Yildizbasi and Arioz focused on selecting the most efficient green supplier from among four electronics companies. They concluded that using fuzzy logic-based multi-criteria decision-making (MCDM) techniques and big data analysis enables the selection of the best-performing green supplier by providing input data for decision-making, thereby facilitating a systematic reduction of information into more concise insights.

SC managers are investing in data analytics to reduce costs and uncertainties and gain a competitive advantage (Kache & Seuring, 2017; Wamba et al., 2017). According to Tiwari et al. (2018), BDA allows for the extraction, diagnosis, and transformation of SC data into valuable and meaningful information for decision-makers. Integrating this tool also enables simultaneous inventory optimization across the entire SC. For example, Procter & Gamble's multi-echelon optimization system, inventory management can extend to 200 factories, more than 50 distribution centers, and thousands of points of sale, as illustrated in the work of Lawal & Ajayi (2025). Indeed, this system integrates real-time data on demand fluctuations, transportation constraints, and production capacities, helping to reduce inventory investments and improve customer service.

However, the complexity of modern inventory management systems remains a significant challenge, as companies face difficulties integrating data, particularly those with legacy systems and multiple data formats. Implementing this system requires robust infrastructure and sophisticated software platforms. Furthermore, the diversity of data sources, such as ERP systems, warehouses, transportation, and suppliers, also presents a challenge for managers, who must optimize their ability to manage data at very large scale to make decisions based on data quality.

Big Data at the Heart of Accounting Practices

Studies by Siahaan et al. (2025), using structural equation modeling and partial least squares analysis (PLS-SEM) applied to 128 multinational companies across various sectors, showed that BDA significantly improves strategic management accounting practices ($\beta = 0.694$, $p < 0.001$) and directly enhances the quality of decision-making ($\beta = 0.483$, $p < 0.001$). Masuke et al. (2025) explored the influence of BDA on management accounting and decision-making in Southern Africa. Following a

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qualitative analysis conducted with 24 accounting managers, the results show that BDA transforms management accounting practices, thereby improving decision-making.

Indeed, integrating BD into a company's accounting function is of paramount importance. Big data-driven accounting management contributes to improving the company's true and fair view. Timely financial reports enable decision-makers to make high-quality, real-time decisions. According to Gul (2025), BD integration contributes to an efficient and detailed evaluation of financial indicators. Automating tasks and implementing a centralized data processing system could help reduce information asymmetry while improving the qualitative characteristics of accounting information. Beyond improving information quality, it is also important to note that, unlike traditional accounting systems, big data-driven accounting systems take into account information generated by the environment, such as the market, competitors, and social media. Furthermore, decisions are made taking into account factors other than accounting figures.

Moreover, implementing high-quality information processing also requires competent and qualified personnel. Companies would benefit from training accountants in advanced analytical techniques, such as modeling, machine learning, and data visualization. One of the challenges for decision-makers is to migrate to a strategic information analysis system that is both relevant and predictive in order to ensure competitive intelligence.

Big Data at the Heart of Human Resources Decision-Making

Widjaja & Soetjipto (2025) evaluated the effect of BD utilization on the quality of HR D-M and identified the supporting and inhibiting factors for its implementation. The results show that BDA significantly improved the quality of HR D-M, with HR digital competencies and organizational culture as important mediating factors. The introduction of BD into HR management has improved the organizational level of the company. Traditional recruitment decisions, once based on intuition and family and friendly relationships, have shifted towards a modern recruitment system anchored in skills and qualifications for the position. The automation of the recruitment system has also made it possible to bypass the review of physical files, which was more time-consuming and resulted in additional costs for the company. Furthermore, the implementation of a modern HR management system focused on BD contributes to the development of employee skills. Ongoing training that keeps pace with technological advancements allows employees to maintain productivity and remain competitive internationally. Performance indicators derived from big data analysis could help identify skills gaps and training needs, facilitating targeted development programs.

Nevertheless, technical and managerial challenges remain a hindrance to effective data management. The dissemination of outdated, inconsistent, or incomplete data can impede the extraction of reliable and relevant information for D-M regarding recruitment, development, or employee retention. Indeed,

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although data analysis tools allow for the aggregation of information from diverse sources, analysts and decision-makers should remain vigilant during the data extraction process. Implementing a sophisticated control system could enable real-time action. Furthermore, the use of BD in HR raises ethical questions related to employee privacy and data security. Organizations are required to find a balance between using data for D-M and respecting employee rights in order to build trust.

Big Data-Driven Decision-Making for Sustainable Development

Hossain et al. (2024) evaluated the impact of BD and business intelligence on the sustainable development initiatives and operational efficiency of an organization in the United States. The results showed a 7.1% reduction in its operating costs while decreasing its CO2 emissions by 5%. Energy consumption performance improved, with a 20% decrease, and inventory turnover was also enhanced. It must also be acknowledged that BD plays a significant role in reducing greenhouse gas emissions. In 2020, for example, Tesla announced that it had reduced its greenhouse gas emissions by 5% across all its operations, representing the first five years of progress thanks to data-driven innovations (McCarthy, 2020). Indeed, this company uses to monitor BDA the performance of its electric vehicles and optimize battery usage through real-time data collection (Houssain et al., 2024). Research by Anwar et al. (2024), has also shown that BDA affect SMEs' capabilities, operations, and sustainable performance.

This research reveals that the use of digital tools should evolve at the same pace across all disciplines to facilitate operations. The connection between domains, functions, departments, and their interdependence highlights the effectiveness of modern technologies such as Big Data. The implementation of a digital operating system in banks, aimed at facilitating business access to banking services and decision-making, should evolve in parallel with the modernization of management and production systems within companies. Indeed, the digitization of one function generally leads to the digitization of other functions within the company. A digitized accounting department, for example, affects logistics, finance, production, and marketing, and vice versa. A digitized HR department could also have an impact on production and marketing. Furthermore, the instant sharing of information allows stakeholders and all related functions to obtain information in real time. As a result, we are witnessing a system of information unity. Decisions made in various fields are also based on this information relayed from the platform. Furthermore, the effectiveness of digital tools is also demonstrated by widespread adoption, as the existence of a digital divide could hinder organizations' expansion into new markets.

The advent of BD has revolutionized management practices in various sectors. Its application in accounting, marketing, finance, and HR has led to improvements in organizational, financial, commercial, and environmental performance. While its application leads to better risk management and increased revenue through predictive and prescriptive analytics, the effective and efficient use of this tool in organizations raises several challenges, such as cultural and ethical barriers, data privacy and

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security, algorithmic bias, infrastructure complexity, resource constraints, political instability, and terrorism. Studies rarely highlight the difficulties encountered by companies adopting new technological tools such as BD. Research tends to emphasize the advantages of these tools and their contribution to D-M quality and performance; however, few studies have focused on the data privacy and security, and other challenge face by companies. The authors mentioned above focused on specific areas and case studies. Research on the effectiveness of BD connecting company departments could highlight the overall performance of this tool on organizational growth and performance.

Recommendations

Organizations must prioritize data accuracy and regulatory compliance to optimize the effectiveness of big data applications. Infrastructure maintenance planning can also ensure the continuity and availability of real-time data. To ensure effective management, managers must be extremely vigilant regarding risky events. Furthermore, the constant evolution of technologies should encourage companies to provide ongoing training for their employees and adopt a skills-based management approach.

Companies that strive to integrate AI and BD into the D-M process will be able to improve their overall performance while maintaining their market agility. Integrating AI will make it possible to extract and analyze unstructured information such as images, videos, and text from social networks and to anticipate fraud detection.

Conclusion and Futures Research

The objective of this study was to highlight the strategic role played by BD in D-M and business performance. Starting with a systematic literature review, a rigorous methodology was developed to extract relevant articles according to the PRISMA method. Reading the selected articles allowed for classification into six areas: finance, accounting, supply chain, marketing, human resources, and sustainable development.

The introduction of BD and BDA in finance has proven to be a positive response to the problems of risk management, solvency, and fraud detection. Data from BDA has made it possible to improve the credit rating system by reducing information asymmetry problems. Incorporating this technological tool into marketing decisions leads to improved revenue and customer satisfaction. Furthermore, considering environmental factors, including the market, competition, and social media, when analyzing BD improves accounting practices and D-M quality. Beyond accounting practices, integrating BD into the supply chain leads to a significant reduction in storage costs and procurement expenses. Human resource management has also undergone a transformation due to improved D-M quality and organizational performance.

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However, the effective use of BD faces certain requirements that decision-makers should consider, including: data security, protection of clients' private data, compliance with ethical regulations, infrastructure maintenance, ongoing employee training, and skills management. Financial institutions, for example, would benefit from implementing a robust financial system capable of preventing bias and protecting private data. Future research could focus on the introduction of AI into the D-M process; the factors contributing to improve real-time D-M; and the reduction of bias in information conveyed by BD. This study derives its originality from a recent consolidation of work on D-M focused on BD and BDA. However, the data extraction was limited to the Google Schools, DOAJ, Scopus and Web of Science databases. Taking into account areas such as health and education would also broaden the scope of study. Moreover, future research should also focus on integrating AI into D-M. The mechanisms leading to the improvement of real-time D-M.

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Appendix

Journal	Title	Author
International Journal of Operations Management	Strategic Decision Making: The Effects of Big Data	Turner & Atkinson (2021)
Journal of theoretical and applied research in e-commerce	Deploying Big Data Enablers to Strengthen Supply Chain Agility to Mitigate Bullwhip Effect: An Empirical Study of China's Electronic Manufacturers	Hsu et al. (2021)
Technological Forecasting and Social Change	Big data analytics capability and decision-making: The role of data-driven insight on circular economy performance	Usama et al. (2021)
Journal of Big Data	Machine learning approach for predicting production delays: a quarry company case study	Kannan et al. (2022)
Soft Computing	Green supplier selection in new era for sustainability: A novel method for integrating big data analytics and a hybrid fuzzy multi-criteria decision making	Yildizbasi, & Arioz (2022)

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Information Processing & Management	Big data-assisted social media analytics for business model for business decision making system competitive analysis	Zhang et al. (2022)
Technological Forecasting and Social Change	Evaluating the impact of big data analytics usage on the decision-making quality of organizations	Lei et al. (2022)
Decision Support Systems	IT-business alignment, big data analytics capability, and strategic decision-making: Moderating roles of event criticality and disruption of COVID-19	Chen et al. (2022)
West African Journal of Business	Database Management System and decision-making process of commercial banks in rivers state	Jaja & Obikoya (2023)
Information & Technology Management	Structural equation modeling for impact of Data Fabric Framework on business decision-making and risk management	Rumman1 & Al-Abbadi (2023)
Pakistan Journal of Humanities and Social Sciences	Exploring the Impact of Big Data Analytics on Organizational Decision Making and Performance: Insights from Pakistan's Industrial Sector	Latif et al. (2023)
Technovation	The role of absorptive capacity and big data analytics in strategic purchasing and supply chain management decisions	Patrucco et al. (2023)
Information	The Impact of Data Science Solutions on the Company Turnover	Cristescu et al. (2023)
Technological Forecasting & Social Change	Assessing the impact of big data analytics on decision-making processes, forecasting, and performance of a firm.	Sheshadri, et al. (2023)
Decision Analytics Journal	A data-driven decision-making readiness assessment model: the case of a Swedish food manufacturer	Elragal et al. (2024)
International Journal for Multidisciplinary Research	Big Data and Business Intelligence: Key Drivers of Sustainable Development in USA-based Organizations	Hossain et al. (2024)
Journal of Computing and Engineering Technology	Big Data Analytics for Financial Decision Making in Malaysia	Kadjiha, (2024)
Library Progress International,	Decision-Making Process in Management: The influence of data analytics and Big data	Tripathi et al. (2024)
Journal of Project Management	Data-driven strategic decisions: Leveraging business analytics and big data to improve decision-making insights in the international organizations	Khawaldeh et al. (2024)
International Journal of Data and Network Science	The influence of social media, big data, and data mining on the evolution of organizational behavior: Empirical study in Jordanian telecommunication sector	Mansoura et al. (2024)

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Management of Environmental Quality: An International Journal	Big data analytics and competitive performance: the role of environmental uncertainty, managerial support and data-driven culture	Almheiri et al. (2024)
International Journal Software Engineering and Computer Science	The Application of Artificial Intelligence for Anomaly Detection in Big Data Systems for Decision-Making	Octiva et al. (2024)
Technological Forecasting & Social Change	Antecedents of big data analytics adoption and its impact on decision quality and environmental performance of SMEs in recycling sector	Anwar et al. (2024)
International Journal of Sustainable Development Through AI, ML and IoT	Leveraging Big Data Analytics for Enhanced Decision Making in Business Intelligence	Gami & Batra (2024)
Journal of Open Innovation: Technology, Market, and Complexity	A hybrid approach to financial big data analysis using extended ensemble learning and optimized spark streaming	Babar, M (2025)
International Journal of Digital business	Case Study of the Use of Big Data in Business Decision Making	Burga & Ridwan (2025)
Digital Innovation: International Journal of Management	Data-Driven Management : Utilization of Big Data in HR Decision Making in the Digital Age	Widjaja1 & Soetjipto (2025)
International Journal of Environmental Sciences	Exploring The Role Of Big Data Analytics In Strategic Decision-Making And Performance Improvement	Sridevi et al. (2025)
International Journal of Research Publication and Reviews	The Impact of Big Data on Decision-Making in Supply Chain Management: Transforming American Enterprise Operations	Lawal & Ajayi (2025)
Journal of accounting	Strategic management accounting and digital transformation: the role of big data analytics in decision making	Siahaan et al. (2025)
Risk and Financial Management	The Role of Big Data Finance in Supporting and Supervising Corporate Financial Decision-Making	Xiong, (2025)
Innovative Marketing	The impact of big data analytics on digital marketing decision-making: A comprehensive analysis	Bajrami et al. (2025)
International Journal of Information Systems and Project Management	Contribution of big data analytics to risks and disruptions mitigation and agility performance	Barhmi, & Laghzaoui (2025)
Studia UBB Negotia	Big data analytics and its influence on management accounting: evidence from southern Africa	Masuke et al (2025)
Archives for Technical Sciences	Integrating industrie 4.0 and management information systems for improved decision making effectiveness in modern organizations	Rajkumar et al. (2025)

Appendices 1: Articles included in the study

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Authors	Title	Objective	Results
Turner & Atkinson (2021)	Strategic Decision Making: The Effects of Big Data	Explore the potential barriers to big data integration within businesses, and sought to understand how these could be removed.	An emerging gulf between those who have adopted data big sets and those who have not. knowledge and understanding is lagging far behind benchmarks set by some businesses
Hsu et al (2021)	Deploying Big Data Enablers to Strengthen Supply Chain Agility to Mitigate Bullwhip Effect: An Empirical Study of China's Electronic Manufacturers	It proposes an integrated multi-criteria decision support framework and uses the example of the largest relay manufacturer in China to identify the key levers of big data to improve the agility of supply chains and mitigate the bullwhip effect.	A QFD method based on the integrated FDM-FISM-ANP-GRA framework has been proposed to identify key efficiency factors (BEF), key performance indicators (SCAI) and key performance indicators (BDE). The constructed MCDM-QFD method provides decision support for improving the manufacturing of electronic equipment.
Usama et al (2021)	Big data analytics capability and decision-making: The role of data-driven insight on circular economy performance	Examine the association of Big data analytics capability with CE performance and examined the mediating role of data-driven insights in the relationship between big data analytics capability and decision-making.	Big data analytics capability and Business Intelligence BI&A are positively associated with decision-making quality.
Kannan et al .(2022)	Machine learning approach for predicting production delays: a quarry company case study	Demonstrate how data analytics and machine learning approaches may be utilized to predict production delays in a quarry firm as a case study	The multilayer neural network and logistic regression accurately predict production delays, with an F-score of 0.973. This improves decision-making for the mining company and reduces potential delays on the production line.
Zhang et al. (2022)	Big data-assisted social media analytics for business model for business decision making system competitive analysis	Assess the impact of the Big Data-assisted social media analytics model (BD-SMAB) on business decision-making and commercial performance	The BD-SMAB method increases awareness and affects decision-makers in marketing Strategies; enhance customer satisfaction and experience and develop brand awareness.
Lei et al. (2022)	Evaluating the impact of big data analytics usage on the decision-making quality of organizations	Investigated the impact of big data analytics usage on decision-making quality and tested the mediating effect of data analytic capabilities.	Big data analytics usage had a positive impact on decision-making quality and that big data analytics capabilities played a mediating role in the relationship between big data analytics usage and decision-making quality.

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Yildizbasi & Arioz (2022)	Green Supplier Selection in New Era for Sustainability: A Novel Method for Integrating Big Data Analytics and a Hybrid Fuzzy Multi-Criteria Decision Making	Select the most efficient green supplier with fuzzy integrated MCDM approaches and big data analysis.	Big Data analysis provides input for decision-making, enabling a systematic reduction to more concise information.
Chen et al. (2022)	IT-business alignment, big data analytics capability, and strategic decision-making: Moderating roles of event criticality and disruption of COVID-19	Examine the effects of IT-business alignment (ITBA) and big data analytics capability (BDAC) on strategic decision-making in the context of COVID-19	The disruptions caused by the COVID-19 event reinforce the effect of the BDAC on the speed and quality of the decision
Jaja & Obikoya (2023)	Database Management System and decision-making process of commercial banks in rivers state	Examine the relationship between the database management system and the decision-making process of commercial banks in Rivers State.	A positive and significant relationship between the database management system and the strategic and tactical decision-making of commercial banks in Rivers State.
Rumman & Al-Abbadi (2023)	Structural equation modeling for impact of Data Fabric Framework on business decision-making and risk management	Explore how data fabric, which is a useful way of organizing data, affects decision-making and risk assessment	Positive relationship between data fabric and decision-making, data fabric, and risk management
Patrucco et al. (2023)	The role of absorptive capacity and big data analytics in strategic purchasing and supply chain management decisions	Examine l'impact de la BDA sur les décisions stratégiques en matière de PSM ainsi que son interaction avec la capacité d'absorption de l'entreprise.	Companies that use Big Data Analytics within the PSM function improve their purchasing and supply-related decision-making as well as their performance.
Latif et al. (2023)	Exploring the Impact of Big Data Analytics on Organizational Decision Making and Performance: Insights from Pakistan's Industrial Sector	Examine the relationship between BDA and organizational decision-making as well as the degree to which BDA influences decision-making	Big Data Analytics has a favorable impact on an organization's capacity for decision-making and effectiveness. there are no statistical differences between major firms and medium-sized businesses when it comes to the pathways from Big Data analytics to successful decision-making
Cristescu et al. (2023)	The Impact of Data Science Solutions on the Company Turnover	Explores the potential of data science software solutions like Customer Relationship Management Software (CRM) for	A positive correlation exists between the use of Big Data and the increase in online sales.

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		increasing the revenue generation of businesses.	
Sheshadri, et al. (2023)	Assessing the impact of big data analytics on decision-making processes, forecasting, and performance of a firm.	examining the impacts of big data analytics on the process of decision-making, forecasting and firm performance	Big data analytics has a positive and significant impact on the decision-making process, forecasting, and performance of companies.
Elragal et al. (2024)	A data-driven decision-making readiness assessment model: the case of a Swedish food manufacturer	Propose a model to assess data-driven decision-making (DDDM) readiness in organizations	Organizations are not yet ready to integrate analytics data into their decision-making process
Hossain et al. (2024)	Big Data and Business Intelligence: Key Drivers of Sustainable Development in USA-based Organizations	Evaluating the impact of Big Data and business intelligence on sustainable development initiatives and the operational efficiency of an organization in the United States	A 7.1% reduction in its operating costs while decreasing its CO2 emissions by 5%. Improved energy consumption performance, with a 20% decrease, improving Inventory turnover.
Kadjiha (2024)	Big Data Analytics for Financial Decision Making in Malaysia	Analyze the big data analytics for financial decision making in Malaysia.	Big data analytics (BDA) improves financial decision-making in Malaysia by extracting valuable insights from vast datasets. It enhances risk management, customer segmentation, and the operational efficiency of financial institutions. It also strengthens fraud detection capabilities.
Tripathi et al. (2024)	Decision-Making Process in Management: The influence of data analytics and Big data	Explore the role of data in decision-making for management and show how the increased adoption of data analytics have shifted conventional decision-making methods	78% of manager often implement data analytics tools in strategic decision. There is a positive correlation between the frequency of data analytics usage and perception of efficiency improvement
Khawaldeh et al. (2024)	Data-driven strategic decisions: Leveraging business analytics and big data to improve decision-making insights in the international organizations	Examine the relationship between data analysis, Big Data, and decision-making information.	Positive and statistically significant relationship ($p < 0.01$) between data analysis, Big Data and decision-making information.

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Mansour et al. (2024)	The influence of social media, big data, and data mining on the evolution of organizational behavior: Empirical study in Jordanian telecommunication sector	Evaluate the impact of social media, big data, and data mining on the development of organizational behavior within the telecommunications industry in Jordan.	The integration of social media, big data, and data mining technologies has had a beneficial effect on the development of organizational behavior within the telecommunications industry in Jordan.
Almheiri et al. (2024)	Big data analytics and competitive performance: the role of environmental uncertainty, managerial support and data-driven culture	Examines the influence of big data analytics (BDA) on the competitive performance of firms in the United Arab Emirates	Their results suggest that big data analysis and IT-enabled dynamic capabilities impact both supply chain resilience and competitive performance.
Octiva et al. (2024)	The Application of Artificial Intelligence for Anomaly Detection in Big Data Systems for Decision-Making	Examine the application of artificial intelligence (AI) in detecting anomalies in big data systems to support faster, more accurate and effective decision-making.	The application of AI can significantly improve the ability to detect anomalies compared to conventional methods, with an average accuracy of 92%.
Anwar et al. (2024)	Antecedents of big data analytics adoption and its impact on decision quality and environmental performance of SMEs in recycling sector	Explores the BDA adoption and the mechanism through which it affects processes, operations, and decisions to achieve higher environmental performance of SMEs in the scrape and recycling industries.	Big Data analytics can enable SMEs in the scrap and recycling industry to gather, process, and analyze large amounts of data quickly and efficiently, enhancing SMEs' decision quality and environmental performance.
Gami, & Batra (2024)	Leveraging Big Data Analytics for Enhanced Decision Making in Business Intelligence	Explore the transformative impact of big data analytics on business intelligence (BI) and decision-making processes	Predictive analytics reshaping decision-making processes and driving operational efficiency.
Babar, M (2025)	A hybrid approach to financial big data analysis using extended ensemble learning and optimized spark streaming	Using machine learning (a comprehensive method) to process large-scale financial data, with an emphasis on efficiency and accuracy.	The proposed architecture improves the accuracy of predicting customer behavior, such as loan underwriting decisions, and promotes robust, scalable, and real-time financial decision-making.
Burga & Ridwan (2025)	Case Study of the Use of Big Data in Business Decision Making	Explore the impact of Big Data Analytics (BDA) on business decision making and business performance at PT XYZ, a leading e-commerce company in Indonesia	The results show a 12% increase in revenue, a 15% improvement in customer satisfaction and an 8% reduction in operating costs following the adoption of Big Data-based decision-making processes.

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Widjaja & Soetjipto (2025)	Data-Driven Management : Utilization of Big Data in HR Decision Making in the Digital Age	Investigate the effect of big data utilization on the quality of HR decision-making and identify the supporting and inhibiting factors for its implementation	Big data analytics significantly improved the quality of HR decision-making, with HR digital competencies and organizational culture as important mediating factors.
Sridevi et al. (2025)	Exploring The Role Of Big Data Analytics In Strategic Decision-Making And Performance Improvement	Determine the influence of Big Data Analytics on companies' decision making and execution, and the role of this technique in performance improvement.	Organizations that adopt Big Data are more competitive and better positioned for growth.
Lawal & Ajayi (2025)	The Impact of Big Data on Decision-Making in Supply Chain Management: Transforming American Enterprise Operations	Examine the big data implementation in US supply chains, evaluating its impact on operational efficiency, cost reduction, and strategic positioning.	Organizations that integrate big data achieve improvements of 15 to 25% in the accuracy of their forecasts, reductions of 20 to 30% in storage costs and an optimization of 10 to 15% in their procurement spending.
Siahaan et al. (2025)	Strategic management accounting and digital transformation: the role of big data analytics in decision making	Examines how big data analytics capabilities create competitive advantages through enhanced analytical depth and strategic decision quality.	Big data analysis significantly improves strategic management accounting practices ($\beta = 0.694$, $p < 0.001$) and directly improves the quality of decision-making ($\beta = 0.483$, $p < 0.001$).
Xiong, (2025)	The Role of Big Data Finance in Supporting and Supervising Corporate Financial Decision-Making	Examine the concept and evolution of Big Data in finance, and construct a theoretical framework of "supervision, optimization of decisions and prevention of risks"	Big Data in finance significantly strengthens companies' real-time internal control capabilities, improves the accuracy of budgeting and financial forecasting, and improves the quality of financial information and reduces the risk of financial fraud
Bajrami et al. (2025)	The impact of big data analytics on digital marketing decision-making: A comprehensive analysis	Explores how big data analytics contributes to effective decision-making, targeting precision, and customer engagement among digital marketing professionals.	The most active users (35%) saw a 30% increase in targeting accuracy and a 25% gain in efficiency; moderate users (40%) saw a 15% gain in efficiency;
Barhmi, & Laghzaoui (2025)	Contribution of big data analytics to risks and disruptions mitigation and agility performance	Understanding the mechanisms by which supply chain data analytics capabilities (ADCA) influence supply chain agility performance (PACA), either directly or through other capabilities.	ADCA's capabilities strengthen the capabilities of GRCA, RCA and RCA, and indirectly improve PACA through the partial and exclusive mediation of RCA's capacity.

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Masuke & al. (2025)	Big data analytics and its influence on management accounting: evidence from southern Africa	Explores the influence of big data and its analysis on management accounting practices and decision-making in Southern Africa.	Big data analytics has transformed management accounting practices, leading to better decision-making. It supports organizational strategy through improved customer service, targeted marketing, and cost control.
Rajkumar et al. (2025)	Integrating industrie 4.0 and management information systems for improved decision making effectiveness in modern organizations	Explore how Industries' 4.0 technologies are integrated with Management Information Systems and how it affects the effectiveness of decision making in modern organizations through case studies	The use of Industry 4.0 tools offers companies' immediate visibility into their operations, facilitates more efficient planning, and supports the best strategic and operational choices.

Appendices 2: Objectives and Results of recent studies

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