

# A Scoping Review of the Role of Data Analytics in Management Decision Making

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**Purpose.** This study examines the role of data analytics in management decision-making. **Design / Method / Approach.** A PRISMA-compliant scoping review was conducted through a literature search across academic databases including Scopus, EBSCOhost, ABI/INFORM, IEEE Xplore, PubMed, and ScienceDirect, as well as Google Scholar. Selection was guided by predefined inclusion and exclusion criteria to ensure relevance and quality. **Findings.** The literature reveals a paradigm shift from intuition-based to data-driven decision-making. Predictive analytics, machine learning, and quantitative methods empower managers to improve risk assessment and scenario modeling. The four analytics types — descriptive, diagnostic, predictive, and prescriptive — yield measurable gains in operational efficiency (up to 35%), productivity, and competitive positioning across healthcare and retail sectors. Successful adoption requires strong leadership, data governance frameworks, and organizational data literacy. Persistent barriers including data quality issues, skill deficits, cultural resistance, and privacy concerns continue to impede implementation. **Theoretical Implications.** This review links established decision-making frameworks with contemporary AI-driven applications, offering a balanced synthesis of current knowledge, albeit with breadth prioritized over depth. **Practical Implications.** The findings provide actionable guidance for managers and leaders, with relevance for emerging economies investing in data infrastructure and literacy. **Originality / Value.** The study offers a consolidated perspective on data analytics as a core component of modern management practice, synthesizing evidence from business and healthcare domains. **Research Limitations / Future Research.** Future research should extend to empirical investigations and longitudinal studies assessing the long-term organizational impact of data analytics on management decision-making. **Article Type.** Review.

## Keywords:

data analytics, quantitative methods, management decision-making, big data

**Мета.** У статті досліджується роль аналізу даних у прийнятті управлінських рішень. **Дизайн / Метод / Підхід.** Проведено оглядове дослідження відповідно до вимог PRISMA на основі систематичного пошуку літератури в академічних базах даних — Scopus, EBSCOhost, ABI/INFORM, IEEE Xplore, PubMed, ScienceDirect та Google Scholar. Відбір джерел здійснювався за заздалегідь визначеними критеріями включення та виключення задля забезпечення тематичної відповідності матеріалу. **Результати.** Аналіз літератури засвідчує зміну парадигми: на зміну інтуїтивному приходять обґрунтоване прийняття рішень на основі даних. Методи статистичного прогнозування, машинне навчання та кількісний аналіз дають змогу керівникам підвищити якість оцінювання ризиків і моделювання сценаріїв. Чотири різновиди аналізу даних — описовий, діагностичний, прогностичний і приписний — забезпечують вимірювані покращення операційної ефективності (до 35%), продуктивності та конкурентоспроможності в охороні здоров'я і роздрібній торгівлі. Успішне впровадження потребує належного керівництва, дієвих механізмів управління даними та інформаційної культури організації. Водночас стійкими перешкодами залишаються низька якість даних, брак кваліфікованих фахівців, організаційний супротив і захист персональних даних. **Теоретичне значення.** Огляд поєднує усталені концепції прийняття рішень із сучасними застосуваннями штучного інтелекту, пропонуючи збалансоване узагальнення наявного стану знань у цій галузі — попри перевагу широти охоплення над глибиною аналізу. **Практичне значення.** Результати містять практичні рекомендації для керівників організацій, зокрема в країнах з економіками, що розвиваються та інвестують у розбудову інфраструктури даних і підвищення аналітичної грамотності. **Оригінальність / Цінність.** Дослідження пропонує цілісний погляд на аналіз даних як ключовий складник сучасної управлінської практики, узагальнюючи досвід бізнес-середовища та системи охорони здоров'я. **Обмеження дослідження / Майбутні дослідження.** Подальші дослідження мають виходити за межі оглядових і охоплювати цільові емпіричні та лонгітюдні оцінювання довгострокового впливу ініціатив з аналізу даних на прийняття управлінських рішень. **Тип статті.** Огляд.

## Ключові слова:

аналітика даних, кількісні методи, прийняття управлінських рішень, великі дані

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This study sets out to offer insight into the vital role of data analytics in management decision-making and modeling across diverse industries, with relevance in business sectors. This scoping review consolidates findings from multiple studies, emphasizing how data analytics facilitates informed decision-making through insights generated from complex datasets. The incorporation of advanced technologies such as machine learning and artificial intelligence further contributes to operational efficiencies and the development of evidence-based strategies. Data analytics is revolutionizing management decision-making by enabling more precise, data-driven strategic planning and risk assessment.

Multiple studies provide strong evidence for this transformation. Manikandan and Anju (2025) demonstrate that quantitative methods are replacing intuition-based approaches, with mathematical modeling allowing managers to evaluate risks and model potential outcomes. Rasool et al. (2025) found that data analytics empowers businesses to convert raw data into valuable insights through techniques like predictive analytics and machine learning.

## Overview of Data Analytics in Modern Business / Management Decision-Making

In the contemporary landscape characterized by rapid technological advancement, corporations increasingly rely on data analytics to inform their strategic planning and daily operational activities. Data analytics involves the meticulous examination of raw data to extract meaningful insights that facilitate organizational success (Provost & Fawcett, 2013). Historically, decision-making primarily depended on intuition and prior experience; however, it is now predominantly driven by data-driven approaches. Advanced tools such as artificial intelligence, machine learning, and business intelligence solutions are instrumental in transforming data into actionable insights that influence corporate operations (Brynjolfsson & McElheran, 2016).

In recent years, the significance of data analysis in informing business decision-making has emerged as a prominent subject within both academic and commercial spheres. Historically, data analysis began with elementary techniques such as basic statistical methods; however, it has since evolved to encompass more sophisticated tools, including machine learning and artificial intelligence. Davenport and Harris (2017) highlighted the transition of businesses from conventional data handling practices to advanced methodologies that facilitate more rapid and effective decision-making. The initial focus of research in this domain was predominantly centered on retrospective data analysis aimed at identifying trends and understanding past occurrences (Provost & Fawcett, 2013). Over time, this focus has shifted toward predictive analytics techniques that forecast potential future outcomes and prescriptive analytics, which offer actionable recommendations to support improved decision-making. McAfee and Brynjolfsson (2012) established that organizations leveraging data analytics tend to outperform their counterparts in critical areas such as operational performance and growth. Such companies utilize insights derived from data to inform strategic positioning, product development, and customer engagement strategies. Additionally, Sivarajah et al. (2017) demonstrated that the implementation of data analysis can enhance decision accuracy by mitigating bias and relying on empirical evidence to substantiate actions.

### Types of Data Analytics and Their Applications in Management Decision-Making

Data analytics entails the systematic examination of datasets to offer insights into their underlying information. This discipline employs statistical techniques and computational methods to identify patterns, trends, and valuable insights that inform decision-making processes within organizations. As articulated by McAfee and Brynjolfsson (2012), the increasing volume, velocity, and variety of data — commonly referred to as the three Vs of big data — necessitates the utilization of sophisticated analytical techniques. Organizations leverage analytics to enhance operational efficiency, mitigate risks, and achieve a competitive advantage. For instance, artificial intelligence-driven analytics facilitates customer relationship management by predicting potential customer behaviors and preferences, as highlighted by Sharma (2020).

**Descriptive Analytics.** This methodology entails systematic

aggregation and synthesis of historical data to detect recurring patterns and temporal trends. It serves as a fundamental step in comprehending prior performance metrics and establishing a foundation for subsequent analytical procedures (Ray & Deepanshi, 2025).

**Diagnostic Analytics.** This methodology involves comprehensive data analysis to elucidate the underlying factors contributing to historical outcomes. It enables decision-makers to accurately identify determinants of successes and failures, thereby supporting more data-driven and informed decision-making processes (Ray et al., 2025).

**Predictive Analytics.** This approach employs statistical models and machine learning algorithms to estimate future trends and behavioral patterns. It is extensively applied in the retail sector for forecasting customer demand and optimizing inventory management processes (Bhuvanya et al., 2025).

**Prescriptive Analytics.** This sophisticated analytical approach facilitates the formulation of actionable strategies to attain specified objectives. It plays a critical role in strategic decision-making and optimizing operational performance by providing recommendations derived from data-driven insights (Ray et al., 2025).

Premised on the preceding declaration, the advantages of utilizing data in decision-making processes are evident when examining the competitive dynamics among businesses. Employing data analytics enables organizations to gain a deeper understanding of their customer base, enhance operational efficiencies, and anticipate market fluctuations. For instance, Brynjolfsson et al. (2011) demonstrated that companies leveraging data analysis experienced a 5% increase in productivity relative to their counterparts, alongside a 6% improvement in operating profits. This evidence indicates that organizations adopting data-driven strategies are more likely to successfully adapt and attain their strategic objectives (Sun et al., 2016).

Furthermore, decisions based on data enhance organizational accountability and promote greater transparency. When choices are substantiated by quantitative evidence, the potential for blame-shifting diminishes. This transition toward data-centric decision-making also fosters a collaborative culture, as fact-based approaches encourage teamwork and facilitate contributions from employees at all levels (Hora et al., 2017).

Equally importantly, the utilization of data analytics enhances decision quality and concurrently shortens the time required to reach conclusions. Within conventional procedures, decision-making frequently involves prolonged processes due to multiple levels of managerial approval. Conversely, data analytics tools enable the rapid analysis of substantial datasets, providing real-time results that facilitate expedited decision-making by managers (Ikegwu et al., 2022). This increased speed is particularly crucial in instances of swiftly evolving market conditions, wherein firms must adapt promptly and effectively.

### Theoretical Framework: Data-Driven Decision-Making Methodology

Numerous empirical investigations have examined organizational utilization of information for decision-making processes. Choo (1996) identifies three primary strategic applications of information within organizations: (1) monitoring and interpreting changes within the operational environment, (2) generating novel knowledge to facilitate innovation, and (3) informing and selecting appropriate courses of action. Additionally, considerable scholarly discourse has focused on Data-Driven Decision-Making (DDDM), defined as decision processes grounded primarily in the analysis of data rather than intuitive judgment (Provost & Fawcett, 2013). Organizations employ data collection and analytical techniques to enhance decision accuracy, efficiency, and timeliness. In the context of online retailing, data streams originate from diverse sources, including user interaction logs (clickstream data), purchase transactions, audio recordings, and video content. Nonetheless, research has revealed that a substantial proportion of organizations that invest in advanced data analytics capabilities underutilize their available analytical tools and resources.

### Conceptual Framework

The conceptual framework for data-informed decision-making is depicted in Figure 1. This framework is predicated on a

comprehensive understanding of what constitutes being data-driven for educational practitioners. It presumes that stakeholders at a school organizational level, from classroom educators to central administrative personnel, encounter questions, challenges, or issues necessitating the collection, analysis, and interpretation of data to inform sound decision processes. This requirement applies uniformly across the entire organizational system hierarchy. A holistic overview of decision types across various system levels is addressed in a system-based evaluation framework.

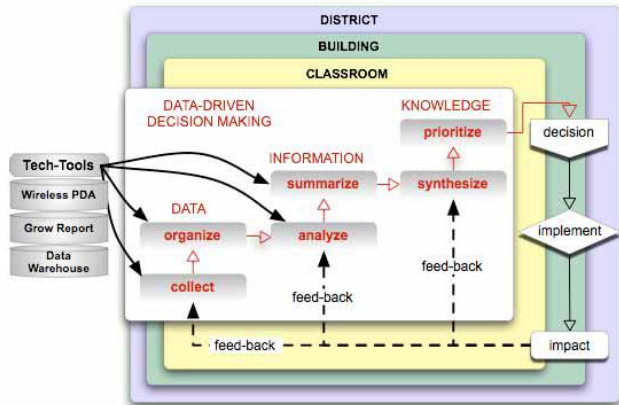


Figure 1. Framework for Data-Driven Decision Making (Mandinach et al., 2006)

The conceptual model presented has been iteratively developed and influenced by prior research and academic collaboration. Initially, CCT researchers such as Light et al. (2004) examined organizational and managerial utilization of data within decision-making frameworks. In constructing a model for data utilization and transformation, they incorporated theoretical perspectives characterized by data, information, and knowledge as components of a continuous transformation process: data is transformed into information, which subsequently becomes knowledge suitable for decision support. In line with the preceding assertion, the distinctions among them are articulated as follows.

**Data** exists in its raw, unprocessed form and possesses no inherent meaning; it may vary in utility. The interpretive process determines whether data constitutes information.

**Information** is data contextualized and endowed with meaning, facilitating understanding and situating data within its relevant framework. However, in isolation, information does not inherently specify subsequent actions.

**Knowledge** is actionable information that informs and guides decision-making. It emerges through cognitive and interpretive processes. For example, a teacher's capacity to analyze correlations between student performance on various assessments and instructional strategies, subsequently leveraging this insight for instructional improvement, exemplifies knowledge.

### Effect of Data Analytics on Business Processes

Erica et al. (2024) reveal substantial adoption rates (78%) of data analytics tools, with reported enhancements in operational efficiency (35%) and competitive advantage (22%). Rabelo et al. (2021) further confirm analytics' impact on inventory management, sales forecasting, and consumer behavior modeling. In line with the preceding assertion, effective utilization of data analytics is a crucial tool for managing online businesses, as highlighted by Phippen et al. (2004). Data analytics enables tracking of customer behaviors and provides valuable insights. Also referred to as marketing analytics, it offers methods to measure, analyze, predict, and optimize company performance, thereby enhancing outcomes and maximizing return on investment. Due to its significance, data has been likened to "the oil" of the digital economy, as noted by Wedel and Kannan (2016). Additionally, the online environment is continuously evolving with technological advancements, requiring online retailers to stay competitive by leveraging data-driven strategies to improve their business models and identify new opportunities. Taking into consideration the ongoing discussion, data analytics is essential for improving management decision-making; however, organizations often encounter several notable challenges that can impede its

effective application. These obstacles may affect planning and analysis processes, thereby influencing overall decision quality.

### Barriers to Data Analytics in Management Decision-Making

Organizations increasingly encounter interconnected challenges in effectively utilizing data analytics, which can hinder informed decision-making. Persistent issues related to data quality, such as inaccuracies and incompleteness, can lead to flawed analyses and misguided strategic decisions (Ray et al., 2025; Erica et al., 2024). These challenges are further amplified by the growing volume and complexity of data, often exceeding the capabilities of traditional analytics systems and limiting real-time analysis and responsiveness (Medida & Kumar, 2024). Additionally, the shortage of skilled data analytics professionals restricts organizations' ability to interpret complex datasets and generate actionable insights (Medida & Kumar, 2024). Organizational barriers, including resistance to fostering a data-driven culture, also impede the integration of analytics into routine decision-making processes (Ray et al., 2025; Bhuvanya et al., 2024). Privacy and security concerns related to sensitive data handling present ethical and operational challenges, potentially limiting the full utilization of analytics capabilities (Bhuvanya et al., 2024).

Research further indicates that the primary obstacles to effective data analytics utilization include, but are not limited to, insufficient financial resources, skills, and infrastructure, as well as data quality issues and the lack of appropriate analytical tools. Another significant challenge in data analysis is concerned with the handling of large volumes of unstructured data. Generally, unstructured data such as social media posts, customer reviews, and IoT sensor data constitutes nearly 80% of enterprise data but is difficult to analyze effectively (Gandomi & Haider, 2015).

### Success Factors in the Implementation of Data Analytics in Management Decision-Making

Active engagement from senior leadership and a supportive organizational culture are critical factors contributing to the successful adoption of data analytics practices. Nevertheless, findings indicate that organizations can address these challenges, and they can realize improved operational efficiency and maintain a competitive advantage. This underscores the importance of implementing strong data governance frameworks and cultivating a culture that values data-driven insights. In this regard, and for successful employment of data analytics, organizations can utilize key analytical techniques such as predictive analytics, which leverages historical data to forecast future trends and facilitate proactive measures in areas like inventory management and customer engagement (Bhuvanya et al., 2025). Additionally, descriptive and diagnostic analytics are employed to evaluate past performance and identify root causes of outcomes, supporting more informed decision-making (Ray et al., 2025). Complementary approaches like mathematical modeling, including simulation and decision trees, aid in risk assessment and resource optimization (Manikandan & Anju, 2025). Effective implementation of data analytics requires robust data governance to ensure data quality, integrity, and reliability (Khan, 2024). Promoting a data-driven culture through enhanced data literacy and cross-functional collaboration further enhances the impact of analytics initiatives (Khan, 2024; Bhuvanya et al., 2025). Industry examples demonstrate how these practices can improve operational efficiency and customer satisfaction (Khan, 2024). While the benefits are significant, organizations must also address ongoing challenges such as data privacy concerns and the need for organizational change to maximize the potential of data analytics in enhancing management decisions.

In line with the preceding assertion, the successful implementation of data analytics in management decision-making hinges on several critical success factors. These factors are essential for organizations to leverage data analytics effectively, thereby gaining competitive advantages and improving performance. The integration of data analytics into decision-making processes requires alignment with organizational goals, robust technological infrastructure, and a supportive culture. Aligning data analytics strategies with overarching business objectives and in-depth customer insights is crucial for maximizing organizational value from big data. This alignment

ensures that analytical initiatives directly support strategic priorities rather than operating independently (Santoso, 2023). Successful implementation requires seamless integration of analytics across organizational structures, technological systems, and human resources to establish a cohesive ecosystem that facilitates effective adoption and utilization (Tarmidi et al., 2023).

A strong technological infrastructure is fundamental to these efforts, providing adequate IT resources, appropriate tools, and enabling technologies that support efficient data analytics processes (Santoso, 2023). Equally importantly, system quality and scalability allow organizations to manage increasing data volumes while maintaining reliable and adaptable operations in response to evolving needs (Müller et al., 2020; Moitas et al., 2023).

Cultivating a data-driven organizational culture, along with active support from senior management, is essential for promoting widespread adoption of data analytics and integrating it into routine practices (Santoso, 2023). High levels of user engagement and acceptance are also vital, as they ensure that insights generated are effectively applied in decision-making processes (Moitas et al., 2023). Underlying these components is effective data management and governance, which protect data quality, security, and integration — key factors for establishing trustworthy and actionable analytics (Al-Sai et al., 2020). The implementation of automated or semi-automated tools further enhances efficiency and accuracy in data processing and analysis (Santoso, 2023). Despite the foundational importance of these elements, high failure rates in business analytics projects highlight the complexities involved. To overcome these challenges and fully leverage data analytics for improved decision-making, organizations should adopt comprehensive strategies that address both technical infrastructure and cultural change, ensuring ongoing alignment and meaningful impact.

## Materials and Methods

This investigation utilized a scoping review methodology aligned with PRISMA-compliant standards to systematically analyze the utilization of data analytics in management decision-making. Secondary data sources, such as peer-reviewed journal articles, industry reports, biographical accounts, and other scholarly materials, were collected from various electronic databases and search engines.

### Data Search Strategy

The search strategy incorporated pertinent keywords such as "data analytics," "quantitative methods," "management decision-making," and "big data," which were combined utilizing Boolean operators (AND, OR, NOT) to improve query accuracy. Data collection was conducted across various platforms, including Scopus, EBSCOhost, ABI/INFORM, IEEE Xplore, PubMed, and ScienceDirect, as well as open-access search engines such as Google Scholar, Google, and Bing. Notable repositories identified as particularly productive included SABINET, IEEE Xplore, ScienceDirect, and Google Scholar. A substantial body of relevant literature was assembled for comprehensive analysis. The review process involved a critical examination and synthesis of these sources, with a specific focus on elucidating the role of data analytics in management decision-making and analysis. This process ultimately led to the development of conclusions based on the integrated findings.

### Inclusion Criteria

In terms of the inclusion criteria, only conceptual and theoretical papers, legal analyses, policy reports, and grey literature produced by reputable organizations and studies capable of addressing the research topic were regarded as significant.

### Exclusion Criteria

Based on the exclusion criteria, studies that lack relevance to data analytics, including those published in languages other than English, were excluded. Additionally, studies with a policy-oriented focus were deemed to be of insufficient significance.

### Data Extraction and Synthesis

Data were extracted utilizing a standardized extraction format that comprehensively captured bibliographic details of studies

pertaining to data analytics and management decision-making, including associated challenges and successful implementation strategies.

## Findings and Discussion

This thematic analysis synthesizes the literature examined within the provided scoping review introduction, which adheres to PRISMA-compliant methodologies for scoping reviews. It incorporates data extracted from peer-reviewed scholarly articles, conceptual frameworks, and industry insights within the domains of business and healthcare. The analytical process involved familiarization with the sources, inductive coding of recurring patterns such as shifts in decision-making paradigms, types of analytics, impacts, barriers, and enablers, followed by the generation, review, and refinement of themes. Six overarching themes were identified, supported by robust evidence from both historical and recent empirical review studies. These themes corroborate the assertion in the introduction that data analytics is transforming management decision-making through precise and evidence-based strategies, while also underscoring ongoing challenges in implementation.

### Theme 1: Transformation from Intuition-Based to Data-Driven Decision-Making

The body of literature consistently indicates a paradigm shift whereby quantitative methods, mathematical modeling, predictive analytics, and machine learning are increasingly supplanting intuition and experience-based approaches. Contemporary managers are now better equipped to evaluate risks, model potential outcomes, and transform raw data into actionable insights with greater efficacy. Manikandan and Anju (2025) explicitly demonstrate that mathematical modeling and data analysis facilitate managers in assessing risks and simulating potential scenarios, thus advancing beyond subjective judgment. Similarly, Rasool et al. (2025) highlight the capacity of predictive analytics and machine learning to empower organizations in extracting significant insights from complex datasets. Recent systematic reviews reinforce these findings within the healthcare sector; a 2025 PRISMA-guided review identified that data analytics markedly enhances nurse managers' administrative decision-making by providing objective, real-time evidence (Lyu, 2025). Bibliometric and narrative reviews conducted between 2024 and 2025 further corroborate that organizations employing big data analytics (BDA) and business intelligence (BI) outperform their peers in strategic positioning, forecasting accuracy, and operational agility. This transformation is congruent with foundational scholarly works (e.g., Provost & Fawcett, 2013; Davenport & Harris, 2017; McAfee & Brynjolfsson, 2012), which document the evolution from retrospective to forward-looking analytics.

### Theme 2: Evolution and Types of Data Analytics with Management Applications

The extant literature delineates the evolution of data analytics from foundational statistical techniques to advanced artificial intelligence and machine learning-driven methodologies, categorizing them into four distinct types: descriptive, diagnostic, predictive, and prescriptive analyses, as outlined by Ray et al. (2025) and corroborated by standard frameworks.

**Descriptive Analytics.** This category involves the aggregation of historical data to identify patterns and trends, serving as a fundamental component for understanding performance metrics.

**Diagnostic Analytics.** This segment aims to elucidate the underlying causes of outcomes, facilitating root-cause analysis.

**Predictive Analytics.** Utilizing statistical models and machine learning algorithms, this approach forecasts future trends, such as customer demand and inventory levels in retail contexts (Bhuvanya et al., 2025).

**Prescriptive Analytics.** This type provides recommendations for actions to optimize desired outcomes, thereby directly supporting strategic and operational decision-making processes.

The reviews emphasize the integration of artificial intelligence across these analytical categories to enable real-time applications in marketing, supply chain management, and patient care. The characteristics of big data, often described by the "three Vs" — volume, velocity, and variety — necessitate the deployment of these sophisticated analytical tools to secure a competitive advantage.

### **Theme 3: Positive Effects on Business Processes, Efficiency, and Performance**

Empirical evidence robustly substantiates enhancements in operational efficiency, productivity, competitive positioning, and accountability. Erica et al. (2024) document a high adoption rate, with strategic users experiencing a 35% improvement in operational efficiency and a 22% gain in competitive advantage. Brynjolfsson et al. (2011) have quantified productivity increases of approximately 5% and operating profit enhancements of roughly 6% among data-driven enterprises; these findings are corroborated by subsequent meta-analyses. Research by Rabelo et al. (2021) and related studies affirm effects on inventory management, sales forecasting, and consumer behavior modeling. Data analytics serves to reduce decision-making cycles, diminish bias, and promote collaboration and transparency (Ikegwu et al., 2022; Hora et al., 2017). In sectors such as healthcare and online retail, it enhances customer engagement, risk assessment, and resource optimization. A meta-analysis on strategic business development identified in the literature review further corroborates these performance improvements across various industries.

### **Theme 4: Theoretical and Conceptual Frameworks for Data-Driven Decision-Making (DDDM)**

Frameworks accentuate the continuum from data to information and ultimately to knowledge (Light et al., 2004), in conjunction with the strategic information applications outlined by Choo (1996), including environmental scanning, innovation, and action selection. Provost and Fawcett (2013) characterize data-driven decision-making (DDDM) as a process that prioritizes data analysis over intuitive judgment. The conceptual model illustrated in Figure 1 (as described) is applicable across various organizational levels, spanning from frontline staff to executive management, and has been validated through empirical research conducted in 2024–2025 within the domains of marketing, nursing, and patient management.

### **Theme 5: Barriers to Effective Utilization**

Persistent challenges impede the realization of full potential despite recognized benefits. Several principal barriers have been identified in the literature.

Data quality issues, including inaccuracies and incompleteness, coupled with the rapid proliferation of unstructured data, which accounts for approximately 80% of enterprise data (Gandomi & Haider, 2015). Shortages of skilled personnel and limitations in infrastructure (Medida & Kumar, 2024). Organizational resistance and the absence of a pervasive data-driven culture (Ray et al., 2025; Bhuvanya et al., 2025). Concerns related to privacy, security, ethics, and resource constraints, encompassing both financial and technological aspects.

Reviews conducted in the literature indicate that numerous organizations underutilize advanced analytical tools due to these interconnected challenges, resulting in notably high failure rates of analytics initiatives.

### **Theme 6: Success Factors for Implementation and Competitive Advantage**

Construed from the reviewed literature, it is affirmed that organizations surmount barriers through several key means identified in the literature.

Establishing strong senior leadership and cultivating a data-driven organizational culture are foundational prerequisites (Santoso, 2023; Müller et al., 2020; Moitas et al., 2023). Implementing robust data governance frameworks ensures data quality, security, and integrity (Khan, 2024; Al-Sai et al., 2020). Aligning analytics initiatives with overarching business objectives, developing scalable infrastructure, and fostering cross-functional collaboration are equally critical (Tarmidi et al., 2023; Santoso, 2023). Enhancing data literacy across the organization, along with the deployment of automated tools and analytical techniques such as predictive modeling and decision trees, further strengthens these efforts (Manikandan & Anju, 2025; Bhuvanya et al., 2024).

These findings affirm that addressing challenges related to governance and data literacy is instrumental in developing sustainable data-driven decision-making capabilities, ultimately leading to

increased efficiency, innovation, and improved financial performance.

### **Practical Implications**

The synthesis makes a notable theoretical contribution by linking traditional decision-making frameworks with contemporary AI-driven applications, while also providing practical insights for managers and healthcare leaders. Specifically, it emphasizes prioritizing organizational culture and governance to optimize returns and mitigate risks. For policymakers in emerging markets, such as South Africa, the findings underscore the importance of advancing data literacy and infrastructure development.

### **Theoretical Implications**

Although constrained by the scope's emphasis on breadth over depth and potential recency bias, this review offers a timely and balanced addition to the scholarly literature. It affirms that although data analytics confers substantial benefits, successful transformation necessitates deliberate strategies and effective governance, serving both as an evidence-based synthesis and a strategic call to action to advance decision-making in an increasingly data-centric world.

### **Conclusions**

This scoping review has established that data analytics has become a transformative force in managerial decision-making within both business and healthcare sectors. Through the synthesis of evidence from foundational and contemporary literature, the study affirms a discernible paradigm shift from intuition- and experience-based approaches to precise, evidence-based, and data-driven strategies. The integration of descriptive, diagnostic, predictive, and prescriptive analytics — facilitated by advancements in artificial intelligence, machine learning, and mathematical modeling — empowers organizations to extract actionable insights from complex datasets, improve risk assessment, optimize resource allocation, and enhance strategic planning processes.

Empirical evidence consistently indicates significant positive impacts, including enhanced operational efficiency, increased productivity, strengthened competitive advantage, expedited decision-making cycles, and greater transparency and accountability within organizations. These benefits are particularly pronounced in domains such as inventory management, customer engagement, sales forecasting, and clinical-administrative operations in healthcare settings. Nonetheless, the review identifies ongoing barriers that limit the full realization of data analytics potential. Challenges related to data quality — particularly the prevalence of unstructured data — skills shortages, insufficient technological infrastructure, organizational resistance to cultural change, and concerns regarding privacy and security continue to hinder effective implementation across numerous organizations.

The successful adoption of data analytics is contingent upon several critical success factors, including committed leadership from senior management, the fostering of a pervasive data-driven organizational culture, the establishment of robust data governance frameworks, strategic alignment of analytics initiatives with organizational objectives, and ongoing investments in data literacy and cross-functional collaboration. Organizations that effectively address these enablers are better positioned to translate analytical capabilities into sustainable competitive advantages and improved performance outcomes. In conclusion, while data analytics is revolutionizing management decision-making by supplanting subjective judgment with objective, quantifiable insights, its successful integration necessitates more than technological investments. It requires deliberate organizational transformation, ethical considerations, and a sustained commitment to developing analytical maturity. For emerging economies such as South Africa, investments in data infrastructure, skills development, and governance frameworks are vital to harnessing these opportunities and maintaining competitiveness within an increasingly data-centric global environment.

### **Future Research Directions**

Future research should extend beyond scoping reviews to include targeted empirical investigations and longitudinal studies

assessing the long-term impact of data analytics initiatives on management decision-making, especially within resource-constrained contexts. As the volume, velocity, and variety of data continue to grow, the capacity to responsibly and effectively leverage data

analytics will become increasingly critical to organizational success in the digital age, considering the management role in decision-making.

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