

THE IMPACT OF BIG DATA ANALYTICS CAPABILITIES ON MANAGERIAL DECISION-MAKING AND ORGANIZATIONAL PERFORMANCE : A SYSTEMATIC LITERATURE REVIEW

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Abstract

The development of *Big Data Analytics* (BDA) has changed the way organizations design strategies, manage information, and make managerial decisions. However, empirical evidence on how *Big Data Analytics Capabilities* (BDAC) create organizational value still shows inconsistent patterns and is often indirect. This article aims to systematically synthesize the empirical literature discussing the relationship between BDAC, managerial decision-making, and organizational performance. This study uses a *Systematic Literature Review* (SLR) approach following the PRISMA, through a comprehensive search of the Scopus, Web of Science, Google Scholar, and ScienceDirect databases for empirical articles from 2015 to 2025. The synthesis results show that BDAC does not automatically improve organizational performance but works through various mediating mechanisms such as decision-making quality, dynamic capabilities, analytical practices, innovation, and human resource readiness and data governance. The findings also confirm that the role of humans and the organizational context remain determining factors in the success of data-driven decision-making. This study identifies conceptual fragmentation and methodological limitations in the existing literature and proposes a more integrative and contextual future research agenda. In practical terms, this article provides a more comprehensive understanding of how organizations can configure BDAC as a strategic capability to support quality managerial decisions and the creation of sustainable organizational performance.

Keywords: Big Data Analytics Capabilities, Managerial Decision-Making, Organizational Performance, Dynamic Capabilities, Data-Driven Decision Making, Systematic Literature Review

1. INTRODUCTION

The contemporary business environment is undergoing a profound transformation driven by digitalization and the rapid growth of data generated from sources such as the *Internet of Things* (IoT), social media, and digital transactions. In response to this development, *Big Data Analytics Capabilities* (BDAC) have emerged as a critical organizational capability, referring to an organization's ability to acquire, integrate, analyze, and interpret large-scale data to support strategic decision-making (Mikalef, Krogstie, et al., 2020). However, prior studies indicate that the impact of BDAC on organizational performance is not direct. Instead, BDAC creates value

through intermediate mechanisms, such as enhanced dynamic capabilities, operational capabilities, and improved managerial decision-making processes (Mikalef, Boura, et al., 2020; Thiraton et al., 2017)

Despite growing scholarly interest, the existing literature on BDAC remains fragmented and conceptually dispersed, with limited clarity regarding causal pathways, mediating and moderating mechanisms, and cross-sectoral applicability. This fragmentation underscores the need for a *Systematic Literature Review* (SLR) to synthesize empirical evidence, clarify theoretical linkages, and develop an integrative understanding of how BDAC influences managerial decision-making and organizational performance.

From a theoretical perspective, this SLR contributes by integrating diverse frameworks, including the *Resource-Based View* (RBV) and the Technology–Organization–Environment (TOE) framework (Mikalef, Boura, et al., 2020; Zakaria & Abdalla, 2025), while opening the “*black box*” that connects analytical capabilities with business outcomes. Methodologically, the review highlights limitations in the predominance of cross-sectional research and advocates for more robust approaches, such as longitudinal and mixed-methods designs. Practically, the findings provide evidence-based guidance for organizations on configuring BDAC, allocating analytical resources, and embedding data-driven insights into strategic, tactical, and operational decision-making (Chernyi & Uotila, 2024). Moreover, the relevance of BDAC extends to education and sustainability, including curriculum development for data analytics skills (Imjai et al., 2024) and contributions to Sustainable Development Goals such as green innovation and disaster resilience (Ali et al., 2020; Aslam et al., 2025; Zakaria & Abdalla, 2025)

To achieve these objectives, this SLR addresses five research questions: RQ1 examines how BDAC is defined, conceptualized, and measured in empirical studies; RQ2 explores the direct relationship between BDAC, managerial decision-making quality, and organizational performance; RQ3 identifies mediating variables explaining the indirect effects of BDAC; RQ4 investigates moderating factors influencing these relationships; and RQ5 identifies emerging themes, research gaps, and future research directions in BDAC research.

2. METHODOLOGY

This study employed a *Systematic Literature Review* (SLR) approach guided by the methodological principles of Kitchenham and Charters and reported in accordance with the PRISMA framework to ensure transparency and replicability. The SLR method was selected to systematically synthesize the fragmented and multidisciplinary literature on *Big Data Analytics Capabilities* (BDAC), managerial decision-making, and organizational performance across information systems, management, and accounting domains.

The literature search was conducted using four major academic databases: Scopus as the primary source due to its extensive multidisciplinary coverage; Web of Science Core Collection to capture high-impact journals; ScienceDirect (Elsevier) to access domain-specific outlets; and Google Scholar to support forward citation tracking and the identification of relevant grey literature. A high-recall search strategy was adopted through an iterative keyword development process.

The search strategy was developed through an iterative process guided by a high-recall principle to minimize the risk of omitting potentially relevant studies. Based on the main research questions, three core constructs—namely *Big Data Analytics Capabilities* (BDAC), managerial decision-making, and organizational performance—were decomposed into a set of keywords and their respective synonyms. Using Boolean operators (AND, OR), comprehensive search strings were constructed by combining terms such as “*big data analytic* capability**,” “*managerial decision making*,” and “*organizational performance*.” Searches were conducted across article metadata (titles, abstracts, and keywords), with syntax tailored to the technical specifications of each database.

To ensure that only relevant and high-quality studies were included in the review, a clear and consistent set of inclusion and exclusion criteria was applied. The inclusion criteria limited studies to original empirical research articles (quantitative, qualitative, or mixed-methods) published in journals between 2015 and 2025, explicitly examining the relationship between BDAC and managerial decision-making or organizational performance, and situated within business or public sector organizational contexts. Conversely, the exclusion criteria eliminated non-empirical articles (e.g., purely conceptual papers or editorials), studies focusing solely on technical algorithmic aspects without organizational relevance, research conducted exclusively at the individual level of analysis, duplicate publications, and studies assessed as having low methodological quality.

The article selection process was conducted in a rigorous, multi-stage manner, guided by an adapted PRISMA flow diagram. The first stage was identification, in which search results from all databases were consolidated and duplicates were removed using reference management software. The second stage involved screening, where initial eligibility was assessed independently by the researchers based on titles and abstracts; any disagreements were resolved through discussion or arbitration. Articles that passed this stage proceeded to the third stage, full-text eligibility assessment, which involved comprehensive evaluation of the full texts and methodological quality appraisal using a hybrid checklist instrument integrating elements from the *Critical Appraisal Skills Programme* (CASP) and standards commonly applied in the Journal of Business Research. In the final stage, the selected articles were revalidated, reference tracking (snowballing) was conducted to identify additional relevant studies, and data from each study were extracted into a structured

template capturing bibliographic information, research objectives, methods, variables, and key findings.

All stages of the process were documented in detail to ensure transparency, rigor, and auditability, thereby establishing a robust foundation for the synthesis and analysis of findings presented in the results and discussion sections.

3. FINDINGS AND DISCUSSION

Based on the systematic *Systematic Literature Review* (SLR) process, a number of relevant empirical articles were identified for further analysis. The analysis of these articles was conducted through structured data extraction into a synthesis table, which included information such as authors, year of publication, research objectives, methods, variables, and key findings. Based on this extraction table, an in-depth analysis was subsequently carried out, resulting in the identification of four main thematic discussion areas.

Table 1. Extracy Data

Author	Year	Purpose	Method	Variables focus	/	Main findings
Patrick Mikalef, John Krogstie, Illias O. Pappas, Paul Pavlou	2020	Investigating al the relationship between a company's BDA capabilities and competitive performance through the mediating role of dynamic and operational capabilities.	Quantitative: Survey of IT and business managers, tested using <i>the Resource-Based View</i> (RBV).	<i>Big Data Analytics Capability</i> (BDAC), Dynamic Capabilities, Competitive Performance.		BDAC does not directly improve performance, but rather through strengthening the company's dynamic and operational capabilities first.
Usarat Thiraton, Bernhard Wieder, Zoltan Matolcsy, Maria-Luise Ossimitz	2017	Analyzing the impact of <i>Big Data Analytics</i> capabilities and practices on decision-making and organizational performance.	Quantitative: Online survey of 163 senior IT managers in Australia using PLS-SEM.	BDA Capabilities, Analytical Practices, Decision Making, Organizational Performance.		Big data alone does not provide an advantage; organizations must have analytical capabilities to transform data into insights that improve decisions and performance.
Ashish Kumar Jha, Maher	2020	Identifying drivers and barriers in building <i>Big</i>	Qualitative Study (In-depth interviews with senior managers).	BDA Capabilities, Supply Chain Management,		The success of BDA depends on the integration of management

A.N. Agi, Eric W.T. Ngai.		<i>Data Analytics</i> (BDA) capabilities in the supply chain.		Competitive Advantage.	support, data quality, and technical skills of staff to create business value.
Saqib Ali, Petra Poulouva, Fakhra Yasmin, Muhammad Danish, Waheed Akhtaar & Hafiz Muhammad Usama Javed.	2020	Investigating how <i>Big Data Analytics</i> (BDA) improves organizational performance through the mediating role of sustainable product development.	Quantitative: <i>Structural Equation Modeling</i> (SEM) using data from manufacturing companies in Pakistan.	<i>Big Data Analytics</i> , Sustainable Product Development, Organizational Performance.	BDA significantly improves organizational performance, especially when mediated by a company's ability to develop environmentally friendly products.
Nada Elgendy, Ahmed Elragal	2016	Investigating how <i>big data</i> analytics can be integrated into organizational decision-making processes	<i>Design Science</i> methodology through the development of the B-DAD (<i>Big Data, Analytics, and Decisions</i>) framework.	<i>Big data</i> analytics, decision-making processes, B-DAD framework.	The integration of <i>big data</i> analytics provides significant added value in improving the quality of decision-making processes in organizations
Jenifer Pedro, Irwin Brown & Mike Hart	2019	Determining the capabilities required by large organizations to be ready for successful <i>big data</i> analytics (BDA) initiatives.	Thematic analysis based on interviews with stakeholders at a large telecommunications company in South Africa.	Organizational capabilities, BDA readiness, legal compliance with data protection.	Identifying key capability themes similar to previous research, but adding "legal compliance" as a new critical capability for data protection.
Alex Chernyi, Juha Uotila	2024	Investigating the decision-making logic used by managers in prioritizing stakeholders.	Qualitative: Semi-structured interviews with senior managers in various organizational contexts.	Stakeholder Management, Decision Logic (Introspective, Relational, Attributive).	Managers rely on introspective logic for long-term strategies, which are then adjusted on a case-by-case basis using relational and attributive logic.

Muhamma d Aslam, Muhamma d Zia Aslam & Bilal Ahmad	2025	Investigating the relationship between green innovation and BDA capabilities on the sustainable performance of SMEs.	Quantitative: <i>Partial Least Square Structural Equation Modeling</i> (PLS-SEM).	Green Innovation, BDA Capabilities, Strategic Change, SME Sustainable Performance.	Green innovation and BDA capabilities are positively related to sustainable performance, with strategic change as an important mediator.
Maria Holmlund, Yves Van Vaerenbergh, Robert Ciuchita, Annika Ravald	2020	Developing a strategic framework for managing <i>customer experience</i> in the era of <i>Big Data Analytics</i> .	Development of a <i>conceptual</i> framework.	<i>Customer Experience</i> (CX), <i>Big Data Analytics</i> (BDA), Customer Experience Management.	The proposed framework helps companies transform large amounts of customer data into deep <i>insights</i> to create strategic value.
Suliman Zakaria, Suliman Abdalla	2025	Investigating the factors influencing the adoption of BDA in Disaster Risk Management (DRM) to enhance resilience and sustainability.	Quantitative: Survey with ordinal logistic regression analysis (TOE-DOI framework).	BDA adoption, Disaster Risk Management, Organizational Readiness, Technology & Environmental Factors.	The main drivers of BDA adoption are technical prediction efficiency and organizational readiness, which significantly improve disaster response capabilities.
Narithon Imjai, Trairong Swatdikum, Prasit Rungruang, Rohaida Basiruddin & Somnuk Aujiapongpan	2024	Exploring the development of BDA skills, diagnostics, and forensic accounting among Gen Z accounting students in Thailand.	Quantitative: Online survey and statistical analysis.	<i>Big Data Analytics Skills</i> (BAS), <i>Diagnostic Skills</i> (DS), <i>Forensic Accounting Skills</i> (FAS), Gen Z.	BDA skills have a direct positive influence on diagnostic and forensic capabilities, which are crucial for accountants in the era of data complexity.
Franziska Franke & Martin R.W. Hiebl	2022	Analyzing the role of management accountants' data analytics skills in mediating the relationship	Quantitative: Survey of 140 companies in the US (processed using multiple regression).	<i>Big Data</i> Source Quality, Accountant Analytical Skills, Decision Quality.	Data source quality is positively related to decision quality, but the role of human skills (accountants) is

		between <i>Big Data</i> and decision quality.			crucial to maximize the potential of such data.
Mahmood Toorchi, Kaveh Asiaei, & Mansour Dehghan	2015	Investigating the relationship between <i>intellectual capital</i> and contemporary management accounting practices in Iran.	Quantitative: Survey of companies listed on the Iranian stock exchange using a <i>fit-as-mediation</i> framework.	<i>Intellectual Capital</i> (IC), Management Accounting Practices (MAPs), Budget Control.	Companies with high levels of intellectual capital tend to adopt more contemporary and strategic management accounting practices.
Serhat Simsek, Abdullah Albizri, Marina Johnson, Tyler Custis & Stephan Weikert	2020	Developing a decision support tool to predict MLB player contract extensions using data analytics.	<i>Design Science Research</i> (DSR) and the use of <i>Artificial Neural Networks</i> (ANN).	Predictive Analytics, Artificial Intelligence (AI), Contract Extensions, Organizational Performance.	There is a clear relationship between player statistics and contract decisions; ANN-based tools effectively assist managers in making high-cost decisions.
Patrick Mikalef, Maria Boura, George Lekakos, & John Krog	2020	Exploring how <i>Big Data Analytics</i> (BDAC) capabilities and <i>information governance</i> drive corporate innovation.	Quantitative: Survey of 202 companies and analysis using FIMIX-PLS.	<i>Big Data Analytics Capabilities</i> (BDAC), Information Governance, Incremental & Radical Innovation.	BDAC has a positive impact on innovation. However, strong information governance is crucial to ensure high-quality data that can generate radical innovation.

Source: Scopus, Google Scholar, Web of Science Core Collection, ScieneDirect (Elsevier)

3.1 Pattern of Findings

The analysis of synthesized research reveals that the impact of *Big Data Analytics* (BDA) on organizations is not a uniform technological result, but a complex process characterized by four interrelated patterns. Primarily, BDA functions as a systemic capability rather than a mere technical instrument. According to (Mikalef, Krogstie, et al., 2020) BDA capabilities only produce tangible results when operationalized through the dynamic and operational capabilities of the firm. This suggests that its strategic value is indirect and mediative; without organizational readiness and mature internal processes, data remains a "*passive asset*" that cannot be capitalized into a competitive advantage (Thiraton et al., 2017).

Central to this effectiveness is the human dimension, which serves as the bridge between raw data and strategic value. (Jha et al., 2020) emphasize that the success of BDA implementation is determined not by software capacity, but by the quality of available data and the legitimacy of management support. Furthermore, BDA acts as a cognitive complement rather than a substitute for human logic; (Chernyi & Uotila, 2024) argue that strategic decisions still contain vital human dimensions, such as intuition and stakeholder relationships, meaning the process is never entirely mechanistic.

Furthermore, the application of BDA has evolved into a transformative force for organizational strategy. Research by (Ali et al., 2020) and (Aslam et al., 2025) demonstrates that BDA does more than optimize operations—it encourages the creation of new product innovations and business models that support long-term sustainability. This represents a shift toward *"BDA for organizational strategy change,"* a pattern reinforced by (Zakaria & Abdalla, 2025), who found that BDA serves as a critical instrument for mitigating external uncertainty and disaster risk.

Finally, the integration of BDA marks a shift toward decision augmentation. Using frameworks like the B-DAD model (Elgendy & Elragal, 2016) or the ANN model (Simsek et al., 2020), organizations are transitioning from using data as a simple reference to utilizing it as a *"strategic advisor"* that structures high-value decisions. Collectively, these patterns suggest that the maximum value of BDA is realized only at the intersection of technological infrastructure and organizational readiness, requiring a holistic blend of data governance, human talent, and long-term strategic orientation.

3.2 Comparison of Research Results

The synthesis of prior studies shows that *Big Data Analytics* (BDA) generates strategic value in a context-dependent and indirect manner. While some studies identify a direct relationship between BDA capabilities and performance through green innovation (Ali et al., 2020; Aslam et al., 2025) others emphasize that performance gains largely depend on mediating mechanisms such as dynamic and operational capabilities (Mikalef, Krogstie, et al., 2020). In managerial decision-making, BDA enhances decision quality by supporting analytical rigor, yet it functions as a complement rather than a substitute for managerial judgment and intuition (Chernyi & Uotila, 2024; Elgendy & Elragal, 2016). The effectiveness of BDA further varies across industries, shaped by factors such as management support, regulatory requirements, and institutional contexts (Jha et al., 2020; Pedro et al., 2019; Zakaria & Abdalla, 2025). Overall, the impact of BDA on innovation and performance reflects a maturity-based progression, evolving from an informational resource to a transformative capability when supported by strong governance and high data quality (Aslam et al., 2025; Mikalef, Boura, et al., 2020).

3.3 Dominant Methods Used

The methodological synthesis of *Big Data Analytics* (BDA) research highlights three dominant approaches: quantitative, qualitative, and *Design Science Research*

(DSR). Quantitative studies prevail, employing techniques such as PLS-SEM and regression analysis to test causal relationships between BDA and organizational outcomes ((Ali et al., 2020; Aslam et al., 2025; Thiraton et al., 2017). Qualitative research complements this by uncovering contextual and human factors—such as managerial support, organizational culture, and intuition—that shape BDA implementation (Chernyi & Uotila, 2024; Jha et al., 2020). Meanwhile, DSR contributes by developing analytical frameworks and technological artifacts that translate theory into practice (Elgendy & Elragal, 2016; Simsek et al., 2020). Overall, this methodological pattern reflects a maturing research field and points toward mixed-method approaches as a promising direction for capturing both technical and organizational dimensions of BDA.

3.4 Research Gaps

The research gaps identified from this synthesis are multidimensional. First, there is an inconsistency in causal models regarding whether BDAC influences performance directly, as suggested by Ali et al. (2020) and Aslam et al. (2025), or through complex mediators such as dynamic capabilities, as argued by Mikalef et al. (2020). Second, an epistemological tension exists between data-driven perspectives (Elgendy & Elragal, 2016) and those emphasizing the irreplaceable role of human intuition and politics (Chernyi & Uotila, 2024). Third, a contextual gap persists; findings vary significantly across sectors and regions—such as the regulatory focus in telecommunications (Pedro et al., 2019) versus disaster management (Abdalla, 2025)—yet a comprehensive contingency framework is still lacking. Finally, there is a gap in the level of analysis, as most research focuses on the organizational level, leaving the micro-level (individual cognition) and macro-level (ecosystems) under-investigated. Collectively, these gaps indicate that the literature remains fragmented and requires a more holistic, integrative model.

3.5 Theoretical Implications

Based on these gaps, this study draws several significant theoretical implications. The findings reinforce the necessity of moving beyond a static *Resource-Based View* (RBV) toward a Dynamic Capabilities perspective, which better explains how BDAC is reconfigured to adapt to environmental changes (Mikalef, Krogstie, et al., 2020). Furthermore, there is a need for deeper theoretical integration, bridging technology-centric models like the TOE framework with Behavioral Decision Theory. This is essential to open the cognitive "*black box*" of managers and understand how analytical insights are actually assimilated into practice. Ultimately, this research proposes that BDAC be reconceptualized as a "*hybrid capability*" that is deeply embedded within the organization's social systems—including people, processes, and culture—rather than just its technical infrastructure.

3.6 Research Recommendations

Future research on *Big Data Analytics Capabilities* (BDAC) should prioritize the development of integrative, multi-level models that capture the interaction between

technological infrastructure, organizational culture, and individual cognition to better explain holistic value creation (Aslam et al., 2025). Greater attention is also needed for context-specific and comparative studies, particularly in underexplored settings such as SMEs, non-profit organizations, and developing economies, to strengthen contingency-based explanations of BDA success and failure. Methodologically, the field should move beyond cross-sectional designs toward longitudinal and mixed-method approaches to capture capability evolution over time and incorporate human-centered insights (Franke, 2021). Finally, adopting Design Science Research is recommended to develop and validate practical analytical artifacts that enhance the real-world effectiveness of BDAC, such as decision-support frameworks and advanced analytical tools (Elgendy & Elragal, 2016; Simsek et al., 2020).

4. CONCLUSION

This study concludes that *Big Data Analytics Capabilities* (BDAC) do not automatically improve organizational performance but instead work through various mediating mechanisms, such as decision-making quality, dynamic capabilities, and human resource readiness. The synthesis results demonstrate that the impact of BDA is not a uniform technological result; rather, it is a systemic capability that provides strategic value only when supported by organizational readiness and mature internal processes. Central to this effectiveness is the human dimension, which serves as a bridge between raw data and strategic value, positioning BDA as a cognitive complement to managerial intuition rather than a substitute for human logic.

The findings also reveal that the application of BDA has evolved into a transformative force that encourages green innovation and new business models, shifting its role from a mere tool for competitive advantage to a catalyst for organizational strategy change and disaster resilience. Ultimately, the value of BDA is categorized within a tiered maturity model, evolving from basic informational and analytical functions to a transformative function that reshapes organizational architecture.

Theoretically, this research reinforces the need to move from a static Resource-Based View toward a Dynamic Capabilities perspective to explain how organizations reconfigure BDAC to adapt to environmental changes. Practically, it suggests that BDAC should be reconceptualized as a *"hybrid capability"* embedded within social systems—including people, processes, and culture—rather than just technical infrastructure. To address existing conceptual fragmentation, future research should adopt longitudinal and mixed-methods designs to develop integrative, multi-level models that capture the complex intersection of technological maturity and organizational readiness.

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