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Exploring Organizational Motivation for Implementing Big Data Analytics: A Systematic Literature Review

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Abstract

The objective of this study is to gain insights into the motivations behind organizations in adopting Big Data Analytics (BDA) by conducting a systematic literature review that provides the key determinants of BDA implementation in different sectors. This study follows the PRISMA guidelines using the PICOC principle to formulate research questions and establish inclusion criteria, and involves a systematic literature search followed by analysis to synthesize findings related to motivations for BDA adoption across sectors. The results of this study on the different sectors, including manufacturing, the public sector, Healthcare, education, and retail, have revealed that operational efficiency, product innovation, data management, and the management support of the organization act as the motivating factors in any BDA adoption decision. This study concludes that the motivation for BDA adoption across sectors is influenced by factors such as technological capabilities, organizational support, environmental pressures, and economic incentives, with specific differences in each sector indicating unique challenges and benefits, and offers a basis for further research and practical applications in the field of BDA.

Keywords: *big data analytics, BDA adoption, organizational motivations, key drivers, sector-specific*

1 Introduction

Big Data Analytics (BDA) has emerged as a critical factor in enhancing performance and competitiveness within modern organizations. Today, various digital platforms, ranging from social media applications to Internet of Things (IoT) sensors, continuously generate vast amounts of data, which organizations seek to leverage for optimizing their operational structures [1]. This ongoing digital transformation is driven by the imperative to improve business decision-making and strategies through extensive data utilization. The ability of BDA to rapidly process large volumes of data provides organizations with a strategic advantage by enabling real-time analysis and swift responses to changes in market conditions and customer needs [1], [2]. BDA is not only pivotal for operational efficiency but also crucial for sustaining long-term competitive advantage in a fast-evolving business environment.

Several key areas illustrate how Big Data has been successfully integrated into business models to drive innovation, such as enhancing decision-making processes, optimizing operations, and improving customer engagement. However, a comprehensive understanding of Big Data's impact across various organizational and industry contexts remains insufficient. This is due to the lack of systematic analysis regarding the motivations behind organizations decisions to adopt and implement BDA [3]. In addition, the contribution of digital technologies to circular economy practices and life cycle analysis has been discussed, revealing that while the primary focus is on desirability and efficiency, there are important insights into how advanced technologies can be incorporated into organizational practices, particularly in implementing BDA [4]. Complementing this, practical applications of IoT and advanced analytics in manufacturing demonstrate how IoT data can enhance maintenance and operational planning. Nonetheless, gaps persist in fully leveraging analytics for production planning [5]. Building on this, the application of advanced analytical techniques, such as Machine Learning (ML) and Deep Learning (DL), on IoT data highlights the need for transparency in understanding the relationship between input and output variables in Artificial Intelligence (AI)-based models. This underscores the necessity for further research to address gaps in data enhancement and improve the adoption of BDA technologies for operational efficiency [6]. Moreover, from a product

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design perspective, the challenges associated with personal data privacy in the context of the IoT emphasize the need for IoT product design guidelines that protect user data. This highlights the importance of aligning innovation with strategies to address data privacy concerns in the adoption of BDA technologies [7]. In essence, BDA enhances sustainability and also provides operational efficiency in sustainable supply chain management, but its impact on business continuity is not so great; it seeks to focus on long-term strategies that ensure operational stability [8], [9], [10]. Big data resources, government support, and data governance must be managed in such a way as to effectively drive innovation, so that organizational learning, facilitated by BDA, can significantly enhance the competitive agility and cost-effective innovation of firms to drive further innovation and market agility [11], [12]. In addition, the diffusion of big data technology is further clarified by the existence of relative advantage, top management support, competitive pressure, and trading partner pressure, with key determinants calling for policy interventions at the global level to reduce the digital divide and enhance standardization [1], [13]. Furthermore, the motivational factors and challenges faced by various institutions and sectors also put organizational agility and Information Technology (IT) capabilities at the forefront in addressing technical issues and support issues, which are essential for effective big data implementation [14], [15], [16].

Despite the extensive body of research on BDA, there remains a notable gap in the literature regarding the systematic description of the conceptual structure of BDA motivation research and its theoretical foundations. While previous studies have explored various aspects of BDA implementation, including its drivers, challenges, and benefits, few have attempted to provide a comprehensive analysis of the underlying motivations for adopting BDA across different organizational contexts. This gap is particularly evident in the lack of studies that integrate findings across different sectors, such as finance, healthcare, and manufacturing, to develop a holistic understanding of BDA motivations.

The objective of this review is to provide a comprehensive understanding of the conceptual structure underlying organizational motivation research in BDA implementation. This study adopts a Systematic Literature Review (SLR) approach, which involves content analysis of relevant research articles to uncover nuanced aspects of organizational motivations in BDA. By synthesizing key findings across different studies, this review offers a novel contribution to the literature by illuminating the driving forces and influential trends within the existing research. The structured approach taken in this study is expected to identify key factors shaping organizational motivation in BDA adoption, thereby contributing to both theoretical advancements and practical applications in the field.

2 Literature Review

BDA has increasingly become the touchstone of modern organizational strategies, considering its radical path to exploiting the avalanche of data produced in today's digital world. The role of BDA in modern organizations is no longer simply a technological innovation; it has become a strategic enabler for businesses in understanding complicated environments, providing ways for informed decisions to create and sustain competitive advantages [8], [9]. The incorporation of BDA in organizational designs is hinged on the ability to compute, analyze, and interpret massive datasets that make it possible for organizations to unlock hidden patterns and insights that were out of reach before. Organizations are in a position to make speedy responses to marketplace changes, improve operational efficiencies, and avail propositions that are fitting to individual customers with such analytical capabilities. For example, BDA, through predictive analytics, allows organizations to predict trends and behaviors, therefore shaping strategies in an anticipatory manner. Moreover, BDA facilitates the assimilation of multiple data sources by breaking the data silos, thus ensuring that the business issues can be viewed in totality.

Such integration is essential in a networked world because decisions are increasingly required to be evidence-based. Companies use BDA to improve the supply chain, rationalize financial processes, and reinvent human resource management with a specific focus on employee retention and talent acquisition [8], [9], [17]. But BDA implementation comes with several issues. The organizations must handle data privacy, data security challenges, and the ethical use of data to maintain trust with all stakeholders [18], [19], [15], [16], [20]. Furthermore, successful adoption of BDA should be about

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cultural change within organizations in line with supporting a data-driven culture where data will be used as a strategic asset. It takes tremendous investments in technology, talent, and processes, thus calling for effective change management [20], [8], [9]. With respect to evidence, BDA is a very deep paradigm change in how current organizations build and operate—potentially fueling growth and innovation like never before. Business is indeed not going to slow down with the growth in digital world complexity, and strategic initiatives continue to remain underpinned by BDA for ensuring business success in this age of being data-driven. Factors in BDA adoption are numerous and influence business settings; these also play pivotal roles in the conformation of strategic decisions that lead to BDA integration. By recognizing these key drivers, organizations will be in a position to wield the power of BDA for long-term competitive advantages that remain sustainable.

For instance, one sees the increased volume, velocity, and variety of data originating from digital interactions as the prime drivers in BDA adoption. The volume of data is growing exponentially; therefore, it requires advanced analytics, which compels organizations to move toward BDA to tap this potential. Big data needs to be analyzed in real time to provide a competitive advantage because it enables quick and, most importantly, correct decisions, [21], [22]. Besides, BDA is supportive of innovation itself; it analyzes market trends and customer feedback to find new opportunities for developing new products or services. The study brings out unmet needs and emerging demands in the market, therefore offering solutions that are ideal for customers. This proactive approach to innovation guarantees that organizations stay competitive and relevant in dynamic markets.

BDA also enhances organizational performance through risk management. Risk is a fact of doing business and with advanced analytics; organizations are in a position to identify potential risks and vulnerabilities [23]. For instance, BDA finds applications in detecting fraud and assessing credit risk for financial institutions, so it gets a practice set that would protect its assets and enhance its financial soundness. BDA can be incorporated into strategic planning processes, therefore providing data-driven foundations of decisions that improve organizational performance. BDA enables organizations to measure the effectiveness of strategy developed while making sure that strategies are in line with the organizational goals and vision. This will, therefore, make the key performance indicators identified to be adjusted along with the plans in order to respond to the dynamism of changes in the market; hence, the need for agility [16]. In current, highly dynamic business environments, timeliness and astuteness of decision-making is critical for success. BDA is a powerful force for change that garners maximum performance from an organizational point of view. It assists the organization with enhancements in operational efficiency, innovation, stimulating better customer experiences, and managing risks. With BDA unfolding as it continues its developmental journey, its influence on organizational performance will further open up new scopes of improvement and competitive advantage.

Thus, the field of BDA has risen to become a quintessential element in modern organizational strategy through which competitive advantages are sustained and improved decision-making processes take place. But more basic research is needed in terms of what motivates and what kind of challenges the organizations face while implementing BDA. While a fair amount of research has been devoted to the technology and strategy of BDA, there is a need for deeper analysis pertaining to the impact of industry, organizational culture, and the market dynamic within which an organization operates on the implementation of BDA. Moreover, the infusion of BDA within the organizational process, especially business analysis and strategic prioritization, are mostly unknown. This could be valuable research, therefore, in developing actionable strategies about BDA implementation in organizational activities by helping to discern complicated motivations and contextual factors that are in operation about BDA adoption.

3 Research Method

The research design adhered to the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines [24], ensuring a comprehensive and transparent approach to the SLR.

3.1 Research Questions

The Population, Intervention, Comparison, Outcome, and Context (PICOC) principles were used to formulate research questions (RQs) and determine the characteristics of the studies to be included. This is detailed in Table 1.

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Table 1. PICOC principles used to formulate RQs

PICOC	Description
Population	Organizations that implement BDA
Intervention	Initiatives or efforts to implement BDA within organizations
Comparison	Not Existing
Outcome	Key drivers, specific motivations, and variations in motivation based on industry and sector for adopting BDA
Context	Various sectors applying BDA, as well as the organizational context affecting BDA adoption

The RQs are as follows:
RQ1: What types of organizations are motivated to implement BDA?
RQ2: What are the key drivers for organizations to implement BDA initiatives?
RQ3: What factors motivate organizations in the implementation of BDA?
RQ4: How are the organizational motivations to implement BDA different across sectors?

3.2 Eligibility Criteria

The eligibility criteria in this SLR are based on the need for the systematic identification and inclusion of only those studies that have direct relevance to the RQs. Only studies explicitly examining one or more of the defined RQs have been included. That is to say, the selected literature will contribute something substantive to saying something about the motivations and factors influencing BDA implementation in different organizational contexts. This review is limited to peer-reviewed journals published in the last five years, thus ensuring a temporal limitation on concepts that reflect contemporary perspectives and developments within the area under study while at the same time ensuring high standards of academic rigor and reliability. Second, only studies on the basis of a robust research design—including qualitative, quantitative, or mixed-method approaches—are taken into consideration to make sure that any findings synthesized through this review are based on sound empirical data. Further, the review is limited to studies in English to ensure that the research exists and is understandable for any possible international academic audience.

3.3 Selection of Studies

The selection process of studies followed the PRISMA guidelines, which consist of four main stages: identification, screening, eligibility, and inclusion. At the first stage, studies were identified through an exhaustive search. Then, the titles and abstracts were screened to exclude irrelevant studies. In the eligibility stage, a full-text review was performed to assess the relevance of the studies to the criteria of this study. Finally, the most relevant studies were included in the analysis. Detailed results of this selection process, including a PRISMA flowchart, are presented in section 4.1, Collection and Selection of Studies.

3.4 Data Sources and Search Strategy

The literature search was conducted across several prominent academic databases, including Scopus, Pubmed, Semantic Scholar, and Google Scholar. These databases were selected for their extensive coverage of peer-reviewed articles in the fields of BDA and organizational behavior. By leveraging these diverse sources, the review aimed to capture a comprehensive snapshot of the existing literature on BDA adoption.

A systematic search strategy was employed using a combination of keywords and phrases relevant to the RQs. The primary search terms included "organizational motivation", "Big Data Analytics", "implementation" and "adoption". Boolean operators such as AND, OR, and NOT were utilized to refine searches and include variations of terms to ensure a comprehensive retrieval of pertinent literature. The search strings were iteratively refined based on initial results to enhance relevance, and a comprehensive record of search queries was maintained for transparency and reproducibility. This strategy ensured a thorough search process, as detailed in section 4.2 Descriptive Analysis.

 ISSN:2302-8149
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3.5 Data Extraction and Synthesis

Data extraction was performed systematically, capturing relevant information to address the RQs. The synthesis involved thematic analysis to organize findings into key themes, as outlined in Section 4.3 Results Based on Research Questions and further discussed in Section 4.4 Discussion, which highlights the robustness of the findings.

4 Results and Analysis

This section consists of two main parts. The first part provides the results of the selection process, a descriptive analysis of the data collected from the reviewed studies, and answers to the RQs. The second part presents a discussion in the form of a synthesis of findings, implications for theory and practice, strengths and limitations of the study, and recommendations for future research.

4.1 Selection of Studies

In this systematic review, an appropriate data selection process was taken into consideration so that the included studies were representative and relevant to the research topic. Initial identification involved database searching that obtained 1,069 records from relevant databases. A total of 125 duplicate records were removed, and records that did not meet the initial inclusion criteria or could not be accessed were removed from the list. From there, 944 records were left, and then 702 records were also excluded with the use of the abstract and title, not meeting the inclusion criteria. Of the 242 reports obtained, 15 were not under retrieval, and the remaining 227 were assessed according to the inclusion criteria set in advance. The excluded were reports not directly addressing the adoption of big data or the motivations of organisations, reviews from the first-hand literature, those bearing invalid methodologies, or those absent from a peer review. Finally, 32 research studies were selected to be included in this systematic review.

Being more specific, Figure 1 shows the PRISMA diagram to further underline the screening and selection process that needed to have only relevant and excellent-quality studies to ensure a holistic view of the motivations for which organisations implement BDA.

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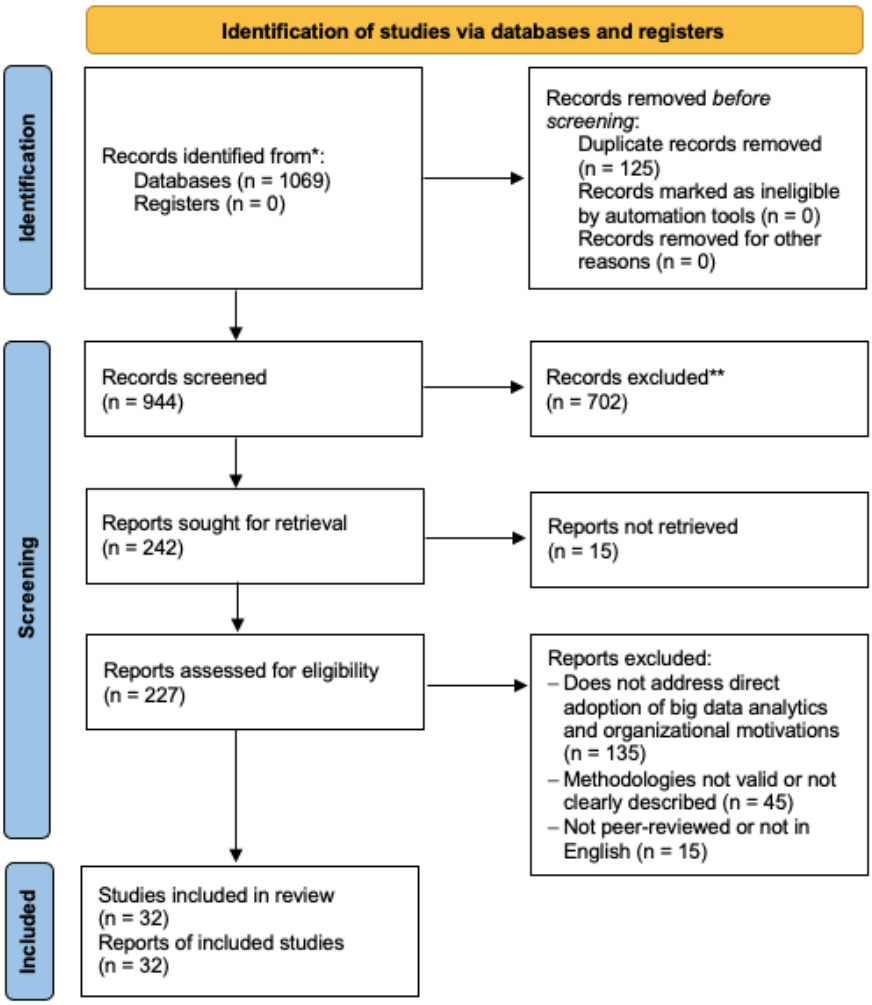

Figure 1. PRISMA diagram of study selection

Table 2 below lists the articles selected according to the search and selection criteria.

Table 2. Characteristics of selected articles according to search and selection criteria

References	Year	Study Location(s)	Organizational Setting(s)	Methodology/ Methods	Participants
[8]	2023	Indian	Manufacturing	Quantitative	Experts
[9]	2024	France	Healthcare	Quantitative	Practitioners, Researchers, Managers, Stakeholders
[11]	2024	China	Public Sector	Quantitative	Firms
[21]	2024	Saudi Arabia	Public Sector	Quantitative	Experts
[25]	2024	Jordan	Retail Sector	Quantitative	Managers
[10]	2024	Middle East (countries not specified)	Retail Sector	Quantitative	Operations Managers
[22]	2023	Nigeria	Public Sector	Quantitative	Professionals
[23]	2021	US	Public Sector	Quantitative	Public Sector Organizations

 ISSN:2302-8149
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[26]	2021	Malaysia	Healthcare	Mixed methods	Healthcare Employees
[27]	2020	Indian	Manufacturing	Quantitative	Firms
[28]	2021	Iran	Retail Sector	Quantitative	Managers
[29]	2023	Morroca	Public Sector	Quantitative	BDA Users
[1]	2020	Thailand	Public Sector	Quantitative	Employees
[30]	2022	Iran	Public Sector	Quantitative	Firms
[16]	2022	China	Manufacturing	Quantitative	Employees
[18]	2021	Slovakia	Healthcare	Quantitative	Medical Professionals
[19]	2020	Europe (8 countries)	Healthcare	Quantitative	Patients, Professionals, Care Providers, IT Companies, Payers Society
[31]	2023	Iran	Manufacturing	Qualitative	Top Management
[2]	2021	Mexico	Retail Sector	Mixed methods	Managers
[17]	2021	Saudi Arabia	Manufacturing	Quantitative	Top Management
[32]	2024	China	Manufacturing	Quantitative	Managers
[20]	2021	Latin America (19 countries)	Education	Quantitative	Members Of Universities
[12]	2024	Jordan	Healthcare	Quantitative	Managers
[33]	2020	China	Manufacturing	Quantitative	Companies
[34]	2020	Indian	Manufacturing	Quantitative	Firms
[14]	2024	Finland, Pakistan	Education	Quantitative	Practitioners
[35]	2023	Italy	Manufacturing	Quantitative	Practitioners, Profesional
[13]	2023	Indian	Manufacturing	Quantitative	Experts
[36]	2023	Malaysia	Public Sector	Qualitative	Experts, Top Management
[37]	2022	Greece	Public Sector	Quantitative	Users, Profesional
[15]	2022	China	Manufacturing	Quantitative	Managers
[38]	2022	Malaysia	Manufacturing	Quantitative	Professionals

4.2 Descriptive Analysis

4.2.1 The Number of Reviewed Studies and Publication Years

The total number of the reviewed studies was 32. All studies were empirical and published in various journals focusing on BDA and organizational motivation. Five studies were published in 2020, seven in 2021, five in 2022, seven in 2023, and eight in 2024. Figure 2 illustrates the year of publication and the number of reviewed studies published in each journal.

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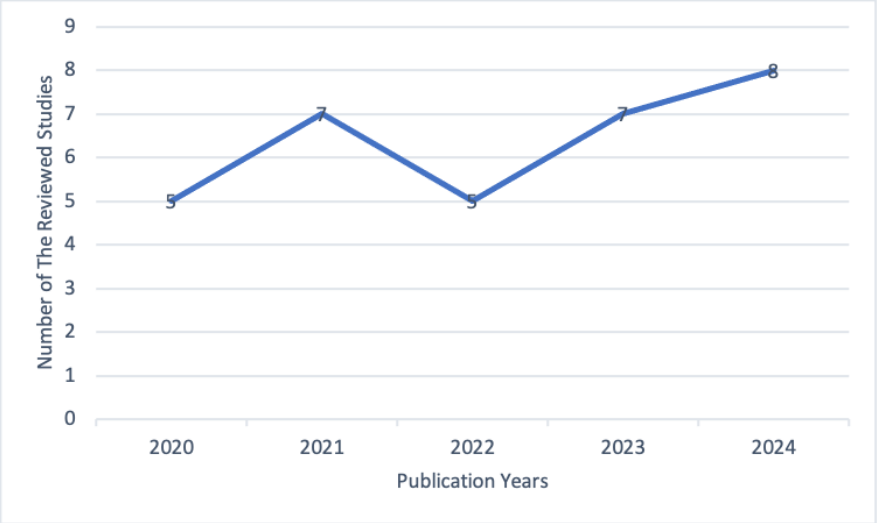

Figure 2. Number of reviewed studies published per year

4.2.2 Geographical Distribution

The distribution of articles based on the country of research is as follows: China (5); India, USA, Morocco, Slovakia, Pakistan, and Mexico (4 each); Malaysia and Iran (3 each); France, Saudi Arabia, and Jordan (2 each); Nigeria, Thailand, and 26 other countries (1 each). Additionally, one article was conducted in the Middle East without specifying the country. The geographic distribution of the research is illustrated in Figure 3.

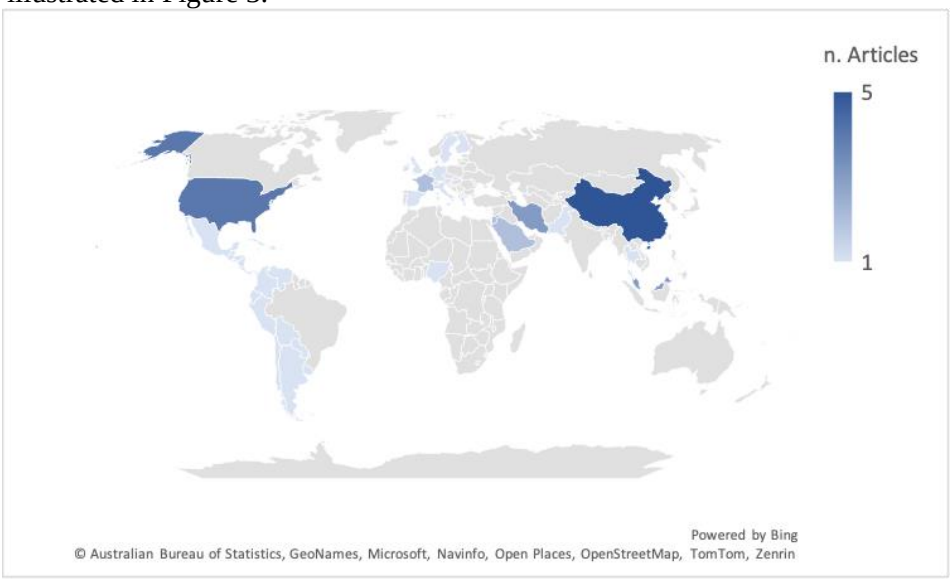

Figure 3. Geographic distribution of of the reviewed studies

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4.2.3 Research Methodology Approaches

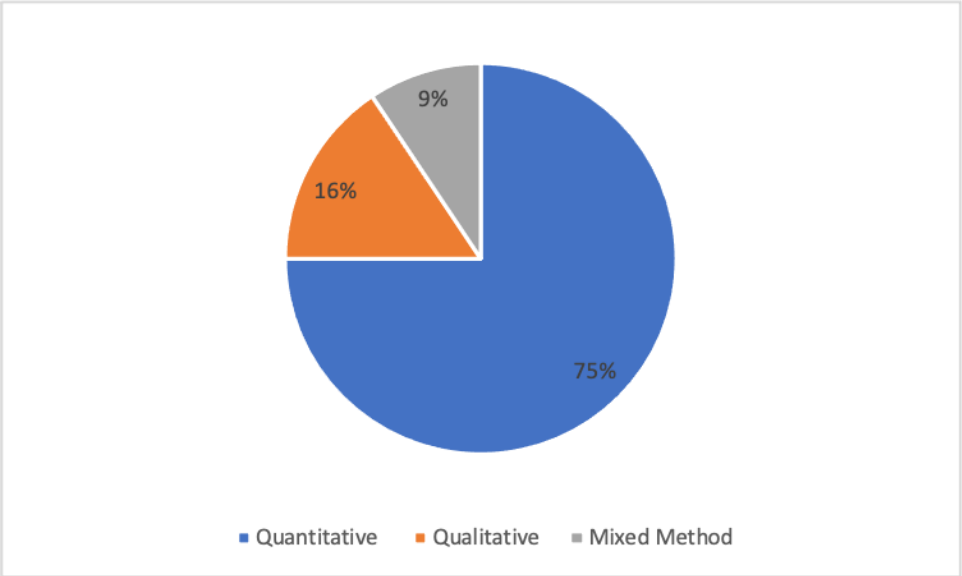

Figure 4. Research methodology approaches of the reviewed studies

Of the 32 studies reviewed, the vast majority—24 articles—utilized quantitative methods, thereby accounting for 75% of the total. On the contrary, qualitative methodology has been used only by a small subset of 5 articles, which represents 15.6%. Additionally, 3 articles, or 9.4%, incorporated mixed methods. All of these results are shown completely in Figure 4.

4.3 Results Based on Research Questions

4.3.1 Types of Organizations Motivated to Implement BDA (RQ1)

This section addresses RQ1 by examining the types of organizations that are motivated to adopt BDA. It highlights the diverse sectors involved, including manufacturing, public organizations, healthcare, education, and retail, and explores the specific motivations driving BDA adoption within these varied organizational contexts.

1. Manufacturing Organizations

In the manufacturing sector, the main motivations for implementing BDA focus on improving performance, product innovation, and competitiveness, where big data management capabilities supported by IT play a vital role in improving organizational performance, while BDA also serves as an important mediator in improving project performance through knowledge management and operational capabilities [16], [27]. On the other hand, six major barriers to implementing BDA in smart factories, including technical and organizational challenges, have been identified [15]. Nevertheless, the important role of BDA in supporting product innovation and new business model development with government support and data governance as key factors has also been announced [11], [38].

2. Public Organizations

Good organizational architecture can facilitate BDA adoption, reduce risks, and improve analytical outcomes, as well as reduce tax burdens in the public sector [23]. On the other hand, the implementation of BDA in the public sector can improve public performance and services with better data management and evidence-based decision making [19].

3. Healthcare Organizations

The BDA in healthcare supply chain management is mediated by green process innovation toward environmental performance improvement [9]. The readiness for BDA adoption is influenced by technological, organizational, and environmental factors, but it can also be barred by the aforementioned technological complexity in the era of multimorbidity, and, thus there has to be an integration of electronic health data and artificial intelligence in order to better manage the same [18], [26]. Furthermore, an exploration of BDA implementation in 12 projects in the European healthcare sector revealed the need for more effective data management [19].

 ISSN:2302-8149
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4. Educational Institutions

Ten motivating factors and 41 challenges in the adoption of digital technologies in higher education institutions have been identified, with the main challenges being resource constraints and resistance to change [14]. There has been an acceleration in the adoption of virtual education and the use of BDA for innovation and data management, with factors such as compatibility, good data environment, and external support being key in adopting BDA, which has a positive impact on knowledge management and organizational performance [20].

5. Retail Organizations

Retail organizations are pressed towards the adoption of BDA for enhancing customer experience, personalizing services, improving operational efficiency, and also because BDA helps the retail organization to have an understanding of consumer behavior and forecast demand [33]. In addition, BDA is used for inventory management to adapt it according to market pressures and consumer needs [13].

4.3.2 Key Drivers for Organizations to Implement BDA Initiatives (RQ2)

This section addresses RQ2 by examining the key drivers behind the adoption of BDA initiatives. It identifies and discusses the critical technological, organizational, environmental, and economic factors that propel organizations to implement BDA, offering insights into the primary motivations influencing their decision-making processes.

1. Technological Drivers

The role of BDA is supported by the fact that the ability to acquire and integrate big data is driving product and business model innovation, facilitated by government and data governance [11]. In addition, IT infrastructure and IT capabilities and organizational agility have been found to improve manufacturing company performance [16]. Furthermore, top management support, and a data-driven culture, inspired by supply chain connectivity, play a substantial role in determining whether transformation BDA through supply chain can happen [17]. The use of Technology-Organization-Environment (TOE) framework and Resource-Based View (RBV) approaches for evaluating BDA opposability shows that preparations should be made in advance. In addition, the technical and organizational challenges must be overcome to take full advantage of BDA [15].

2. Organizational Drivers

Organizational capacity to make data-driven decisions and adapt to environmental dynamics has been shown to be crucial for effective use of BDA [13], [21]. BDA acts as a mediator between knowledge management and project performance, improving project and operational outcomes [27], [28]. Managerial support and task-technology fit influence BDA adoption intentions, with managerial support as an important moderating factor [13], [29]. In addition, BDA capabilities support new product development, enhance customer agility, and organizational competitiveness [30].

Managerial support also plays an important role in linking technological, organizational, and environmental factors [31], [32]. Open innovation, ecological, and technological capabilities enhance SME performance and competitiveness [2]. Organizational readiness in the pre-adoption phase of BDA is critical to guide decisions and growth [32], [38].

3. Environmental Drivers

Green process innovation in healthcare and supply chain management demonstrates how BDA can improve environmental performance [9]. Government support and data governance play a significant role in mediating big data capabilities and innovation [11]. Big data capabilities improved manufacturing firms' performance by leveraging organizational agility and IT infrastructure [16]. Environmental factors such as competitive pressure and security influence BDA adoption [25], [31]. In addition, BDA drives innovation and competitive advantage through organizational learning in the context of cost-effective innovation [12]. BDA and IoT adoption are influenced by perceived value and ease of use, with data quality as key [37]. Technical and social barriers in smart factories also hinder BDA adoption, indicating the need to address these challenges for successful technology implementation [15].

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4. Economic Incentives

Adoption of BDA has been shown to improve operational and economic performance, making it a key motivator [25], [28]. In addition, BDA improves project efficiency through knowledge management and operational capabilities, making project efficiency a significant economic incentive [27]. Big data quality is a key driver that impacts business performance [13]. While BDA capabilities improve project success and business sustainability in the retail sector, although they do not affect long-term continuity [10]. In the manufacturing sector, BDA helps improve performance through organizational agility and IT support [16], and mediates the impact of organizational culture and analytical knowledge on firm performance, offering economic incentives through improved overall performance [34].

5. Knowledge and Skills

BDA capabilities significantly improve firm performance through internal analytical knowledge, organizational culture, and project knowledge management skills, linking knowledge management to operational capabilities and supporting new product success with in-depth data analysis skills [27], [30], [34]. In addition, skills in data management and IT enhance the effectiveness of BDA, especially in a crisis context, emphasizing the importance of technical knowledge and top management support in BDA adoption, with supply chain connectivity as a moderating factor [16], [17]. Knowledge and skills in big data technologies also influence technology readiness and compatibility, which are important for adoption BDA and improve business and operational performance [13], [25], [31].

4.3.3 Factors Motivating the Adoption of BDA (RQ3)

This section is used to answer RQ3 which looks at individual issues actuating organizations in adopting BDA. This study explores the technological, organizational, environmental and economic factors influencing organizations to use BDA.

1. Technological Factors

Technical competence and availability of technological resources, along with top management support, competitive pressures, regulations, and data and technology quality, greatly influence an organization's intention to adopt BDA and ensure accuracy and efficiency in data processing [13], [16], [33]. Technical barriers, such as hardware and software compatibility issues, and technical support, are major challenges in BDA adoption, requiring effective management of technological factors to leverage business analytics [15], [21], [22]. In addition, perceived value, ease of use of BDA, and big data technology readiness are key factors in the adoption of this technology, especially in digital transformation involving IoT, with TOE and resource-based frameworks guiding adoption and organizational growth [37], [38].

2. Organizational Factors

A positive organizational culture for the use of data and internal analytical knowledge also influences BDA effectiveness, which in turn positively effects firm performance [34]. Aside from the space factors, project knowledge management and operational capabilities of organizations can also transform into readiness for exploiting BDA to enhance project performance [27]. It signifies that for efficiency, top management support, and business culture, favoring the practice of BDA is most important [17], [25]. While the adoption of BDA by organizations leads to superior firm performance owing to organizational aptitudes, it is also contingent on two capabilities, namely organization readiness and a digital innovation culture [13], [22], [31], [38]. BDA is effective because of its adaptability and internal support [16]. We can also consider organizational structure and readiness to adopt technology in addition to the usage of BDA, particularly within the healthcare sector [26]. Furthermore, internal learning mechanisms take on a mediating role with respect to the effects of BDA technologies as such in relation to heterogeneous innovation and competitive agility that drive organizational responses in terms of market changes [12].

3. Environmental Factors

Based on the observation, among others to be successful in big data projects and implementations; market support is important together with sustainability, that determines sustainable business practices [10]. Regulation and incentives: regulation actually very influences on BDA adoption for improve SME operation performance [28].

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Trading partners and compliance ensure the need, though advantage and competition factor into organizational decision-making around big data [1], [13], [22]. The effects of top management support on BDA adoption can be demonstrated by the moderation effect from supply chain connectivity, and similarly we found how big data capabilities impact firm performance intimately through moderated mediation pathway associated with market conditions and global environment [16], [17]. Adequate environment and regulatory preparedness also play a role in BDA adoption within the healthcare, education industry [14], [26].

4. Economic Factors

The role of financial incentives such as subsidies and investment support in effecting firm adoption of BDA can contribute to enhancing both understanding on how to leverage public policy instruments, fostering BDA adoption, and significantly improving operational and financial performance, especially for policymakers seeking answers on what works best with regard to the effects that these policies have over time [13], [16], [28]. Green incentives are an important antecedent in the recycling sector, which prompts organizations to take a green initiative by using BDA, whereas relative advantage and expected financial benefits have also been key determinants behind adaptation decisions [25], [32]. Implementation costs and technical barriers play a part in determining the uptake, underscoring that with adequate financial support and investment, this could potentially be ameliorated [15], [17].

5. Knowledge and Skills Factors

Knowledge and skills in big data management and IT significantly improve firm performance, both in normal and crisis situations [16]. Internal analytical skills and an organizational culture that supports big data utilization contribute to improved company performance [34]. In addition, skills in BDA influence project performance, as well as adoption decisions in the B2B sector and supply chain integration [17], [27], [33]. The lack of knowledge is the main hurdle to realizing the potential for successful adoption of BDA [14], [15], [26], [31].

4.3.4 Variations in Motivations Across Sectors (RQ4)

This section addresses RQ4 by looking at how organizational motivations for implementing BDA may differ across sectors.

1. Manufacturing Sector

Motivations for BDA adoption in the manufacturing sector have a different focus compared to other sectors, with BDA being more directed towards improving operational efficiency and project performance [27]. Manufacturing companies use BDA to improve organizational agility and resilience in the face of market uncertainty, with an emphasis on adaptation and resilience [16]. The main focus in this sector also includes increasing economic benefits and smart factory automation, oriented towards efficiency and productivity [15], [28], [38]. In addition, the manufacturing sector often emphasizes product and business model innovation [11].

2. Public Sector

In the public sector, the motivation for BDA adoption is centered on several key objectives that reflect the specific needs of the sector, and is also used to improve transparency, accountability, and efficiency in public services, with an emphasis on good data governance [23]. Support for data-driven management and culture also drive BDA adoption, which helps optimize supply chain management and improve the quality of public services [17]. The public sector leverages BDA to improve organizational agility and IT capacity, which are critical in responding to crises [16]. In addition, BDA adoption is driven by the need to make better data-driven decisions in public management [1]. The primary motivation is to improve organizational performance and efficiency through BDA, with a focus on strategic decision-making and transparency in public services [38].

3. Healthcare Sector

BDA in the Healthcare sector is used to support continuous process innovation and improve environmental performance in medical operations and supply chains [9]. The main focus is also on improving operational efficiency and quality of healthcare services, with an emphasis on technological readiness and organizational support [26]. In addition, BDA is applied to improve medical supply chain planning, ensuring timely availability of products and services [35]. BDA also plays a role in the development of new healthcare products and services, with the aim of identifying

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patient needs and providing more effective solutions [30]. Motivations in the healthcare sector center on continuous innovation, improving operational efficiency, and developing better healthcare solutions for optimal patient outcomes [19].

4. Education Sector

In the education sector, the main motivations for implementing BDA focus on improving teaching quality, knowledge management, and administrative efficiency [20]. BDA is used to analyze student data to improve teaching strategies and learning outcomes, as well as support curriculum innovation and data-driven decision-making [20], [33]. In addition, the education sector seeks to improve learning experiences and administrative efficiency through BDA, despite challenges related to infrastructure and resistance to change [14].

5. Retail Sector

Improving customer experience and personalizing services are top priorities, with BDA being used to understand consumer behavior and preferences [33]. In addition, BDA plays a key role in improving operational efficiency and inventory management, with the ability to forecast demand and manage stock more effectively [28]. The sector also leverages BDA to respond to market pressures and competition, enabling faster adaptation to market trends and needs [13]. Furthermore, developing new products and marketing strategies that are tailored to consumer needs is a key focus, with BDA assisting in this [30]. However, technical barriers and the need for organizational support often pose challenges to the adoption process [15].

4.4 Discussion

4.4.1 Summary of Findings

BDA addoption has been observed across a very wide array of organizational types, each actuated by some needs for operational efficiency enhancement, decision-making processes, and competitive advantage. In a manufacturing organization, this is driven by performance improvements, product innovations, and rising competitiveness—everything keeping an eye on the use of BDA in operational optimization and new business models. Public organizations aim at increasing transparency, accountability, and better use of resources; they work to enhance public services by adopting data-driven decisions. In the Healthcare sector, BDA is impelled by needs such as better patient outcomes, efficient operations, and innovative ways of delivering medical services. The adoption of BDA in educational institutes is necessitated by the requirement for advancement of teaching methodologies, efficient management of resources, and digital learning to maximize outcomes. Likewise, interest in the implementation of BDA is increasing amongst retail organizations with a view to improving customer experience through personalized offerings and supply chain management. Operational excellence, strategic decision-making, and innovation are the motivating factors behind the implementation of BDA in all these sectors; therefore, this approach is indispensable in any organization today. This finding aligns with Acciarini et al. [3] who showed that various types of organizations, both in the public and private sectors, are motivated to implement BDA to take advantage of business model innovation opportunities, reflecting their motivation to adopt this technology according to their business characteristics and needs.

What drives BDA initiatives within the organization, therefore, are the strategic and systemic drivers, which are oriented toward long-term goals. From a technological perspective, BDA forms an important part of digital transformation, as it helps harness and integrate huge datasets that further drive innovation in products and business models. The pairing of robust IT infrastructure with a strong data governance framework sets any organization on the road to effectively using its data for sustained competitive advantage. Organizational drivers are related to requirements for agility in decision-making and adaptability, which exist under a data-driven culture embracing top management support in infusing BDA into the core business strategy. Last but not least, other environmental drivers may force organizations to adopt BDA in areas such as regulatory compliance, setting goals related to sustainability set by society, societal expectations, and good practice, all treading together under the banner of broader environmental and social governance objectives. Economically, striving for operational efficiency, cost reduction, and better decision-making fuels the move toward BDA as

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the tool for optimizing resources and maximizing returns. Not least of all, knowledge and skills drive it forward, as internal analytical capacity development and proper knowledge management are definitely the means to ensure that organizations can fully exploit the strategic potential of BDA. The key drivers thus become collectively bound to the factor of the necessity of BDA in attaining long-term innovation, efficiency, and competitive positioning. The strategic and long-term motivations drive the implementation of BDA as a part of business transformation and continuous innovation. The rationale makes a point that technological, organizational, environmental, economic, and knowledge factors all combine and associate themselves with the attainment of long-term strategic objectives. This finding concurs with Hariyani et al. [4] who emphasized that digital technology, through the optimization of various resources, is a major driver for organizations to adopt BDA initiatives to improve efficiency and sustainability.

The reasons influencing its adoption seem to be focused on a set of focal and immediate factors that directly impact organizational decision-making. From the technology side, it seems that data quality problems, hardware-software compatibility, or perceived easiness in the use of BDA solutions are driving organizations. These factors become especially critical in environments where rapid digital transformation is required, such as in the case of IoT integration. This would also include organizational factors—readiness to innovate, presence of a supportive data-driven culture, and availability of internal analytical expertise—that play their part in ensuring the successful adoption of BDA. Other environmental factors influencing the specific motivations to BDA include regulatory pressures, competitive dynamics, and sustainability initiatives; that is, organizations wish to respond appropriately to the external environment while improving operational efficiency. Key drivers of some are those related to economic factors, like financial incentives, cost savings, and potential revenue increases. After all, short-term ROI is normally estimated by organizations with respect to BDA technologies. Besides, there are knowledge and skills, since the availability of special skills in data management and analytics enables the consumption of necessary competencies that help overcome inhibitors to adoption and realize quick wins. These specific factors reflect the practical and outcome-oriented considerations that guide an organization toward the integration of BDA into its processes. The synthesis places emphasis on direct and pragmatic drivers of BDA technologies and process adoptions, focusing on solving immediate problems, making short-term decisions, and obtaining immediate operational benefits. As described, these specific factors are the primary considerations in BDA adoptions. These findings resonate with Presciuttini et al. [5] that highlights that BDA integration provides new opportunities in operations management and reveals specific factors that motivate organizations to adopt BDA technologies to improve efficiency and productivity.

There are many reasons for adopting BDA in different sectors because BDA means different things to different sectors facing different goals and issues. So, in the case of the manufacturing sector, the goals to be achieved are related to operational performance and project outcomes, as well as improving the innovative capacity of the organization. The reason why this sector adopts BDA is due to the increasing need to achieve organizational flexibility, monetary benefits, and protection against the hardships of market volatility. On the other hand, the goals of public sector organizations are based on policies such as openness and accountability, and better public service delivery, where BDA is used to digitally enable the supply chain, promote a data culture, and alliances to improve crisis management. The healthcare sector concentrates on improving frontline processes, on positively changing environmental impacts, and on the quality of care, where BDA can improve healthcare delivery, as well as supply chain management. On the other hand, educational institutions require BDA for curriculum development and improving the quality of teaching and learning in general. In the retail sector, the motivation is directed at customer satisfaction and better targeting of services to each individual, as well as better stock control, and BDA in helping change according to market trends and customer trends. Thus, these different motivations by sector demonstrate the diverse strategic objectives that organizations in different sectors have for adopting BDA, in a way that illustrates how different sectors adapt BDA approaches to suit their operational needs and imperatives. These findings underline how different sector needs influence motivations and approaches in BDA implementation, consistent with the research of Acciarini et al. [3], which highlights how the use of Big Data varies across business areas and types of organizations, both in the public and private sectors, which can provide insight into differences in motivations between sectors in implementing BDA.

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4.4.2 Implications for Theory and Practice

The findings of this study are significant for theory and practice. The current results thus indicate a need for the reassessment and revision of technology adoption frameworks such as TOE and RBV. Again, this will require fine-tuning models to adequately consider various sectoral complexities, as this study found that all the distinct sectoral dynamics cannot be captured by these traditional theories. The results, therefore, highlight the increasing necessity of being able to instill organizational agility into the theory of data management to fully understand how BDA contributes to competitive advantage and innovation.

In practice terms, the findings are a major guide to applying BDA across sectors. For the manufacturing sector, there is a need to integrate BDA into operational strategies with a view to enhancing efficiency and reducing waste. In the retail sector, BDA should be used for inventory management and improving the customer experience. In the Healthcare sector, it is able to improve the quality of service and patients' data management. The use of BDA in the public sector would increase transparency, accountability, and efficiency in resource management. Finally, in the education sector, BDA should improve the quality of teaching and administration and personalize learning experiences. Effective BDA implementation can provide a large number of competitive advantages, improve operational efficiency, and support product and service innovation across sectors. These findings need to be taken into consideration by decision-makers while adopting and implementing BDA adoption strategies, more precisely by placing emphasis on the sectoral factors that influence the motivation and process of adoption.

4.4.3 Limitations of the Study

The study has notable limitations. Regarding the sample's representativeness, there may be limited generalizability because variations within sectors—for example, heavy versus light manufacturing—might get lost. With the data being self-reported, there is potential response bias, although steps through triangulation are taken to minimize this risk. Further, with the focus on established organizations, the particular issues startup enterprises or SMEs confront are ignored. One of the most critical limitations of this research is its cross-sectional design; that is, the correlations detected do not present causality. Last but not least, the very high speed of technological changes and sectorial contexts can affect the long-term relevance of the findings. Such limitations need to be addressed in future research, with the inclusion of more varied samples and longitudinal designs, so that a deeper understanding of BDA adoption can be achieved.

4.4.4 Recommendations for Future Research

A few future research directions have been recommended to help advance the knowledge base and help in deepening the understanding of BDA adoption and address the limitations of the present study. In this respect, longitudinal studies need to be done in order to find out the causal linkages between BDA adoption and organizational performance by tracking changes over time for assessing the long-term impact. This would further include supplementary sector-specific studies and cross-sector comparative studies focusing on the different drivers and barriers of the adoption of BDA within different industries, along with learning from how cross-sector knowledge sharing influences implementation.

This also includes research in the areas of artificial intelligence, machine learning, and blockchain in regard to their integration with BDA. Focusing on small enterprises and startups will give insight into their challenges and opportunities in the adoption of BDA. It is in this respect that the organizational culture and role of leadership on BDA readiness and implementation call for deep analysis, like an investigation into leadership style and cultural attributes that impact BDA success.

This would also imply examination of the policy and regulatory environment influencing adoption, not least because it frames BDA strategies and compliance differently. Multi-disciplinary approaches that merge insights from the information systems, management science, and data science knowledge bases will continue to yield increased insight into how the dynamics of BDA come into play. Lastly, the methodological rigour will be enhanced by the use of mixed-methods and superior analytical techniques to underpin the results of future research. Recommendations that follow are aimed at filling this lacuna and at greater understanding of how BDA has implications both in theory and practice.

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5 Conclusion

This study provides a comprehensive summary of key findings related to the motivations of organizations across sectors to implement BDA. The motivations for adopting BDA in manufacturing, the public sector, healthcare, education, and retail sectors stem from the ability of BDA to drive operational efficiency, financial performance, and decision-making within organizations. The study identifies key drivers of BDA adoption related to technological capabilities, organizational support, environmental factors, and economic incentives. These factors are: technological factors related to data quality and IT capabilities, organizational factors such as culture and management support, environmental pressures in the marketplace and regulations, and economic benefits. To a related point, the research displays how the motivations for BDA implementation differ from industry to industry, pointing out specific motivations and challenges in each of the sectors it represents. Some limitations apply to this study and thus are acknowledged. First, the focus on specific sectors may not provide much insight into the diversity of motivations that exist across sectors. Furthermore, the findings are subject to obsolescence due to the rapidly changing nature of technology and data analytics, and therefore need to be updated periodically in line with contemporary trends and challenges. This will involve future research on BDA adoption, across sectors and geographic contexts, toward a much more general understanding of the factors influencing BDA implementation. Longitudinal studies can help to probe into the long-term impacts and change of BDA practice within organizations. The current study thus adds to the nuanced understanding of the drivers and motivations for BDA adoption across sectors. It defines the factors governing BDA implementation, thus laying the groundwork for future research studies in academia and practical applications aimed at leveraging Big Data for organizational development.

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