

Mapping the Global Trends and Thematic Evolution of Big Data Analytics Capabilities Research: A Bibliometric Review

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Abstract: The objective of the paper is to explore and analyze global research trends, influential works, and key themes in Big Data Analytics Capabilities (BDAC) and to identify the most active authors, institutions, countries, and journals contributing to the field. Adopting bibliometric tools such as Bibliomagika, OpenRefine, VOSviewer, and Biblioshiny, this study used a bibliometric approach to collect 281 journal articles, conference papers, book chapters, reviews, and other document types from the Scopus database. By cleansing the data beforehand, this ensures the accuracy and reliability of subsequent analyses, enabling researchers to derive meaningful insights with confidence. The results clearly show a steady growth in BDAC-related publications over the past five years (2020–2024). This trajectory reflects the increasing scholarly interest and recognition of BDAC as a crucial organizational capability, especially in the context of digital transformation and firm performance. The findings revealed thematic cluster analyses that uncovered five dominant research themes. Firm performance and decision-making, sustainability and green supply chains and green innovation, business model innovation, artificial intelligence integration, and healthcare and sectoral applications.

Keywords: *Bibliometric analysis, big data analytics, big data analytics capabilities, data-driven culture*

1. Introduction

Big Data Analytics Capabilities (BDAC) have emerged as a key component of contemporary organizational strategy and competitiveness in an era characterized by exponential data growth. Organizations across all sectors are being compelled to utilize substantial volumes of both structured and unstructured data to facilitate informed decision-making, enhance operational effectiveness and foster innovation (Mikalef et al., 2018).

The ability of a company to obtain, handle, evaluate, and apply big data assets to create business value is known as BDAC. This ability encompasses organizational culture, technical infrastructure, trained staff, and strategic alignment, making it a complex concept with increasing significance. Over the past decade, scholarly interest in BDAC has increased as it has gained popularity in industries such as business, healthcare, and manufacturing.

The body of knowledge in BDAC literature remains widely spread, despite its focus on specific industries. Without providing a thorough overview of the field's conceptual evolution, existing research frequently focuses on particular elements, such as technology platforms, human expertise, or domain-specific applications. Furthermore, studies on BDAC are scattered throughout numerous journals and fields, making it challenging to identify significant contributions, trends in collaboration, and new themes. A thorough bibliometric analysis is required to fill these gaps by methodically mapping the field of BDAC research and providing more precise insights into its intellectual framework and future directions. The objective of the paper is to explore and analyze global research trends, influential works, and key themes in Big Data Analytics Capabilities (BDAC). Other than that, to identify the most active authors, institutions, countries, and journals contributing to the field. This study aims to answer the following research questions.

- What are the trends in publication for BDAC research?
- Who are the most prominent authors, and what themes dominate their work?
- What are the most influential institutions and countries in BDAC research?
- Which are the most active journals in publishing BDAC-related studies?
- What are the most highly cited documents and the themes they explored in BDAC?

- What are the most common keywords, and how have they evolved?
- What key themes emerge from co-occurrence analyses of keywords and title/abstract terms?

The rest of this paper is structured as follows. The next section presents a literature review that charts the historical and recent development of BDAC research, emphasizing theoretical frameworks and prior bibliometric efforts. Section 3 describes the methodological approach for data collection, processing, and analysis. Section 4 provides pieces of evidence of the results of the bibliometric analysis, including descriptive insights and thematic mappings. Lastly, Section 5 offers a discussion of findings and implications, while Section 6 concludes with key takeaways, research limitations, and directions for future exploration.

2. Literature Review

The roots of Big Data Analytics Capability (BDAC) lie at the intersection of data technology and strategic management theory. This reflects how BDAC emerged as a link between technological advancements in big data infrastructure and analytics and strategic value creation in organizations. In a previous study by Yong et al. (2019), their focus was directed toward big data infrastructure and storage systems. The promise of adopting a big data strategic architecture is that it maximizes technologies' capabilities in automating decision-making and drives these values through innovation. Over time, however, focus shifted toward the strategic use of data and analytics as a capability that drives organizational value. The early ideas, such as those by Barney (1991), drew upon the Resource-Based View (RBV), positioning BDAC as a valuable, rare and inimitable resource, whereas early on BDAC scholars like Mikalef et al. (2018) have emphasized that it requires specific capabilities beyond regular ones to develop big data-specific capabilities. Building on this, Dynamic Capabilities Theory (Teece, 2007) has been used to explain how firms continuously develop, integrate, and reconfigure analytics capabilities in response to environmental changes.

Over the past decade, scholarly interest in BDAC has increased as it has gained popularity in industries such as business, healthcare, and manufacturing. But recent studies have shown that BDAC has permeated a wide range of sectors, from finance and healthcare to sustainability. Recent studies explored BDAC's role in applying sustainability practices such as green supply chain sustainability (Rahman et al., 2024). The statistical analysis revealed that BDAC positively impacts all three dimensions of supply chain sustainability: economic, social, and environmental. Additionally, green supply chain management (GSCM) practices significantly moderate the relationship between BDAC and supply chain sustainability (Rahman et al., 2024). While others explored BDAC's influence on sustainable business performance (Novicka and Volkova, 2025). Their study contributes the BDAC elements' key success factors necessary to integrate sustainability reporting into organizational processes. Other than that, there are studies focused on the application of BDAC to financial reporting quality (Aboelfotoh et al., 2025) and the adoption of big data analytics in financial auditing (Maulani & Widuri, 2024), and Thayyib et al. (2023) analyzed its integration with artificial intelligence across multiple domains. Overall, these studies show a shift of BDAC from a support function to a strategic driver. There are also studies on bibliometric analysis conducted on healthcare sectors, as big data analytics has become an effective tool in the healthcare industry, revolutionizing medical research, patient care, and healthcare management (Mohd Daril et al., 2024).

On the methodological front, bibliometric tools such as VOSviewer and Biblioshiny have enabled researchers to conduct deeper and more nuanced analyses (Pathak et al., 2024; Aboelmaged & Mouakket, 2020). Co-citation networks, keyword trends, and thematic mapping have proven particularly effective in uncovering latent patterns within the literature (Thayyib et al., 2023). Recent studies have also begun to integrate advanced techniques such as mixed methods and topic modeling (Fauzi et al., 2023). Theoretically, scholars are expanding the scope of BDAC inquiry by incorporating stakeholder theory, Environmental, Social and Governance (ESG) frameworks, and digital transformation paradigms (Murad et al., 2023; Novicka & Volkova, 2025; Dubey et al., 2019). Organizations are not only harnessing and analyzing big data for improved transparency and decision-making but also for improving collaboration among partners in supply chains to meet sustainability goals and address environmental issues (Dubey et al., 2019).

Several scholars have attempted to chart the BDAC research landscape using bibliometric techniques. Inamdar et al. (2021) conducted a review focusing on big data analytics (BDA) adoption between 2014 and 2018, with

an emphasis on enabling technologies and implementation challenges. The author has found that the benefits of adopting BDA, coupled with a lack of adequate research in the field, have motivated their study. The bibliometric analysis they conducted has categorized papers into seven main areas and found that most of the studies were carried out in manufacturing and services.

Other bibliometric analyses conducted by Aboelmaged and Mouakket (2020) examined key influencing models and determinants in big data analytics, which suggest that the analysis reveals that BDA adoption research demonstrates attributes suggestive of a topic at an initial stage of development as it is broadly dispersed across different domains and employs a wide range of models, some of which overlap. Most of the applied models are generic in nature, focusing on variance-based relationships and snapshot prediction with little consensus. Fauzi et al. (2023) looked at how BDA intersects with human resource management. The bibliometric study conducted on the human resource area has found significant research clusters that imply the knowledge structure and mapping of research streams in HRM.

More recently, Pathak et al. (2024) delivered a sophisticated bibliometric and co-citation analysis, identifying core research clusters such as capability antecedents, business value creation, and organizational adaptability. In sum, most of the current research focuses on the value creation mechanisms of BDAC but uses multiple theoretical logics to examine it. The evolving research themes indicate an emphasis on supply chain (resilience, agility, sustainability), manufacturing performance, innovation, competitive performance, and strategic value creation.

Other contributions by academicians and practitioners have recently begun to accord artificial intelligence (AI) and big data analytics (BDA) significant consideration when exploring emerging research trends in different fields. Thayyib et al. (2023) provided a cross-domain bibliometric summary of BDA and artificial intelligence across five key industries, highlighting the growing interdisciplinary nature of the field. While all these studies have expanded the field's analytical scope, many have not delved deeply into performance-related constructs or the evolving theoretical paradigms underpinning BDAC.

However, while other authors are focusing on conducting reviews on how big data analytics intersects with other disciplines and technology adoption, Rialti et al. (2019) have focused directly on the capability view of big data analytics. The author conducted a bibliometric analysis that revealed four clusters of papers on big data and dynamic capabilities. The four clusters were classified as big data and supply chain management, knowledge management, decision-making, business process management, and big data analytics. At the same time, the author conducted a systematic literature review, which helped to clarify each cluster's content. Building on this foundation, the current study offers a focused and updated bibliometric review exclusively targeting BDAC literature. By analyzing a cleaned Scopus dataset, it contributes refined insights into the intellectual architecture, thematic directions, and collaborative networks shaping the field.

3. Method

This study employed a bibliometric approach using a final corpus of 281 Scopus-indexed journal articles, conference papers, book chapters, reviews, and other document types from the Scopus database. The well-known database Scopus served as the basis for this study's data collection for the bibliometric analysis. Using the Scopus database allows researchers to discover curated research and enrich data and scholarly literature to support academic research with comprehensive content. It also offers global coverage, enabling researchers to access critical, high-quality research from developing countries. The study uses the search field by extracting articles based on the article title, abstract, and keywords.

Data were retrieved from the Scopus database on 25 November 2024. Scopus was selected because of its broad multidisciplinary coverage and structured bibliographic metadata, which are suitable for bibliometric analysis. The search was performed using the title, abstract, and keyword fields with the query TITLE-ABS-KEY ("big data analytics capabilities"), limited to publications between 2020 and 2024. The initial search returned 354 records. To improve conceptual precision, the retrieved records were manually screened by reviewing their titles and abstracts. Records were excluded when the search term did not refer to Big Data Analytics Capability, when BDAC was mentioned only incidentally without substantive relevance to the study, or when the record

did not provide sufficient bibliographic information for analysis.

Following screening, 73 records were excluded and 281 documents were retained for bibliometric analysis. The final dataset included different Scopus-indexed publication formats to capture the broader scholarly development of BDAC research. Bibliographic information extracted included publication title, year, author names and affiliations, source title, abstract, author keywords, and citation counts. The keyword search looks at general terms of “big data analytic capabilities.” With the specific keyword, this study aims to investigate the evolution of the specific construct Big Data Analytics Capabilities (BDAC) as conceptualized in the resource-based view and dynamic capability literature. This methodological rationale acknowledges that the use of a construct-specific search string may have excluded studies employing alternative terminology, which is now stated as a limitation and an avenue for future research.

Additionally, only publications from the years 2020 to 2024 were chosen for the analysis. The following information was combined with the data from the bibliometric search. (i) the title of the paper, (ii) the date of publication, (iii) the main author details (name(s) and affiliation(s)), (iv) the title of the article, (v) the authors’ keywords, (vi) the abstract, and (vii) the number of citations. The data were analyzed and presented using the new bibliometric tool BiblioMagika (Ahmi, A., 2024) along with other introduced tools like VOSviewer and RStudio’s Biblioshiny packages (Ragazou et al., 2023). These tools provided analysis tables, graphs, and maps, such as network visualization maps that demonstrate the research trends. BiblioMagika is an Excel-based tool designed for conducting bibliometric analysis, with a focus on assessing publication productivity and evaluating scholarly impact. It offers a range of calculations, including total publications (TP), contributing authors (NCA), cited publications (NCP), total citations (TC), average citations per publication (C/P), average citations per cited publication (C/CP), h-index, g-index, m-index, citations sum within the h-core, cumulative total publications, and more. This analysis can be performed across various parameters such as publication year, source titles, authors, affiliations, and countries.

BiblioMagika streamlines the data cleaning and harmonization process for author names and affiliations, ensuring standardized data presentation for accurate analyses (Ahmi, 2024). Additionally, it facilitates the identification of missing data and offers tools for data completion. Moreover, BiblioMagika prepares datasets for compatibility with other bibliometric tools such as VOSviewer and Biblioshiny. By cleansing the data beforehand, it ensures the accuracy and reliability of subsequent analyses, enabling researchers to derive meaningful insights with confidence. Data collected from Scopus for this study, referring to Figure 1, includes the keyword search is shown and thoroughly stated in the PRISMA diagram. The bibliographic data were retrieved from Scopus in November 2024.

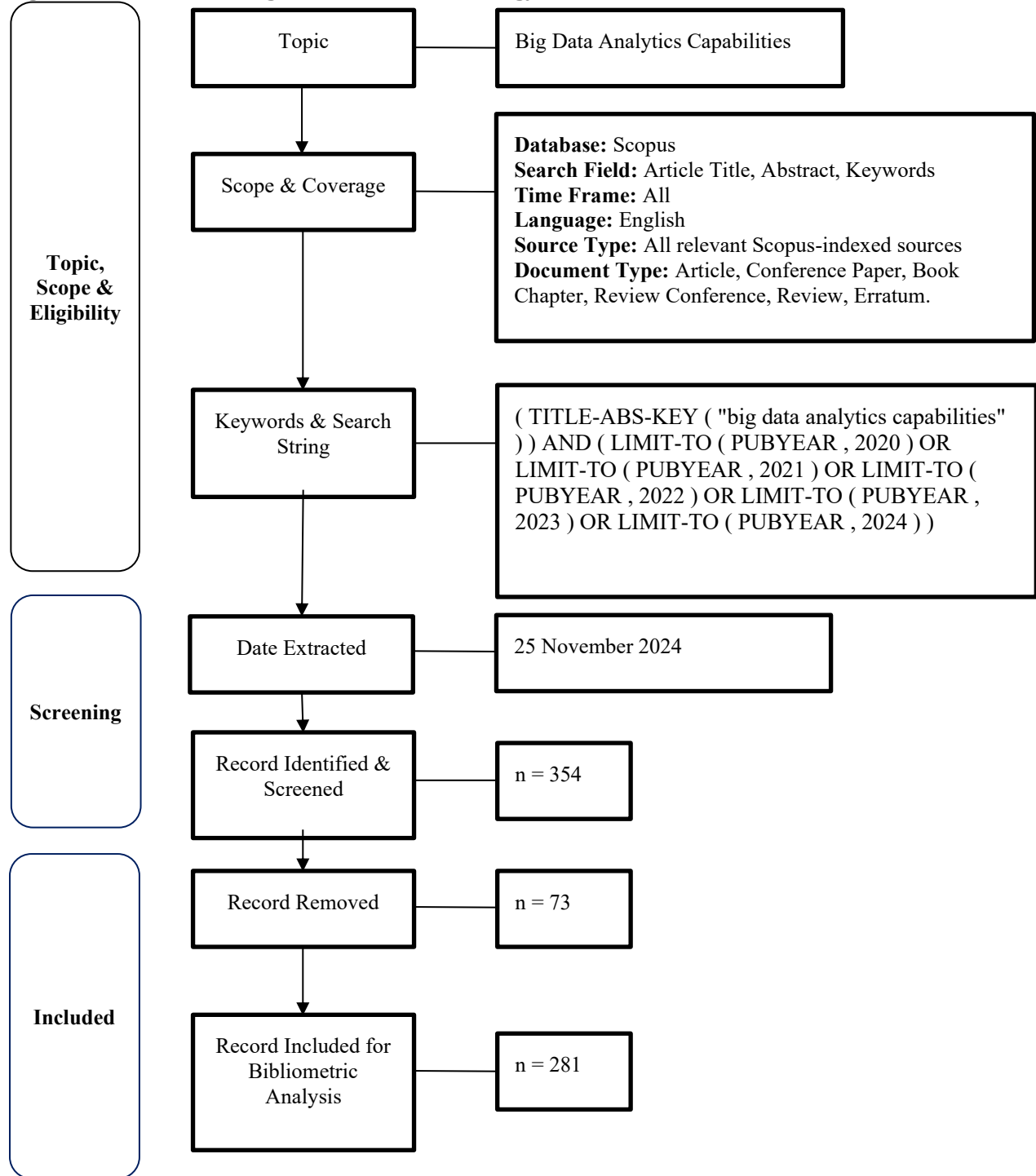
Data cleaning and consistency verification were conducted before the bibliometric analysis. This process is to improve the reliability and accuracy of the dataset. Bibliometric datasets exported from Scopus frequently contain inconsistencies arising from variations in authors' names, institutional affiliations, keywords and document metadata. These inconsistencies may distort publication counts, collaboration networks, citation analysis, and keyword co-occurrence maps.

The initial dataset of 354 records was first screened manually by reviewing the titles and abstracts to ensure conceptual relevance to big data analytics capability (BDAC). Those documents that were not related to the study objectives, duplicate records and publications outside the predefined inclusion criteria were removed, resulting in the final dataset of 281 publications. Later, the bibliographic records were cleaned using BiblioMagika®, followed by verification in Biblioshiny (Bibliometrix) before being imported into VOSviewer for network visualization.

The data cleaning process included removal of duplicate records; standardization of author names where alternative spellings or name variants existed; harmonization of institutional affiliations to combine identical institutions recorded under different names; verification of publication years, document types, and source titles; correction of inconsistencies in author keywords by merging synonymous terms and resolving spelling variations where appropriate; and validation of missing or incomplete bibliographic metadata where possible. Following data cleaning, the dataset was subjected to consistency checks by comparing publication counts across document types, source types, publication years, countries, authors, and journals. The totals reported in

all descriptive analyses were cross-validated to ensure consistency throughout the study. This process minimized potential bias caused by duplicate records, inconsistent metadata, and fragmented author or institutional identities, thereby improving the robustness and reproducibility of the bibliometric findings.

Figure 1: PRISMA flow diagram of the search strategy.



4. Results

Table 1 shows that the 281 documents in the dataset have been categorized based on the publication type, sources, languages, and subject area.

According to Table 1, showing the dominance of journal articles dominate. The articles accounted for 78.29% (220 publications), which indicates that most of the research output on the topic of big data analytics capabilities (BDAC) and firm performance has been published in peer-reviewed academic journals. This high percentage shows a high level of academic interest and possibly rigorous peer-review standards contributing to the development in this field. The next most common document types are conference papers (12.81%) and book chapters (4.27%). Conference papers are the type of documents that have been published in Scopus, showing ongoing discussions and presentations at academic gatherings, which often precede journal publication, and this also indicates emerging research directions on the particular topic. Book chapters suggest a specific topic or theme, such as big data analytics capabilities. The others have been categorized as review papers, errata, and retracted papers. Review papers (2.14%) are relatively limited, suggesting a gap in comprehensive summaries or syntheses in this field, which highlights an opportunity for future research. Erratum and retracted documents, constituting only 0.36%, each, show high data integrity and minimal issues in Scopus. Therefore, it is proven that the topic BDAC is primarily journal-driven, which is considered to have good impact and citation visibility. The results have shown a relatively small number of review articles, which can become an opportunity for researchers to embark on writing big data analytics capability review articles, which will fill a needed gap.

Table 1: Document Type

Document Type	Total Publications (TP)	Percentage (%)
Article	220	78.29
Conference Paper	36	12.81
Book Chapter	12	4.27
Review	6	2.14
Conference Review	5	1.78
Erratum	1	0.36
Retracted	1	0.36
Total	281	100

Referring to Table 2, the table illustrates the distribution of publication sources from which BDAC and firm performance-related studies emerged. Journal source type is shown to dominate the field, where journals contributed 81.49% (229 publications) of the total sources. This information is consistent with Table 1, which confirms that the most contributions to the field are peer-reviewed and academically validated. Journal publications also indicate that the area is gaining researchers' interest, scholarly maturity, and recognition. Conference proceedings (11.03%) represent a smaller but significant share of the contribution. Usually, a conference is a stepping stone for early-stage and emerging researchers to showcase their new ideas as well as gather peer or expert feedback before finalizing the journal publication. The remaining data sources came from book series (5.34%) and books (2.14%), which include common themes of BDAC, suggesting a growing interest in the field, especially in the fields of strategic orientation, dynamic capabilities, value creation, and capabilities. The study uses the dynamic capability approach to investigate how turbulent and competitive contexts influence big data analytics capabilities, which in turn affect supply chain (SC) agility (Cadden et al., 2021). The study by Park et al. (2021) seeks to evaluate the impact of big data analytics capacity on big data values and business performance in organizations that undertake big data analytics, which is one of the leading technologies in the fourth industrial revolution. Big data values in this study include transactional, strategic, transformative, and informative. Whereas Moseneke and Brown (2022) stated that their study focuses on describing BDAC requirements to build business value that originates from the work practice level, this topic is regarded as less investigated. All these are presented in the form of books and book series, which show interdisciplinary and long-form engagement with the topic, which may offer more conceptual or case-based perspectives.

Table 2: Source Type

Source Type	Total Publication (TP)	Percentage (%)
Journal	229	81.49
Conference Proceeding	31	11.03
Book Series	15	5.34
Book	6	2.14
Total	281	100

Table 3 highlights the language distribution of the 281 publications in the dataset. English has been identified as the dominant language, as 100% of the documents are published in English, although one also includes Chinese (0.36%) and Serbian (0.36%), which are most likely dual-language publications. This confirms that BDAC and firm performance research are globally oriented and are sought broadly by scholarly reach through the use of the lingua franca of academia, which is English. For global accessibility and citation potential, an English-language publication is preferred in this area. Regional viewpoints may be under-represented, especially in non-English-speaking developing economies where BDAC adoption is increasing. Future studies could look into grey literature or local databases to collect these regional insights if inclusivity or context-specific analysis is required.

Table 3: Languages

Language	Total Publications (TP)	Percentage (%)
English	281	100.00%
Chinese	1	0.36%
Serbian	1	0.36%
Total	281	100

*One or two documents have been prepared in dual languages

Table 4 categorizes publications based on their subject classifications. Most papers are indexed in more than one area, reflecting the multidisciplinary nature of BDAC. The top dominant fields are business, management, and accounting (60.14%). Expectedly, this shows that BDAC is most often applied in the context of organizational performance, strategic decision-making, and resource utilization. In terms of firm performance, the study focuses on examining how BDAC influences firm performance through dynamic capabilities (Mikalef et al., 2020), sustainable performance in healthcare (Shokouhyar et al., 2020), data governance as a critical enabler of BDAC success, which is directly connected to firm performance and governance mechanisms (Mikalef et al., 2020), sustainability practices in manufacturing contexts (Bag et al., 2021), and supply chain sustainability and operational performance (Razaghi & Shokouhyar, 2021). These authors are key contributors to this area. Preceding the business management and accounting field is computer science (39.15%). As a technology-driven capability, BDAC's foundation in computing, for instance, data processing, artificial intelligence, and machine learning, reflects the collaboration between technical and business management disciplines. Decision sciences (24.91%) is marked as the 3rd dominant field. This is a key area where BDAC contributed to analytics for informed decisions in multiple areas like supply chain, finance, marketing, and strategic planning. Other supporting disciplines are social sciences (21%) and engineering (20.28%). This considers broader societal and systems-oriented applications, for instance, in smart cities, engineering processes, and analysis using human skills. There are also supporting disciplines such as environmental science (9.96%) and economics, econometrics, and finance (7.47%) that have emerged. This reflects the growing interest in using BDAC in sustainability, ESG performance, and economic analysis that certain studies uniquely target. In relation to BDAC, there are niche subject areas with emerging interest, such as psychology (6.05%), energy (5.69%), mathematics (4.98%), and medicine (1.07%). Here, the application of BDAC is assumed to understand human behavior, enhance predictive models in certain areas, and optimize the usage of energy. Concerning BDAC, this analysis highlights how intersections between business, technology, and environmental disciplines are evolving, and this might give insight for future research to focus on the subject areas that have less investigation, such as arts and humanities, medicine, materials science, physics and astronomy, chemical engineering, earth and planetary sciences, and nursing.

Table 4: Subject Area

Subject Area	Total Publications (TP)	Percentage (%)
Business, Management and Accounting	169	60.14
Computer Science	110	39.15
Decision Sciences	70	24.91
Social Sciences	59	21.00
Engineering	57	20.28
Environmental Science	28	9.96
Economics, Econometrics & Finance	21	7.47
Psychology	17	6.05
Energy	16	5.69
Mathematics	14	4.98
Arts and Humanities	5	1.78
Medicine	3	1.07
Materials Science	2	0.71
Physics and Astronomy	2	0.71
Chemical Engineering	1	0.36
Earth and Planetary Sciences	1	0.36
Nursing	1	0.36

Table 5 represents the publication year, including the annual distribution and citation performance related to significant big data analytics capabilities (BDAC). It also portrays the BDAC impact on firm performance over the last five years (2020-2024), based on the 281 documents in the dataset. Based on the output, the total number of publications (TP) has steadily increased from 30 (2020) to 94 (2024), showing that there's significant growth in academic interest in BDAC and its relationship with organizational and sustainability performance. This is consistent with the data observed in the dataset. By the year 2024, it was shown that 94 out of 281 total outputs accounted for 33%, showing that the field is still expanding rapidly. Referring to citation impact, there has been a decline in citation performance over time (2020-2024). Even though the publication output is rising, citation impact is declining. As seen in the table, average citations per publication (C/P) and citations per cited publication (C/CP) declined from 93.3 (2020) to just 4.57 (2024) and from 97.17 (2020) to 7.54 (2024), respectively. The declination is considered normal in bibliometric studies, as the older papers have had more time to accumulate citations. Usually, a high citation rate reflects early foundational studies; for instance, as referred to in this data, prominent authors in BDAC areas are Mikalef et al. and Wamba et al. in the years 2020-2021. The citation metrics, such as a reference to the h-index and g-index, offer insight into the productivity and impact of publications by year. The highest h-index (26) and g-index (38) are from the year 2022, which shows that there is a strong influence of papers from that year. Despite having more publications, 2023 and 2024 have lower h-/g-index values (16/22 and 12/18, respectively), indicating that they are newer and have not yet received considerable citations. Figure 2 reflects the same information in a chart format; the total publications and citations by year visualize both publication volume and citation impact over time. This dual-axis chart shows the blue bars and orange line, which constitute the total number of publications on the left Y-axis and the total number of citations on the right Y-axis. Overall, the 2 diagrams show that there is consistent growth in publication output (2020-2024), and this confirms that BDAC and the firm performance research field are growing steadily, especially in 2022-2024. In terms of citations, it can be seen that there is a declining citation trend despite growth. The total citations peak in 2020 (2818) and decline steadily to 2024 (430).

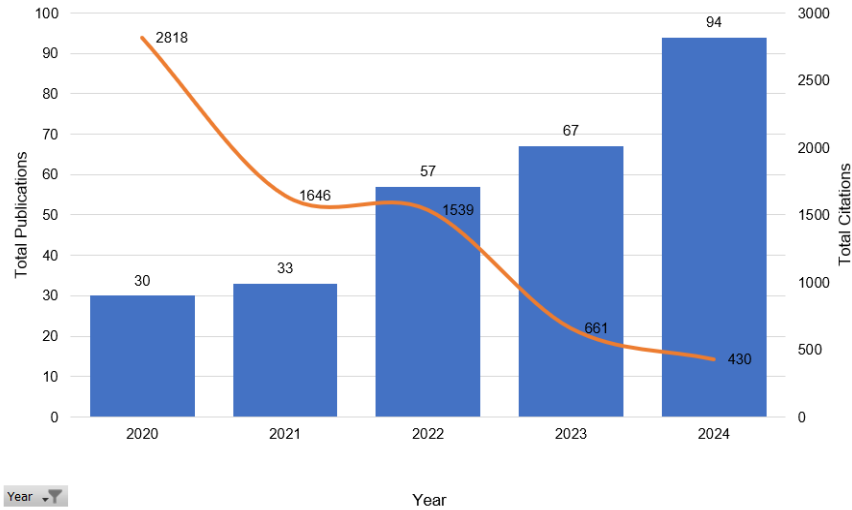
Table 5: Year of Publication

Year	TP	NCP	TC	C/P	C/CP	h-index	g-index
2020	30	29	2818	93.93	97.17	20	30
2021	33	30	1646	49.88	54.87	18	33
2022	57	48	1539	27.00	32.06	26	38

2023	67	52	661	9.87	12.71	16	22
2024	94	57	430	4.57	7.54	12	18
Grand Total	281	216	7094	25.25	32.84	92	141

Notes: TP=total number of publications; NCP=number of cited publications; TC=total citations; C/P=average citations per publication; C/CP=average citations per cited publication; h=h-index; and g=g-index.

Figure 2: Total Publications and Citations by Year



Source: Generated by the author(s) using biblioMagika® (Ahmi, 2024)

Table 6 shows the most productive countries by total publications contributing to publications. This table presents the geographical distribution of BDAC publications from the dataset, highlighting key productivity and impact metrics by country. According to the table, the 5 most productive countries by total publications are 1) China (198 papers), 2) Malaysia (83 papers), 3) United Kingdom (73 papers), 4) Pakistan (39 papers), and 5) Italy (35 papers). China dominates publication productivity with 198 papers (27.77% of the total 713), more than other countries. Malaysia ranks notably high (83 papers), showing significant research involvement in this area within the region. According to the same table, the total citations (TC) impact is led by China, followed by the UK, Italy, the US, and Turkey. Despite China's (4423) lead in quantity, the United Kingdom (4174) is highly competitive in citation impact. The citation efficiency (C/P) shows the average citations per publication. The top-performing countries that have high average citations per paper are the US, the UK, Italy, and Finland. This indicates a focus on impactful and high-quality publications. Research productivity and impact indicators can be seen in the table in the columns h-index and g-index. China ranks the highest in h-index (37) and g-index (66), reflecting the country's productivity and influence contributed to publications. The UK follows with an h-index of 29 and a g-index of 64, which shows high-quality and impactful research output. Whereas the h-index (16) is comparable to developed countries like Turkey & Pakistan, it is believed that these countries are showing growing interest in research maturity. Additionally, countries like New Zealand, Finland, and Iran show outstanding citation efficiency, but they contribute only a few publications. Malaysia is the only ASEAN country that is listed in the top ranks, which shows a strong research footprint in BDAC topics. Other countries portraying low C/P and T/C might be emerging players or focused on local or applied research contexts. Conclusively, China is the leading player in most publications as the leading quantity producer in BDAC research. The countries that have the most citations is China.

The geographical distribution of BDAC studies has suggested that the field is becoming less concentrated within traditionally dominant Western research systems. Earlier reviews reported that BDAC studies were disproportionately situated in developed-country contexts (Murad et al., 2023). In contrast, referring to the results in Table 6. Most Productive Countries, the present analysis identifies China and Malaysia as the two most productive countries, followed by the United Kingdom. This pattern shows the increasing contribution of Asian research communities to the development of BDAC scholarship.

Table 6: Most Productive Countries

Country	TP	NCA	NCP	TC	C/P	C/CP	<i>h</i>	<i>g</i>	<i>m</i>
China	198	11	156	4423	22.34	28.35	37	66	6.167
Malaysia	83	11	64	967	11.65	15.11	16	31	3.200
United Kingdom	73	9	65	4174	57.18	64.22	29	64	4.833
Jordan	41	16	15	291	7.10	19.40	8	17	2.000
Pakistan	39	2	35	661	16.95	18.89	16	25	3.200
Italy	35	6	30	1794	51.26	59.80	12	35	2.400
Australia	32	10	25	602	18.81	24.08	10	24	1.667
Turkey	30	7	24	1270	42.33	52.92	11	30	1.833
United States	29	24	23	1551	53.48	67.43	15	29	2.500
United Arab Emirates	28	NR	23	476	17.00	20.70	10	21	2.000
Spain	19	2	12	228	12.00	19.00	5	15	1.000
Saudi Arabia	15	5	13	172	11.47	13.23	6	13	1.000
Iran	12	NR	12	428	35.67	35.67	7	12	1.167
Thailand	10	NR	9	102	10.20	11.33	8	10	1.333
Taiwan	10	2	6	247	24.70	41.17	5	10	0.833
Finland	6	NR	6	330	55.00	55.00	4	6	0.800
Ireland	6	NR	6	172	28.67	28.67	5	6	0.833
Canada	6	NR	6	129	21.50	21.50	5	6	1.250
Sweden	5	NR	4	171	34.20	42.75	3	5	0.500
Iraq	5	NR	1	5	1.00	5.00	1	2	0.333
Ghana	5	NR	5	112	22.40	22.40	2	5	0.500
Indonesia	5	51	5	5	1.00	1.00	1	2	0.333
Russian Federation	4	2	4	4	1.00	1.00	1	2	0.333
Portugal	3	2	3	6	2.00	2.00	2	2	0.667
South Korea	3	4	3	37	12.33	12.33	2	3	0.333

Note: TP=total number of publications; NCA=number of contributing authors; NCP=number of cited publications; TC=total citations; C/P=average citations per publication; C/CP=average citations per cited publication; *h*=*h*-index; *g*=*g*-index, *m*=*m*-index.

Source: Generated by the author(s) using biblioMagika® (Ahmi, 2024)

Table 7 represents the institutional-level analysis highlighting the most productive institutions' productivity and citation impact for institutions contributing to BDAC research. The most productive institutions by the total number of publications (TP) are Jiangsu University (24), followed by the University of Technology Sydney (16), Harbin Institute of China Technology (15), Northwestern Polytechnical University (14), Universiti Sains Malaysia (11), and Universiti Kebangsaan Malaysia (9), and several institutions have minimally contributed to publication in the BDAC topic. This reflects that China has dominated the research area in terms of the number of publications. According to total citations (TC), the Norwegian University of Science and Technology (1932) stands out as the most influential institution, followed by the University of Florence (1061), Liverpool John Moores University (848), Harbin Institute of Technology (670), the University of Roehampton (652), and Jiangsu University (499). Referring to the most productive institution that has high research impact, Jiangsu University leads in both based on the *h*-index (14) and *g*-index (22). Conclusively, the field is highly influenced by China, Australia, and Malaysia.

Referring to Table 7, the results in the Most Productive Institutions indicate that China's domination is also visible at the institutional level as compared to Table 6 results, with Jiangsu University, Harbin Institute of

Technology, and Northwestern Polytechnical University among the leading contributors. Universiti Sains Malaysia and Universiti Kebangsaan Malaysia similarly support Malaysia's position. The United Kingdom, however, demonstrated a different pattern of influence, while its publication volume is lower than China's. Its citation per publication (C/CP) is considerably stronger: 106 and 33.27 (C/CP: China). This suggests that productivity and scholarly impact are not necessarily concentrated in the same national systems.

Table 7: Most Productive Institutions

Institution Name	Country	TP	NCP	TC	C/P	C/CP	h	g	m
Jiangsu University	China	24	15	499	20.79	33.27	14	22	3.500
University of Technology Sydney	Australia	16	13	182	11.38	14.00	5	13	0.833
Harbin Institute of Technology	China	15	15	670	44.67	44.67	12	15	2.000
Northwestern Polytechnical University	China	14	14	244	17.43	17.43	8	14	2.000
Universiti Sains Malaysia	Malaysia	11	8	320	29.09	40.00	4	11	0.800
Universiti Kebangsaan Malaysia	Malaysia	9	8	99	11.00	12.38	5	9	1.250
Luminus Technical University College	Jordan	9	8	259	28.78	32.38	7	9	1.750
Abu Dhabi University	United Arab Emirates	9	9	268	29.78	29.78	5	9	1.000
Shahid Beheshti University	Iran	8	8	326	40.75	40.75	6	8	1.000
Universidad de Sevilla	Spain	8	7	96	12.00	13.71	3	8	1.000
Liverpool John Moores University	United Kingdom	8	8	848	106.00	106.00	8	8	1.600
Indian Institute of Management Kashipur	India	7	3	33	4.71	11.00	3	5	1.000
University of Roehampton	United Kingdom	7	7	652	93.14	93.14	7	7	1.400
University of Florence	Italy	7	7	1061	151.57	151.57	4	7	0.800
Universidad de Antioquia	Colombia	7	7	132	18.86	18.86	7	7	1.400
Tunku Abdul Rahman University College	Malaysia	7	5	9	1.29	1.80	2	3	0.400
Norwegian University of Science and Technology	Norway	7	7	1932	276.00	276.00	5	7	0.833
Affiliation NA	Country NA	7	0	0	0.00	0.00	0	0	0.000
Coventry University	United Kingdom	6	6	211	35.17	35.17	5	6	0.833
Chongqing University	China	6	6	106	17.67	17.67	6	6	1.500
Yarmouk University	Jordan	6	1	2	0.33	2.00	1	1	0.333
King's College London	United Kingdom	6	3	3	0.50	1.00	1	1	0.333
Yunnan University of Finance and Economics	China	6	6	64	10.67	10.67	6	6	1.500
Yasar University	Turkey	6	6	53	8.83	8.83	4	6	0.800
Al-Bayt University	Jordan	6	0	0	0.00	0.00	0	0	0.000

Note: TP=total number of publications; NCA=number of contributing authors; NCP=number of cited publications; TC=total citations; C/P=average citations per publication; C/CP=average citations per cited publication; h=h-index; g=g-index, m=m-index.

Source: Generated by the author(s) using biblioMagika® (Ahmi, 2024)

Table 8 highlights the most productive individual authors in BDAC and firm performance research based on the number of publications (TP) and their citation impacts. The most productive authors by total publications (TP) are Alkhatib, Ayman Wael (10), followed by Norzalita Abd Aziz (5), Taiwen Feng (5), and Sajjad Shokouhyar (5). Ayman Wael Alkhatib (Jordan) is the most prolific author with 10 publications, and Norzalita

Abd Aziz (Malaysia) and Taiwen Feng are the leaders among Asia-based researchers. The most influential authors by their total citations (TC) are Patrick Mikalef (Norway), who stands out with the highest total citations (698) with only 3 publications, which indicates that his works are highly influential and widely cited. The highest citation efficiency, as seen by the average citations per publication (C/P) is held by Patrick Mikalef (232.6), followed by Foropon (93.33), Bryde (93.33), Dubey (93.33) and Wamba (45.00). The highest impact per publication belongs to Mikalef, considered as reinforcing his key role in shaping BDAC literature. The research impact belongs to Ayman Wael Alkhatib, h-index (8) and g-index (10); Feng Taiwen, h-index (5) and g-index (5) and Norzalita Abd Aziz, h-index (4) and g-index (5). This shows consistency in productivity and citation impact. According to the table, there are significant contributions from Asian authors, which shows a strong regional presence from Malaysia, China and Jordan. The BDAC field is driven both by quantity-oriented authors such as Ayman Wael Alkhatib and quality-oriented, highly cited authors such as Mikalef, Foropon, Dubey and Bryde

Table 8: Most Productive Authors

Full Name	Current Affiliation	Country	TP	NCP	TC	C/P	C/CP	h	g
Alkhatib, Ayman Wael	Luminus Technical University College	Jordan	10	9	286	28.60	31.78	8	10
AN, NA	Affiliation NA	Country NA	7	0	0	0.00	0.00	0	0
Aziz, Norzalita Abd	Universiti Kebangsaan Malaysia	Malaysia	5	5	28	5.60	5.60	4	5
Feng, Taiwen	Harbin Institute of Technology	China	5	5	131	26.20	26.20	5	5
Shokouhyar, Sajjad	Beheshti University	Iran	4	4	179	44.75	44.75	3	4
Chong, Chu-Le	Tunku Abdul Rahman University College	Malaysia	4	2	3	0.75	1.50	1	1
Kazancoglu, Yigit	Yasar University	Turkey	4	4	46	11.50	11.50	3	4
Mangla, Sachin Kumar	O P Jindal Global University	India	3	3	42	14.00	14.00	3	3
Uddin Murad, Md Ahsan	University of Technology Sydney	Australia	3	2	6	2.00	3.00	2	2
Chakraborty, Subrata	University of Technology Sydney	Australia	3	2	6	2.00	3.00	2	2
Foropon, Cyril	Montpellier Business School	France	3	3	280	93.33	93.33	3	3
Mikalef, Patrick	IT-bygget	Norway	3	3	698	232.67	232.67	3	3
Bryde, David J.	Liverpool John Moore's University	United Kingdom	3	3	280	93.33	93.33	3	3
Gupta, Shivam	NEOMA Business School	France	3	3	43	14.33	14.33	2	3
Cetindamar, Dilek	University of Technology Sydney	Australia	3	2	45	15.00	22.50	2	3
Tipu, Syed Awais Ahmad	University of Sharjah	United Arab Emirates	3	3	18	6.00	6.00	3	3
Long, Fei	Guangdong Ocean University	China	3	3	18	6.00	6.00	3	3
Ferraris, Alberto	University of Torino	Italy	3	3	72	24.00	24.00	3	3
Binti Khalid, Haliyana	Universiti Teknologi Malaysia	Malaysia	3	1	1	0.33	1.00	1	1
Dubey, Rameshwar	Liverpool John Moores University	United Kingdom	3	3	280	93.33	93.33	3	3
Song, Jianmin	Chongqing University	China	3	3	53	17.67	17.67	3	3
Wamba, Samuel Fosso	TBS Business School	France	3	3	135	45.00	45.00	3	3
Arias-Pérez, José	Universidad de Antioquia	Colombia	3	3	60	20.00	20.00	3	3
Abdul Rasid, Siti Zaleha	Universiti Teknologi Malaysia	Malaysia	3	1	16	5.33	16.00	1	3

Fantazy, Kamel	The University of Winnipeg	Canada	3	3	18	6.00	6.00	3	3
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Note: TP=total number of publications; NCA=number of contributing authors; NCP=number of cited publications; TC=total citations; C/P=average citations per publication; C/CP=average citations per cited publication; h=h-index; g=g-index, m=m-index.

Source: Generated by the author(s) using biblioMagika® (Ahmi, 2024)

Table 9 and Figure 3 rank journals and conference proceedings based on their contribution to the BDAC field, using productivity and citation impact indicators. There are two journals considered the most productive sources, according to their total publications (TP), with 11 publications each. Those are the Business Process Management Journal and Technological Forecasting and Social Change. Technological Forecasting and Social Change and Information and Management are the most highly cited sources. Information and Management has the highest citation efficiency based on the average citations per publication (CP) and average citations per cited publication (C/CP), with 193.25 citations per article. This makes it a key target for high-impact BDAC research distribution. Technological Forecasting and Social Change has the highest h-index (9) and g-index (11), showing high productivity and high-impact research. Business Process Management Journal also ranks high (h = 8, g = 11), confirming its consistency and influence. Several entries in the table, such as the Proceedings of the Annual Hawaii International Conference on System Sciences, the International Conference on Research and Innovation in Information Systems (ICRIIS), and the 2022 International Conference on Computer Network, Electronic and Automation (ICCNEA 2022), represent conference proceedings rather than journal publications. These conference venues demonstrate the field's engagement with academic events and the dissemination of early-stage research. However, as expected for non-journal sources, these publications generally exhibit lower citation impact than their journal counterparts.

The results show that the concentration of BDAC publications in journals such as Business Process Management Journal, Technological Forecasting and Social Change, Journal of Business Research and Information & Management reveals the conceptual migration of BDAC from predominantly technological topics towards a broader management and strategy domain. These patterns are consistent with the recent reviews that position BDAC as an organizational capability concerned with value creation, innovation, digital transformation, and competitive performance rather than merely with data processing technologies (Huynh et al., 2023; Pathak et al., 2024). The highest citation efficiency of Information & Management can also be regarded in light of the influence of capability-oriented studies such as Mikalef et al (2020), which connects BDAC with dynamic capabilities and operational efficiencies. This journal dominance appears to mirror the field's intellectual transition from technical analytics towards strategic management and organizational transformation.

Table 9: Most Productive Source Title

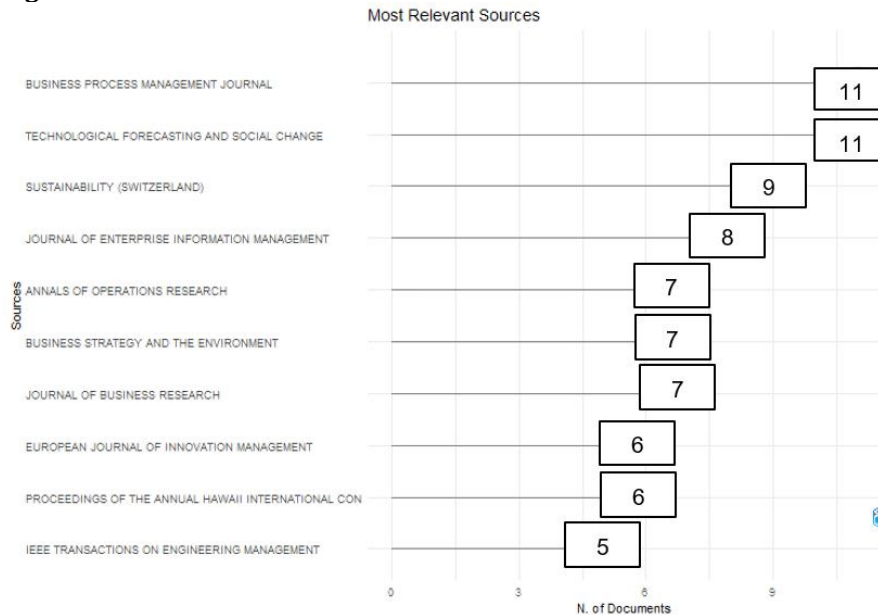
Source Title	TP	NCA	NCP	TC	C/P	C/CP	h	g	m
Business Process Management Journal	11	31	9	269	24.45	29.89	8	11	1.60
Technological Forecasting and Social Change	11	45	11	958	87.09	87.09	9	11	1.50
Sustainability (Switzerland)	9	29	9	189	21.00	21.00	6	9	1.00
Journal of Enterprise Information Management	8	26	6	93	11.63	15.50	5	8	1.00
Business Strategy and the Environment	7	22	6	130	18.57	21.67	5	7	1.67
Journal of Business Research	7	36	6	705	100.7	117.5	4	7	0.67
Annals of Operations Research	7	33	7	181	25.86	25.86	7	7	1.40
Proceedings of the Annual Hawaii International Conference on System Sciences	6	15	4	12	2.00	3.00	2	3	0.33
European Journal of Innovation Management	6	21	6	190	31.67	31.67	5	6	0.83
Lecture Notes in Networks and Systems	5	9	1	2	0.40	2.00	1	1	0.33
IEEE Transactions on Engineering Management	5	18	4	24	4.80	6.00	2	4	0.67
Information and Management	4	16	4	773	193.3	193.3	4	4	0.67

Journal of Manufacturing Technology Management	4	12	3	18	4.50	6.00	2	4	1.00
Benchmarking	4	8	3	30	7.50	10.00	2	4	0.67
International Conference on Research and Innovation in Information Systems, ICRIS	4	10	2	3	0.75	1.50	1	1	0.20
Industrial Management and Data Systems	4	15	4	84	21.00	21.00	4	4	0.80
International Journal of Productivity and Performance Management	3	7	1	5	1.67	5.00	1	2	0.50
Frontiers in Psychology	3	13	3	57	19.00	19.00	3	3	0.75
Proceedings - 2022 International Conference on Computer Network, Electronic and Automation, ICCNEA 2022	2	2	0	0	0.00	0.00	0	0	0.00
Decision Support Systems	2	8	2	147	73.50	73.50	2	2	0.33

Note: TP=total number of publications; NCA=number of contributing authors; NCP=number of cited publications; TC=total citations; C/P=average citations per publication; C/CP=average citations per cited publication; h=h-index; g=g-index; m=m-index.

Source: Generated by the author(s) using biblioMagika® (Ahmi, 2024)

Figure 3: Most Relevant Source



Source: Generated by the author(s) using Biblioshiny (Aria, M. & Cucurolo, C. (2017)).

Table 10 illustrates that the top 50 highly cited articles from 2020 to 2024 reflect the intellectual foundations and thematic directions of big data analytics capabilities (BDAC) research in recent years. The most cited work is by Mikalef et al. (2020); the title of the article was *“Exploring the relationship between big data analytics capability and competitive performance: The mediating roles of dynamic and operational capabilities,”* which was published in the Information and Management journal, with 538 citations of 538 and 89.67 citations per year (C/Y). Besides Mikalef, there are other highly cited papers, including Bag et al. (2021) (435 citations), Ciampi et al. (2021) (348), and Awan et al. (2021) (260), emphasizing themes such as supply chain performance, business model innovation, and circular economy decision-making. These articles emphasize research themes such as sustainable supply chain performance, entrepreneurial orientation, and circular economy performance. There are notable appearances multiple times within the top 50 highly cited authors. Several authors who appear multiple times are Mikalef Patrick, who also contributed to the role of information governance in big data analytics-driven innovation; Dubey Rameshwar, who is present in at least a few highly cited works; and Wamba S.F., who has been a notable recurring contributor to big data analytics capabilities, innovation, and performance. These scholars are not only highly cited but also serve as intellectual anchors within the BDAC field.

Table 10: Top 50 Highly Cited Articles

No.	Author(s)	Title	Source Title	TC	C/Y
1	Mikalef P.; Krogstie J.; Pappas I.O.; Pavlou P. (2020)	Exploring the relationship between big data analytics capability and competitive performance: The mediating roles of dynamic and operational capabilities	Information and Management	538	89.67
2	Bag S.; Wood L.C.; Xu L.; Dhamija P.; Kayikci Y. (2021)	Big data analytics as an operational excellence approach to enhance sustainable supply chain performance	Resources, Conservation and Recycling	435	72.50
3	Ciampi F.; Demi S.; Magrini A.; Marzi G.; Papa A. (2021)	Exploring the impact of big data analytics capabilities on business model innovation: The mediating role of entrepreneurial orientation	Journal of Business Research	348	69.60
4	Awan U.; Shamim S.; Khan Z.; Zia N.U.Shariq S.M.; Khan M.N. (2021)	Big data analytics capability and decision-making: The role of data-driven insight on circular economy performance	Technological Forecasting and Social Change	260	52.00
5	Chiappetta Jabbour C.J.; Fiorini P.D.C.; Ndubisi N.O.; Queiroz M.M.; Piato É.L. (2020)	Digitally-enabled sustainable supply chains in the 21st century: A review and a research agenda	Science of the Total Environment	216	36.00
6	Wang C.; Zhang Q.; Zhang W. (2020)	Corporate social responsibility, Green supply chain management and firm performance: The moderating role of big-data analytics capability	Research in Transportation Business and Management	204	34.00
7	Kamble S.S.; Gunasekaran A. (2020)	Big data-driven supply chain performance measurement system: a review and framework for implementation	International Journal of Production Research	189	31.50
8	Yasmin M.; Tatoglu E.; Kilic H.S.; Zaim S.; Delen D. (2020)	Big data analytics capabilities and firm performance: An integrated MCDM approach	Journal of Business Research	160	26.67
9	Yu W.; Zhao G.; Liu Q.; Song Y. (2021)	Role of big data analytics capability in developing integrated hospital supply chains and operational flexibility: An organizational information processing theory perspective	Technological Forecasting and Social Change	159	31.80
10	Mikalef P.; Boura M.; Lekakos G.; Krogstie J. (2020)	The role of information governance in big data analytics-driven innovation	Information and Management	157	26.17
11	Dubey R.; Bryde D.J.; Foropon C.; Tiwari M.; Dwivedi Y.; Schiffing S. (2021)	An investigation of information alignment and collaboration as complements to supply chain agility in humanitarian supply chain	International Journal of Production Research	144	28.80
12	Shamim S.; Zeng J.; Khan Z.; Zia N.U. (2020)	Big data analytics capability and decision-making performance in emerging market firms: The role of contractual and relational governance mechanisms	Technological Forecasting and Social Change	139	23.17
13	Upadhyay P.; Kumar A. (2020)	The intermediating role of organizational culture and internal analytical knowledge between the capability of big data analytics and a firm's performance	International Journal of Information Management	134	22.33
14	Dubey R.; Bryde D.J.; Dwivedi Y.K.; Graham G.; Foropon C. (2022)	Impact of artificial intelligence-driven big data analytics culture on agility and resilience in humanitarian supply chain: A practice-based view	International Journal of Production Economics	124	31.00
15	Yu W.; Wong C.Y.; Chavez R.; Jacobs M.A. (2021)	Integrating big data analytics into supply chain finance: The roles of information processing and data-driven culture	International Journal of Production Economics	121	24.20

16	Jha A.K.; Agi M.A.N.; Ngai E.W.T. (2020)	A note on big data analytics capability development in supply chain	Decision Support Systems	115	19.17
17	Behl A.; Gaur J.; Pereira V.; Yadav R.; Laker B. (2022)	Role of big data analytics capabilities to improve sustainable competitive advantage of MSME service firms during COVID-19 – A multi-theoretical approach	Journal of Business Research	102	25.50
18	Ashaari M.A.; Singh K.S.D.; Abbasi G.A.; Amran A.; Liebana- Cabanillas F.J. (2021)	Big data analytics capability for improved performance of higher education institutions in the Era of IR 4.0: A multi-analytical SEM & ANN perspective.	Technological Forecasting and Social Change	95	19.00
19	Bahrami M.; Shokouhyar S. (2022)	The role of big data analytics capabilities in bolstering supply chain resilience and firm performance: a dynamic capability view	Information Technology and People	90	22.50
20	Akter S.; Gunasekaran A.; Wamba S.F.; Babu M.M.; Hani U. (2020)	Reshaping competitive advantages with analytics capabilities in service systems	Technological Forecasting and Social Change	89	14.83
21	Olabode O.E.; Boso N.; Hultman M.; Leonidou C.N. (2022)	Big data analytics capability and market performance: The roles of disruptive business models and competitive intensity	Journal of Business Research	87	21.75
22	Mariani M.M.; Nambisan S. (2021)	Innovation Analytics and Digital Innovation Experimentation: The Rise of Research-driven Online Review Platforms	Technological Forecasting and Social Change	82	16.40
23	AlNuaimi B.K.; Khan M.; Ajmal M.M. (2021)	The role of big data analytics capabilities in greening e-procurement: A higher-order PLS-SEM analysis	Technological Forecasting and Social Change	82	16.40
24	Khan A.; Tao M.; Li C. (2022)	Knowledge absorption capacity's efficacy in enhancing innovation performance through big data analytics and digital platform capability	Journal of Innovation and Knowledge	75	18.75
25	Behl A. (2022)	Antecedents to firm performance and competitiveness using the lens of big data analytics: a cross-cultural study	Management Decision	71	17.75
26	Alkhatib A.W.; Valeri M. (2024)	Can intellectual capital promote the competitive advantage? Service innovation and big data analytics capabilities in a moderated mediation model	European Journal of Innovation Management	68	34.00
27	Al-Khatib A.W. (2022)	Can big data analytics capabilities promote a competitive advantage? Green radical innovation, green incremental innovation and data-driven culture in a moderated mediation model	Business Process Management Journal	60	15.00
28	Shokouhyar S.; Seddigh M.R.; Panahifar F. (2020)	Impact of big data analytics capabilities on supply chain sustainability: A case study of Iran	World Journal of Science, Technology and Sustainable Development	58	9.67
29	Su X.; Zeng W.; Zheng M.; Jiang X.; Lin W.; Xu A. (2022)	Big data analytics capabilities and organizational performance: the mediating effect of dual innovations	European Journal of Innovation Management	57	14.25
30	Mugiraneza T.; Nascetti A.; Ban Y. (2020)	Continuous monitoring of urban land cover change trajectories with Landsat time series and landtrendr-google earth engine cloud computing	Remote Sensing	56	9.33
31	Zhang D.; Pan S.L.; Yu J.; Liu W. (2022)	Orchestrating big data analytics capability for sustainability: A study of air pollution management in China	Information and Management	52	13.00
32	Zhu C.; Du J.; Shahzad F.; Wattou M.U. (2022)	Environmental Sustainability Is a Corporate Social Responsibility: Measuring the Nexus between Sustainable Supply Chain Management, Big Data	Sustainability (Switzerland)	51	12.75

Analytics Capabilities, and Organizational Performance					
33	Gu V.C.; Zhou B.; Cao Q.; Adams J. (2021)	Exploring the relationship between supplier development, big data analytics capability, and firm performance	Annals of Operations Research	51	10.20
34	Xiao X.; Tian Q.; Mao H. (2020)	How the interaction of big data analytics capabilities and digital platform capabilities affects service innovation: A dynamic capabilities view	IEEE Access	50	8.33
35	Horng J.-S.; Liu C.-H.; Chou S.-F.; Yu T.-Y.; Hu D.-C. (2022)	Role of big data capabilities in enhancing competitive advantage and performance in the hospitality sector: Knowledge-based dynamic capabilities view	Journal of Hospitality and Tourism Management	49	12.25
36	Aljumah A.I.; Nuseir M.T.; Alam M.M. (2021) - RETRACTED	Organizational performance and capabilities to analyze big data: do the ambidexterity and business value of big data analytics matter?	Business Process Management Journal	49	9.80
37	Ramadan M.; Shuqqo H.; Qtaishat L.; Asmar H.; Salah B. (2020)	Sustainable competitive advantage driven by big data analytics and innovation	Applied Sciences (Switzerland)	46	7.67
38	Al-Khatib A.W. (2022)	Big data analytics capabilities and green supply chain performance: investigating the moderated mediation model for green innovation and technological intensity	Business Process Management Journal	45	11.25
39	Albergaria M.; Chiappetta Jabbour C.J. (2020)	The role of big data analytics capabilities (BDAC) in understanding the challenges of service information and operations management in the sharing economy: Evidence of peer effects in libraries	International Journal of Information Management	45	7.50
40	Xing Y.; Wang X.; Qiu C.; Li Y.; He W. (2022)	Research on opinion polarization by big data analytics capabilities in online social networks	Technology in Society	43	10.75
41	Zhang H.; Song M.; He H. (2020)	Achieving the success of sustainability development projects through big data analytics and artificial intelligence capability	Sustainability (Switzerland)	43	7.17
42	Ciasullo M.V.; Montera R.; Douglas A. (2022)	Building SMEs' resilience in times of uncertainty: the role of big data analytics capability and co-innovation	Transforming Government: People, Process and Policy	41	10.25
43	Cetindamar D.; Shdifat B.; Erfani E. (2022)	Understanding Big Data Analytics Capability and Sustainable Supply Chains	Information Systems Management	41	10.25
44	Sun B.; Liu Y. (2020)	Business model designs, big data analytics capabilities and new product development performance: evidence from China	European Journal of Innovation Management	41	6.83
45	Jiang Y.; Feng T.; Huang Y. (2024)	Antecedent configurations toward supply chain resilience: The joint impact of supply chain integration and big data analytics capability	Journal of Operations Management	39	19.50
46	Bhatti S.H.; Ahmed A.; Ferraris A.; Hirwani Wan Hussain W.M.; Wamba S.F. (2022)	Big data analytics capabilities and MSME innovation and performance: A double mediation model of digital platform and network capabilities	Annals of Operations Research	38	9.50
47	Sahoo S.; Upadhyay A.; Kumar A. (2023)	Circular economy practices and environmental performance: Analysing the role of big data analytics capability and responsible research and innovation	Business Strategy and the Environment	37	12.33
48	Xin X.; Miao X.; Cui R. (2023)	Enhancing sustainable development: Innovation ecosystem coopetition, environmental resource orchestration, and disruptive green innovation (the moderating effect of BDAC)	Business Strategy and the Environment	37	12.33

49	Wang T.; Lin X.; Sheng F. (2022)	Digital leadership and exploratory innovation: From the dual perspectives of strategic orientation and organizational culture	Frontiers in Psychology	35	8.75
50	Yu D.; Tao S.; Hanan A.; Ong T.S.; Latif B.; Ali M. (2022)	Fostering Green Innovation Adoption through Green Dynamic Capability: The Moderating Role of Environmental Dynamism and Big Data Analytic Capability	International Journal of Environmental Research and Public Health	35	8.75

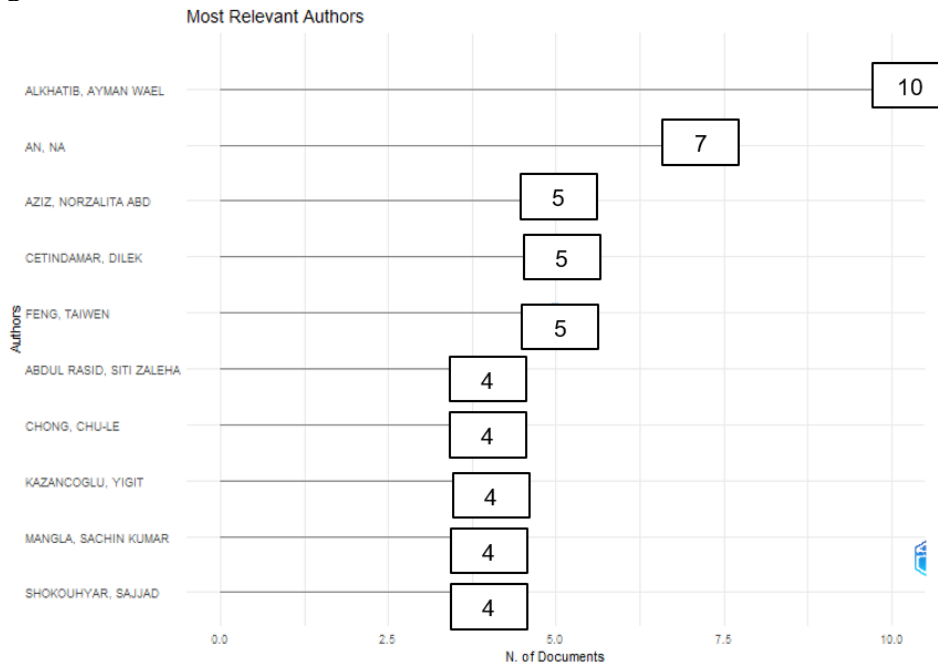
Source: Generated by the author(s) using biblioMagika® (Ahmi, 2024)

Refer to the following table 11, which shows the key thematic areas of the top-cited articles that revolve around the recurring topics. To conclude, the findings of the top 50 cited documents from 2020 to 2024 confirm that the BDAC field is advancing rapidly with strong citation performance; the key themes revolve around sustainability, performance impact, innovation, and technological integration; and methodologically and theoretically, the field has matured, demonstrating multidimensional relevance across domains.

Table 11: BDAC Research Themes

Theme	Sample Articles
Firm Performance & Decision-Making	Mikalef et al. (2020); Shamim et al. (2020); Yasmin et al. (2020); Bag et al. (2021); Wang et al. (2020); Kamble et al. (2020); Shamim et al. (2020); Upadhyay & Kumar (2020); Ashaari et al. (2021); Bahrami & Shokouyar (2022); Olabode et al. (2022); Khan et al. (2022); Behl A. (2022); Su et al. (2022); Zhu et al. (2022); Gu et al. (2021); Horng et al. (2022)—Hospitality industry; Aljumah et al. (2021); Alkhatib (2022); Sun & Liu (2020); Bhatti et al (2022); Sahoo et al. (2023)
Sustainability & Green Supply Chains & Green Innovation	Bag et al. (2021); C.J. Chiappetta Jabbour et al. (2020); Wang et al. (2020); Behl et al. (2022); Zhu et al. (2022); Cetindamar et al. (2022); Wang et al. (2020); AlNuaimi et al. (2021); Al Khatib (2022); Xin et al. (2023); Yu et al. (2022)
Business Model Innovation	Ciampi et al. (2021); Al Khatib (2022); Olabode et al. (2022); Sun B (2020)
Artificial Intelligence Integration	Dubey et al. (2022); Zhang et al. (2022)
Healthcare and Sectoral Applications	Yu et al. (2021)

Figure 4: Most Relevant Authors



Source: Generated by the author(s) using Biblioshiny (Aria, M & Cucurolo, C. (2017))

Table 12 and Figure 4 represent the most relevant authors in the field of big data analytics capabilities (BDAC). The tables were ranked by the number of documents contributed to the particular research field. The relevancies were measured both in terms of total publications and fractionalized authorship, which refers to co-authorship and shared contributions. The top of the list, with 10 publications and a fractionalized score of 7.67, is Alkhatib, Ayman Wael, indicating a high degree of individual contribution in the sustainability, green supply chain, and innovation context. Next, AN, NA, with 7 publications and a fractional score of & shows a consistent solo or primary authorship pattern, although further investigation may be needed to verify the identity or completeness of the author entry. According to Ahmi (2024), to address the issue of documents with no author name, "AN" refers to "Author Name", and "NA" stands for "Not Available". Therefore, in cleaning the dataset extracted from Scopus, the reference to Ahmi's (2024) suggestions was adopted to address the issue of missing values. Other prolific contributors with 5 or more publications include Aziz; Norzalita Abd; Cetindamar, Dilek; and Feng. Taiwen, all showing moderate fractional authorship scores (~1.6), suggesting frequent collaboration. Authors such as Chong, Chu-Le, Shokouhyar, Sajjad, Abdul Rasid, and Siti Zaleha each have 4 publications with fractionalized scores between 1.1 and 1.6, indicating active participation in multi-author teams. Kazancoglu, Yigit, and Mangla, Sachin Kumar, while having the same number of publications (4), show lower fractional scores (0.85). The data indicate that BDAC research is characterized by both concentrated individual contributions and highly collaborative environments.

Table 12: Most Relevant Authors

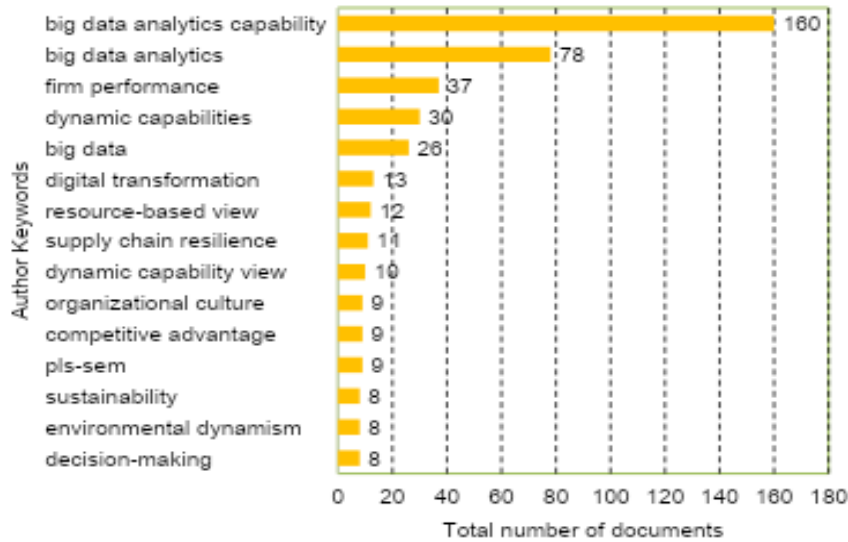
Authors	Articles	Articles Fractionalized
ALKHATIB, AYMAN WAEL	10	7.67
AN, NA	7	7
AZIZ, NORZALITA ABD	5	1.58
CETINDAMAR, DILEK	5	1.67
FENG, TAIWEN	5	1.67
ABDUL RASID, SITI ZALEHA	4	1.12
CHONG, CHU-LE	4	1.17
KAZANCOGLU, YIGIT	4	0.85
MANGLA, SACHIN KUMAR	4	0.85
SHOKOUHYAR, SAJJAD	4	1.67

This section shows a visual representation to quickly identify the most frequently used keywords, enabling a clearer understanding of the key topics and themes within the dataset.

Figure 5 and Table 13 present the 15 most frequently used keywords across the dataset. These keywords revealed the prominent themes in the BDAC literature, and a keyword frequency analysis was performed using the authors' commonly used terms. The most often used keyword is "big data analytics capability", which appears 160 times (11.71%). This establishes it as the field's conceptual anchor. The larger term "big data analytics" ranks second with 78 occurrences (5.71%), indicating a broader perspective that covers applications and methodologies beyond capability building. "Firm performance" (37 occurrences, 2.71%) is the primary dependent variable of interest, indicating that academics frequently investigate how BDAC affects business outcomes. Several high-ranking keywords represent theoretical frameworks and strategic constructs. According to the data, the terms "dynamic capabilities" (30 instances) and "dynamic capability view" (10 mentions) demonstrate the extensive use of dynamic capabilities theory to frame BDAC as an adaptive asset. "Resource-based view" (12 occurrences) is consistent with studies stressing BDAC as a distinct organizational resource that contributes to competitive advantage. "Organizational culture," "decision-making," and "competitive advantage" represent the conceptual diversity of BDAC literature, bridging operational, behavioral, and strategic dimensions. There are growing topics that have arisen as frequent buzzwords, such as "digital transformation" (13), "supply chain resilience" (11), "sustainability" (8), and "environmental dynamism" (8), indicating a rising integration of BDAC into broader organizational and environmental contexts. The presence of "PLS-SEM" (9) among the top keywords represents a methodological trend, showing that partial least squares structural equation modelling is a popular analytical tool in BDAC research. The diversity and ranking of keywords indicate a transition in the field from technical and infrastructure debates

to performance, transformation, and strategic alignment topics. It also implies an increasing interest in transdisciplinary applications, particularly those connected to resilience, sustainability and digital innovation.

Figure 5: Frequency Distribution of Top 15 Author Keywords



Source: Generated by the author(s) using biblioMagika® (Ahmi, 2024)

Table 13: Top Author Keywords

Author Keywords	Count	Percentage
big data analytics capability	160	11.71%
big data analytics	78	5.71%
firm performance	37	2.71%
dynamic capabilities	30	2.20%
big data	26	1.90%
digital transformation	13	0.95%
resource-based view	12	0.88%
supply chain resilience	11	0.81%
dynamic capability view	10	0.73%
organizational culture	9	0.66%
competitive advantage	9	0.66%
pls-sem	9	0.66%
sustainability	8	0.59%
environmental dynamism	8	0.59%
decision-making	8	0.59%

The co-occurrence keyword analysis reveals several key areas for future research in big data analytics capability. Table 14 summarizes the co-occurrence keyword analysis conducted on big data analytics capability. The co-occurrence analysis revealed six distinct thematic clusters, each representing a core research stream in BDAC literature. The keyword structure provides further evidence of the field's theoretical consolidation. Rialti et al. (2019) identified capabilities, decision-making, supply chain management, and business process management as important components of the earlier big data literature. Aboelmaged and Mouakket (2020) also identified dynamic capabilities and the resource-based view (RBV) among the theoretical frameworks employed in big data analytics (BDA) research but argued that the field lacked consensus and remained dispersed across models. In the present study, dynamic capabilities and RBV are considered relevant, and both appear among the most frequently occurring author keywords. At the same time,

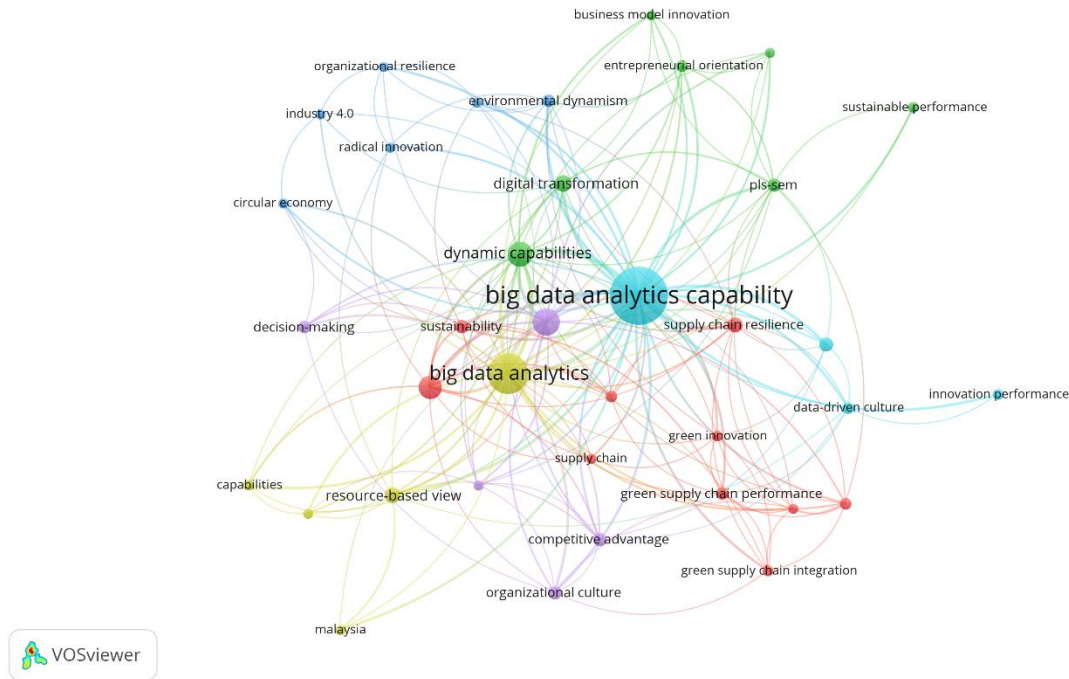
newer terms such as digital transformation, supply chain resilience, sustainability, and environmental dynamism demonstrate that the theoretical conversation is expanding towards adaptation and sustainability.

Table 14: Co-occurrence Author Keywords Analysis on Big Data Analytics Capability

Cluster Number	Cluster Color	Cluster Label	Number of Keywords	Representative Keywords	
1	Red	Supply Chain and Sustainability	8	Green Innovation Green Supply Chain Integration Green Supply Chain Performance Supply Chain Supply Chain Agility Supply Chain Management Supply Chain Resilience Sustainability	This cluster (red) emphasizes the role of BDAC in fostering sustainable and resilient supply chains. Illustrate how BDAC contributes to both operational efficiency and environmental stewardship.
2	green	Organizational and Cultural Integration	7	Business Model Innovation Digital Transformation Dynamic Capabilities Entrepreneurial Orientation Organizational Agility PLS-SEM Sustainable Performance	The green cluster focuses on the internal organizational enablers of BDAC effectiveness. It highlights business model innovation, digital transformation, dynamic capabilities, and organizational agility as critical drivers, often supported by PLS-SEM methodologies to study these relationships.
3	blue	Circular Economy & Industry 4.0	6	Circular Economy Environmental Dynamism Industry 4.0 Organizational Resilience Radical Innovation SMES	This blue cluster reflects the integration of BDAC within broader technological and societal paradigms. Indicates a growing focus on sustainability-driven innovation and adaptation to the fourth industrial revolution.
4	yellow	Business Value, Resources & Capabilities	5	Big data analytics Business value Capabilities Malaysia Resource-based view	The yellow cluster centers on BDAC as a strategic resource and capability, contributing to organizational value creation. Highlight the theoretical and empirical investigations of BDAC as a source of competitive advantage.
5	Purple	Firm Performance & Competitive Advantage	5	Competitive Advantage Decision-Making Firm Performance Innovation Organizational Culture	This purple cluster examines the impact of BDAC on firm-level outcomes. Underscoring BDAC's role in improving both financial and strategic performance metrics.
6	Turquoise	Data-driven culture and Dynamic Capability	4	Big data analytics capability Data-driven culture Dynamic capability view Innovation performance	The turquoise cluster explores how data-driven culture and dynamic capability view contribute to innovation performance. This stream underscores the human and cultural dimensions that underpin the successful deployment of BDAC in achieving strategic goals.

Source: Generated by the author(s) using VOSviewer

Figure 6: Network visualization map of the Co-occurrence Author Keywords Analysis on Big Data Analytics Capability



Source: Generated by the author(s) using VOSviewer

Table 15: Comparison of previous studies in relation to present study

Study	Main emphasis	Main themes/findings	Relationship to present study
Rialti et al. (2019)	Big data and dynamic capabilities	Supply chain, knowledge management, decision-making, BPM, analytics	The present study confirms these foundations but finds stronger sustainability and resilience themes
Aboelmaged & Mouakket (2020)	BDA adoption theories	RBV, dynamic capabilities and multiple overlapping adoption models	Present results suggest greater theoretical consolidation around RBV/DCT
Inamdar et al. (2021)	BDA adoption, Sectoral adoption	Manufacturing, services, sustainable supply-chain opportunities	The sustainable supply chain now appears as a major established cluster
Fauzi et al. (2023)	BDA and HRM	Firm performance, BDA challenges, data-driven culture	The present study shows these themes extending beyond HRM
Murad et al. (2023)	BDAC and sustainability	Developed-country concentration; performance, innovation, supply chain	The present study shows stronger Asian participation and sustainability centrality
Huynh et al. (2023)	Conceptual status of BDAC systematic review	Fragmented theoretical base, survey dominance	The present study shows RBV/DCT as clear intellectual anchors but increasing thematic diversification
Pathak et al. (2024)	Domain and knowledge structure	RBV/DCT, antecedents, consequences, advanced analytics, environmental dynamics	The present study corroborates these and identifies green supply chains, circular economy and data-driven culture as prominent recent themes

Discussion

This study provides an updated mapping of the intellectual landscape of Big Data Analytics Capabilities (BDAC) research between 2020 and 2024 through a comprehensive bibliometric analysis, addressing seven key research questions. The findings reveal a broader transformation in how BDAC is conceptualized and applied, rather than just viewing the bibliometric indicators solely as publication productivity measurements. Overall, the results suggest that BDAC research has progressed from emphasis on technological adoption and analytics infrastructure towards an organizational capability perspective. This highlights the concern with value creation, dynamic capabilities, firm performance, resilience, sustainability, and digital transformation. The results have addressed the key research questions proposed earlier.

The first question examined the trends in publication for BDAC research. The results showed substantial growth during the five years. The number of publications increased from 30 documents in 2020 to 94 in 2024. Out of 281 documents included in the analysis, there are approximately one-third of the total (94 publications) produced in 2024. This shows that BDAC is growing and developing from a relatively specialized research topic into an increasingly established area within information systems, strategic management, and organizational studies. This is aligned with previous reviews and also indicates that the field has progressed well. For instance, previous studies characterized earlier big data analytic (BDA) adoption research as relatively dispersed across different domains and theoretical models, with considerable overlap and limited consensus (Aboelmaged and Mouakket, 2020). Additionally, Rialti et al. (2019) observed that research linking big data with dynamic capabilities has identified the research streams involving supply chain management, knowledge management, decision-making, and business process management. This trajectory reflects the increasing scholarly interest and recognition of BDAC as a crucial organizational capability, especially in the context of digital transformation and firm performance. Although the number of citations per publication has declined in recent years, a pattern typical in bibliometrics, since older works have had more time to accrue citations, the growing publication volume suggests a vibrant and expanding research field.

The second research question concerned the most prominent authors and the themes associated with their work. The results reveal an important distinction between productivity and intellectual influence. The analysis identified Ayman Wael Alkhatib as the most prolific author, with 10 publications, often focusing on sustainability, innovation, and green supply chains. Other prominent contributors include Norzalita Abd Aziz and Taiwen Feng, who are notable for their collaborative and cross-disciplinary work. However, in terms of influence, Patrick Mikalef, despite having fewer publications, stands out with the highest citation impact, reflecting the foundational and highly cited nature of his contributions on BDAC and competitive performance. Together, these authors demonstrate the field's dual orientation toward both quantity and high-impact quality.

The third research question examined the geographical and institutional distribution of BDAC scholarship. The research landscape is dominated geographically by China, which leads in both total publications and institutional productivity, notably through Jiangsu University and Harbin Institute of Technology. However, institutions like the Norwegian University of Science and Technology and the University of Florence exhibit exceptional citation impact despite fewer publications. Among countries, China is followed by Malaysia and the UK in publication count, with the UK showing stronger citation efficiency, underscoring its emphasis on impactful research.

The fourth research question concerned the journals that are most active in BDAC research. The prominence of Business Process Management Journal, Technological Forecasting and Social Change, Journal of Business Research, Information & Management, and related management and information systems outlets provide evidence of the disciplinary evolution of BDAC. These outlets have become central to the dissemination of BDAC research, reflecting their alignment with the field's strategic, technological, and organizational focus.

The fifth research question examined the most influential publications and their underlying themes. The highly cited documents identified in this study indicate that the intellectual foundation of contemporary BDAC research is strongly capability-oriented. The most cited article is by Mikalef et al. (2020), which explored the mediating role of dynamic and operational capabilities in the BDAC–performance relationship. Other highly cited works delve into themes such as sustainable supply chains (Bag et al., 2021), business model innovation (Ciampi et al., 2021), and circular economy performance (Awan et al., 2021). Collectively, the top-cited works

highlight the centrality of BDAC in driving organizational performance, innovation, and sustainability. From the highly cited authors' analysis, this study has identified 5 research themes that are associated based on the similar topic that has been discussed in a few research studies by the collective top highly cited articles, which are the following: 1) Firm Performance & Decision-Making, 2) Sustainability & Green Supply Chains & Green Innovation, 3) Business Model Innovation, 4) Artificial Intelligence Integration, and 5) Healthcare and Sectoral Applications

The sixth research question examined the most common keywords and their evolution. The keyword structure provides some of the strongest evidence that the BDAC field is undergoing theoretical and practical transformation. Keyword analysis reveals that "big data analytics capability" is firmly established as the conceptual core of the field. Other prominent keywords such as "firm performance", "dynamic capabilities", "digital transformation", and "sustainability" point to the expanding theoretical and practical scope of BDAC research. The increasing appearance of terms like "supply chain resilience" and "environmental dynamism" suggests a growing interest in how BDAC enables organizational adaptation to volatile environments. The emergence of sustainability-related terminology is particularly significant. A previous study concluded that the relationship between BDAC and sustainability remained largely underexplored (Murad et al., 2023). Previous research has been found to be concerned with firm performance, innovation-related and supply chain resilience. The present study's analysis suggests that sustainability, green supply chain integration, green innovation, and circular economy, as well as organizational performance, are closely interconnected to form identifiable thematic structures.

The seventh research question examined the thematic clusters emerging from keyword co-occurrence analysis. Six major clusters were identified from the co-occurrence keyword, and thematic cluster analyses uncovered dominant research themes as referenced in Table 15 and Figure 6. These clusters illustrate the multidimensional relevance of BDAC, spanning supply chain resilience and fostering sustainability practices; internal organizational enablers of BDAC effectiveness; growing focus on sustainability-driven innovation; and adaptation to the fourth industrial revolution; BDAC as a source of competitive advantage; BDAC's role in improving both financial and strategic performance metrics; and successful deployment of BDAC in achieving strategic goals.

Overall, the results and findings from this bibliometric study suggest that BDAC research has evolved through several overlapping stages. Previous studies concentrated largely on an adoption-oriented phase, whereas the present findings indicate that the field is now entering into a broader strategic transformation-oriented phase. Firm performance and competitive advantage remain the focal point, but they coexist with organizational agility, digital transformation, resilience, environmental dynamism, green innovation, sustainable performance, circular economy, and data-driven culture.

5. Conclusion and Implications

Theory and Theory Development

This study shows that big data analytics capability (BDAC) is evolving from a simple technological asset into a core strategic and integrative capability for organizations. It emphasizes that BDAC now supports digital transformation and helps achieve sustainable performance (Shokouhyar et al., 2020), as highlighted in recent research. Existing research proposes that BDACs enable firms to generate insight that can help strengthen their dynamic capabilities, which, in turn, positively impact marketing and technological capabilities; therefore, a strong BDAC can help firms build a competitive advantage (Mikalef et al., 2020). It is acknowledged that there are relevancies of classical frameworks such as the resource-based view (RBV) and dynamic capabilities theory (DCT) in explaining how organizations create and sustain competitive advantage through data-driven insights. However, there have been noticeable themes, according to studies that have uncovered them, encompassing different areas or themes. For instance, sustainability, agility, and supply chain performance suggest that BDAC has outgrown single-theory explanations. Theoretically, future research could therefore move toward multi-theoretical integration, combining RBV, stakeholder theory, and institutional perspectives, and organizational information processing theory perspectives (OIPT) to capture the interplay between analytics capabilities, governance, and contextual factors in dynamic markets. Such theoretical enrichment can deepen understanding of how firms in developing regions transform technological potential into adaptive and resilient organizational competencies.

Readers and Researchers

For scholars and readers, the findings provide a comprehensive map of the intellectual and thematic structure of BDAC research and clarify its most active contributors, evolving keywords, and emerging research hotspots. The identified clusters, spanning firm performance & decision-making, sustainability & green supply chains & green innovation, business model innovation, artificial intelligence integration, and healthcare and sectoral applications, illustrate where academic attention is converging and where conceptual gaps remain. In particular, limited research on BDAC implementation contexts presents opportunities for scholars to explore how cultural, institutional, and economic diversity influence capability development and analytics-driven decision-making. The trend toward cross-disciplinary collaboration is evident from co-authorship networks, which also indicates that future research will benefit from partnerships that bridge technology, management, and social science disciplines. This paper thus serves as a knowledge guide for researchers seeking to position their work within global BDAC discourse while contributing region-specific insights.

Business and management practices

For practitioners and policymakers, the findings highlight that BDAC is not solely a technological function but a strategic enabler of organizational transformation. Firms that successfully embed analytics into their management systems demonstrate higher levels of innovation, decision agility, and sustainability performance. The recurring themes of firm performance & decision-making, sustainability & green supply chains & green innovation, business model innovation, artificial intelligence integration, and healthcare and sectoral applications underscore that competitive advantage increasingly depends on intelligent data orchestration and human capabilities. For Asia-Pacific businesses, particularly those in emerging markets, this implies that investments in BDAC should extend beyond technology to include managerial competencies, data governance frameworks, and cross-functional integration. Moreover, the alignment of BDAC with ESG and sustainability objectives presents a critical pathway for firms to enhance both profitability and societal value. Policymakers can also leverage these insights to support capability-building initiatives that strengthen regional competitiveness in the data-driven economy.

Conclusion

The bibliometric analysis conducted confirms that BDAC research has evolved into a mature and interdisciplinary field that bridges technology, strategy, and sustainability. While the field is growing rapidly in publication output and thematic diversity, future studies could further explore underrepresented areas, such as BDAC's application in arts, medicine, and emerging economies, and adopt more longitudinal and experimental methodologies to deepen our understanding of its long-term impact. This study contributes to analyzing the trends between the years 2020 and 2024. It has offered a list of authors to be referred to for the BDAC topic in research, highlighting the highly cited and their contributions. The findings have come up with thematic cluster analyses that uncovered five dominant research themes, which can be referred to by researchers to come up with upcoming research in the same field. The fewest cited articles are from the Healthcare and Sectoral Applications, which can be one of the areas to focus on in future research that relates to the application of digital technologies such as big data analytics and organizational capabilities.

Limitations of the study

The study has faced a few limitations in collecting data from Scopus, and finalizing data for each article is time-consuming, as the keyword search on BDAC is not limited to only the title search but also the abstract. It is useful to confirm the search by looking at the abstract of the article, as not all titles present the keyword on big data analytics capability, but the paper does discuss BDAC. If the article is removed, it will affect the total number of analyses. Therefore, it is advisable not to exclude the article based on the title search but to reconfirm the article content from the abstract.

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