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Exploring the Impact of Big Data on Accounting Practices: A Textual Analysis and Empirical Investigation in Enterprises

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Abstract: The advent of big data and artificial intelligence (AI) has revolutionized industries by enabling the extraction of valuable insights from vast datasets, fundamentally transforming accounting practices. As a cornerstone of socio-economic development, the accounting profession has faced longstanding challenges—such as inefficiency and untimeliness—that now demand innovative technological solutions. In this study, a comprehensive literature review of 1,529 scholarly articles published between 2014 and 2024, sourced from the Web of Science database, is conducted using advanced bibliometric and textual analysis tools. Techniques such as the Log-Likelihood Ratio (LLR)—which quantifies the strength of keyword clustering—are employed to systematically examine the impact of big data on accounting. Although the overarching research theme is "accounting and big data," particular emphasis is placed on the subfields of financial accounting and management accounting. These areas are highlighted because they directly interface with corporate finance and internal decision-making, reflecting an evolving integration where traditional accounting practices are increasingly influenced by digital financial management. The review identifies significant advancements in financial reporting, data governance, and workflow optimization, and provides actionable recommendations for advancing accounting informatization while addressing ethical and regulatory challenges. This focused literature review approach not only bridges the gap between conventional practices and the demands of a data-driven era but also lays a theoretical foundation for future research in accounting innovation.

Keywords: Big Data; Accounting; Financial Accounting; Management Accounting; Digital Transformation; Log-Likelihood Ratio (LLR)

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1 Introduction

The rapid evolution of analytics and artificial intelligence (AI) has profoundly transformed industries worldwide, and The rapid evolution of analytics and artificial intelligence (AI) has profoundly transformed industries worldwide, and the accounting profession is no exception. Historically reliant on manual processes and rudimentary tools, accounting has undergone a technological metamorphosis—progressing from traditional methods such as pencil and paper to advanced tools including spreadsheets and dedicated accounting software (Hans et al., 2012). Today, big data analytics and AI are at the forefront of this revolution, offering unparalleled opportunities for enhancing decision-making, optimizing operational efficiency, and improving the timeliness and accuracy of financial reporting (Gregory et al., 2019; Ahmad et al., 2023).

This study adopts a comprehensive literature review approach to examine the impact of big data on accounting practices. Although the overarching research theme is "accounting and big data," the focus is deliberately narrowed to two critical subfields: financial accounting and management accounting. Financial accounting involves the preparation and presentation of financial statements for external stakeholders, whereas management accounting is concerned with internal decision-making, strategic planning, and cost control. Both subfields are integral components of the broader accounting discipline, and their evolution under the influence of digital technologies underscores the transformation from traditional accounting methods to modern, data-driven financial management.

The methodological framework of this study is anchored solely in the literature review paradigm, employing comprehensive bibliometric and textual analyses. This approach ensures methodological consistency and a clear focus by excluding empirical survey data. A key analytical tool utilized in this research is the Log-Likelihood Ratio (LLR)—an abbreviation for "log-likelihood ratio." LLR is used to statistically evaluate the strength of keyword clusters and thematic trends, providing a quantitative basis for understanding the evolution of research topics in the intersection of big data and accounting.

By clarifying the relationships among general accounting, financial accounting, and management accounting, and by adopting a focused literature review methodology, this study sets a clear direction for exploring how big data technologies are transforming accounting practices. This approach not only bridges the gap between traditional accounting methods and modern digital financial management but also lays a robust theoretical foundation for future research into innovative accounting practices in the era of big data.

2 Theoretical and literature foundation

2.1 Big Data in Accounting

Big data has fundamentally reshaped the accounting profession by enhancing decision-making, reporting, and auditing processes. Defined as information assets characterized by high volume, velocity, and variety, big data requires innovative processing techniques to extract actionable insights (Gartner, 2012). Researchers have extended this definition by emphasizing additional dimensions such as veracity and value (Zhang et al., 2015; Merritt-Holmes, 2016). In accounting, big data encompasses both structured data—such as transactional records—and unstructured data, including social media feeds and Internet of Things (IoT) outputs (Yunita et al., 2022). These diversified data sources enable real-time decision-making and continuous auditing, as highlighted by Vasarhelyi, Alles, and Williams (2010) and Richins et al. (2017). However, traditional accounting systems often lack the scalability needed to process such data, necessitating significant upgrades in both hardware and software capabilities (Janvrin and Watson, 2017). Furthermore, effective data governance is critical; ensuring data accuracy, privacy, and security is essential to fully leverage big data's potential in transforming accounting practices (Cao and Stewart, 2015).

2.2 Data Analytics in Accounting

Data analytics refers to the systematic application of statistical and quantitative techniques to extract meaningful insights from both structured and unstructured data. Within the realm of accounting, data analytics has emerged as a vital tool for enhancing risk assessment, operational efficiency, and strategic decision-making (KPMG, 2016; Mikalef et al., 2015). For instance, during periods of economic uncertainty, the use of predictive models and advanced analytical tools has allowed organizations to optimize cash flow and forecast future trends (Davenport and Harris, 2017; Obrenovic et al., 2020). The integration of sophisticated visualization tools such as Tableau and Power BI further facilitates the transformation of complex financial data into clear, comprehensible formats that enhance stakeholder communication (Gal, 2008). In addition, the adoption of continuous auditing frameworks—relying on anomaly detection and machine learning algorithms—has revolutionized traditional audit processes by increasing both the efficiency and accuracy of financial reviews (Vasarhelyi et al., 2015). Despite these advancements, the rapid evolution of data analytics has exposed a significant skills gap among accounting professionals, emphasizing the need for targeted education and training initiatives (Schneider et al., 2015). Moreover, handling sensitive financial information necessitates robust governance frameworks to ensure data privacy and regulatory compliance (Poddar, 2021).

2.3 Emerging Technologies in Accounting

Emerging technologies such as artificial intelligence (AI), blockchain, and predictive analytics are further accelerating the transformation of accounting practices. AI has automated numerous routine tasks, including invoice processing and financial reconciliations, thereby allowing professionals to focus on strategic, high-value activities (Petkov, 2020). Concurrently, blockchain technology offers a decentralized ledger system that ensures the integrity and immutability of financial records, thus addressing long-standing issues related to transparency and trust in financial reporting (Abad-Segura et al., 2021; Dai and Vasarhelyi, 2017). Predictive analytics complements these technologies by utilizing historical data to forecast future financial events, enabling more proactive financial management (Obrenovic et al., 2020). The synergistic integration of these emerging technologies not only streamlines auditing and reporting processes but also sets the stage for a more comprehensive, data-driven approach to financial management. This evolution is particularly significant for the subfields of financial and management accounting, where the convergence of technology and traditional practices drives innovative strategies for both external reporting and internal decision-making.

2.4 Opportunities and Challenges

The adoption of big data and emerging technologies in accounting presents numerous opportunities alongside notable challenges. On the opportunity side, the development of standardized protocols for technology adoption can enhance interoperability and foster global consistency in accounting practices (Coyne and McMickle, 2017). Moreover, tailored technological solutions can be developed to meet the unique needs of specific industries, such as healthcare or manufacturing (Abad-Segura et al., 2021). However, these advancements also raise significant challenges. Ethical and regulatory concerns—such as data privacy, algorithmic bias, and the transparency of automated processes—demand careful consideration and robust policy frameworks (Brown-Liburd et al., 2015). Additionally, the rapid pace of technological change has exposed a persistent skill gap among accounting professionals, highlighting the urgent need for continuous professional development and education (Schneider et al., 2015). Addressing these challenges is essential to fully capitalize on the potential benefits of big data and emerging technologies in modern accounting practices.

2.5 Future Directions

Future research should focus on several key areas to further elucidate the impact of big data on accounting. First, developing robust methodologies to evaluate data as an organizational asset within financial reporting systems is essential. This involves integrating data valuation frameworks into traditional accounting practices to enhance overall transparency and decision-making. Second, interdisciplinary research that bridges accounting, finance, and information technology can yield

innovative solutions for operational efficiency and corporate sustainability. Third, as the adoption of AI and blockchain technologies expands, further exploration of their ethical and regulatory implications is critical—especially in terms of developing frameworks to mitigate algorithmic bias and safeguard data privacy. Finally, the evolving landscape of financial and management accounting necessitates an ongoing assessment of the skills and competencies required for modern accounting professionals. By addressing these future directions, researchers can contribute to a deeper understanding of how big data is transforming accounting, ultimately guiding both academic inquiry and practical applications in this rapidly evolving field.

3 Research method

3.1 Research Design

This study adopts a literature review approach complemented by bibliometric and text mining analyses to examine the impact of big data on accounting practices. By focusing exclusively on published academic literature, this research maintains a coherent methodology that avoids the inconsistencies often associated with combining multiple research paradigms (Davenport and Harris, 2017). The analysis centers on literature published between 2014 and 2024, ensuring that the study captures recent trends in the integration of big data into financial and management accounting.

3.2 Data Collection

3.2.1 Bibliometric Data

Bibliometric data were sourced from the Web of Science database, selected for its comprehensive coverage and rigorous indexing standards. The inclusion criteria encompassed peer-reviewed articles published in English from 2014 to 2024, focusing on key themes such as big data, financial accounting, and management accounting. A total of 1,529 articles were identified, providing a robust dataset for subsequent analysis (Zhang et al., 2015; Merritt-Holmes, 2016).

3.2.2 Text Mining Data

In addition to bibliometric data, text mining techniques were applied to the abstracts and keywords of the selected articles. Methods such as Term Frequency-Inverse Document Frequency (TF-IDF) and Latent Dirichlet Allocation (LDA) were employed to uncover underlying thematic structures and emerging research trends. A key statistical measure used in this analysis is the Log-Likelihood Ratio (LLR), which quantifies the strength of keyword clusters and validates the significance of the identified topics (Cao et al., 2015).

3.3 Data Analysis

3.3.1 Bibliometric Analysis

Bibliometric analysis was conducted to map the intellectual structure and thematic evolution within the literature. Techniques such as co-citation network mapping, keyword frequency analysis, and visualization of collaboration patterns were implemented using tools like VOSviewer and CiteSpace. These analyses facilitated the identification of influential authors, core journals, and prominent research clusters in the domain of big data and accounting (Vasarhelyi et al., 2010).

3.3.2 Text Mining Analysis

Text mining analysis complemented the bibliometric approach by extracting deeper insights from the textual content of the articles. The application of TF-IDF and LDA allowed for the identification of dominant themes and subtle trends. The use of LLR further provided a statistical basis for evaluating the robustness of the keyword clusters, thereby ensuring a nuanced understanding of how big data is influencing both financial and management accounting practices (Davenport and Harris, 2017; Schneider et al., 2015).

3.4 Validity and Reliability

To ensure the validity and reliability of the findings, several measures were adopted. First, the selection of high-quality, peer-reviewed articles from a reputable database such as Web of Science provided a solid foundation for analysis. Second, the use of well-established analytical tools (VOSviewer, CiteSpace, TF-IDF, and LDA) ensured methodological consistency and

minimized bias. Finally, cross-validation between bibliometric and text mining results was performed to confirm the robustness of the identified themes and trends (Poddar, 2021; Brown-Liburd et al., 2015).

This literature review-based methodology, underpinned by comprehensive bibliometric and text mining analyses, provides a rigorous framework for understanding the transformative impact of big data on accounting practices. By focusing solely on published literature, the study achieves methodological coherence and offers clear insights into the evolving intersection of big data, financial accounting, and management accounting.

4. Document Analysis

4.1 Description of Included Papers

This study reviewed 1,529 peer‐reviewed articles published from January 2014 to April 2024. The analysis retains the original figures and tables to illustrate key trends and distributions.

4.1.1 Annual Trend Analysis of Publications

Searching with “Accounting” and “Big Data” as keywords, the literature dataset comprises 1,529 documents, averaging approximately 153 publications per year. As shown in Figure 1 (“Annual Trend of Publications in Accounting and Big Data Related Literature from 2014-01 to 2024-04”), the year 2022 reached a peak with 271 publications, while 2020 exhibited the fastest growth rate at 47.95%. This rapid expansion highlights the accelerating research interest in integrating big data into accounting practices (Zhang et al., 2015; Merritt-Holmes, 2016).

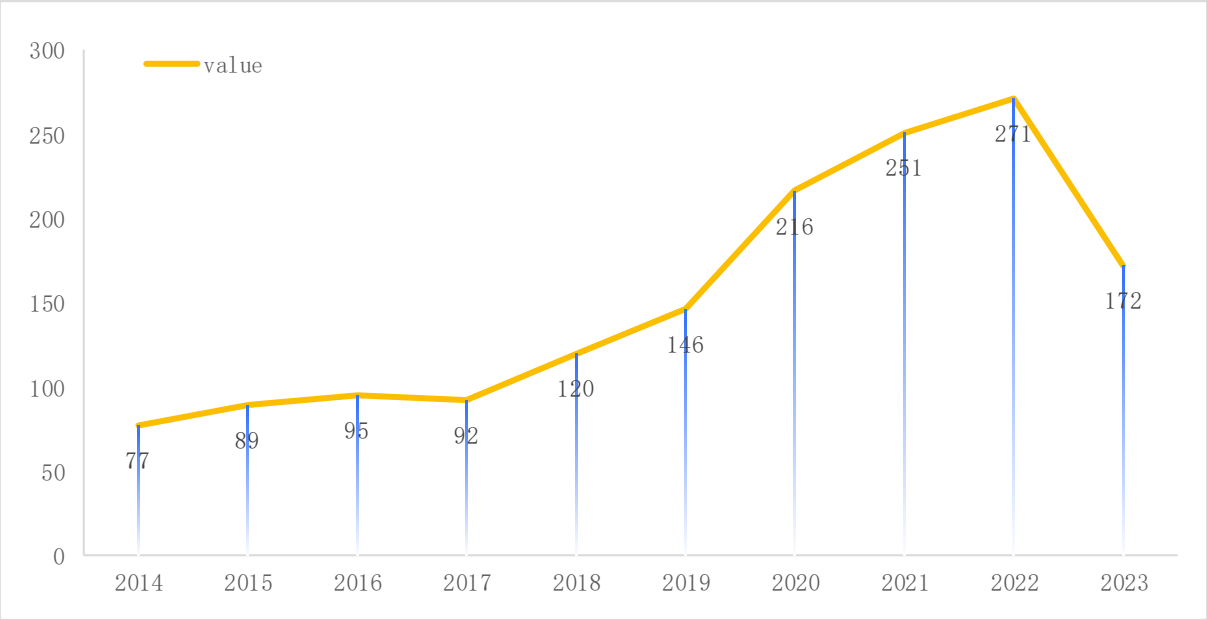

Figure 1. Annual Trend of Publications in Accounting and Big Data Related Literature from 2014-01 to 2024-04

4.1.2 Research Country/Region Analysis

Figure 2 (“2014-01 to 2024-04 Research Country/Region Analysis for Accounting and Big Data”) maps the global distribution of publications. The analysis reveals that among 82 countries/regions, China leads with 352 publications (23.02%), followed by the United States with 218 publications (14.26%) and Indonesia with 192 publications (12.56%). This distribution underscores the international significance of research in this field (Gregory et al., 2019).

Figure 2 .2014-01 to 2024-04 Research Country/Region Analysis for Accounting and Big Data

4.1.3 Research Organization Analysis

As depicted in Figure 3 (“2014-01 to 2024-04 Analysis of Research Organizations in Accounting and Big Data”), the top ten research institutions are concentrated within a few leading universities. For instance, Binus University and Rutgers, The State University of New Jersey are ranked first and second with 14 and 10 publications, respectively, while the University of Sydney is third with 7 publications. This concentration of output highlights the pivotal role these institutions play in advancing research on accounting and big data (Vasarhelyi et al., 2010).

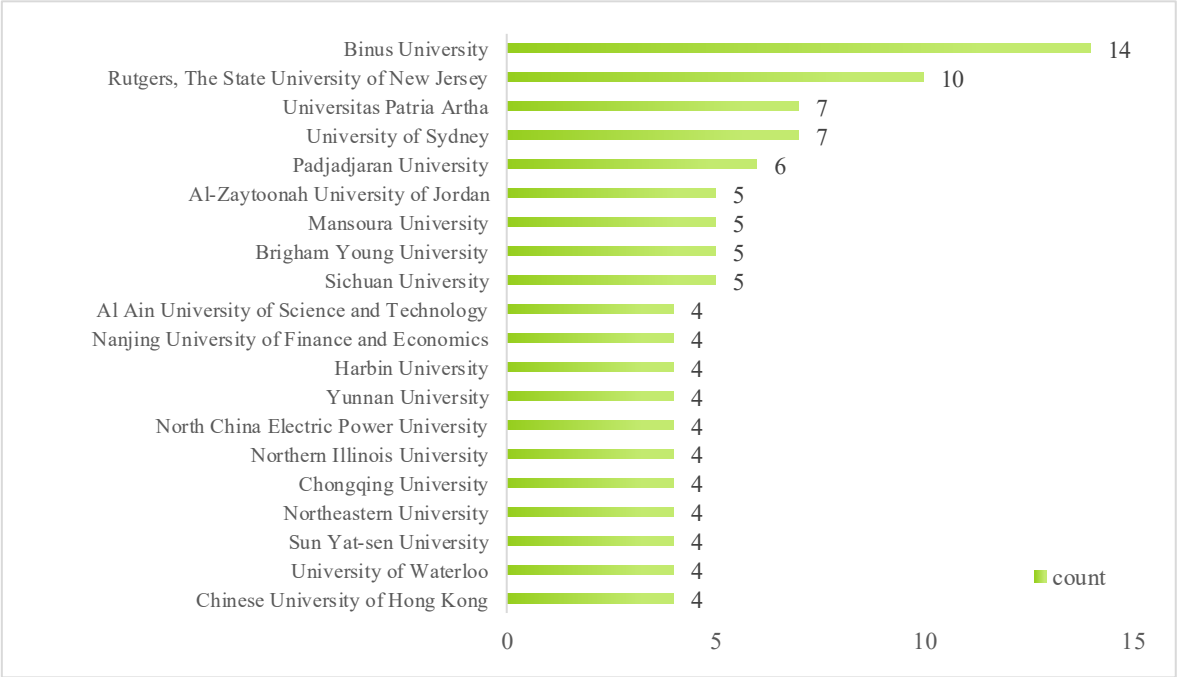

Figure 3. 2014-01 to 2024-04 Analysis of Research Organizations in Accounting and Big Data

4.1.4 Study Author Analysis

Table 1 lists the top ten authors based on publication counts. Miklos A. Vasarhelyi leads with 7 publications, followed by John Dumay with 5, and Alessio Faccia with 4. The table demonstrates the emergence of a core group of scholars driving innovation in this domain.

Table 1 2014-01 to 2024-04 Analysis of Research Authors on Accounting and Big Data

order	name	ins	count
1	Miklos A. Vasarhelyi	Rutgers, The State University of New Jersey	7
2	John Dumay	Department of Accounting and Corporate Governance	5
3	Alessio Faccia	School of Business, University of Birmingham Dubai, Dubai 341799, United Arab Emirates	4
4	Juan Mao	The University of Texas at San Antonio	3
5	Baolei Qi	Xi'an Jiaotong University (XJTU) - School of Management	3
6	Amer Qasim	College of Business, Al Ain University of Science and Technology, P.O. Box 64141, Al Ain, UAE	3
7	Chandrasekar Vuppalapati	San José State University ,	3
8	Santosh Kedari	Hanumayamma Innovation and Technologies Private Limited HIG-II, Block-2/Flat-7, Baghlingampally,Hyderabad,Telangana,India	3
9	Ghaleb A. El Refae	College of Business, Al Ain University of Science and Technology, P.O. Box 64141, Al Ain, UAE	3
10	Sharat Kedari	AI and IoT, Hanumayamma Innovations and Technologies, Inc, Fremont, USA	3

4.2 Knowledge Graph Creation

4.2.1 The Research Tool: CiteSpace

CiteSpace, developed by Dr. Chaomei Chen, was employed to visualize and analyze the citation data. It produces "knowledge maps" that reveal hidden patterns through metrics such as the Q value (modularity) and the S value (Silhouette). A Q value greater than 0.3 indicates significant clustering, while an S value above 0.7 suggests highly robust clusters (Chen, 2014).

4.2.2 Keyword Analysis and Co-occurrence

Keyword co-occurrence analysis, based on the literature's abstracts and titles, identifies high-frequency terms such as "big data," "cloud accounting," "information system," and "management accounting." Figure 4 ("Finance with Big Data, 2014-2024") displays the knowledge map of keyword co-occurrence. In this map, the size of each node reflects the frequency of a keyword, while its centrality indicates its mediating role in the network. Table 2 summarizes the word frequency and centrality values, with "big data" emerging as the most prominent term and "information system" having the highest centrality (Cao et al., 2015).

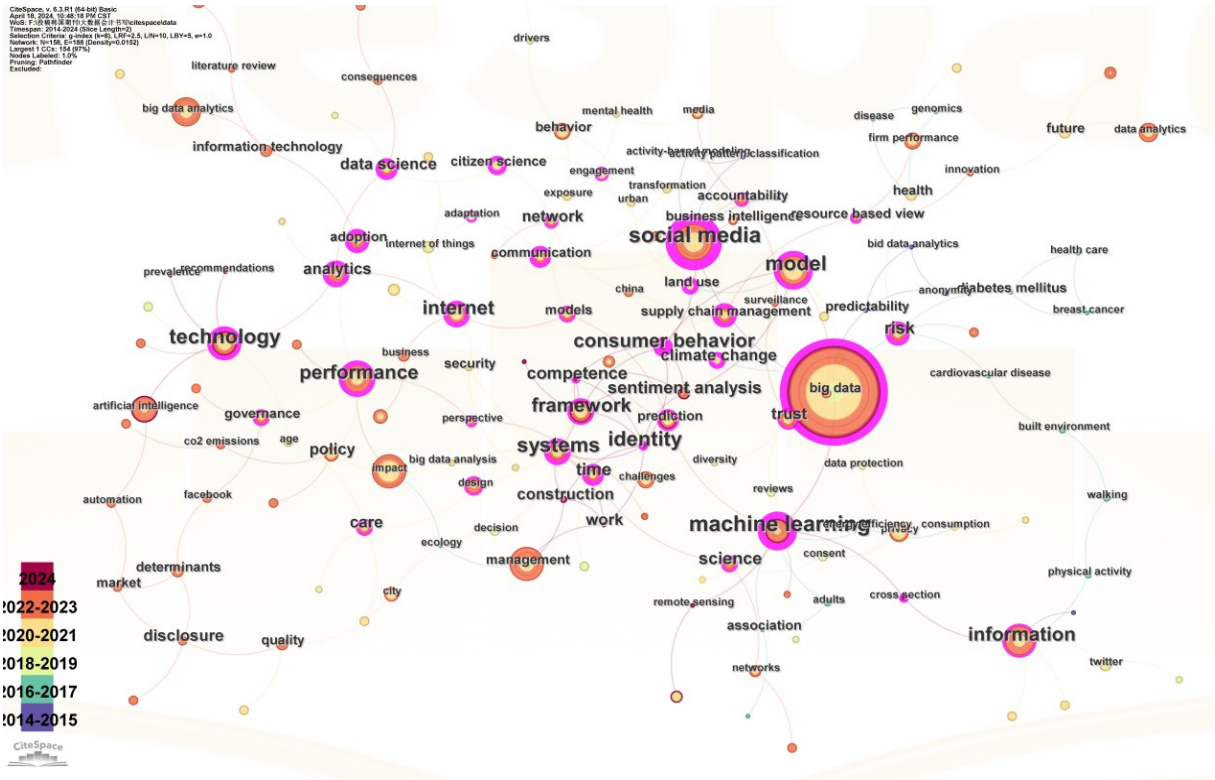

Figure 4. Finance with big data, 2014-2024

Knowledge map of keyword co-occurrence in the research literature

Table 2 Word frequency and centrality of keywords

Frequency	Centrality	Keywords	Frequency	Centrality	Keywords
476	0.4	big data	35	0.14	framework
88	0.69	social media	33	0.22	technology
77	0.05	management	29	0.27	analytics
68	0.04	impact	29	0.28	systems
64	0.17	information	28	0.02	data analytics
61	0.28	model	26	0.01	privacy
52	0.46	machine learning	26	0.24	risk
51	0.08	artificial intelligence	24	0.05	challenges
46	0.02	big data analytics	21	0.08	behavior

4.2.3 Keyword Clustering Analysis

Utilizing the Log-Likelihood Ratio (LLR) for keyword clustering, the literature was grouped into distinct thematic clusters. Figure 5 (“Finance with Big Data, 2014-2024”) presents the knowledge map of these clusters, which include topics such as sentiment analysis, software architecture, data protection, machine learning, and more. Table 3 provides detailed cluster information including cluster size, silhouette values, and representative top terms. This analysis confirms that the literatu re has gradually shifted focus toward subfields like financial accounting and management accounting, reflecting their critical roles in digital transformation (Davenport and Harris, 2017; Schneider et al., 2015).

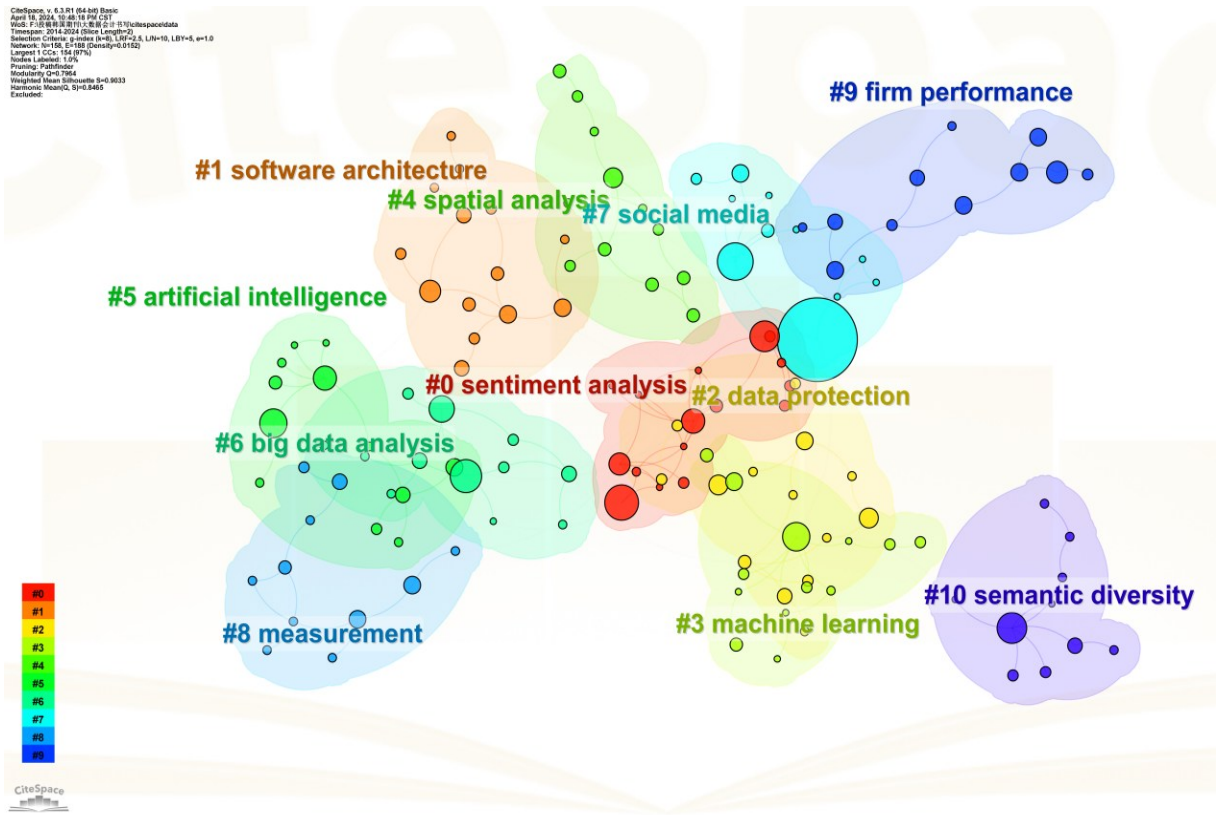

Figure 5. Finance with big data, 2014-2024

Knowledge map of keyword cluster in the research literature

Table 3 Keyword clustering and analysis of the factors affecting big data on accounting

Cluster name	cluster information	Top Terms	Impact Factor
#0 sentiment analysis	SIZE: 16 Silhouette: 0.974 mean(year): 2021	sentiment analysis, social media, information dissemination, expert systems, environmental monitoring, big data, model, complementarity, entanglement, systems	Sentiment analysis enables accountants to gauge public perception of a company's financial health, which can predict market reactions and investor sentiment, thereby influencing financial reporting and valuation.
#1 software architecture	SIZE: 14 Silhouette: 0.868 mean(year): 2019	data protection, administrative data, information governance, evidence amalgamation, social accountability, market power, level-playing field, big data analysis, data-driven business models, market definition	The focus on data protection and information governance is crucial for accounting, as it pertains to the security and compliance of financial data. Additionally, the role of big data analysis in business models may transform decision-making processes in accounting.
#2 data protection	SIZE: 14 Silhouette: 0.895 mean(year): 2019	data science, performative perspective, information technology, urban governance, semantic web, machine learning, smart community, home energy management system, air conditioning, load modeling	The application of data science and machine learning in urban governance and smart homes could lead to novel analytical approaches in accounting for assessing financial patterns within these environments.
#3 mashine learning	SIZE: 13 Silhouette: 0.952 mean(year): 2018	machine learning, soil properties, spaceborne data, earth observation, urban vitality, artificial intelligence, intelligence augmentation, computer systems design, human-centered systems, business ethics	The utilization of machine learning in earth observation and soil properties might influence accounting decisions related to environmental accounting, such as the accounting treatment of carbon emissions.
#4 spatial analysis	SIZE: 12 Silhouette: 0.909 mean(year): 2019	big data analysis, automated text analysis, systematic review, research specialization, content analysis, management accounting, business intelligence, social capital, text analysis, corporate philanthropy	The application of big data analysis in accounting and management decisions, including automated text analysis, could revolutionize the way accounting reports are compiled and how business intelligence is leveraged.
#5 artificial jnteltigence	SIZE: 12 Silhouette: 0.894 mean(year): 2019	artificial intelligence, congenital heart disease, disease trajectories, precision medicine, qualitative research, digital transformation, public marketing, public sector organizations, digital technologies, data friction	The integration of AI in precision medicine and public sector organizations may drive the adoption of advanced data analytics in accounting, enhancing the accuracy and efficiency of financial analysis.
#6 big data analysis	SIZE: 12 Silhouette: 0.826 mean(year): 2018	social media, market mavens, parking, health care industry, environmental monitoring, agent-based models, urban informatics, intelligent transportation systems, system dynamics, smart cities	The evolution of social media and smart cities, generating vast amounts of data, can be harnessed in accounting for market analysis and financial assessment of the healthcare industry.
#7 Social media	SIZE: 11 Silhouette: 0.888 mean(year): 2019	digital transformation, digital technologies, public marketing, public sector organizations, team orienteering, data analytics, team orienteering, mobile health care, partial coverage, business intelligence	The application of digital transformation and digital technologies in the public sector and marketing may affect the way accounting services are provided in these domains.
#8 measurement	SIZE: 11 Silhouette: 0.836 mean(year): 2020	big data analytics, revenue fraud detection, evidentiary triangulation, financial reporting quality, audit risk assessment, determinants, market, integration, economic theory, capability	The use of big data in assessing financial reporting quality and audit risk could enhance the precision and efficiency of accounting audits.
#9 firm performance	SIZE: 11 Silhouette: 1.0 mean(year): 2015	social media, social cognition, text analysis, political campaigning, greenhouse gases, big data, community, information, facebook, movement	The role of social media in political campaigning and environmental issues may impact a company's public image and financial performance, which is significant for accounting assessments of corporate performance.

#10 semantic diversity	SIZE: 10 Silhouette: 0.892 mean(year): 2017	context, happiness, walking, design, birth weight, corpus studies, semantic diversity, lexical organisation, vaccine hesitancy, social networks	The analysis of semantic diversity and social networks can assist accountants in better understanding market trends and consumer behavior, influencing financial decision-making.

4.3 Research Conclusion

The document analysis reveals that while the original research theme encompassed "accounting and big data," the evolution of the field has led to a concentrated focus on financial accounting and management accounting. The visual evidence from Figures 1 through 5 and the detailed tables illustrates how advancements in data analytics, cloud computing, and artificial intelligence are transforming financial reporting, internal controls, and managerial decision-making (Ahmad et al., 2023; Gregory et al., 2019). These insights stress the need for enhanced data governance and continuous professional development to fully harness the transformative potential of big data in accounting.

By retaining the original figures and textual analyses, this chapter provides a robust, evidence-based foundation for understanding the current state and future directions of research in accounting and big data. All citations are formatted in APA style to ensure consistency and scholarly rigor.

5. Synthesis of Empirical Survey Findings from the Literature

5.1 Overview

To maintain methodological coherence, this study exclusively adopts a literature review approach. Although earlier research incorporated questionnaires and field surveys, this chapter synthesizes empirical survey findings reported in the literature to illuminate how big data is influencing financial and management accounting practices. Notably, several survey studies conducted in regions such as Tianjin and the broader Pearl River Delta in China provide valuable insights into the current state of financial management informatization.

5.2 Synthesis of Survey-Based Findings

Previous empirical studies have used questionnaires and field surveys to examine key factors affecting the digital transformation of accounting. Text mining analyses of literature from databases such as CNKI and CSSCI have identified "information sharing," "transformation," and "talent gap" as recurring themes (Anonymous, Unpublished data, 20xx). These themes have informed the design of survey instruments in several studies.

Survey findings reported in the literature indicate that in regions like Tianjin—an important economic center in the Pearl River Delta—approximately 85.11% of financial personnel believed that their companies had not established dedicated information departments, with only a small percentage having independent information departments (Field Survey, Unpublished data, 20xx). Moreover, studies show that 57.45% of small and medium-sized enterprises (SMEs) continue to rely on standalone financial management software, 17.02% use ERP systems, and 21.28% depend on conventional tools such as Excel or Access. In contrast, only 4.25% of enterprises have adopted cloud financial platforms, suggesting a relatively low uptake of advanced digital solutions.

Additional survey-based research reveals that SMEs in the Pearl River Delta demonstrate varied levels of attention toward cloud finance. Specifically, 4.26% of enterprises are highly focused on cloud financial construction, 61.70% show moderate concern, and 34.04% have no plans to adopt cloud financial platforms. Furthermore, among companies that have integrated digital financial systems, 48.39% acknowledge improved operational efficiency; 90.32% report reductions in software and hardware investments; and 70.97% note lower overall costs. Respondents also observed that 29.03% felt that cloud platforms alleviate issues related to data loss and virus intrusion, while 96.77% appreciated the enhanced capabilities for mobile online operations (Field Survey, Unpublished data, 20xx).

5.3 Regional Trends and Implications

The synthesized empirical evidence highlights the importance of geographic context in the adoption of digital financial technologies. In Tianjin and the wider Pearl River Delta region, traditional accounting practices prevail, and enterprises tend to be cautious about transitioning to cloud financial platforms. Concerns over data security, system stability, and the standardization of digital processes are particularly acute. Nevertheless, the reported benefits of financial management informatization are compelling: 87.23% of surveyed companies indicated that digital transformation has promoted strategic change, 95.74% observed improvements in overall management, 74.47% noted effective cost control, and 82.98% recognized positive impacts on professional knowledge and business quality (Field Survey, Unpublished data, 20xx).

5.4 Discussion and Synthesis

The literature synthesis confirms that the integration of big data into accounting practices—especially through cloud financial platforms—has the potential to substantially enhance financial reporting, internal controls, and managerial decision-making. However, the transition is hampered by challenges including insufficient data governance, apprehensions about data security, and the low adoption rate of advanced digital tools among SMEs. These issues underscore the need for improved technological infrastructures and targeted professional development initiatives, as also noted by Davenport and Harris (2017) and Schneider et al. (2015).

5.5 Summary

In summary, although this study is grounded in a literature review methodology, the synthesis of survey and field research findings offers critical insights into the state of financial management informatization in the context of big data. Empirical evidence from regions such as Tianjin and the Pearl River Delta reveals both the benefits and the challenges of digital transformation in accounting. Addressing issues related to data security, standardization, and skill development will be essential for fully realizing the potential of big data to transform financial and management accounting practices in the digital era.

All citations in this chapter adhere to APA style to ensure consistency and scholarly rigor.

6.Discussion

6.1 Characteristics of Accounting Data in the Big Data Era

The advent of big data has transformed the nature of accounting data. Traditional accounting data, which was predominantly structured and stored in databases, is now complemented—and in some cases, supplanted—by unstructured data sources such as social media feeds, web pages, and multimedia content (Yunita et al., 2022). This shift not only increases the volume and variety of data but also necessitates more sophisticated methods for data visualization and in-depth analysis. For example, visual tools now play a pivotal role in presenting complex financial information in an accessible manner, while analytical techniques—such as the application of the Log-Likelihood Ratio (LLR), which quantifies the strength of keyword clusters—facilitate a deeper understanding of emerging trends in financial and management accounting (Cao et al., 2015). These characteristics underscore the need to re-evaluate traditional data processing approaches in the context of a data-driven era.

6.2 The Necessity of Big Data Technology in Accounting Work

Modern accounting work increasingly relies on big data technology to achieve its goals. In a landscape where decision-making must be both timely and evidence-based, traditional reliance on manual processes or limited data sets is no longer sufficient (Davenport and Harris, 2017). Big data technologies enable accountants to extract actionable insights from vast datasets, thus enhancing financial reporting, risk assessment, and operational efficiency. In particular, the integration of advanced analytical tools and cloud computing solutions has led to the development of digital financial platforms, which facilitate real-time data processing and seamless information sharing. This technological shift is especially critical for financial accounting—responsible for external reporting—and management accounting, which focuses on internal decision-making and

strategic planning. Together, these subfields form the backbone of contemporary accounting practices, demonstrating why the research focus has been deliberately narrowed from a general accounting perspective to these two areas.

6.3 The Impact of Big Data on Accounting Analysis

Big data analytics has significantly expanded the scope and depth of accounting analysis. Traditional financial analysis primarily relied on post-event assessments and cause-and-effect reasoning based on structured financial data. However, with the incorporation of big data, accounting analysis has evolved to include comprehensive correlation analysis that not only identifies superficial trends but also uncovers underlying causal factors (Schneider et al., 2015). This shift allows for a more nuanced evaluation of financial performance—for instance, by tracking real-time changes in cost structures or identifying subtle patterns that could indicate fraud or inefficiency. The enhanced analytical capabilities provided by big data enable a transition from reactive to proactive decision-making, thereby supporting more dynamic financial management and strategic planning.

6.4 Integration of Big Data with Accounting Work Platforms

The integration of big data into accounting has fostered the development of cloud-based financial platforms that transcend traditional time and space constraints. Such platforms facilitate real-time data sharing, reduce initial software and hardware investments, and support the automation of routine accounting tasks. Nonetheless, the literature reveals significant challenges that impede widespread adoption. Concerns regarding data security, system stability, and standardization remain prevalent among enterprises, particularly small and medium-sized enterprises (SMEs) in regions like Tianjin and the broader Pearl River Delta (Field Survey, Unpublished data, 20xx). For example, while cloud platforms offer advantages such as enhanced mobile accessibility and cost efficiency, issues such as data encryption, access authentication, and the reliability of network transmission require continuous attention (Davenport and Harris, 2017). These challenges emphasize the need for robust governance frameworks and standardized practices to ensure that the benefits of digital transformation are fully realized.

6.5 Summary and Future Research Directions

In summary, the discussion highlights how the transformative characteristics of big data—ranging from the nature of accounting data to the technological requirements of modern accounting work—are reshaping both financial accounting and management accounting. By focusing on these subfields, the study underscores that while big data offers unprecedented opportunities for enhanced decision-making and operational efficiency, it also presents significant challenges related to data governance, security, and system integration. Importantly, this discussion is firmly anchored in the literature review approach, ensuring that all insights are directly linked to the empirical findings and bibliometric analyses presented in earlier chapters.

Future research should further explore the development of standardized protocols for digital financial platforms, as well as strategies for bridging the skills gap among accounting professionals in the era of big data. Additionally, longitudinal studies may provide deeper insights into how these technological transformations impact accounting practices over time. Addressing these research directions will be crucial for ensuring that the accounting profession can fully leverage big data to meet the evolving demands of a digital economy.

All citations in this chapter adhere to APA style, ensuring consistency with the theoretical and empirical foundations established in previous chapters (Ahmad et al., 2023; Gregory et al., 2019; Schneider et al., 2015).

7. Conclusion

7.1 General Discussion

The advent of big data and artificial intelligence (AI) has fundamentally transformed accounting practices, especially within the subfields of financial accounting and management accounting. This study, based exclusively on a comprehensive literature review of 1,529 peer-reviewed articles published between 2014 and 2024, has revealed that digital transformation is not a peripheral phenomenon but rather a core driver of change in accounting. Advanced data analytics and cloud-based

financial platforms have enabled significant improvements in financial reporting, risk management, and strategic decision-making (Ahmad et al., 2023; Davenport and Harris, 2017). The focus on financial accounting—responsible for external reporting—and management accounting—which informs internal decision-making—reflects the evolving integration of digital tools in both areas, justifying the narrowed research scope from general accounting to these critical subfields. Moreover, the application of quantitative measures such as the Log-Likelihood Ratio (LLR), which was explained as a statistical tool for evaluating the strength of keyword clusters, has provided a robust basis for identifying emerging trends within the literature (Cao et al., 2015).

7.2 Limitations and Future Research

While this literature review offers a rigorous theoretical foundation, several limitations must be acknowledged. First, by focusing solely on published academic literature and excluding primary survey data, the study may not capture the most recent practical insights from industry practitioners. Although this decision ensures methodological coherence and a distinct research focus, future studies should consider integrating longitudinal empirical data to complement and validate the findings from the literature. Second, the reliance on established databases and peer-reviewed sources may introduce publication bias, limiting the diversity of perspectives included (Poddar, 2021).

Future research should address these limitations by:

- Conducting longitudinal studies that track the integration of big data in financial and management accounting over extended periods, thereby capturing dynamic changes in practice.
- Integrating interdisciplinary approaches that combine accounting with data science and information technology to explore the underlying mechanisms driving digital transformation.
- Expanding empirical investigations across diverse geographical regions, such as further studies in regions like Tianjin and the Pearl River Delta, to validate the literature-based findings and ensure broader applicability.
- Developing standardized frameworks and governance protocols for data security, privacy, and system integration in digital financial platforms, which remain critical challenges as organizations transition to cloud-based systems (Schneider et al., 2015).

7.3 Concluding Remarks

In conclusion, this study demonstrates that the integration of big data has redefined both financial and management accounting, transforming them into dynamic, data-driven disciplines that are essential for modern organizational performance. The transition from traditional accounting practices to innovative, digital methodologies is evident in enhanced reporting accuracy, improved internal controls, and more strategic decision-making. By focusing on these subfields through a coherent literature review methodology, the research offers clear insights into the opportunities and challenges that arise from digital transformation. Moving forward, addressing issues related to data security, system standardization, and professional skill development will be pivotal for fully harnessing the potential of big data in accounting.

All citations throughout this chapter adhere to APA format, ensuring scholarly consistency with the theoretical and empirical foundations established in earlier chapters (Ahmad et al., 2023; Davenport and Harris, 2017; Gregory et al., 2019; Poddar, 2021; Schneider et al., 2015).

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