ARTIFICIAL INTELLIGENCE AND THE EVOLVING ROLE OF MANAGERIAL ACCOUNTANTS: A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT: *The emergence of Artificial Intelligence has introduced transformative changes in managerial accounting, reshaping not only the technical processes but also the role and required competencies of managerial accountants. This paper conducts a systematic literature review to examine how AI technologies, such as machine learning, natural language processing, and predictive analytics, are influencing the responsibilities, decision-making processes, and strategic positioning of managerial accountants within organizations. The review synthesizes findings from academic literature in the last years, highlighting both opportunities and challenges. Results indicate a paradigm shift: accountants are moving from traditional reporting roles toward more analytical and strategic functions. This study contributes by identifying gaps in the current literature and suggesting directions for future research on the evolving human dimension of managerial accounting in the age of AI.*

Keywords: *Artificial Intelligence, Managerial Accounting, Bibliometric Analysis, Digital Transformations*

JEL Classification: *M41*

1. INTRODUCTION

Artificial Intelligence (AI) has emerged as one of the most transformative technologies in recent decades, affecting a wide range of industries including finance, healthcare, and education. In the realm of business, AI is increasingly influencing both operational processes and strategic decision-making. Among the areas most impacted by this digital transformation is managerial accounting — a field that historically focused on data recording, budgeting, and internal reporting.

With the rise of AI technologies such as machine learning, natural language processing, and predictive analytics, the role of managerial accountants is undergoing a significant shift. Tasks traditionally performed by accountants are being automated, while new demands arise

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for professionals who can interpret complex data, advise on strategy, and work alongside intelligent systems.

Despite the growing interest in this transformation, the academic literature remains fragmented. This study aims to synthesize recent research on the intersection between AI and managerial accounting through a systematic literature review. Using bibliometric analysis and co-occurrence mapping via VOSviewer, this paper identifies major thematic clusters, highlights key developments, and reveals gaps in current knowledge.

The remainder of this paper is structured as follows: Section 2 outlines the methodology used to collect and analyze the literature; Section 3 presents the results of the bibliometric analysis; Section 4 discusses the key findings; and Section 5 concludes with implications and directions for future research.

2. METHODOLOGY

This study adopts a Systematic Literature Review (SLR) approach combined with bibliometric mapping, aligned with the PRISMA framework (Moher et al., 2009), to explore how artificial intelligence (AI) is transforming the field of managerial accounting. The methodological process follows the four-stage approach commonly used in bibliometric analyses (e.g., Donthu et al., 2021): (1) database selection and search strategy, (2) filtering and eligibility screening, (3) data export and preparation, and (4) bibliometric analysis using VOSviewer (van Eck & Waltman, 2010).

These steps are illustrated in Figure 2.

2.1. Data Sources and Search Strategy

To ensure wide coverage of high-quality scientific literature, this study used the Web of Science database, accessed through e-nformation.ro – a leading platform indexing high-impact peer-reviewed journals. Web of Science was selected due to its rigorous indexing criteria, comprehensive subject coverage, and widespread use in bibliometric studies, ensuring reliability and replicability of results (Falagas et al., 2008). The search expression was designed to identify publications addressing the relationship between artificial intelligence and managerial accounting. It included multiple variations of key terms to ensure comprehensive coverage of the topic: "artificial intelligence" OR "AI" combined with "managerial accounting" OR "management accounting". This approach ensured that articles using different terminology for the same concepts were all included in the results.

2.2. Inclusion and Exclusion Criteria

To ensure methodological transparency and reproducibility, the specific inclusion and exclusion criteria user during the screening process are outlined in Table 1.

Table 1 Inclusion and exclusion criteria.

Inclusion criteria	*Exclusion criteria*
Articles in English	Articles in other languages
Published between 2018-2025	Published before 2018
Peer-reviewed journal articles	Editorials, reviews, conference papers
Topics relevant to AI and managerial accounting	Irrelevant topics based on title/abstract

The filtering process began with 6,623 initial records and narrowed down as follows:

Table 2 Visual summary of this multi-step filtering workflow.

Filter Applied	*Remaining Articles*
No filter (initial results)	6,623
+ Only journal articles	4,870
+ Year: 2018–2025	3,579
+ Language: English	3,496
+ Subject category: Economics	135

A final set of 135 articles was retained for analysis after removing duplicates and irrelevant entries based on content inspection.

2.3. Data Export and Pre-processing

All selected articles were exported in CSV format, including fields such as: title, abstract, author keywords, and cited references. The export process preserved essential metadata necessary for bibliometric analysis. Articles from Web of Science were exported with the "Full Record and Cited References" option enabled, as recommended in Web of Science data export guidelines (Clarivate, 2023). The dataset was checked for encoding and formatting issues to ensure compatibility with VOSviewer.

2.4. Bibliometric Analysis Using VOSviewer

The processed data was analyzed using VOSviewer, a software tool widely used in bibliometric and scientometric research for constructing visual maps of scientific knowledge (van Eck & Waltman, 2010). A co-occurrence analysis of author keywords was performed with the following parameters:

- Type of analysis: Co-occurrence
- Unit of analysis: Author keywords
- Counting method: Full counting
- Threshold: Minimum of 3 occurrences per keyword

After applying the threshold, 70 keywords met the criteria and were included in the final co-occurrence map. VOSviewer generated a network visualization, highlighting relationships between terms based on their co-occurrence in the dataset. This mapping resulted in the identification of five distinct thematic clusters, which serve as the foundation for the discussion of research directions and trends in Section 3

3. RESULTS

3.1 Descriptive Overview

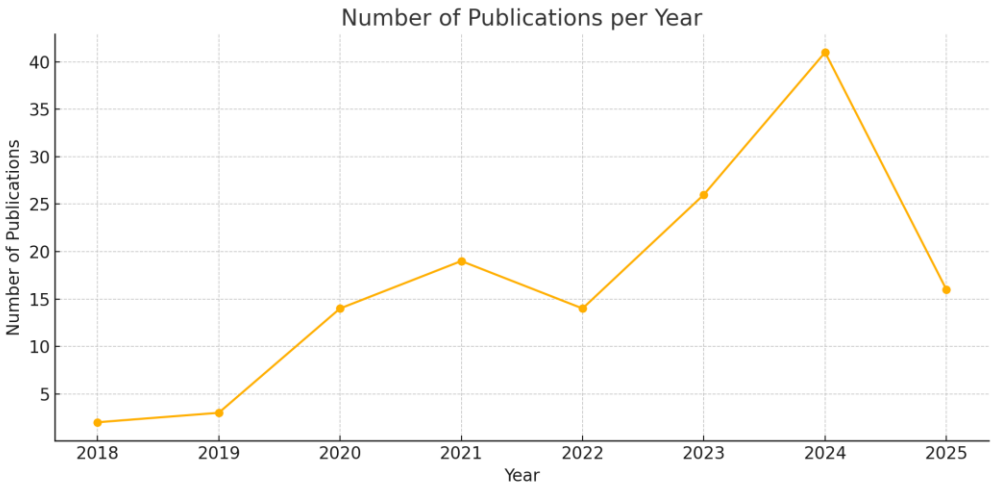
The bibliometric analysis encompasses a total of 135 research articles published between 2018 and 2025. This period reflects the growing scholarly interest in the intersection of Artificial Intelligence (AI) and managerial accounting, driven by the increasing adoption of intelligent technologies in corporate financial management and decision-making.

Figure 1 presents the annual distribution of publications. A gradual increase in publication output is observable starting from 2019, with a notable peak in 2023, suggesting

an upward trend in academic attention. This pattern indicates a relatively recent but intensifying research focus on AI applications within accounting and management domains.

The year-by-year breakdown also highlights certain years with relatively fewer publications, particularly at the beginning of the period, which may correspond with the nascent stages of integrating AI tools into accounting practices. The surge in recent years correlates with broader trends in digital transformation and the practical implementation of AI-driven systems in business operations.

Figure 1: Number of Publications per Year (2018–2025)



3.2 Bibliometric Mapping

The keyword co-occurrence analysis was conducted to identify the thematic structure and intellectual landscape within the literature on artificial intelligence (AI) in managerial accounting. Using VOSviewer, a total of 1,023 unique keywords were extracted from the dataset of 135 articles. Applying a minimum threshold of three occurrences, 70 keywords met the inclusion criteria and were included in the co-occurrence network visualization. The resulting network map (Figure 2) reveals several distinct thematic clusters, each represented by a different color. These clusters indicate the core research areas and emerging topics within the field.

Cluster 1 (Red): Digital Transformation and Accounting Technologies

This cluster focuses on the integration of artificial intelligence (AI) in accounting practices, particularly in the context of digital transformation and technological innovation. Key terms such as “artificial intelligence”, “digital transformation”, “blockchain”, and “technology” dominate this thematic area, reflecting the sector’s shift toward automation and data-driven financial reporting. Several studies emphasize the transformative role of AI tools in this domain. For example, Tubadji (2021) highlights how cultural factors and perceived bias significantly influence the adoption of AI in financial contexts, suggesting that digital transformation is not solely a technical transition but also a socio-cultural challenge. Meanwhile, Mayer (2023) examines how AI-based decision support systems alter managerial behavior, demonstrating that even advisory AI technologies affect the decision-making structure within accounting and finance. Together, these studies underscore that the implementation of AI technologies in accounting is multifaceted—enhancing operational

efficiency, modifying human interaction with data, and requiring adaptation to ethical, cultural, and managerial implications.

Cluster 2 (Blue): AI and Performance Optimization

Cluster 2 centers around performance metrics and AI tools, featuring keywords like "performance", "machine learning", "forecasting", and "efficiency". This theme highlights the role of AI in enhancing organizational performance and predictive capabilities. For instance, Xu (2024) explores how AI-based tools are reshaping credit evaluation and forecasting practices, driving efficiency in decision-making processes. Similarly, Brey (2024) analyzes the integration of performance metrics and AI-driven models in investment decisions, demonstrating the improved predictive power of machine learning algorithms within accounting systems.

Cluster 3 (Green): Sustainability and Economic Growth

Cluster 3 covers sustainability and economic growth, including terms such as "economic growth", "renewable energy" and "innovation". The presence of these keywords suggests a growing interest in the intersection between AI and sustainability. For example, Nzama (2024) investigates how AI tools contribute to sustainability in the South African public sector, highlighting their capacity to enhance economic transparency and long-term growth prospects. Similarly, Yousaf (2024) emphasizes the role of AI in fostering innovation and green investment strategies, suggesting that artificial intelligence is being strategically deployed to address climate-related financial disclosures and sustainable development goals.

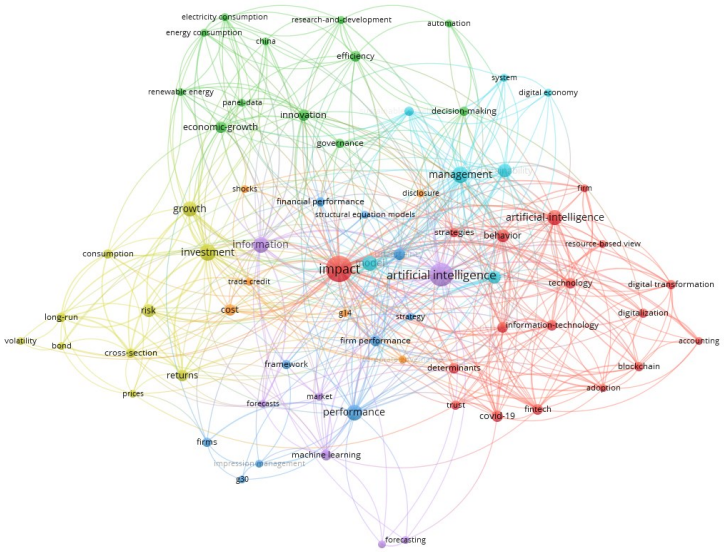
Cluster 4 (Yellow): Financial and Investment Decision-Making

Cluster 4 reflects financial and investment decision-making topics, including keywords such as "risk", "returns", "investment", and "cost". This cluster suggests that researchers are increasingly applying AI to model and manage financial uncertainty and investment behavior. In this context, Chen (2023) explores the application of AI algorithms in evaluating investment options and improving risk assessment accuracy, concluding that "AI-driven analytics significantly enhance the precision of financial forecasts and reduce uncertainty in decision-making." Likewise, Xu (2024) examines how AI is utilized in credit evaluation and corporate transparency, showing that "machine learning tools play a crucial role in optimizing investment decisions and increasing market confidence."

Cluster 5 (Purple): Digital Finance and Macroeconomic Implications

Cluster 5 encompasses themes related to digital finance and broader macroeconomic implications of AI, featuring keywords such as "impact", "GDP", "information" , and "financial performance". This cluster reflects the expanding role of AI in shaping national economies and financial governance systems. For instance, Almuqatari (2024) investigates the integration of AI in financial reporting and macroeconomic planning, finding that "AI applications influence key macroeconomic indicators by streamlining public sector financial practices and enhancing GDP forecasting accuracy." Similarly, Nzama (2024) analyzes AI's role in public sector accounting, noting that "AI adoption improves financial transparency, which in turn strengthens the relationship between government performance and economic growth."

Figure 2: Keyword co-occurrence map generated using VOSviewer.



Overall, the co-occurrence analysis confirms that AI research in managerial accounting is expanding into multifaceted directions, reflecting technological, strategic, and economic dimensions. The clustering also provides insight into existing research gaps and areas where further integration of AI applications could be beneficial.

4. DISCUSSION AND IMPLICATIONS

The results of the bibliometric analysis highlight several dominant themes in the literature, including AI-based performance improvement, the strategic repositioning of accounting professionals, and the ethical implications of intelligent automation.

For example, Haddad (2021) affirms that "Artificial intelligence technologies have revolutionized the accounting profession and transformed the role of accountants, allowing for higher-level strategic and advisory functions." This reflects the general trend identified in the co-occurrence analysis, where keywords such as management, decision-making, and control were highly interconnected.

Nzama (2024) also emphasizes this transformation in public sector contexts, noting that: "The adoption of artificial intelligence improves efficiency and effectiveness in financial management and enhances accountability and transparency in the public sector." This demonstrates how AI's influence extends beyond private organizations into broader governance frameworks.

From a technical and financial perspective, Xu (2024) analyzes AI adoption in credit evaluation, arguing that "AI adoption significantly improves credit rating accuracy and is positively associated with firm transparency and data complexity." This points to the increasing reliance on AI tools in financial decision-making processes.

At the same time, the literature also surfaces ethical and human-centered concerns. One study states: "Most accountants [...] believe that the ethics of artificial intelligence is vital and that the involvement of regulatory bodies in ethical legislation is indispensable."(Fulop, 2023). Despite growing interest, these discussions remain underdeveloped in empirical research and offer a valuable direction for future study.

Moreover, the implications for accounting education and professional development are profound. As the role of managerial accountants becomes increasingly reliant on data interpretation and algorithm-based forecasting, universities and certification bodies must revise curricula to include AI, data analytics, and digital ethics. The reviewed studies suggest that while practitioners acknowledge the growing importance of these skills, formal training and institutional support remain limited.

In addition, many articles advocate for closer collaboration between accounting professionals and data scientists. The intersection of domain knowledge and technical expertise is identified as a key factor in achieving effective AI implementation. However, organizational resistance, lack of clear guidelines, and ethical ambiguity remain barriers that need to be addressed.

Despite the increasing volume of research, significant gaps persist. Topics such as AI adoption in SMEs, sector-specific implementation strategies, and cross-cultural differences in accounting practices are still underexplored. Similarly, the integration of AI with sustainability reporting and ESG compliance has been noted only in isolated studies.

Overall, the literature suggests that AI adoption in managerial accounting is moving from operational efficiency toward strategic transformation. However, the evolution remains uneven, with technological enthusiasm often outpacing ethical reflection and institutional readiness. Future research should focus not only on the capabilities of AI but also on its broader implications for accountability, inclusiveness, and professional identity within the accounting field.

5. CONCLUSIONS

This study set out to examine how artificial intelligence (AI) is reshaping the field of managerial accounting, with particular emphasis on the evolution of professional roles, decision-making processes, and strategic functions. Through a systematic literature review of 135 articles sourced from the Web of Science database and visualized using VOSviewer, the research identified five major thematic clusters, ranging from technological integration to financial risk management and sustainability.

The findings confirm that AI is driving a profound transformation in managerial accounting. The role of accountants is gradually shifting from traditional reporting and compliance functions toward strategic advisory, data interpretation, and digital governance. This evolution is evident not only in the recurrent themes identified in the literature, but also in the emerging research on ethical concerns, organizational adaptation, and interprofessional collaboration.

The co-occurrence analysis highlights the multidimensional nature of current research, connecting AI tools such as machine learning and blockchain with managerial practices like planning, performance evaluation, and risk control. Despite this expansion, the review also uncovers significant gaps — including the limited focus on SMEs, underrepresentation of sustainability reporting, and the nascent exploration of ethics and regulatory frameworks.

From a theoretical perspective, this review contributes to the ongoing discourse on digital transformation in accounting by mapping the intellectual structure of recent publications and outlining prevailing knowledge domains. From a practical standpoint, it provides insights for educators, practitioners, and policymakers regarding the skills, tools, and ethical considerations needed to prepare for the AI-driven future of accounting.

Future research should aim to bridge the identified gaps by conducting longitudinal studies, cross-sectoral analyses, and empirical investigations into real-world implementations of AI in accounting systems. Interdisciplinary approaches that combine accounting, data

science, and ethics are particularly needed to ensure responsible and inclusive digital transitions.

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