Digital Transformation and the Evolving Role of Management Accounting: Intellectual Developments and Future Research Directions

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ABSTRACT

This study maps the development, influence, conceptual structure, and research trajectory of scholarship on digital transformation in management accounting from 1991 to 2025. It also identifies the technologies, contributors, thematic relationships, and future research priorities that have shaped this expanding field. A bibliometric review was conducted using 237 English-language journal articles and reviews retrieved from Scopus. The records were screened from an initial set of 353 documents and analysed in BiblioSpy using performance indicators, source and citation analysis, scientific-production life-cycle modelling, author-keyword co-occurrence, sensitivity testing, and temporal overlay visualisation. The corpus accumulated 7,414 citations, and 166 publications (70.0%) appeared between 2020 and 2025. The literature evolved from early enterprise-system and activity-based-costing applications towards Big Data, business analytics, artificial intelligence, blockchain, and digital transformation. Five interconnected keyword clusters capture managerial decision support; digital transformation and accounting applications; ERP integration and professional roles; Big Data and automation; and strategic accounting, education, and knowledge development. The logistic model indicates that the field remains in an early growth phase, although long-range projections should be interpreted cautiously. Digital transformation in management accounting is cumulative rather than substitutive. Technological value depends on data quality, analytical capability, organisational routines, governance, and the capacity of management accountants to interpret and challenge technology-supported information. Future studies should examine human-technology complementarity, implementation mechanisms, performance and accountability outcomes, and under-researched institutional contexts. The study integrates performance, life-cycle, structural, and temporal analyses across successive technological waves and translates the combined evidence into theory-informed directions for research and practice.

Keywords: management accounting; digital transformation; artificial intelligence; data analytics; bibliometric analysis.

INTRODUCTION

Digital transformation has broadened the scope of management accounting beyond the periodic production of financial information. Enterprise systems, cloud platforms, Big Data, business analytics, artificial intelligence, and blockchain increasingly affect how information is captured, integrated, interpreted, and communicated for planning, control, performance evaluation, and decision-making. These technologies create opportunities for timelier and more forward-looking analysis, but they also raise questions about data quality, system integration, professional competence, organizational change, and accountability for technology-supported decisions.

The literature has developed through successive technological waves. Early research examined enterprise resource planning (ERP) and its implications for management-accounting change (Granlund & Malmi, 2002; Scapens & Jazayeri, 2003). Subsequent studies shifted toward digitalization and Big Data (Bhimani & Willcocks, 2014; Warren et al., 2015), business analytics (Appelbaum et al., 2017; Rikhardsson & Yigitbasioglu, 2018), and the opportunities and risks these technologies create for the accounting profession (Richins et al.,

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2017). More recent research addresses automation of management-accounting work (Korhonen et al., 2021), changing professional roles (Andreassen, 2020; Arkhipova et al., 2024; Rautiainen et al., 2024), artificial-intelligence acceptance (Vărzaru, 2022), machine-learning applications (Nielsen, 2022; Ranta et al., 2023), and the ethical consequences of algorithmic decision support (Zhang et al., 2023).

Despite this growth, the cumulative development of the field remains difficult to assess. Existing reviews have examined digitalization in accounting broadly (Knudsen, 2020), the evolution of the management-accounting profession (Arkhipova et al., 2024), or technologies such as machine learning (Ranta et al., 2023). These studies offer valuable synthesis, but they do not simultaneously trace long-run publication growth, compare scholarly influence, map the relationships among recurring concepts, identify their temporal development, and translate the resulting structure into a theory-informed research agenda. This gap is important because fragmented terminology may obscure whether a study addresses a technological artifact, an analytical capability, a professional role change, or organization-wide digital transformation.

This study addresses the gap by mapping the global development of digital-transformation research in management accounting over 35 years. It combines performance analysis, life-cycle modeling, keyword-network analysis, and temporal overlay visualization to connect publication dynamics, scholarly influence, conceptual structure, and future inquiry. The study addresses four research questions:

RQ1: How has research on digital transformation in management accounting evolved in terms of publication output, citation impact, and scientific-production life cycle?

RQ2: Which journals, publications, authors, institutions, and countries have most strongly shaped the field?

RQ3: What conceptual structures characterize the field, and how have its thematic emphases developed over time?

RQ4: What research gaps and opportunities arise from the field's intellectual and temporal development?

The remainder of the paper is organized as follows. Section 2 reviews the development of digital technologies and their professional and organizational consequences for management accounting. Section 3 explains the search, screening, cleaning, and analytical procedures. Section 4 presents the performance and science-mapping results. Section 5 discusses the findings, implications, recommendations, and limitations, and Section 6 concludes the study.

LITERATURE REVIEW

Digital Technologies and Management Accounting Change

Digital transformation has emerged as a disruptive force within the management accounting domain, driving a comprehensive reconfiguration of organizational processes, capabilities, and structures rather than merely converting analogue data into digital formats. Vial (2019) conceptualizes digital transformation as a process where digital technologies trigger disruptions, prompting organizations to alter their value-creation paths while managing structural changes and organizational barriers. This socio-technical perspective is highly relevant to management accounting, as digitalization simultaneously redefines the technical information systems and the organizational workflows through which financial data supports managerial choice.

Traditionally, management accounting has concentrated on standardized, periodic routines such as budgeting, cost control, variance analysis, and internal report preparation (Granlund & Malmi, 2002). Digital transformation significantly extends the scope of these activities by enabling high-velocity data collection, automated process execution, and real-time predictive analytics. A sophisticated ecosystem of enabling technologies—comprising artificial intelligence (AI), machine learning, big data analytics, cloud computing, robotic process automation (RPA), and blockchain—increasingly shapes how management accounting information is captured, integrated, evaluated, and communicated across enterprise networks (Bhimani & Willcocks, 2014; Warren et al., 2015).

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ERP systems provided an early foundation for integrated organizational data. Foundational studies found that technological integration did not automatically produce radical changes in management-accounting techniques; its effects depended on organizational processes, role allocation, and how users employed the information made available (Granlund & Malmi, 2002; Scapens & Jazayeri, 2003). Later research reinforced the organizational nature of implementation. Integrated information systems can change knowledge flows and control practices (Rom & Rohde, 2007), but accountants also participate in translating and configuring systems in practice (Newman & Westrup, 2005). ERP implementation may create contests over professional jurisdiction (Jack & Kholeif, 2008), while sociomaterial analysis shows that accounting practices and technologies are reconfigured together rather than sequentially (Wagner et al., 2011).

Later work emphasized the scale, variety, and speed of digital data. Big Data expands the evidence available for forecasting, customer analysis, risk assessment, and performance management, while analytics converts data into decision-relevant insights (Bhimani & Willcocks, 2014; Warren et al., 2015). Business analytics can strengthen descriptive, predictive, and prescriptive analysis, yet its value depends on data architecture, analytical capability, and integration with managerial judgment (Appelbaum et al., 2017; Rikhardsson & Yigitbasioglu, 2018). Organizational absorptive capacity is critical for integrating business intelligence with management control (Elbashir et al., 2011), and performance benefits remain contingent on accountants' analytical skills (Franke & Hiebl, 2023) and information-system quality (Papiorek & Hiebl, 2024).

Professional and Organizational Consequences

Digital transformation reshapes management accounting workflows, control arrangements, information relationships, and professional responsibilities. Although automation can reduce routine processing and create opportunities for management accountants to undertake more analytical and advisory roles, such transitions are neither automatic nor universally beneficial. Organizational inertia, resistance to change, inadequate digital competencies, and established professional boundaries may restrict the extent to which technological capabilities translate into strategic involvement (Andreassen, 2020; Heinzelmann, 2018). Furthermore, the increasing participation of data scientists and information technology specialists in business analytics may challenge management accountants' traditional authority over financial information and managerial decision support (Jack & Kholeif, 2008; Knudsen, 2020). Rather than assuming that digital transformation inevitably elevates management accountants to strategic business partners, its professional consequences should be understood as contingent on organizational structures, technological capabilities, professional adaptability, and the distribution of analytical responsibilities. These considerations also raise questions about whether automation enhances existing professional roles, redistributes responsibilities, or marginalizes accounting expertise in increasingly data-driven organizations.

Evidence on professional roles is therefore mixed. Digital technologies can support business partnering and analytical work, while information-technology competence and analytics are becoming central to graduate and controller profiles (Spraakman et al., 2015; Oesterreich & Teuteberg, 2019). Information systems also influence occupational identity by changing both accountants' work and how their expertise is recognized (Heinzelmann, 2018). Rather than a uniform movement from scorekeeper to strategic partner, recent evidence depicts management-accountant roles as fluid and context-dependent (Rautiainen et al., 2024).

Artificial intelligence intensifies these socio-technical tensions. Acceptance depends on perceived usefulness, ease of use, and organizational readiness (Vărzaru, 2022), while machine learning expands opportunities for exploratory and predictive analysis (Nielsen, 2022; Ranta et al., 2023). These applications also raise questions about bias, transparency, responsibility, and ethical use (Zhang et al., 2023). Their organizational value therefore depends on how technologies are combined with people, routines, controls, and governance arrangements.

Emerging Technological Ecosystems and Analytical Nuances

Specialized digital technologies introduce distinct operational capabilities alongside strategic uncertainty. Big Data analytics and business-intelligence platforms can expand corporate visibility by combining structured accounting entries with unstructured operational, social-media, and market data (Warren et al., 2015). This development can move management control beyond descriptive reporting toward diagnostic, predictive, and

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prescriptive decision support (Rikhardsson & Yigitbasioglu, 2018). Artificial intelligence and machine learning can also support anomaly detection and budget-risk evaluation, although algorithmic opacity and ethical concerns constrain their use (Ranta et al., 2023; Zhang et al., 2023).

Cloud computing and integrated enterprise systems provide an architectural foundation for data standardization and timely reporting, but their effectiveness depends on organizational absorptive capacity, information-system quality, and cybersecurity controls (Elbashir et al., 2011; Papiorek & Hiebl, 2024). RPA can reduce transactional errors, while blockchain can provide decentralized and tamper-resistant transaction histories; neither technology creates organizational value automatically (Korhonen et al., 2021). Benefits depend on organizational readiness, role redesign, and continuing alignment between digital architecture and management-control requirements.

The growing application of artificial intelligence and machine learning also introduces governance challenges that extend beyond technical efficiency and analytical accuracy. Algorithmic bias may arise when historical data, model assumptions, or training procedures reproduce existing organizational inequalities, potentially influencing budget allocations, resource prioritization, and performance evaluations. The limited explainability of complex machine-learning models further complicates managerial accountability, particularly when decision-makers cannot adequately interpret or challenge algorithm-generated recommendations. Similarly, increased reliance on interconnected cloud platforms and automated management control systems may expose organizations to cybersecurity threats, unauthorized data access, and disruptions to information integrity. These risks highlight the importance of explainable analytical models, transparent decision procedures, human oversight, and appropriate cybersecurity and data-governance mechanisms (Ranta et al., 2023; Zhang et al., 2023). From a socio-technical perspective, effective digital transformation therefore requires not only technological sophistication but also governance arrangements that preserve professional judgment, accountability, and trust in management accounting information.

Socio-Technical Perspective

This review adopts a socio-technical perspective as its primary interpretive lens. Digital transformation is treated as the joint reconfiguration of technologies, data, work routines, professional roles, and control arrangements rather than as the installation of isolated tools. This perspective reflects the view that digital technologies alter value-creation paths through organizational change (Vial, 2019) and that accounting systems and practices are constituted together through their use (Wagner et al., 2011).

The lens guides the interpretation of the bibliometric results. Technology-related keywords are examined in relation to management-control tasks, organizational capabilities, professional roles, education, and governance. It also provides a basis for assessing whether newer technologies extend or replace earlier accounting infrastructures. Contingency, institutional, and dynamic-capability theories are treated as complementary explanations for specific contexts and outcomes rather than as competing foundations for the review.

METHODS

This study used a bibliometric research design to examine the scientific landscape of digital transformation in management accounting. Bibliometric methods provide a transparent and reproducible means of evaluating publication and citation performance, identifying influential contributions, and mapping relationships among concepts (Donthu et al., 2021; Zupic & Čater, 2015). The procedure comprised database selection, query construction, eligibility screening, metadata cleaning and harmonization, performance analysis, scientific-production life-cycle modelling, author-keyword co-occurrence analysis, and temporal overlay visualization.

Database and Search Strategy

Scopus was selected because it offers broad coverage of peer-reviewed accounting, business, management, decision-science, and information-systems research and provides the bibliographic metadata required for performance analysis and science mapping. The search was conducted on August 3, 2026. It combined three management-accounting expressions with terms representing digital transformation and major enabling

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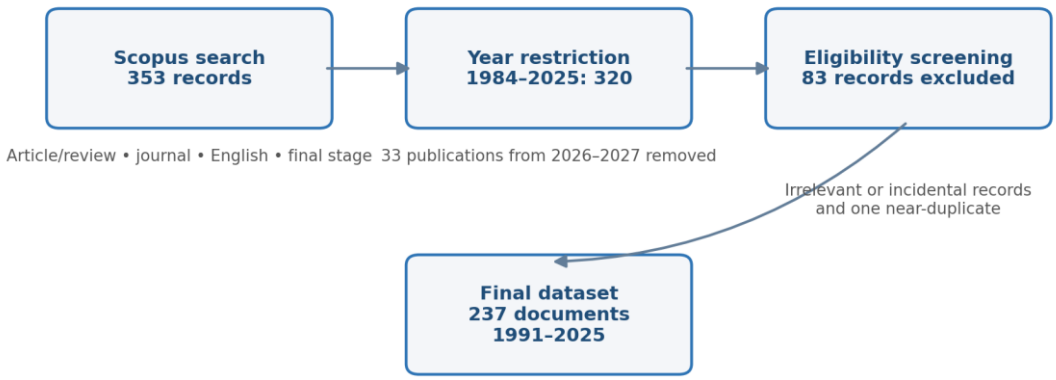
technologies. The query was applied to titles, abstracts, and keywords and was restricted to English-language journal articles and reviews at the final publication stage.

The exact Scopus query was: TITLE-ABS-KEY("management accounting" OR "managerial accounting" OR "management accountant*") AND TITLE-ABS-KEY("digital transformation" OR digitali?ation OR "digital technolog*" OR "artificial intelligence" OR "machine learning" OR "big data" OR "data analytics" OR "business analytics" OR automation OR "robotic process automation" OR "cloud computing" OR blockchain OR "enterprise resource planning" OR ERP), limited to articles or reviews, English language, journal sources, and final publication stage.

Eligibility and Screening

As delineated in the search and screening flow in Figure 1, the initial Scopus export contained 353 records. Thirty-three publications assigned to 2026 or 2027 were removed because 2025 was the latest complete publication year, leaving 320 records for eligibility screening. Titles and abstracts were then reviewed to determine whether digital technology had a substantive relationship with management accounting, management control, costing, budgeting, performance measurement, decision support, or the work of management accountants. Studies were excluded when management accounting or digital technology appeared only incidentally, or when the substantive domain was unrelated, such as engineering, medicine, agriculture, telecommunications, marketing, or supply-chain operations without a management-accounting connection. The screening removed 83 records, including one near-duplicate with almost identical bibliographic content. The final analytical dataset comprised 237 journal articles and reviews published between 1991 and 2025.

Figure 1. Search and screening process



Source: Generated by the authors using BiblioSpy® (Ahmi, 2026).

Data Cleaning and Harmonization

The Scopus CSV file contained citation information, abstracts, keywords, affiliations, countries, and cited references. BiblioSpy reported a data-quality score of 89.6%. Missing values affected one author field, 15 DOI fields, 20 author-keyword fields, 189 index-keyword fields, two affiliation or country fields, and three reference fields. Records were not excluded solely because a DOI or another nonessential field was missing. Because index keywords were unavailable for most records, the conceptual analysis used author keywords.

Keyword harmonization combined spelling variants and semantically equivalent expressions. For example, managerial accounting was consolidated under management accounting, while management accountant was retained as an actor-related concept. Big Data and Big Data analytics were kept separate because the former

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represents a data resource and the latter an analytical process. These decisions preserved meaningful conceptual distinctions while reducing fragmentation caused by inconsistent terminology.

Analytical Procedures

BiblioSpy (Ahmi, 2026) was used to calculate annual publication output, citation trends, yearly indicators, source performance, highly cited documents, and author, institution, and country productivity. Total publications, total citations, citations per publication, citations per cited publication, and h-, g-, and m-indices were reported to distinguish productivity from influence. Citation counts were interpreted cautiously because older publications have had more time to accumulate citations.

The scientific-production life cycle was estimated using a logistic growth model fitted to cumulative publication counts:

$$P(t) = \frac{K}{1 + \exp\left[-b(t - t_0)\right]},$$

where $P(t)$represents cumulative scientific production in year t, $K$is the estimated saturation level, $b$is the growth-rate parameter, and $t_0$is the inflection point. The inflection point also represents the year in which annual publication growth, measured by the first derivative of the cumulative logistic curve, reaches its maximum. The duration of the transition from 10% to 90% of the estimated saturation level was calculated as $\Delta t = 2\ln(9)/b$. Model fit was assessed using the coefficient of determination (R^2), root mean square error (RMSE), Akaike information criterion (AIC), and Bayesian information criterion (BIC). Because the estimates extend substantially beyond the observed 1991–2025 period, the resulting trajectory was interpreted as exploratory rather than deterministic.

The conceptual analysis used author-keyword co-occurrence. Sensitivity analysis tested minimum occurrence thresholds of three, four, and five, producing seven, five, and three clusters, respectively. The threshold of three generated substantial overlap, whereas the threshold of five removed too much thematic detail. A minimum of four occurrences was therefore selected because it produced a clear five-cluster solution while retaining sufficient diversity. The network visualization shows conceptual proximity and cluster membership; the overlay visualization colours keywords by average publication year to indicate temporal movement from earlier foundations toward newer research topics.

RESULTS

The results are organized around the research questions. The analysis first establishes the bibliometric profile, publication trajectory, and scientific-production life cycle. It then examines influential journals, publications, and contributors before interpreting the five-cluster keyword network and its temporal development.

Document profile

To provide a foundational understanding of the research landscape, a comprehensive bibliometric profile of the retrieved dataset was generated. This initial analysis establishes the baseline metrics concerning publication volume, citation impact, and authorship collaboration patterns across the 35-year citable span. Table 1 summarizes the main information and macro indicators characterizing the scientific production of digital transformation scholarship within management accounting.

Table 1. Profile of the dataset

Main Information	Data
Timespan	1991:2025

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Total Publications (TP)	237
Citable Year Span	35 years
Annual Growth Rate	9.52%
Total Contributing Authors	646
Total Citations (TC)	7414
Average Citations per Document	31.28
Average Citations per Cited Paper	35.64
Number of Cited Papers (NCP)	208
Average Citations per Year	211.83
Average Authors per Paper	2.73
Citation Sum within h-Core	5494
h-index	43
g-index	80
m-index	1.229

Source: Generated by the authors using BiblioSpy® (Ahmi, 2026).

As illustrated in Table 1, the final dataset comprises 237 publications produced over a 35-year citable period and accumulated 7,414 citations. Of these publications, 208 had been cited, producing 31.28 citations per document and 35.64 citations per cited paper. The h-index of 43 and g-index of 80 indicate a substantial citation core, while the m-index of 1.229 adjusts that influence for the age of the field. The 646 contributing authors and an average of 2.73 authors per paper also show that research is increasingly collaborative. Taken together, the indicators describe a field that is no longer marginal but remains uneven in the distribution of productivity and impact.

Publication Growth and Trends

Based on the development phases outlined in Table 2, research emerged in 1991 but remained limited for almost two decades. Only four publications appeared during 1991-2000, followed by 22 during 2001-2010. Output expanded gradually between 2011 and 2019, producing 45 publications. A marked acceleration occurred from 2020 onward: 166 publications, representing 70.0% of the dataset, appeared between 2020 and 2025. Annual output increased from 15 publications in 2020 to 44 in 2025. The updated dataset reports an annual growth rate of 9.52%, confirming sustained expansion despite the field's long formative period.

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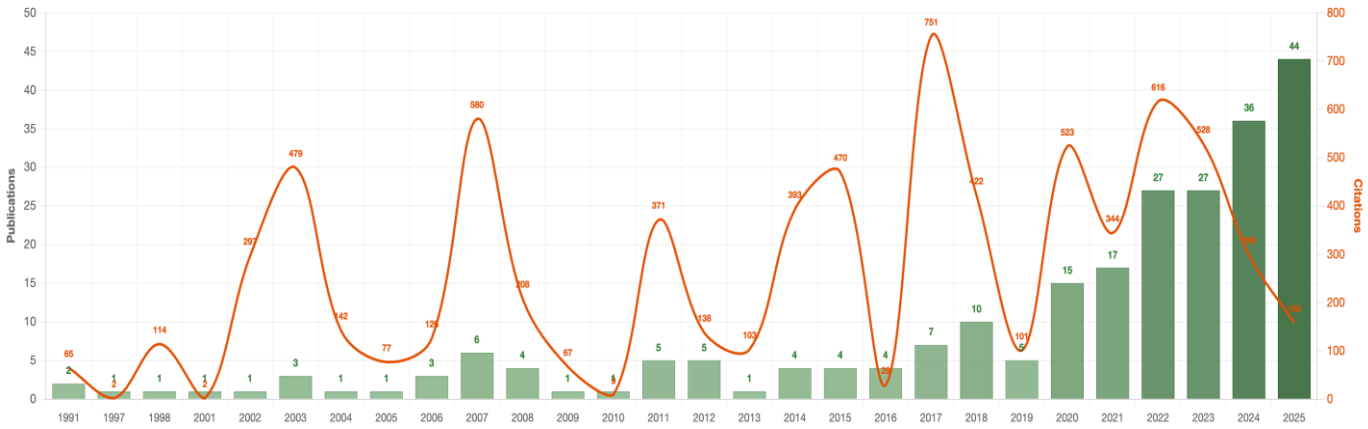
Table 2. Development phases of the literature

Phase	Publications	Percentage
1991–2000: Emergence	4	1.7%
2001–2010: Early development	22	9.3%
2011–2019: Gradual expansion	45	19.0%
2020–2025: Rapid growth	166	70.0%
Total	237	100.0%

Source: Generated by the authors using BiblioSpy® (Ahmi, 2026).

Evident from the longitudinal data plotted in Figure 2, citation totals do not move uniformly with publication volume. Several earlier years display citation peaks because influential studies had more time to diffuse, whereas the most recent publications have experienced only short citation windows. The lower citation totals for 2024 and 2025 should therefore not be interpreted as weaker quality or relevance. The combined publication and citation pattern instead suggests a transition from a small, influence-driven literature toward a larger and more diversified research domain.

Figure 2. Annual publications and citations from 1991 to 2025



Source: Generated by the authors using BiblioSpy® (Ahmi, 2026).

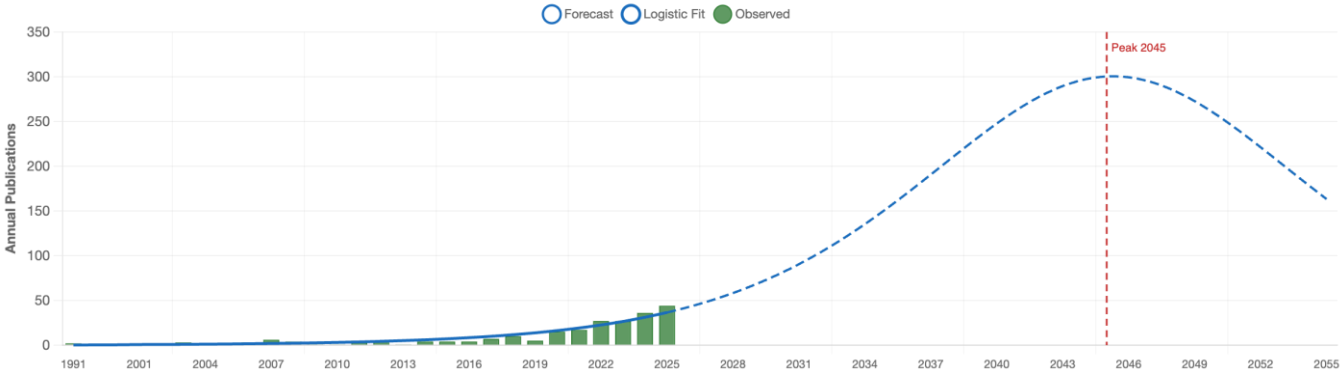
Life Cycle of Scientific Production

Observed publication output increased sharply after 2020. As shown in Figure 3, the logistic model provided an excellent in-sample fit to the cumulative publication trajectory ($R^2 = 0.986$, RMSE = 3.18, AIC = 150.3, and BIC = 154.3). The estimated saturation level was 7,110 publications, with a growth-rate parameter of b = 0.169 per year. The inflection point was estimated at 2045.3, when cumulative production is projected to reach approximately 50% of its estimated saturation level and annual publication output is projected to reach its maximum of approximately 300.5 publications per year. The transition from 10% to 90% of the estimated saturation level spans approximately 26 years, from 2032.3 to 2058.3.

These estimates indicate that the field remains in an early growth phase and has not approached saturation. Nevertheless, the projected trajectory should be interpreted as indicative rather than deterministic because it extrapolates substantially beyond the observed 1991–2025 period and remains sensitive to changes in terminology, database coverage, technological developments, and research priorities.

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Figure 3. Life cycle of annual scientific production



Source: Generated by the authors using BiblioSpy® (Ahmi, 2026).

Most Active Journals

The publication outlets demonstrate that the field spans management accounting, accounting information systems, organizational change, education, and sustainability. Table 3 reports the ten most active journals and distinguishes publication volume from citation influence.

Table 3. Most active journals

Source Title	TP	TC	NCA	NCP	C/P	C/CP	h	g	m
Journal of Accounting and Organizational Change	11	388	26	11	35.273	35.273	10	11	0.526
Qualitative Research in Accounting and Management	8	200	23	8	25	25	7	8	0.35
International Journal of Accounting Information Systems	8	1195	21	8	149.375	149.375	8	8	0.444
Issues in Accounting Education	7	77	20	6	11	12.833	5	7	0.556
European Accounting Review	5	743	9	5	148.6	148.6	5	5	0.238
Sustainability (Switzerland)	5	84	9	5	16.8	16.8	4	5	0.8
Applied Mathematics and Nonlinear Sciences	5	10	8	3	2	3.333	2	3	2
Management Accounting Research	4	440	15	4	110	110	4	4	0.114
International Journal of Accounting and Information Management	4	93	9	4	23.25	23.25	3	4	0.375
Electronics (Switzerland)	4	106	15	4	26.5	26.5	4	4	1

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 authors using BiblioSpy® (Ahmi, 2026).*

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The performance metrics detailed in Table 3 indicate that the Journal of Accounting & Organizational Change published the largest number of documents (11), while the International Journal of Accounting Information Systems generated the highest citation total (1,195) and citations per paper (149.38) among the leading sources. European Accounting Review also displayed high citation impact despite publishing only five documents. Management Accounting Research recorded 440 citations from four papers. These results locate the field across core accounting, accounting-information-systems, organizational-change, education and sustainability outlets.

Highly Cited Publications

The ten most highly cited publications summarized in Table 4 trace the field's intellectual development. ERP studies established that integrated systems create opportunities for management-accounting change but do not guarantee transformation (Granlund & Malmi, 2002; Scapens & Jazayeri, 2003). The focus later shifted toward digital information and Big Data (Bhimani & Willcocks, 2014; Warren et al., 2015), followed by analytics and professional implications (Appelbaum et al., 2017; Richins et al., 2017; Rikhardsson & Yigitbasioglu, 2018). This progression reflects cumulative expansion from enterprise integration toward data, analytical capability, decision support, and professional consequences rather than the replacement of one technological wave by another.

Table 4. Ten most highly cited publications

	Authors	Title	Source	TC	C/Y
1	Appelbaum et al. (2017)	Impact of business analytics and enterprise systems on managerial accounting	International Journal of Accounting Information Systems	409	40.9
2	Warren J.d. et al. (2015)	How big data will change accounting	Accounting Horizons	401	33.42
3	Bhimani & Willcocks (2014)	Digitisation, Big Data and the transformation of accounting information	Accounting and Business Research	373	28.69
4	Scapens & Jazayeri (2003)	ERP systems and management accounting change: opportunities or impacts? A research note	European Accounting Review	350	14.58
5	Granlund & Malmi (2002)	Moderate impact of ERPS on management accounting: A lag or permanent outcome?	Management Accounting Research	297	11.88
6	Rikhardsson & Yigitbasioglu (2018)	Business intelligence & analytics in management accounting research: Status and future focus	International Journal of Accounting Information Systems	268	29.78
7	Richins et al. (2017)	Big data analytics: Opportunity or threat for the accounting profession?	Journal of Information Systems	266	26.6
8	Elbashir et al. (2011)	The role of organizational absorptive capacity in strategic use of business intelligence to support integrated management control systems	Accounting Review	214	13.38

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9	Rom & Rohde (2007)	Management accounting and integrated information systems: A literature review	International Journal of Accounting Information Systems	196	9.8
10	Järvenpää (2007)	Making business partners: A case study on how management accounting culture was changed	European Accounting Review	195	9.75

Note: *TC = Total Citations; C/Y = Citations per Year*

Source: Generated by the authors using BiblioSpy® (Ahmi, 2026).

Leading Authors, Institutions, and Countries

Table 5 summarizes the leading authors, institutions, and countries by publication output and citation influence. Productivity is dispersed, with no single author dominating the dataset. Vărzaru was the most productive author with five publications, followed by Spraakman, Phuc, and Huy with four each. Citation influence did not mirror output: Järvenpää's three papers accumulated 297 citations and Rom's three accumulated 286, whereas the four papers by Phuc and Huy received eight citations each. Copenhagen Business School and the University of Craiova each produced five papers, while the University of Manchester recorded 542 citations from four publications.

Table 5. Leading contributors by productivity and citation influence

Unit	Leading by publication output	Citation perspective
Authors	Vărzaru (5); Spraakman, Phuc and Huy (4 each); Nielsen and six others (3 each)	Järvenpää: 297 citations from 3 papers; Rom: 286 from 3; Spraakman: 188 from 4
Institutions	Copenhagen Business School and University of Craiova (5 each); five institutions (4 each)	University of Manchester: 542 citations from 4 papers; Copenhagen Business School: 337 from 5
Countries	United States (24); China (19); Vietnam and Australia (15 each); Germany and United Kingdom (13 each)	United States: 1,602 citations; United Kingdom: 1,299; Finland: 912; Australia: 900

Source: Generated by the authors using BiblioSpy® (Ahmi, 2026).

The United States led national output with 24 publications and 1,602 citations. China ranked second by output with 19 publications, followed by Vietnam and Australia with 15 each. The United Kingdom produced 13 documents but accumulated 1,299 citations, giving it the highest citations per publication among the leading countries. Finland and Australia also achieved strong citation impact. These differences reinforce the need to evaluate output and influence separately.

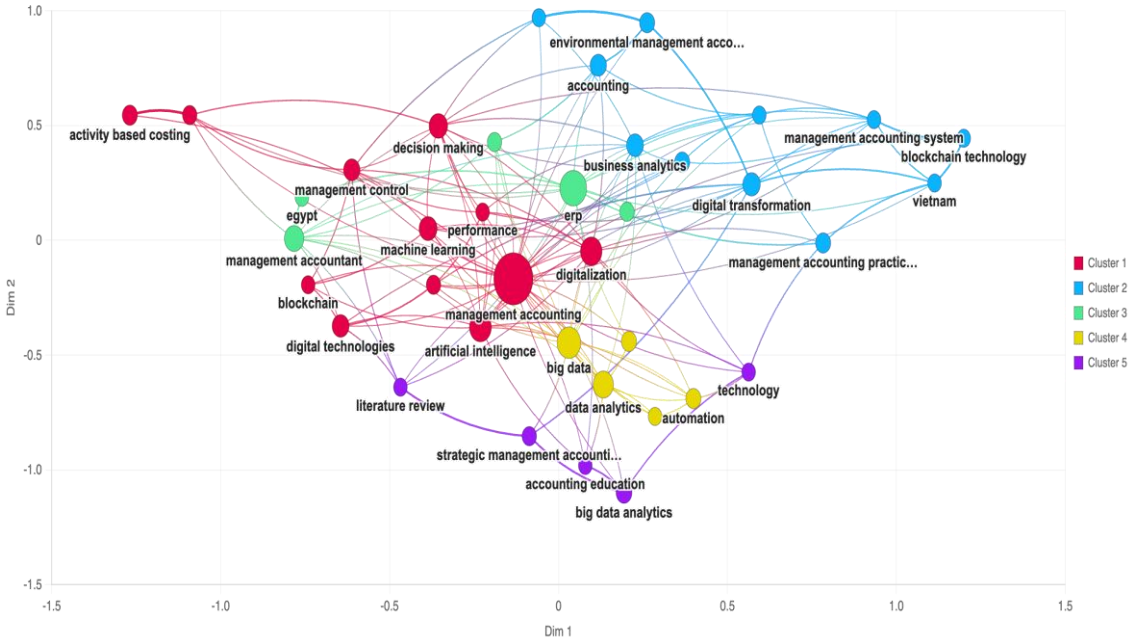
Author Keyword Analysis

Network Visualization

The author-keyword co-occurrence network in Figure 4 identifies five interconnected thematic clusters organized around management accounting. Dense cross-cluster links indicate that technologies, organizational change, professional roles, and decision support are not separate conversations. New analytical applications remain connected to earlier work on enterprise integration, management control, and established management-accounting techniques.

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Figure 4. Network visualization of author-keyword co-occurrence



Source: Generated by the authors using BiblioSpy® (Ahmi, 2026).

Cluster 1 Managerial Decision Support and Control Applications

The largest cluster centres on management accounting and links decision-making, management control, performance, activity-based costing, machine learning, artificial intelligence, digital technologies, and blockchain. It represents the operational core of the field: technologies are studied in relation to established tasks and managerial choices rather than as isolated innovations. The coexistence of activity-based costing and machine learning illustrates how traditional techniques and newer computational methods are increasingly examined within the same decision environment.

Cluster 2 Digital Transformation and Accounting Applications

The second cluster connects digital transformation, business analytics, accounting, environmental management accounting, management-accounting systems and practices, and blockchain technology. It reflects an outward expansion from internal process efficiency toward strategic, sustainability, and system-level applications. The country keyword Vietnam also indicates a visible contextual stream in which technology adoption is examined within emerging-economy settings.

Cluster 3 ERP Integration and Professional Roles

The third cluster groups ERP with management accountants and related professional and contextual terms. This cluster represents the foundational integration stream. Its connections with the other clusters demonstrate that contemporary analytics and AI depend on data architectures, routines, and professional arrangements established through earlier enterprise-system implementations. It therefore cautions against treating each technological wave as a complete replacement for its predecessor.

Cluster 4 Big Data Analytics and Automation

The fourth cluster links Big Data, data analytics, and automation. It captures the movement from data availability toward analytical capability and automated action. The cluster is central to the field's current value proposition, but it also exposes a recurring gap: access to large datasets does not guarantee reliable decisions unless organizations possess adequate data governance, technical competence, and mechanisms for integrating analytical output with managerial judgment.

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Cluster 5 Strategic Accounting Education and Knowledge Development

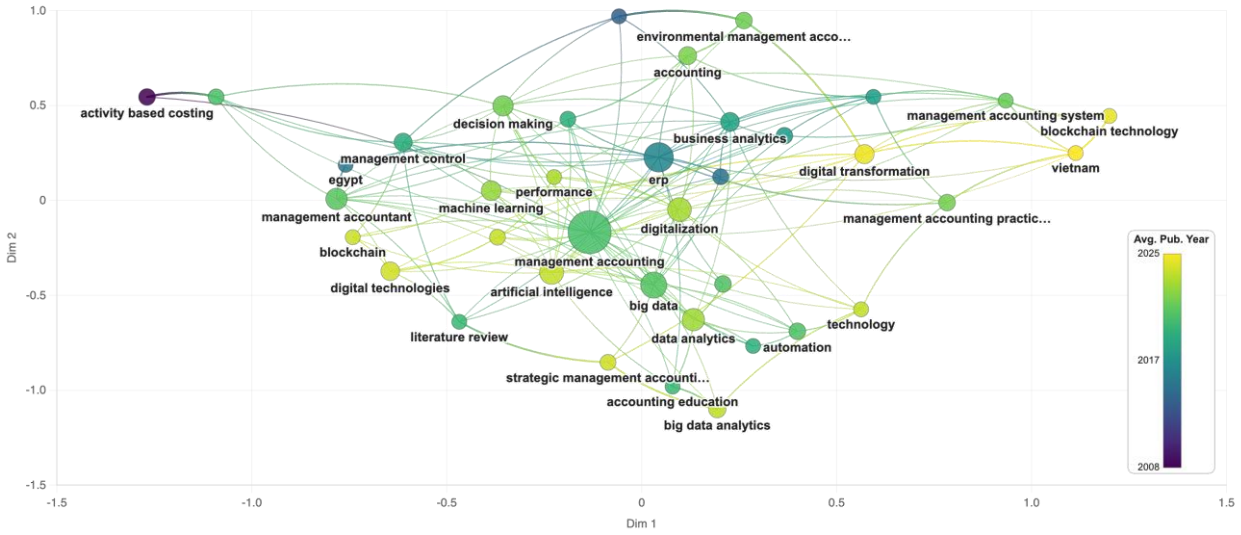
The fifth cluster connects strategic management accounting, accounting education, Big Data analytics, technology, and literature reviews. It reflects the field's attempts to translate technological change into strategic practice, professional education, and cumulative knowledge. This stream is particularly important for curriculum development because it links technical literacy with interpretation, communication, and strategic decision support.

Overlay Visualization

The temporal progression displayed in Figure 5 colours the established author keywords based on their average publication year. The colour gradient mapped in Figure 5 confirms that earlier work is associated with activity-based costing and foundational enterprise-system applications. The middle period emphasizes ERP, management control, management accountants, business analytics, and artificial intelligence. More recent topics include digital transformation, digital technologies, data analytics, blockchain technology, management-accounting systems, and strategic management accounting. This progression shows that the field is moving from questions about system adoption toward questions about analytical integration, organizational transformation, and the strategic use of digitally generated information.

The overlay should be interpreted as a pattern of attention rather than evidence that earlier topics have become obsolete. ERP, management control, and established accounting techniques remain embedded in the newer research fronts because they provide the organizational infrastructure and control logic through which emerging technologies are implemented. The field's development is therefore cumulative: new technologies expand and recombine earlier research concerns.

Figure 5. Temporal overlay visualization of author keywords



Source: Generated by the authors using BiblioSpy® (Ahmi, 2026).

DISCUSSION

From Enterprise Integration to Intelligent Decision Support

The findings show a field that has moved from enterprise integration and technique-specific applications toward data-intensive and intelligent decision support. ERP remains intellectually important because it introduced enduring questions about integration, standardization, organizational routines, and professional roles. Big Data and business analytics broadened the informational scope of management accounting, while AI, machine learning, and automation now raise the possibility of automating prediction, anomaly detection, and parts of managerial analysis. The highly cited literature nevertheless warns against technological determinism: system

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availability does not establish effective use, and analytical output does not eliminate the need for organizational judgment.

The keyword network reinforces this cumulative interpretation. The five clusters do not represent isolated technological eras. Instead, they show that management control, ERP, analytics, automation, professional education, and strategic applications are connected through a shared concern with how digital information enters organizational decisions. This explains why both foundational and recent keywords remain visible in the same conceptual structure.

Growth Fragmentation and Conceptual Consolidation

The concentration of 70% of publications in 2020-2025 demonstrates exceptional recent interest. Rapid expansion can strengthen knowledge creation, but it can also produce conceptual fragmentation when researchers use overlapping terms for related phenomena. The keyword harmonization required in this study illustrates the problem. Future studies should specify whether they examine digital transformation as an organization-wide process, a particular technology, an analytical capability, a system implementation, or a change in professional work. Clearer constructs would improve comparability and reduce the tendency to treat technology adoption as a proxy for transformation.

The distribution across journals further reflects fragmentation. High-impact contributions appear in accounting-information-systems outlets, general accounting journals, management-accounting journals, and organizational-change journals. This multidisciplinary reach is valuable, but it can create parallel conversations. Research on information-system quality (Papiorek & Hiebl, 2024), professional roles (Arkhipova et al., 2024), machine learning (Ranta et al., 2023), and ethical AI (Zhang et al., 2023) should be connected more directly with management-control mechanisms and measurable decision or performance consequences.

Table 5 shows that Vietnam was among the most productive country contexts, with 15 publications, and Vietnam also appears as a keyword in Cluster 2. Together, these patterns indicate a visible emerging-economy stream rather than a field-wide shift away from advanced economies. Recent Vietnamese studies illustrate how digital technologies may reshape management-accounting practices and how management-accounting information systems interact with digital transformation, competitive advantage, and performance (Nguyen, 2024; Nguyen & Vo, 2025). Related research on responsibility accounting further shows that institutional and organizational conditions influence the adoption of management-accounting practices (Tran & Le, 2025). These studies support comparative inquiry into how resource constraints, regulatory arrangements, and national digital agendas shape implementation and outcomes.

Implications for Theory and Practice

The findings are interpreted primarily through a socio-technical lens in which technology is embedded in data infrastructures, work routines, professional roles, controls, and institutional expectations. The five clusters support this interpretation because technical applications remain connected to management-control practices, education, organizational capabilities, and professional judgment. Complementary theories can address more specific questions: contingency theory can explain why outcomes differ across organizational environments; institutional theory can clarify how professional norms and regulatory pressures shape adoption; practice and sociomaterial perspectives can examine how accounting work and systems are configured together; and dynamic-capability theory can explain how organizations convert digital resources into repeatable analytical and decision capabilities. These theories should be matched to the level of analysis and outcome examined rather than added as generic justification.

For practice, value arises from combining reliable data, suitable technology, and management-accounting judgment. Organizations should develop data governance, analytical literacy, cross-functional collaboration, and review mechanisms alongside technology investment. Management accountants can contribute by translating financial and operational data into decision-relevant explanations, challenging model assumptions, documenting uncertainty, and ensuring that automated analyses remain aligned with organizational objectives and

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accountability requirements. These responsibilities extend rather than eliminate the profession's interpretive and control roles.

Importantly, the strategic benefits associated with digital transformation should not be interpreted as inevitable outcomes of technological investment. While advanced analytics, automation, and integrated information systems can improve the availability and processing of management accounting information, their contribution to organizational performance depends on complementary managerial capabilities, implementation conditions, and the effective utilization of analytical outputs (Elbashir et al., 2011; Rikhardsson & Yigitbasioglu, 2018; Papiorek & Hiebl, 2024). These conditions may differ considerably between large enterprises and SMEs. Large organizations may possess more extensive financial resources, specialized analytical personnel, and integrated technological infrastructures, whereas SMEs may encounter greater constraints in digital investment, technical expertise, and system integration. Consequently, the adoption of comparable digital technologies may produce different organizational outcomes across enterprise sizes and institutional contexts. This reinforces the importance of distinguishing technological adoption from effective implementation and demonstrable value creation, rather than assuming that digital transformation necessarily improves decision quality, competitiveness, or financial performance.

Professional and educational bodies should avoid defining digital competence only as software proficiency. The network's education and strategic-accounting cluster suggests a broader curriculum combining data analytics, systems thinking, ethics, communication, model evaluation, and professional scepticism. Organizations should likewise assess digital progress through data reliability, integration, user competence, actual use in decisions, and performance or accountability outcomes rather than the number of systems installed.

RECOMMENDATIONS FOR FUTURE RESEARCH

Future research should move beyond technology adoption and cross-sectional perceptions to establish whether digital transformation in management accounting produces sustained improvements in organizational performance. Longitudinal studies using multi-year panel data, objective system-utilization measures, and financial and non-financial performance indicators could investigate the relationships between digital maturity, management accounting capabilities, decision quality, organizational agility, and firm performance. Such studies should distinguish short-term implementation effects from longer-term organizational outcomes and examine whether improvements arise directly from technological capabilities or indirectly through changes in managerial practices, information quality, and organizational learning. Mixed-method longitudinal designs and field experiments could further clarify the causal mechanisms and contextual conditions influencing these relationships. This research direction would strengthen the empirical foundations of the field by moving beyond technological adoption as a proxy for successful digital transformation.

Another important research direction concerns the changing professional boundaries, occupational identities, and distribution of analytical responsibilities between management accountants, data scientists, and information technology specialists. Although digital technologies create opportunities for management accountants to assume strategic advisory roles, they may also generate professional tensions as analytical expertise and decision-support responsibilities become increasingly distributed across organizational functions. Future studies should investigate whether these developments lead to professional collaboration, role hybridization, jurisdictional competition, or the marginalization of traditional accounting expertise. Longitudinal qualitative studies, comparative organizational case studies, and sociomaterial approaches could provide insights into how professional identities, organizational power relationships, and management control practices evolve alongside technological implementation. Particular attention should be given to the competencies and organizational arrangements that enable management accountants to retain their relevance within multidisciplinary analytical environments.

The increasing incorporation of artificial intelligence and machine learning into budgeting, forecasting, resource allocation, and performance evaluation also creates a need for more systematic research on algorithmic accountability. Future studies should examine how algorithmic bias, limited model explainability, data-quality deficiencies, and cybersecurity vulnerabilities affect the reliability and legitimacy of technology-supported management accounting decisions. Future research should prioritise the development and evaluation of

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governance frameworks incorporating model validation, algorithmic transparency, human oversight, audit trails, cybersecurity safeguards, and clearly defined accountability responsibilities. Design-science research could develop and test practical governance mechanisms, while empirical studies could investigate how explainability, professional scepticism, and organizational control arrangements influence decision-makers' reliance on algorithm-generated information. Such research would help establish how organizations can balance the efficiency and predictive capabilities of intelligent technologies with the requirements of fairness, transparency, accountability, and managerial judgment.

Future research should also broaden its contextual coverage by examining digital transformation in SMEs, public-sector entities, nonprofit organizations, and other under-researched institutional settings. SMEs warrant particular attention because financial constraints, limited technical expertise, fragmented information systems, and lower levels of digital maturity may shape both the adoption and effectiveness of digital management accounting technologies. Research could investigate whether affordable cloud-based platforms, low-code/no-code applications, and modular analytical tools provide viable pathways for improving management accounting capabilities without requiring substantial technological investment. Comparative studies across enterprise sizes, industries, and national contexts could identify implementation barriers, enabling conditions, and cost-effective digital transformation strategies. For public-sector and nonprofit organizations, further research should examine how accountability requirements, regulatory arrangements, resource constraints, and public-value objectives influence digital management accounting practices. These investigations would contribute to more context-sensitive explanations of digital transformation and clarify the conditions under which technological capabilities generate organizational value.

Limitations

This study has several limitations. First, it uses Scopus only, so relevant publications indexed elsewhere may be absent. Second, the search results depend on the selected terminology, and the boundaries between management accounting, accounting information systems, and broader accounting research are not always clear. Third, citation indicators favour older publications and do not directly measure research quality. Fourth, 20 documents lacked author keywords and most lacked index keywords, so the conceptual maps do not represent every record equally. Fifth, the life-cycle model extrapolates from past publication patterns and should not be interpreted as a precise forecast. Finally, bibliometric relationships indicate patterns of attention and association rather than the substantive quality or causal findings of the underlying studies. These limitations support complementary systematic content analysis and primary empirical research.

In addition, although the bibliometric analysis identifies influential publications, conceptual relationships, and emerging research themes, it does not systematically evaluate the empirical research designs, organizational characteristics, or causal evidence reported in every underlying study. Accordingly, conclusions regarding the relative representation of SMEs and large enterprises, the prevalence of specific methodological approaches, and the effectiveness of digital technologies cannot be established directly from keyword co-occurrence and citation patterns. Future systematic reviews and qualitative content analyses could complement the present findings by examining organizational contexts, research methodologies, implementation outcomes, and governance challenges in greater depth.

CONCLUSION

This study consolidates 237 Scopus-indexed journal articles and reviews published between 1991 and 2025 to explain how digital-transformation research in management accounting has developed and to identify its emerging directions. Publication activity accelerated markedly after 2020, and the life-cycle model indicates that the field remains in an early growth phase. The intellectual structure evolved cumulatively from enterprise integration and established accounting techniques toward Big Data, analytics, automation, AI, blockchain, and wider strategic applications.

Five interconnected keyword clusters organize the field: managerial decision support and control applications; digital transformation and accounting applications; ERP integration and professional roles; Big Data analytics and automation; and strategic accounting, education, and knowledge development. The temporal overlay

confirms a movement toward digital transformation, data analytics, blockchain technology, and management-accounting systems, without displacing the foundational importance of ERP, management control, and professional judgment.

The central conclusion is that technology alone does not transform management accounting. Its organizational value depends on the interaction between technological capabilities, data quality, professional competencies, organizational routines, and governance arrangements. Although digital transformation creates opportunities for management accountants to assume more analytical and strategic responsibilities, these outcomes are contingent on organizational conditions and may be accompanied by professional displacement, role ambiguity, and increased algorithmic and cybersecurity risks. Future research should therefore prioritize longitudinal evaluations of organizational performance, interdisciplinary professional dynamics, algorithmic accountability, and context-specific implementation in SMEs and other under-researched organizations. By examining both the opportunities and constraints associated with digital transformation, scholarship can develop a more balanced and empirically grounded understanding of how emerging technologies reshape management accounting practices, professional roles, and organizational value creation.

Declarations

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Conflict of interest: The authors declare no conflict of interest.

Ethical approval: Not applicable. This bibliometric study analysed published bibliographic metadata and did not involve human participants or animals.

Data availability: The bibliographic metadata analyzed in this study were exported from Scopus. The cleaned dataset and screening decisions are available from the corresponding author upon reasonable request.

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