

ERP SYSTEMS AND AI IN THE ACCOUNTING PROFESSION: A BIBLIOMETRIC ANALYSIS

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Abstract

Enterprise Resource Planning (ERP) systems and Artificial Intelligence (AI) are revolutionizing the accounting profession, increasing efficiency, accuracy, and decision-making capabilities. This article explores the transformative impact of ERP systems and AI solutions, which serve to integrate diverse business processes, including finance, supply chain, and human resources. Centralizing data and automating routine tasks with ERP systems allows accountants to focus on strategic activities. These technologies facilitate advanced data analytics, predictive modelling, and real-time reporting, allowing accountants to gain insights from large amounts of data. The ability to analyse data in real time enables more informed decision-making, allowing businesses to capitalize on emerging opportunities. The article aims to highlight the importance of technology in modern financial practices, but also serves as a benchmark for accounting professionals to adapt and thrive in this digital age. By harnessing the power of these technologies, accountants can position themselves as strategic partners in their organizations, driving innovation and contributing to the overall success of the business. The results obtained reflect a clear trend of increasing academic interest in this topic over the past two decades, marking a paradigm shift in the way accounting functions are understood and practiced in a digitalized and increasingly automated environment.

Keywords

ERP systems, Artificial Intelligence, accounting profession, data analytics, skills, bibliometric analysis.

JEL Classification

M15, M40, M41

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Introduction

As a result of the recent digital transformations, the accounting profession has undergone massive changes in the way it operates. ERP and AI systems are revolutionizing the way organizations manage financial data, streamlining processes and ensuring compliance with evolving regulations. These systems are designed to eliminate errors caused by fragmented data streams, ensuring accuracy and improving the overall operational efficiency of the organization. AI-based tools can provide a comprehensive analysis of a large volume of financial transactions, while also flagging anomalies and potential fraud.

Thus, accounting professionals need to acquire new skills, including skills in data analysis and understanding of artificial intelligence-based tools. The connection between ERP systems and AI is a necessity for the future of the accounting profession, because as regulatory requirements become more complex, so do stakeholder expectations.

The purpose of this article is to explore the benefits, challenges and future implications of ERP systems and AI, exploring how they are redefining the role of accountants in the digital age.

1. Review of the scientific literature

The literature indicates that the accounting profession has been associated with computers and other processes in the past, so over time, the accounting profession has migrated into this area (Akher and Sultana, 2018). Management accounting assists managers in executing “*three vital activities of an organization – planning, controlling and decision-making*” (Alam and Hossain, 2021). According to Chandra and Gupta (2022), they believe that these cloud-based services offer superior accessibility compared to traditional versions. These services are storage services and analytics tools. According to Chandra and Gupta (2022), “*Cloud-based accounting is the future of accounting as it makes accounting information easily accessible to various stakeholders such as managers*”. Fettry et al. (2019) represent the benefits and costs of digitizing in accounting are represented in table no. 1.

Table no. 1. Benefits and costs of digitizing in accounting

Benefits	Cost
- Faster cycle times	- Investments required in computer hardware and software
- Broader geographic reach	- Initial need for expensive consultants
- Continuous service availability	- Costs involved in systems, processes, processing of information and report generation changes
- Reduced error rates	- Continual training or retraining needs and/or requirements for personnel with specialized skills
- Reduced accounting staff and improved productivity	- User resistance
- Better cash management	- Careful attention needs to be
- Cost savings in mail, paper and storage of paper	
- Improved audit trails and security	

	paid to security, control and audit requirements for financial transactions during the initial configuration
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Source: Deshmukh (2006, cited by Fettry et al., 2019)

The skills that accountants should have would help digitalize the tax function using the most advanced technological solutions (ERP systems and AI) (Gherman et al., 2021; Kamaraj, 2023), which increase the transparency of information for a better overview of the organization's situation. Thus, ERP systems have the role of integrating different data and complex corporate operations (Grabski et al., 2011), with *“all financial data being stored in a single database”*. The advanced AI functions that ERP systems can *“incorporate allow managers to perform complex analysis”* (Parker, 2019). Data management and information security *“become an important issue for the accounting professionals”* (Stanciu and Gheorghe, 2017).

According to Grabski et al. (2011), ERP systems are *“integrated cross-functional systems containing selectable software modules that address a wide range of operational activities in the firm, such as accounting and finance, human resources, manufacturing, sales and distribution”*. According to Kamaraj (2023), *“accounting transition to digital technology makes it possible to automatically produce financial statements and shareholders equity statements”* (Liyan, 2013; Olsen, 2019).

According to Shaffer et al. (2020), AI is defined as *synthetic intelligence or computer systems intelligence that simulates intellectual functions*. Organizations that use AI will be focused on analysing and interpreting results to match high customer requirements.

Table no. 2 presents relevant information on the development of the accounting profession according to Shaffer et al. (2020):

Table no. 2. Areas of the accounting profession

Areas of the accounting profession:	Modules	Description
Subject to re-training and professional development	Accounts Payable / Receivable and General Bookkeeping	Accountants must be trained on Optical Character Recognition (OCR) to create searchable, editable text from printed documents or handwritten texts.
	Audit / Risk Management	Accountants must be trained on cognitive technology (CT) to process data faster and more precisely than any person.
	Inventory Management	Accountants used to perform routine inventory control as a means of monitoring fixed assets.
	Accounting firm staffing	CPA firms are hiring non-accounting graduates to integrate new tools into the organization.

Areas of the accounting profession:	Modules	Description
Experiencing moderate impact	Financial Reporting	Substantial changes in financial reporting have occurred with the development of enterprise resource planning (ERP) tools used to collect, store, manage, and interpret data from business activities. An ERP system enables accountants to receive information in real-time, while improving internal decision-making.
	Tax Accounting	OCR software scans through income tax returns, which drastically decreases the amount of time spent on each return. The time available from the use of OCR software allows accountants to concentrate on more “value-added services”.
Experiencing little impact	Financial Planning	Accountants have not been impacted as much in areas of individual financial planning/investment strategy or forecasting.
	Management Accounting	The primary role of a management accountant is the interpretation of the accounting data; thus AI systems, presently, performs this function inadequately.

Source: adapted by Shaffer et al., 2020

AI is generally used for data analysis and bank fraud detection, but also for tax preparation (Zhang et al., 2020). The integration of artificial intelligence (AI) “into the field of accounting has brought about a significant transformation in the management of financial data, the generation of reports based on such data, and the overall decision-making procedures” (Ahmad, 2024).

Modern ERP (Enterprise Resource Planning) systems have *implemented AI-enabled wizards for better utilization and advanced data analysis. AI creates space for the creativity of IT users, and the interest is in process mapping, detailed analysis of selected business processes, and searching for hidden relationships in data, with subsequent interpretation of the results. IT users must have the necessary skills to solve needed activities*” (Janakova and Suchanek, 2023; Kale, 2024).

There are three pillars needed to be developed by accounting professionals: technological, data and human interaction. Incorporating the three pillars, they focus on developing cognitive skills such as "critical thinking, teamwork and communication" (Shaffer et al., 2020; Suarta et al., 2022). In the next section, the literature review presented will be analysed.

2. Research methodology

The research in this article was based on a bibliometric analysis using the VOSviewer v.1.6.18 application of the main Web of Science articles selected in January 2025 based on the keywords "ERP systems" OR "Artificial Intelligence" AND "accounting profession", resulting in a sample consisting of 5419 articles published between 2015 and 2025 (from the authors' point of view, a representative sample was selected, taking into account only recently published articles). The main reason why the authors chose only articles from the last 10 years was the massive digitalization in recent years, more precisely, after the COVID-19 pandemic, when all activities that were taking place physically had to be forced to take place online.

The structure of the selected sample presented the report that can be viewed in figure no. 1.



Figure no. 1. Article selected from Web of Science and the main indicators

Source: Web of Science, 2025

The main countries and regions of origin of the articles selected in the sample are presented in figure no. 2.

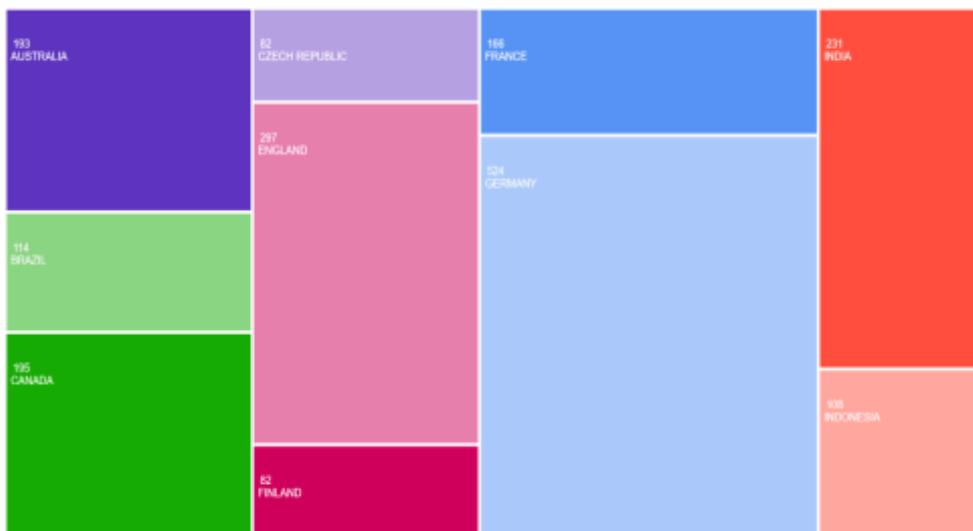


Figure no. 2. Countries and regions

Source: Web of Science, 2025

Many articles come from Germany (524 articles) and England (297 articles), as these countries have a very developed organizational culture, and a number of studies are being carried out here. The reason why so many articles have been written in Germany about ERP systems and AI is due to the high level of technological and industrial development, the strong academic ecosystem (Fraunhofer Institute, TU Munich, RWTH Aachen, Oxford, Cambridge, Imperial College London), and the strategic interest in digitalization and innovation in these countries. Germany is considered a global leader in manufacturing and automation and is the "home" of SAP - one of the world's largest ERP providers.

3. Results and discussion

By bibliometrically analysing the selected articles using the VOSviewer v.1.6.18 application (Co-occurrence - All keywords module), the following results were obtained, presented in figure no. 3.

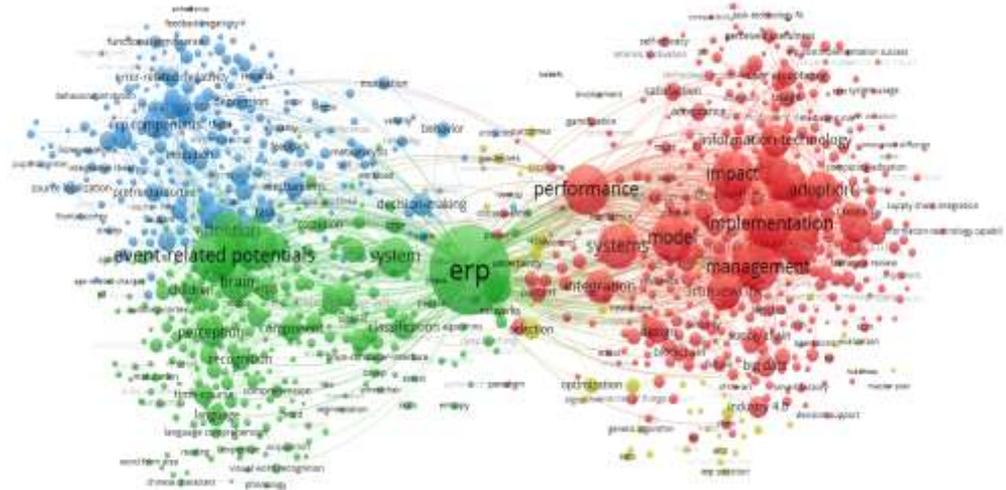


Figure no. 3. Bibliometric analysis of articles Web of Science (Co-occurrence – All keywords)

Source: Web of Science, 2025

Four clusters were identified in the 980 keywords identified in the selected Web of Science articles, and these are presented in table no. 3 and for each cluster, were represented the main ten keywords.

Table no. 3. The four clusters identified in Web of Science articles

Cluster 1 – color: red	Cluster 2 – color: green
<ul style="list-style-type: none"> - accounting education - accounting information - accounting profession - automation - behavioral intention - big data - blockchain - business performance - complexity - decision support 	<ul style="list-style-type: none"> - adaptation - attention - auditory - brain activation - communication - experience - face recognition - perception - predictability - speech perception
Cluster 3 – color: blue	Cluster 4 – color: yellow
<ul style="list-style-type: none"> - cognitive control - error negativity - feedback - prediction error - probability 	<ul style="list-style-type: none"> - aggregation operators - construction - decision making - ERP selection - evaluation

The bibliometric analysis highlights the fact that ERP systems represent the core of digital transformation in accounting, and the integration of artificial intelligence marks a significant evolutionary stage, oriented towards automation, predictive analysis and increased organizational performance. Analysis finded in this article suggests that: the accountant's role is evolving from data entry to data analysis; AI and ERP skills are becoming essential; ERP and AI contribute to error reduction, continuous auditing and predictive financial decisions.

Conclusions

This study has highlighted, through a rigorous bibliometric analysis, how ERP systems and artificial intelligence (AI) are fundamentally influencing and transforming the accounting profession, as well as how organizations manage financial processes, optimize decision-making and improve overall performance. The results obtained reflect a clear trend of increasing academic interest in this topic over the past two decades, marking a paradigm shift in the way accounting functions are understood and practiced in a digitalized and increasingly automated environment.

These systems streamline operations, reduce errors and provide valuable information to stimulate strategic growth.

ERP systems facilitate the seamless flow of data between departments, ensuring transparency and accuracy of financial reporting. However, it must be taken into account that their implementation is a complex process that requires careful planning, user training and alignment with organizational objectives. The adoption of ERP systems relies heavily on the interaction of human and technological factors, where user acceptance and proper change management become essential for success.

Artificial intelligence amplifies the capabilities of ERP systems by automating repetitive tasks, improving data analysis and enabling predictive insights, thus allowing accountants to focus their attention on higher-value activities, such as strategic decision-making.

Accountants interacting with ERP systems are subject to attention, perception and cognition processes. ERP systems are easy to use, intuitive and able to support cognitive engagement without overwhelming users. The research analysed also highlighted changes in the profile of the modern accountant, who must have strong digital skills, basic programming knowledge, but also a deep understanding of data analysis.

The results obtained show that ERP systems represent a central element in the accounting digitalization process, functioning as an essential infrastructure for the integration and exploitation of artificial intelligence-based technologies.

The results also suggest that integrating AI into ERP systems significantly contributes to increasing the efficiency of the accounting function by reducing errors, automating repetitive tasks and improving the quality of financial information. In this context, the accounting profession is in a process of profound transformation, in which digital, analytical and technological skills are becoming essential. From a practical perspective, the findings highlight the need for organizations and accounting professionals to strategically adopt AI-integrated ERP solutions to remain competitive in an increasingly digitalized economic environment.

In conclusion, the synergy between ERP systems, AI and the accounting profession represents a new era of innovation and efficiency, with ERP and AI systems no longer just an option for the accounting profession, but a necessity. These technologies not only improve operational performance but also empower accountants to evolve into strategic business partnerships. By recognizing the cognitive aspects of technology adoption and emphasizing user-centered design, organizations can increase the effectiveness of ERP systems while mitigating the challenges associated with their implementation. As AI continues to advance, its integration into ERP systems will further revolutionize the accounting profession, promoting a future where technology and human expertise work hand in hand to achieve organizational excellence.

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