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The Role of ERP Systems and of Artificial Intelligence in Auditing Organizational Sustainability and Progress

Univ. Assist. Laura-Eugenia-Lavinia BARNA,
Ph. D.,
Management Information System Department,
Researcher at Doctoral School of Accounting, Bucharest
University of Economic Studies, Romania,
e-mail: laura.barna@cig.ase.ro

Univ. Prof. Bogdan-Ştefan IONESCU, Ph. D.,
Management Information System Department, Bucharest
University of Economic Studies, Romania,
e-mail: bogdan.ionescu@cig.ase.ro

Abstract

The intersection of digital technologies and sustainability has become very important for researchers and practitioners as a result of the expansion of the phenomenon of artificial intelligence (AI) and digitalization. Integrated ERP systems and technologies based on artificial intelligence (AI) offer both operational efficiency and specific activities that support the achievement of sustainability objectives by organizations, ensuring transparency in data reporting and effectiveness in the implementation of audit processes.

The authors aimed to analyze the impact of ERP systems and artificial intelligence (AI) in sustainability auditing and how they contribute to organizational progress using a quantitative analysis method based on a bibliometric analysis focused on keywords such as: "ERP systems", "sustainability audit", "artificial intelligence" and "corporate reporting".

The results obtained by the authors emphasize the importance of digital ecosystems by using ERP system platforms that have embedded AI functionalities to considerably improve audit quality, regulatory compliance, and stimulate sustainable and responsible behavior of organizations, finding that technology can have a significant impact on the field of sustainability.

Key words: ERP systems; sustainability audit; artificial intelligence; corporate reporting;

JEL Classification: M40, M42, Q20, Q28

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Introduction

The increased focus on adopting sustainable practices by organizations has fundamentally changed the way corporate performance can be measured, audited and reported, driven by the growing interest of stakeholders (e.g. investors, regulators, consumers and society) in transparency, accountability and measurable progress against environmental, social and governance (ESG) criteria.

Data processing using ERP systems and artificial intelligence helps organizations capture, analyze and validate data to facilitate the most accurate reporting of sustainability issues while ensuring compliance with international standards and providing a complete view of the impact on the social environment. The accuracy and traceability of data processed by these systems are essential to the audit process, reducing the risk of errors as much as possible.

Tools based on artificial intelligence can identify inconsistencies and make various forecasts of the organization's future performance trends.

The aim of the article is to analyze the intersection of ERP systems, artificial intelligence and sustainability auditing using bibliometric analysis, allowing for the systematic mapping of research trends and the exploration of conceptual clusters that underlie the definition of the three concepts. The information presented in this article is useful for:

1. organizations that want to align their technology investments with sustainability strategies, mitigating risks and strengthening stakeholder trust
2. decision-makers and regulators

The article is structured as follows: a section dedicated to the specialized literature with the aim of highlighting the main bibliographic resources that deal with the same topics as the present article, a section dedicated to presenting the research method chosen by the authors, a section dedicated to analyzing the results obtained based on the analysis performed and a section dedicated to presenting the conclusions of the article.

Literature review

Research by other authors has indicated that the intersection between ERP systems and sustainability is in

continuous evolution, with particular emphasis on how ERP systems support or hinder the achievement of sustainability goals set by organizations (Chofreh, Goni, and Klemes, 2018; Chofreh et al., 2019).

Although artificial intelligence components integrated into ERP systems bring numerous benefits, costs and workforce training remain substantial obstacles (Dumitru et al., 2023).

However, the implementation of ERP systems significantly enhances the improvement of the quality and integrity of reports, but the dispersed storage of information across departments, data manipulation by the IT department could undermine audit clarity and control (Kanellou and Spathis, 2009). It should also be taken into account that artificial intelligence can allow for the identification of anomalies, the creation of summaries of voluminous documents, allowing for the cross-checking of statements with reports (Appelbaum et al., 2017; Boiral et al., 2021).

Even though artificial intelligence (AI) can significantly contribute to the well-being of employees, especially the organization in general, the environmental and societal costs that may arise must be taken into account (Kumar et al., 2024).

Authors such as Cohen (2020) and Ren (2024) confirmed in their articles that artificial intelligence (AI) allows text extraction from documents processed using ERP systems. ERP systems thus support managerial decisions and non-financial reporting with an emphasis on sustainability (Hawking and Sellitto, 2019; Kumar and Van Hillegersberg, 2021).

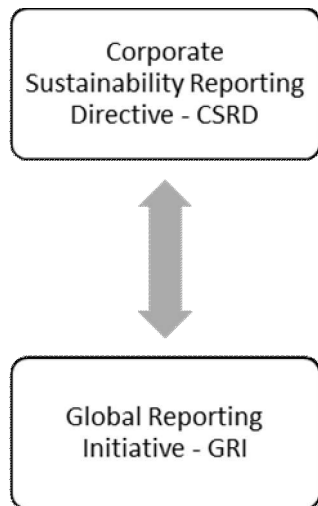
Nguyen et al. (2022) believe that the integration of artificial intelligence into ERP systems "makes predictive analysis, automation of repetitive processes and monitoring of ESG indicators in real time possible".

ERP systems constantly contribute to the collection and reporting of data related to energy consumption, carbon emissions or logistics efficiency (Molla and Abareschi, 2020). The data in these reports is essential and must be presented according to European and international regulations shown in **Figure no. 1**.

Kraus et al. (2022) consider the integration of digitalization into sustainability reporting as a condition for "competitiveness and access to international markets".

According to Appelbaum et al. (2020), separating the collaboration between accounting professionals and IT experts would make it difficult to implement an effective sustainability audit.

Figure no. 1. European and international regulations



Source: La Torre et al., 2020

However, the authors of this article recommend that organizations form multidisciplinary teams that understand both accounting logic and the mechanisms of AI and ERP technologies, which indicates the transformation of academic curricula in the field of accounting and auditing to allow the development of new digital skills.

Research methodology

This article aims to use a quantitative research method focused on bibliometric analysis, with the aim of investigating the role of ERP systems and artificial intelligence in accounting and auditing, tracking organizational progress. The role of bibliometric analysis is to map the intellectual structure of a field or area of research, identifying emerging trends and quantifying scientific productivity.

Figure no. 2. Web of Science categories in which the selected articles are published



Source: Web of Science, 2025

The selection of Web of Science articles was carried out on August 26, 2025 based on the keywords "ERP systems", "sustainability audit", "artificial intelligence" and "corporate reporting", returning 17,390 articles. The results obtained were refined using the logical operators

AND and OR over a time interval between 2015 and 2025. The reason for choosing this interval was the massive and rapid expansion with which ERP systems and artificial intelligence have developed in relation to sustainability. The Web of Science categories in which the selected

Cluster 4 Color: Yellow 42 elements	Cluster 5 Color: Purple 2 elements	Cluster 6 Color: Turquoise 1 element
<ul style="list-style-type: none"> integrated reporting assurance GRI environmental disclosures 	<ul style="list-style-type: none"> heterogeneity quantile regression 	<ul style="list-style-type: none"> Thailand

Source: Authors' contribution, 2025

Cluster 1 (red) focuses on the topic of “Corporate Responsibility and Sustainability”, indicating that the implementation of ERP systems and artificial intelligence are supporting tools to provide transparent and valid data.

Cluster 2 (green) presents concise information on “Corporate Governance and Financial Management”, more precisely focusing on how processed data is managed and reported. Thus, the integration of ERP systems and artificial intelligence in an organization automates financial flows, reducing as much as possible the risk of manipulation of accounting information.

Cluster 3 (blue) focuses on “Determinants and Governance Structures”, where ERP systems and artificial intelligence are considered essential determinants that ensure organizational progress and compliance with accounting legislation and auditing.

Cluster 4 (yellow) considers the development of the concepts of “Integrated Reporting and International Standards”, verifying how these technologies (ERP systems and artificial intelligence) automate reporting so that it is carried out in accordance with international standards, allowing for the reduction of costs and errors.

Cluster 5 (purple) addresses “Statistical and methodological models” indicating the main models of advanced quantitative analysis in studying sustainability, such as heterogeneity and quantile regression.

Cluster 6 (turquoise) focuses on regional differences in the adoption of ERP systems and artificial intelligence in sustainability reporting.

However, if we were to consider the keywords in **Figure no. 4**, the authors consider the red cluster to be focused on the relationship between social responsibility and organizational performance. The green cluster indicates the relationship between corporate governance and information asymmetry in accounting and reporting studies, and the merger with the blue cluster suggests increased attention to be paid to the structure of boards of directors.

The authors state that corporate governance and auditing reduce opportunistic behaviors as much as possible, limiting the manipulation of financial results.

According to **Figure no. 5**, the green cluster indicates the maturity of the research addressed on corporate governance with the aim of protecting investors, limiting opportunistic behaviors as much as possible.

Conclusions

This article aims to analyze how ERP systems and artificial intelligence contribute to improving the sustainability audit process, so as to enable organizational progress. The results obtained from the research highlighted two essential relationships: *sustainability – corporate social responsibility* and *corporate governance – financial performance management*, which responds to regulatory pressures, stakeholder requirements, as well as accelerated technological development.

As mentioned in this article, ERP systems and artificial intelligence are decision-making support tools due to the accuracy, completeness and transparency of data. Thus, the risks of erroneous reporting are diminished, while increasing the trust of stakeholders in the information published by organizations.

The authors identified in the literature that artificial intelligence is considered a catalyst for transformation (e.g., automation of repetitive processes, generation of predictive insights) in order to identify risks and support decision-making within organizations, but also to develop responsible behavior by integrating ESG principles into the organization's strategy.

The main limitations of this article are that it focuses on existing literature, highlighting the current state of research. Therefore, further studies should be conducted to reveal the effectiveness of ERP systems and artificial intelligence in sustainability auditing for organizations.

References

1. Appelbaum, D., Kogan, A., & Vasarhelyi, M. A. (2017). Big Data and Analytics in the Modern Audit Engagement: Research Needs. *Auditing: A Journal of Practice & Theory*, 36(4), 1–27
2. Appelbaum, D., Kogan, A., Vasarhelyi, M. A., & Yan, Z. (2020). Impact of business analytics and enterprise systems on managerial accounting. *International Journal of Accounting Information Systems*, 25, 29–44.
3. Boiral, O., Heras-Saizarbitoria, I., & Brotherton, M.-C. (2021). Sustainability assurance practices: A systematic review. *Sustainability*, 13, 1–24.
4. Chofreh, A.G.; Goni, F.A.; Malik, M.N.; Khan, H. (2019). Evaluation of the Sustainable Enterprise Resource Planning Implementation Steps, *Chemical Engineering Transactions*, 72, pp. 445-450, DOI:10.3303/CET1972075
5. Chofreh, A.G.; Goni, F.A; Klemes, J. (2018). Sustainable enterprise resource planning systems implementation: A framework development, *Journal of Cleaner Production*, 198(1), DOI:10.1016/j.jclepro.2018.07.096
6. Cohen, W. (2020). Analyzing Sustainability Reports Using NLP (ClimateQA). *NeurIPS 2020 CCAI Workshop*.
7. Dumitru, V.F.; Ionescu, B.Ș.; Rîndașu, S.M.; Barna, L.E.L. (2023). Implications for Sustainability Accounting and Reporting in the Context of the Automation-Driven Evolution of ERP Systems, *Electronics*, 12(8), DOI:10.3390/electronics12081819
8. Hawking, P., & Sellitto, C. (2019). The role of ERP systems in sustainability. *Journal of Enterprise Information Management*, 32(5), 856–874.
9. Kanellou, A.; Spathis, C. (2009). ERP Systems and Auditing: a Review, *ICESAL Conference*
10. Kraus, S., Durst, S., Ferreira, J. J., Veiga, P., & Kailer, N. (2022). Digital transformation in business and management research: An overview of the current status quo. *International Journal of Information Management*, 63, 102466.
11. Kumar, A.N.P.; Bogner, J.; Funke, M.; Lago, P. (2024). Balancing Progress and Responsibility: A Synthesis of Sustainability Trade-Offs of AI-Based Systems, *IEEE, 18th International Conference on Software Architecture Companion*, DOI: 10.1109/ICSA-C63560.2024.00045
12. Kumar, K., & van Hillegersberg, J. (2021). ERP systems in the digital age: Challenges and opportunities. *Information Systems Journal*, 31(1), 65–90.
13. La Torre, M., Sabelfeld, S., Blomkvist, M., Tarquinio, L., & Dumay, J. (2020). Harmonizing nonfinancial reporting regulation: CSR and sustainability standards. *Accounting, Auditing & Accountability Journal*, 33(4), 785–809.
14. Molla, A., & Abareshi, A. (2020). Organizational green IT: Review and framework. *Information Systems Frontiers*, 22(3), 695–711.
15. Nguyen, T., Ngo, L. V., & Ruël, H. (2022). Integrating AI into ERP systems: Opportunities and challenges. *Information Systems Frontiers*, 24(2), 345–364.
16. Ren, X. (2024). NLP pipelines for ESG audit. *IJCAI*.