



Digital Transformation, Artificial Intelligence & Sustainability in Management and Economics: A Bibliometric Analysis with VOSviewer Mapping

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ABSTRACT: This study examines the interconnection between digital transformation, artificial intelligence and sustainability in the field of management and economics, through bibliometric analysis with the VOSviewer software. Data were extracted from the Scopus database using keywords that reflected the three main themes, covering the period from 2014-2025. A total of 153 publications were analysed, categorised into five clusters: climate change, economic development, artificial intelligence, data analysis, and digital inventory management. The results indicate a significant increase in scientific interest over recent years, accompanied by the emergence of technological innovation as a key factor in sustainable economic progress. The study contributes to the understanding of contemporary research trends and highlights the need for further investigation into topics such as the ethics of AI, digital equality and green development.

KEYWORDS: Digital Transformation, Artificial Intelligence, Bibliometric Analysis, Sustainability.

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Introduction

Digital transformation, artificial intelligence (AI) and sustainability are three fundamental and interconnected forces that are radically reshaping the field of management and economics. In the modern era, the integration of digital technologies into business and economic processes is no longer an option, but a necessity for the survival and competitiveness of organisations. Technological progress, combined with the increasing social and institutional pressure for sustainable development, is shaping a new paradigm in decision-making, strategic management and policy formulation.

Digital Transformation refers to the widespread adoption of innovative technologies, such as big data, the Internet of Things (IoT), cloud computing and data analytics systems, to improve efficiency, transparency and value offered to stakeholders. At the same time, artificial intelligence, through machine learning and pattern analysis algorithms, enhances the predictive, automated and adaptive capabilities of businesses, allowing them to make more informed and rapid decisions. These technologies are not just changing the tools of management and financial analysis; they are transforming the very framework within which organisations operate.

The sustainability dimension provides a crucial ethical and strategic orientation to this transition. Businesses and economies are being called upon to align their development with environmental, social, and governance (ESG) objectives, creating value not only for shareholders but also for society as a whole. AI and digital technology can act as catalysts for sustainable development, providing tools for measurement, forecasting, and resource optimisation, as well as enhancing transparency and accountability (Papanikolaou et al., 2025).

However, the coexistence of these three dimensions also raises challenges. Issues such as digital inequality, AI ethics, data protection and the need for green infrastructure require careful analysis and regulation. Exploring the interactions between digital transformation, artificial intelligence, and sustainability, therefore, offers a fertile field for research in management and economics to develop models that combine technological innovation with social responsibility and the long-term resilience of systems (Sklavos et al., 2024).

Research Aim

The purpose of this research is to investigate the relationship between digital transformation, artificial intelligence, and sustainability in the fields of management and economics through a bibliometric analysis. The study aims to identify research trends, thematic overlaps, and emerging areas of interest in the international literature, highlighting the role of technological innovation in sustainable development. Furthermore, it aims to identify research gaps and potential directions for future studies, contributing to the understanding of how digitalisation is transforming modern economic and administrative models.

Research Results

The use of VOSviewer software requires data that can be retrieved from indexing services, such as Scopus and Web of Science. In this application of the VOSviewer software, data retrieved from the Scopus indexing service were used. The keywords used were "Digital Transformation", "Artificial Intelligence", "Sustainability", "Management", and "Economics" to identify them in the titles, abstracts,

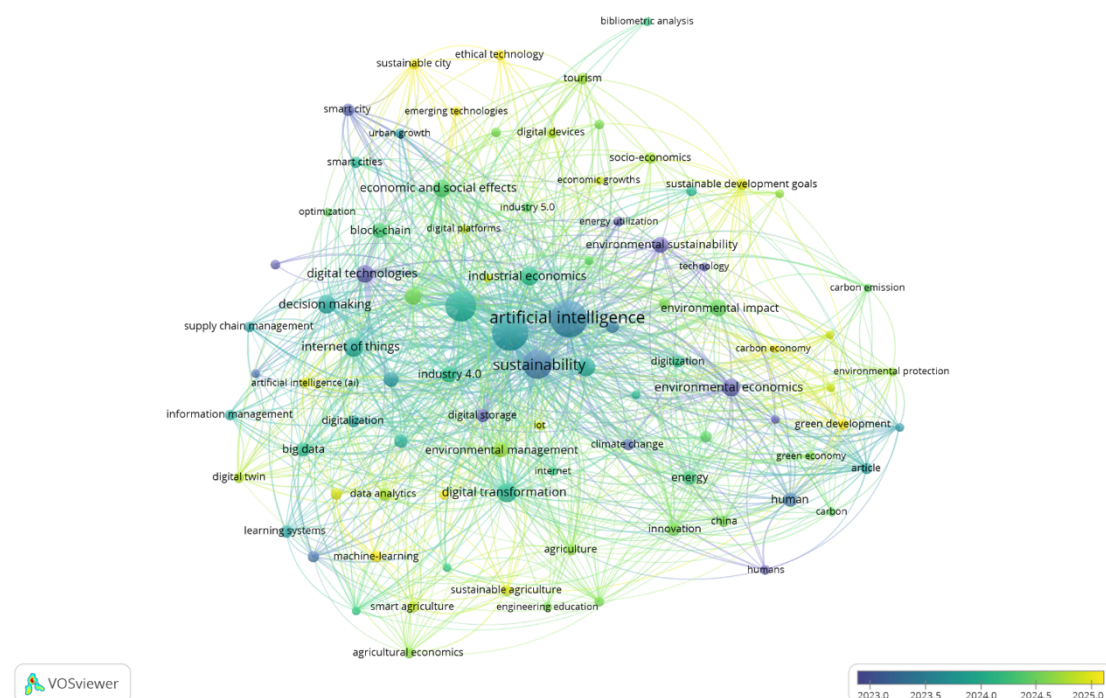
and keywords of the corresponding publications. The search was conducted without any time limit across the entire search range of this platform (Papanikolaou et al., 2025).

A total of 153 publications were extracted from the Scopus database for the search period 2014 to 2025. Over the last five years, 136 publications were identified, compared to the period from 2014 to 2020, when only 17 were recorded, indicating an exponential increase in scientific interest in the field. Using the VOSviewer software, five clusters were created based on the categorisation of the keywords of the publications. Cluster 1 includes words related to climate change and sustainable development, indicating a close connection between technological innovations and environmental goals. Cluster 2 encompasses issues related to economic development and business strategy, with a focus on the role of digitalisation in enhancing productivity and competitiveness. Cluster 3 is related to artificial intelligence, highlighting its applications in decision-making, automation and data management. Cluster 4 focuses on data analysis and big data, which are key tools for understanding and optimising business processes. Finally, cluster 5 concerns digital inventory and supply chain management, reflecting the importance of information technologies in business efficiency.

The analysis of the above clusters reveals that research interest is increasingly converging on the interconnection between digital innovation and sustainable economic development. Through bibliometric mapping, VOSviewer allows the capture of scientific trends and thematic overlaps, offering a valuable tool for investigating the evolution of the field and identifying potential research gaps.

Figure 1

Overlay map of keyword co-occurrence over time for papers published



Conclusions

This bibliometric analysis highlighted the rapid growth of scientific research linking digital transformation, artificial intelligence and sustainability in the field of management and economics. The significant increase in the number of publications over the last five years demonstrates the growing importance of digital technologies as a lever for sustainable development and economic resilience. Cluster analysis using VOSviewer revealed a multidimensional thematic structure, where artificial intelligence, data analysis, and digital management are inextricably linked to issues of environmental policy, corporate strategy, and economic efficiency.

The results confirm that digital innovation is not just a technological tool, but a strategic factor in transforming business and economic practices towards more sustainable and responsible operating models. At the same time, the increasing coexistence of issues related to climate change, data analysis and artificial intelligence indicates the emergence of a new scientific field, in which digitalisation acts as a connecting link between technological progress and sustainability.

However, the analysis also highlights research gaps related to the ethics of AI, the social dimension of digital inequality and the adoption of green technologies in developing economies. Future research can delve deeper into the interactions of these fields, combining quantitative and qualitative approaches. Overall, this study contributes to the understanding of the evolving relationship between technology, economics and sustainability, providing a framework for strategic planning and policies that promote a more digitally mature and sustainable economy.

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