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Editorial: Sustainability of digital transformation for the environment

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Editorial on the Research Topic

Sustainability of digital transformation for the environment

Digital transition and green transition are two major simultaneous processes unfolding today. Both of them play a key role in transforming the development paradigm. In our previous publications, digital transformation was interpreted as “the process of a system transition of the industry from one technological mode to another through the large-scale use of digital and ICT in order to increase its efficiency and competitiveness significantly” (Akberdina et al., 2023a). It is also noteworthy that sustainability, green economy, circular economy, and environmental, social, and governance (ESG) concepts are also an integral part of the new paradigm positively affecting the economy of companies, regions, and countries focusing on how low-carbon, resource-efficient, and socially inclusive economy can improve human wellbeing and provide social justice while reducing environmental threats and resource scarcity. While digitalization enhances productivity, reduces energy intensity, and stimulates economic growth, digital technologies utilize big data that increases energy consumption and digital equipment. Subsequently, natural environment damage occurs with production, maintenance, and disposal. Considering this imperative need to open up a scientific discussion, our Research Topic “Sustainability of Digital Transformation for the Environment” includes fifteen articles that are pictorially depicted in the form of a keyword cloud in Figure 1.

Five papers addressed the challenges of *assessing the influence of digital transformation on sustainability in countries and regions*.

Among them, researchers from Northwest Normal University, Key Laboratory of Resource Environment and Sustainable Development of Oasis, and Lanzhou University investigated the interregional and intersectoral interactions of the digital economy in China. Self-generating ability in the digital industry sector was the most significant and influential factor in the industrial growth of China’s digital economy, followed by the interrelated effect between industry sectors. Contrarily, the inter-industry feedback effect weakly affects the economic system (Ma et al.).

Researchers from Huaqiao University and Minnan Normal University demonstrated the prevailing role of digital industrialization in the low-carbon development in the manufacturing industry (Lyu et al.). These authors claimed that digital transformation

Researchers from Dhurakij Pundit University and Lanzhou University examined whether the digitalization of enterprises could promote corporate green innovation (Fan et al.) and concluded that digital transformation encourages corporate green innovation by easing corporate financing constraints and enhancing corporate awareness through a high perception of social responsibility. Green innovation can be further promoted not only through corporate digitalization but also through the human capital of other high-tech companies, as stated by researchers from Qingdao University (Li et al.).

The topic of corporate governance was the research focus on three articles, devoted to the digitalization effect on corporate goals, namely ESG and corporate social responsibility (CSR).

The asymmetric effect between executive compensation stickiness (ECS) and ESG goals has encouraged executives to improve the ESG indices through digital transformation activities, as denoted by researchers from Hangzhou City University and Pingdingshan University (Chen et al.).

CSR, digital transformation, and innovation performance were jointly examined, and the results revealed that CSR positively moderates the role of digital transformation in innovation performance and that there is a time lag effect on the innovation performance (both product and process innovation performance), as demonstrated by researchers from Hangzhou City University and Pingdingshan University (Wang and Yan).

Fu and Li from the School of Urban Economics and Management and Beijing University of Civil Engineering and Architecture investigated whether ESG affects corporate financial performance and whether this relationship is moderated by digital transformation. They showed that ESG positively and significantly affects corporate financial performance and digital transformation drives this promoting effect. The authors also proved that the positive effect of current ESG on financial performance in the lag period will gradually weaken.

The topics of agriculture development amid digitalization with a special emphasis on behavioral aspects were the research objectives of two more publications. Indeed, the empirical evaluation of ethical practices and digitalization of the agricultural system was employed in the case of Pakistan by researchers from Zhejiang University while defining the ethical practices (knowledge-sharing, trustworthiness in loan providing, loyalty in professionalism, responsibility of actions, and accountability) that primarily affected the digitalization development of the agricultural system (Manzoor et al.).

Wang and Dong from the Institute of Land Engineering and Technology utilized agricultural digital services to investigate farmers' behavior based on the rural revitalization strategy and verified the dominant digital-use behavior factors, such as adoption intention and facility conditions. Performance expectation, social influence, and data quality were important pre-factors affecting farmers' behavior.

Digital transformation is a rapidly transforming and adaptable tool for the environment and sustainability, though it also involves

challenges that are both complementary and convergent to each other. Among them is the digital transformation industry (DTI) that is extended to a plethora of applications, including those in the hospitality industry and "smart" cities, focusing on responding to environmental concerns about industrial innovations (Kyriakopoulos, 2023) and rethinking policies for clean energy supply that are scrutinized by decision-makers or policymakers who are looking at the potential of smart technologies (like that of Industry 4.0) in creating a green economy (Saraji et al., 2021). All these applications showed that digital transformation can play a decisive role in other, rather than purely environmental, contexts of everyday living like socialization, micro- and macro-economy, as well as the circular economy (Kyriakopoulos et al., 2019), and entrepreneurship issues (Kyriakopoulos, 2023). The proposals and the future prospects voiced in our Research Topic and the adoption of appropriate policy measures should be predominately focused on the following:

- Synchronising the digital and green transitions is more of a positive nature.
- Coordinating the digital and green transitions toward a sustainable and prosperous future.
- Identifying challenges and employing integrated methodological-managerial tools for a sustainable digital transformation.

Author contributions

VA: investigation, conceptualization, data curation, formal analysis, methodology, project administration, visualization, writing—original draft, and writing—review. EK: investigation, data curation, formal analysis, project administration, writing—original draft, and writing—review and editing. GK: investigation, supervision, validation, writing—original draft, and writing—review and editing. VK: investigation, supervision, validation, writing—review and editing.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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