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Editorial: Low carbon behavior management and digitalization challenges and opportunities

Shiyong Zheng*,[1], Mengling Ding*,[2], Shah Fahad[3], Muhammad Hafeez[4] and Xiaoguang Yue[5]

[1]College of Digital Economics, Nanning University, Nanning, Guangxi, China, [2]School of Business, Guilin University of Electronic Technology, Guilin, Guangxi, China, [3]Management School of Hainan University, Haikou, Hainan, China, [4]School of Business, University of Agriculture, Faisalabad, Faisalabad, Pakistan, [5]School of Business, European University Cyprus, Engomi, Cyprus

Editorial on the Research Topic
Low carbon behavior management and digitalization challenges and opportunities

1 Introduction

At present, the world is undergoing major changes unseen in a century, the international environment is becoming increasingly complex, and the process of globalization and international cooperation are facing huge uncertainties. In the past 40 years of reform and opening up, seizing the opportunity of global industrial manufacturing has brought 100 trillion GDP to China, and will also bring high energy consumption and high pollution to China. Achieving the goal of low-carbon behavior management will help safeguard national energy security, help economic development get rid of resource dependence, and strengthen innovation-driven. The combination of low-carbon behavior management and digital economy is an inevitable choice for China's development under the severe situation of global energy and environmental problems. The digital economy is a new economic form after the agricultural economy and the industrial economy, and all industries and fields will involve digital development and become part of the digital economy. The "14th Five-Year Plan" for the development of the digital economy proposes that "by 2025, the added value of the core industries of the digital economy will account for 10% of GDP," and the digital economy will move towards a period of comprehensive expansion, and looking forward to 2035, the digital economy will become prosperous and mature, and will contribute another 100 trillion GDP to the developing China. The digital economy is an inevitable choice to achieve the second centenary goal and the great rejuvenation of the Chinese nation.

In the report of the 20th National Congress of the Communist Party of China, General Secretary Xi Jinping pointed out: "Promoting green and low-carbon economic and social development is the key to achieving high-quality development. "This is a major judgment based on the strategic deployment of accelerating the green

transformation of the development mode and the essential requirements of building a Chinese-style modernization in which man and nature coexist in harmony. From the perspective of China's economic development, China's digital economy is in a stage of rapid development, and digital transformation is accelerating and entering a new stage of in-depth development, as shown in the figure below. Therefore, it is particularly important to realize the close integration of low-carbon behavior management and digital economy.

Based on the development practice of the combination of low-carbon and digitalization, this research covers agricultural production, environmental protection, social media platforms, companies and enterprises, and social economy.

2 Overview of the Research Topic

2.1 Digitalization, resource misallocation and low-carbon agricultural production: evidence from China

In terms of agricultural production, with the rapid development of digital technologies such as artificial intelligence, big data, and cloud computing, China's agricultural production is entering a new era characterized by digitalization. Based on China's provincial panel data from 2013 to 2020 (Ran et al., 2023), this paper systematically examines the impact of digitalization on low-carbon agricultural production from the perspective of resource misallocation by using systematic GMM and mediating effect models. The results show that digitalization can significantly inhibit agricultural carbon emissions, thereby promoting low-carbon agricultural production, and this finding still holds true after the robustness test. The heterogeneity analysis shows that the inhibitory effect of digitalization on agricultural carbon emissions is most obvious in the eastern region, and further mechanism analysis shows that digitalization can reduce agricultural carbon emissions by correcting the common misallocation of capital and labor in the agricultural factor market. The findings of this study provide important policy recommendations for low-carbon agricultural production in China (Cai et al., 2021).

2.2 A cost-effective o-toulidine-based Schiff base as an efficient sorbent for metal ion uptake from aqueous and soil samples: synthesis, antimicrobial, and acute toxicity analyses

Heavy metals can cause toxic effects on human health and the environment. They are one of the most common environmental pollutants and are partially released from two sources (natural and man-made). Heavy metals accumulate, deposition and distribute at extremely high rates in natural ecosystems such as water and soil, and affect all species of organisms. Therefore, the practical application and development of low-cost adsorbent materials to remove heavy metals from ecosystems is a global problem. The aim of this study was to find a low-cost ligand that has the potential to adsorb heavy metals from water and soil samples and has biological potential. For this purpose, a Schiff base, dimeric o-toluidine (SBL), was synthesized by condensation, characterized by spectroscopic analysis, and its biological activity was determined. Through the study of adsorbed metal particles in soil, environmental pollution can be greatly reduced and contribute to the development of low-carbon behavior.

2.3 Moving towards carbon neutral lifestyle through FinTech social media platform: a case study of ant forest

This paper adopts an integrated new theoretical framework to explore the mechanisms behind how social mobile applications (i.e., ant forests) change people's long-term behaviors towards low-carbon lifestyles. The rest of this article will cover the theoretical background and the development of hypotheses. For the empirical analysis, a mixed approach was used, including surveys and semi-structured interviews with Ant Forest users, to collect primary data. The results of this study are expected to provide valuable insights into the development of carbon-neutral lifestyles, provide a reference for future research on the impact of social mobile applications on lifestyle choices, and provide inspiration for businesses and governments seeking to achieve a low-carbon society.

2.4 The effect of digitalization transformation on greenwashing of Chinese listed companies: an analysis from the dual perspectives of resource-based view and legitimacy

This paper first puts the digital transformation of enterprises and corporate greenwashing behavior in the same analytical framework, studies the role of digital transformation in inhibiting corporate greenwashing behavior from the perspective of building and improving corporate ESG practice capabilities, reveals the non-economic impact of digital transformation on corporate greenwashing behavior, expands the research ideas of corporate ESG concept in the era of digital economy, and provides a new perspective for enterprises to improve their social responsibility. Secondly, this paper reveals the mechanism of enterprise digital transformation to inhibit corporate greenwashing from three channels: external legitimacy pressure, redundant resources and government subsidies, and opens the black box of causal relationship between enterprise digital transformation and corporate greenwashing to a certain extent, which has certain practical significance. Thirdly, starting from the two sub-indicators of symbolic behavior and substantive behavior of greenwashing, the role of enterprise digital transformation in inhibiting greenwashing behavior is investigated, which provides an empirical basis for further promoting the high-quality development of enterprises. Therefore, it is necessary to conduct in-depth research on the impact of DIT on greening, whether it is based on practical problems or theoretical research gaps (Jun et al., 2022).

2.5 Thriving in uncertainty: examining the relationship between perceived environmental uncertainty and corporate eco-innovation through the lens of dynamic capabilities

The impact of objective environmental uncertainty on entrepreneurs' decision-making needs to be realized by influencing entrepreneurs' perception of uncertainty, which means that uncertainty about the environment is a deeper factor affecting the strategic adjustment of enterprises. This study examines the impact of PEU on SME entrepreneurs' eco-innovation activities, and investigates the moderating effect of government intervention (government subsidies and government official visits) on this relationship. Our study, based on a sample of 2,733 SMEs in the 2016 CPES, provides strong evidence that perceived environmental uncertainty has a significant positive impact on eco-innovation. In addition, this paper also finds that the positive correlation between PEU and eco-innovation of entrepreneurs is strengthened by government subsidies or official visits. The dynamic capabilities of enterprises are essential to overcome environmental uncertainty and drive eco-innovation, enabling them to identify opportunities and threats in the external environment, effectively mobilize internal and external resources to seize opportunities, and constantly adapt their strategies to the changing environment. The conclusions of this paper are of great significance for how enterprises and governments can cooperate to achieve low-carbon development in an uncertain environment.

2.6 Examining the role of digitalization and gig economy in achieving a low carbon society: an empirical study across nations

By examining the international relationship between digitalization, the gig economy, and low-carbon development, this paper concludes that the impact of digitalization on the gig economy varies by income level, showing a positive correlation in high-income countries and a negative correlation in low-income countries. In addition, the gig economy has a significant negative impact on greenhouse gas emissions, especially CO_2 emissions, suggesting that the growth of the gig economy may help reduce emissions and facilitate the transition to a low-carbon society, and the gig economy also plays a mediating role between digitalization and low-carbon development. These findings have important policy implications for governments and stakeholders seeking to drive sustainable development and transition to a low-carbon society. Policymakers should consider supporting the gig economy and digitalization by

taking steps to improve access to technology, upgrade digital skills, and create an enabling regulatory environment. In addition, targeted policies and incentives for low-carbon practices in the gig economy, such as tax breaks or subsidies for the use of energy-efficient technologies or the promotion of renewable energy, can encourage the adoption of sustainable practices and contribute to global efforts to mitigate climate change.

3 Conclusion

It can be seen that digital development plays an important role in low-carbon behavior management, and in order to build a low-carbon future, it is of great significance to actively respond to the report of the 20th National Congress of the Communist Party of China to "promote carbon reduction, pollution reduction, green expansion, growth, promote ecological priority, conservation and intensification, and green and low-carbon development." Through the application of digital technology, enterprises, countries and society as a whole can better quantify, monitor and manage carbon emissions, achieve efficient use of energy and resources, and provide new challenges and opportunities for low-carbon behavior management. Carbon neutrality will depend on digitalization, and digitalization will help the development of low-carbon behaviors, and we have no choice.

Author contributions

SZ: Writing–original draft. MD: Writing–original draft. SF: Writing–review and editing. MH: Writing–review and editing. XY: 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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