

The Impact of Digitalization on Sustainable Economic Development

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Abstract: This article explores the profound impact of digitalization on sustainable economic development. It delves into the transformative power of digital technologies, backed by statistical evidence, in driving efficiency, innovation, and inclusivity. The article highlights key areas such as enhanced productivity, green innovation, job creation, financial inclusion, supply chain transparency, circular economy promotion, and collaborative knowledge sharing. By analyzing relevant statistics and case studies, we uncover the immense potential of digitalization to foster sustainable economic growth and pave the way for a greener, more inclusive future.

Keywords: Digitalization, Sustainable economic development, Efficiency and productivity, Green innovation, Financial inclusion, Supply chain transparency, Circular economy, Collaboration and knowledge sharing, Technology adoption, Globalization, Research and development, Technological advancement, Emerging economies, ICT (Information and Communication Technology), MSMEs (Micro, Small, and Medium-sized Enterprises).

In recent years, digitalization has revolutionized the way we live and work. The widespread adoption of digital technologies has had a profound impact on various aspects of our society, including sustainable economic development. As countries strive to build a greener and more inclusive future, the integration of digital tools and technologies has emerged as a powerful catalyst for achieving sustainable growth. In this article, we will explore the significant impact of digitalization on sustainable economic development, supported by relevant statistics.

Enhancing Efficiency and Productivity:

Digitalization has transformed the way businesses operate, leading to increased efficiency and productivity. According to a study conducted by the McKinsey Global Institute, the adoption of digital technologies could contribute to a potential economic impact of \$13 trillion by 2030. This increase in productivity is driven by automation, streamlined processes, and the ability to leverage data for informed decision-making.

Enabling Green Innovation:

Digital technologies have opened up new avenues for green innovation and sustainability. For instance, the Internet of Things (IoT) allows for the creation of smart grids and intelligent energy management systems, reducing energy consumption and carbon emissions. A report by the Global e-Sustainability

283	ISSN 2576-5973 (online), Published by "Global Research Network LLC" under Volume: 6 Issue: 5 in May-2023 https://globalresearchnetwork.us/index.php/ajebm
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Initiative (GeSI) suggests that IoT applications could enable energy savings of up to 15% by 2030, equivalent to 10.7 billion tons of CO2 emissions.

Fostering Entrepreneurship and Job Creation:

Digitalization has paved the way for entrepreneurship and job creation, particularly in emerging economies. According to the International Finance Corporation (IFC), digital startups have the potential to create 10-45 million jobs by 2030, with a significant impact on poverty reduction. The rise of digital platforms and e-commerce has also enabled small and medium-sized enterprises (SMEs) to access global markets, fostering economic inclusivity.

Improving Access to Financial Services:

Digitalization has played a pivotal role in expanding access to financial services, especially in underserved regions. The World Bank estimates that there are approximately 1.7 billion unbanked individuals worldwide, with limited access to financial resources. However, the emergence of digital payment systems and mobile banking has provided opportunities for financial inclusion. In Sub-Saharan Africa, for example, mobile money services have reached over 50% of the adult population, promoting economic empowerment and resilience.

Enhancing Supply Chain Transparency:

The digitalization of supply chains has brought about increased transparency and traceability, crucial elements for sustainable economic development. Blockchain technology, in particular, has the potential to revolutionize supply chains by providing immutable records of transactions and product origins. This transparency enables consumers to make informed choices, encouraging sustainable consumption and responsible business practices.

Promoting Circular Economy:

Digitalization has also facilitated the transition to a circular economy, which aims to minimize waste and maximize resource efficiency. Through data analytics and machine learning, companies can optimize their resource consumption, reduce waste generation, and improve recycling processes. The Ellen MacArthur Foundation estimates that the circular economy could generate \$4.5 trillion in economic benefits by 2030, creating new business opportunities while reducing environmental impact.

Strengthening Collaboration and Knowledge Sharing:

Digital platforms have revolutionized collaboration and knowledge sharing among businesses, governments, and civil society organizations. Open data initiatives and online platforms enable stakeholders to access and share information, fostering innovation and collaboration towards sustainable development goals. The World Economic Forum reports that digital collaboration could unlock \$100 trillion in value for society and industry over the next decade.

Digitalization is set as an accelerating engine of economic growth. Together with the innovation process and information society, it is the fundament of the digital economy (Li et al., 2020). It boosts economic growth in both developed and developing economies, thus representing a sector of the economy that provides breakthrough opportunities in the global market for all economies worldwide (Myovella et al., 2020). As such, governments should accelerate it (Nair et al., 2020). Adopting digital technology is not always simple for companies since investments in digital innovation are high and depend on the technology domain; therefore, the role of financial institutions like banks is fundamental in supporting digital progression (Yuan et al., 2021). Gerschenkron (1962) has even formed a special name "backwardness" advantage for developing countries that are prone to achieve greater benefits of adopting

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technology that is produced in developed economies than developed countries by itself due to their readiness to risk as well as lower path dependencies based on earlier developments in the economy. The main reason for increased competition is that digital technology is shaping new global trends in the markets through changing the transaction costs on both supply and demand-side, bringing potentially very positive benefits for developing nations (Abeliansky & Hilbert, 2017).

Institutional economists have argued that the most essential precondition for developing countries is the quality of the institutions of a country (Acemoglu et al., 2005). Improving the institutions will therefore remove many barriers for international competition and stimulate export, especially in the digital sphere. Recent discoveries report that national export is primarily affected by the level of productivity that is constrained by both technological prosperity and technological transfer and by the strength of the national economy (Cieřlik & Parteka, 2021). Digital technology expands markets across international borders and provides new online channels of distribution (Glocker & Piribauer, 2021).

In developed economies, investments in research and development are an essential source of technology and achieve a strong impact on decisions about engaging in export (Sharma, 2018). Other authors have studied the effects that globalization has on technology adoption, especially digital, and concluded that this phenomenon fosters technology transfers and spillovers (Skare & Soriano, 2021). The process of globalization shapes the global trend of competitiveness. According to the Solow model, the rising standard of life can only be explained by advances in technology. Recent growth models identify technical improvement as a critical determinant in economic growth (Mentsiev et al., 2020).

In contrast to the Solow growth model, which considers technology to be exogenous, a new growth model has arisen that considers technological advancement to be endogenous. Furthermore, it is said that modern technology rates affect not just expansion and development of the economy but also results like the average lifes-pan, democratic levels, health-related consequences, rates of poverty, and literacy. Many economists and scholars have concentrated on examining the influence of digitalization on the outputs of advanced and emerging nations as a result of the tremendous global advancement of technology in the previous three decades (Aleksandrova et al., 2022). According to the literature on technological innovation, it plays a critical role in fostering economic development in both developed and developing countries. Technological advancements contribute to economic development through meeting demand for digital items, including communication tools, software, and computers, and increasing productivity and investment in hi-tech industries. The relative pricing of high-tech equipment in rich countries may be falling more quickly than in underdeveloped countries, as the more hi-tech investment may lead to learning economies. Developed countries profit more economically from investment in technological innovation than emerging countries. In OECD countries, internet use promotes financial development and trade openness (Habibi and Zabardast, 2020).

Although digitization is a fast-evolving field of national interest—particularly in emerging economies with both benefits and drawbacks, scientists disagree on the direction of their perspectives (Filipiaket al., 2020). The appearance of new technology is the first sign of a shift in economic systems. The evolution of tourism research trends has revealed that the search for economic development determinants in the tourism sector has shifted. There is a pressing need to investigate the influence of a variety of factors on economic growth in emerging countries, together with the advent of industrialization and the development of society, environmental degradation, and macroeconomic determinants that swiftly impact sustainable economic development (Maiti and Kayal, 2017; Vyshnevskyi et al., 2020). Habibi and Zabardast (2020) explore the influence of ICT and education on economic development in the Middle East countries and the OECD economies. The results imply that information and communication technology is positively related to economic growth in both countries.

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Aleksandrova et al. (2022) use a three-pronged approach to examine the effect of digitalization on economic development. They find that the macroenvironment and population preparation for digital transformation does not allow digital technologies to impact economic growth rates significantly. According to Maiti and Kayal (2017), the services industry and MSME divisions, two of India's most vibrant and high-potential growth segments, are both significantly impacted by digitization, because digitization improves MSMEs' performance and helps them overcome financial barriers by providing alternative financing options. Shibata (2021) argues that digitization can enhance working environments and contribute to more stable growth in Japan because it has resulted in deskilling, dispersion of labor responsibilities, a digital gap, labor intensification, and increased workplace surveillance.

Brodny and Tutak (2022) demonstrate an approach introduced to investigate the degree of digitalization and use of innovative technologies among EU firms. The authors show how the EU countries differ greatly in terms of digitalization. Boikova et al. (2021) confirm that the most important factors are macroeconomic stability, R&D, digitalization, foreign direct investment, and trade openness, which are the significant contributions of competitiveness indicators to economic development in EU countries. Nevertheless, Vyshnevskiy et al. (2020) indicate that the level of economic digitalization in the EU countries at the current stage of technological and institutional development has no significant impact on economic growth. Therefore, we formulate the following hypothesis: Digitalization has a significant role in enhancing sustainability.

In conclusion, digitalization has had a profound impact on sustainable economic development. From enhancing efficiency and productivity to promoting green innovation and inclusivity, digital technologies have become indispensable tools for building a more sustainable future. The statistics presented above highlight the potential economic and environmental benefits that can be achieved through the integration of digital tools and strategies. As we continue to harness the power of digitalization, it is crucial to prioritize its responsible and equitable implementation to ensure a sustainable and prosperous future for all.

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