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Mapping the Evolution of the Digital Economy During the COVID-19 Pandemic and in the Post-COVID-19 Period: A Bibliometric Analysis

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Abstract: The rapid adoption of digital technology due to the COVID-19 pandemic has transformed the global economy and underscored the essential role of the digital economy in promoting resilience and economic growth. This study analyzes the transformation of the digital economy during the COVID-19 pandemic (2019–2022) and in the post-COVID-19 period (2023–2024), focusing on key issues such as e-commerce, digital finance, technological innovation, and their associated social and environmental impacts. Using a bibliometric approach, 31 peer-reviewed articles published between 2019 and 2024 were analyzed to identify research trends, thematic developments, and knowledge gaps. Findings indicate that during the COVID-19 pandemic, digital platforms played a vital role in maintaining economic activities amid mobility restrictions. In the post-COVID-19 period, the digital economy has emerged as a key driver of economic recovery, with financial technology (fintech) and sustainability as dominant themes. Nevertheless, persistent challenges—such as the digital divide, data privacy concerns, and uneven regulatory frameworks—hinder inclusive digital transformation. These findings have implications for digital policy formulation, emphasizing the need for equitable access, regulatory harmonization, and investment in human capital. The study suggests that policies should focus on investing in digital infrastructure, making digital tools accessible to everyone, and creating clear rules to support a more inclusive, sustainable, and resilient digital environment. These strategic efforts require ensuring the broad distribution of digitalization benefits and their contribution to long-term socio-economic development.

Keywords: digital economy; COVID-19 pandemic; post-COVID-19 recovery; sustainability; bibliometric analysis
JEL Classification: O33; O35; Q01; H12; C89

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Introduction

Worldwide, the COVID-19 pandemic has had devastating effects since its onset in late 2019 (Barai & Dhar, 2024; Khan et al., 2020), resulting in countless deaths and immense suffering. These disastrous results were a direct consequence of the COVID-19 pandemic during 2019–2022. Evidently, not even the most prosperous countries were prepared to handle the enormous health problems produced by this disaster, which triggered the worst economic crisis since the Great Depression (Tausch, 2021). The crisis did not result in the complete cessation of all activity, despite the great difficulties that were encountered. Amankwah-Amoah et al. (2021) and Brem et al. (2021) both found that advancements in digital

technology allowed many individuals to stay connected and conduct their business remotely. Their perseverance effectively managed the health, social, and economic disturbances that the pandemic generated (Buheji et al., 2020; Clemente-Suárez et al., 2021).

The pandemic disproportionately impacted vulnerable groups, both within and across nations, revealing the importance of digital infrastructure in maintaining economic and social functions. Individuals and institutions with access to digital resources could operate remotely, perform transactions, and access essential services (Datta & Nwankpa, 2021). Organizations, governments, and societies that embraced digitalization demonstrated greater adaptability and resilience, accelerating the adoption of digital technologies (Dubey et al., 2023; Ngoc-Vinh et al., 2022; Santos et al., 2023). As conventional economic activities contracted, digital sectors such as e-commerce and remote services expanded rapidly, signaling a paradigm shift in global economic practices (Potluri & Thomas, 2022; Ricky et al., 2022).

The notion of the "digital economy," introduced by Don Tapscott in 1995, emphasizes that the networks of human interaction enabled by digital technologies are just as vital as the technologies themselves in shaping economic dynamics (Savastano et al., 2024; Shakeyev et al., 2021). This concept encompasses the application of internet-based systems and cutting-edge innovations—such as artificial intelligence (AI) and blockchain—to revolutionize industries, boost efficiency, and generate new streams of economic value (Carlsson, 2004; Berman, 2012; Dong & McIntyre, 2014). One of the core pillars of the digital economy is e-commerce, which supports digital trade through platforms that include business-to-business (B2B), business-to-consumer (B2C), and consumer-to-consumer (C2C) models (Mohdhar & Shaalan, 2021; Chukurna et al., 2024; Mostafa et al., 2025). The significant surge in e-commerce during the COVID-19 pandemic highlights the decisive role of digital transformation in stimulating demand, fostering innovation, and enabling entrepreneurial activity—even amidst global disruptions.

More broadly, digital infrastructure—including broadband internet, data centers, cloud computing, and wireless networks—serves as the backbone of the digital economy (Das, 2024; Du & Wang, 2024). It enables access to digital services across education, finance, health care, and government sectors, improving service delivery and efficiency (Youssef, 2022). As nations increasingly integrate these systems into their economies, digital infrastructure becomes critical for technological advancement, equitable access, and long-term economic competitiveness.

In the post-COVID-19 period, the digital economy has also played a pivotal role in enabling economic recovery, defined as the rebound phase following a downturn and typically characterized by GDP growth, job creation, and increased consumer confidence (Barthélémy et al., 2020). Digital technologies—through innovations in remote work, fintech, and digital commerce—have supported business continuity and public service delivery (Wang et al., 2023). Digital infrastructure has catalyzed recovery in developing regions, enabling previously underserved populations to engage in the formal economy (Alsebai, 2025).

In this context, economic resilience becomes a key policy and analytical concept. It refers to an economy's ability to withstand, adapt to, and recover from external shocks—such as financial crises or pandemics—through diversification, innovation, and robust governance systems (Akhyar & Rahmi, 2024; Martin & Sunley, 2020). The intersection of economic resilience and digital transformation suggests that digital economies may be inherently more capable of managing crises and facilitating inclusive, sustainable recovery.

Although research has explored various aspects of digital transformation—such as the expansion of e-commerce, the rise of fintech, and the role of ICT in development—studies that systematically map the evolution of the digital economy in the context of global crises remain scarce. Most analyses are case-specific or thematic in scope, lacking an integrated understanding of how digital economy components interact to influence economic resilience, recovery, and sustainability.

Zhang et al. (2022) investigated the impact of the digital economy on economic growth in Belt and Road countries using panel regression and the GTAP model. Their study found that the digital economy positively influences growth by promoting industrial upgrading and employment restructuring. However, the benefits are uneven, with some countries experiencing gains. In contrast, others face challenges, highlighting the need to address the digital divide in the post-COVID-19 era. Explored the impact of the COVID-19 pandemic on the sharing economy (SE), focusing on key sectors such as accommodation and transport. Using content analysis of various media sources, the study examined how SE stakeholders—firms, providers, customers, and regulators—responded to challenges like job loss, income decline, cancellations, and safety concerns. The findings highlight critical themes and suggest future research directions to better understand the resilience and adaptation strategies of the SE during crises.

While numerous studies have explored the digital economy during the COVID-19 pandemic, few have systematically mapped the thematic evolution and emerging research clusters using bibliometric techniques. Existing literature often focuses on specific sectors or case studies without comprehensively analyzing trends and gaps. To fill this research gap, the present study applies a bibliometric approach to peer-reviewed publications from 2019 to 2024 to uncover dominant themes, emerging trends, and key areas of inquiry within the digital economy literature. What sets this study apart is its focus on temporal differentiation—between the COVID-19 pandemic and the post-COVID-19 period—which enables a more nuanced analysis of how research priorities in digital transformation have evolved over time.

Although scholarly interest in the digital economy amid the COVID-19 crisis has grown considerably, bibliometric analyses that systematically track its evolution—particularly across the pandemic and post-pandemic periods—remain scarce. Existing research often concentrates on individual sectors, localized case studies, or conceptual discussions, lacking an integrated, longitudinal, and data-driven overview of the broader research landscape. This study addresses that gap by employing bibliometric methods to analyze peer-reviewed publications from 2019 to 2024, aiming to identify major thematic clusters,

prevailing trends, and key research trajectories. The analysis offers insights into how digital economy research evolved during the pandemic and continues to shape post-COVID-19 economic development, primarily through resilience, inclusion, and sustainability frameworks.

This study's main contribution is offering a comprehensive and visualized understanding of digital economy research trends in times of crisis. It provides theoretical contributions to the literature by integrating economic resilience and digital infrastructure concepts within a pandemic and post-pandemic context. Practically, the study offers strategic insights for policymakers and stakeholders aiming to foster inclusive and sustainable digital ecosystems. This research introduces the idea that mapping digital economy research can guide innovative policies and investments that build more resilient societies.

Research Method

Bibliometric Review Steps

This study explores how research on the digital economy evolved during the COVID-19 pandemic (2019–2022) and in the post-COVID-19 period (2023–2024) by applying a bibliometric analysis approach. As a quantitative technique, bibliometric analysis systematically examines metadata to uncover knowledge patterns, dominant research themes, and scholarly collaboration trends within a field (Farooq, 2024). By measuring indicators such as citation frequency, keyword occurrence, and co-authorship, this method enables a broad and integrative understanding of a topic's intellectual landscape—offering deeper insights than traditional literature reviews (Donthu et al., 2021; Wahid et al., 2022).

In alignment with the study's objective—to map the evolution of digital economy research and its implications for economic resilience—this research follows the four-step bibliometric framework outlined by Obrenovic et al. (2024): (1) defining research objectives based on identified gaps in the literature; (2) selecting appropriate analytical methods and tools; (3) retrieving relevant bibliographic records from major databases; and (4) analyzing and visualizing the data to extract insights and propose practical recommendations.

Bibliometric analysis is particularly effective in identifying publication patterns, dominant keywords, institutional collaborations, and emerging research themes. This study applies VOSviewer software to perform keyword mapping and clustering to explore the evolving discourse on the digital economy and economic development across the COVID-19 timeline. Visualizing keyword co-occurrence provides insights into the relationships among frequently studied topics. At the same time, clustering reveals dominant thematic areas and the interconnection of key variables.

Through this approach, the study contributes to the literature by providing an integrated and visual understanding of how digital economy research has developed in response to

a global crisis, thus bridging existing knowledge gaps and supporting practical decision-making for future economic resilience and digital transformation.

Data Collection

The data collection process was carried out in October 2024 and structured into three stages: identification, analysis and visualization, and synthesis for results and discussion. This multi-stage process ensures methodological rigor and transparency in addressing the research objectives.

Stage One: Identification

Bibliographic data were primarily retrieved using Publish or Perish, which extracted records from Google Scholar. This tool was chosen due to its broad coverage of peer-reviewed literature and ability to generate detailed metadata such as authorship, institutional affiliations, and citation counts (Stefanis et al., 2022).

The search strategy targeted the “Article Title, Abstract, and Keywords” (TITLE-ABS-KEY) fields using the following terms: “Digital Economy”, “Economic Development”, “During-COVID-19”, and “Post-COVID-19.”

To ensure the relevance and academic quality of the results, the following inclusion criteria were applied:

- Only peer-reviewed journal articles (Paul et al., 2021),
- Publication years limited to 2022–2024,
- Language limited to English.

The final query string applied in Publish or Perish (Google Scholar) was:

- TITLE-ABS-KEY ("Digital Economy") AND
- TITLE-ABS-KEY ("Economic Development") AND
- TITLE-ABS-KEY ("During-COVID-19") AND
- TITLE-ABS-KEY ("Post-COVID-19") AND
- (LIMIT-TO (PUBYEAR, 2022) OR LIMIT-TO (PUBYEAR, 2024)) AND
- (LIMIT-TO (DOCTYPE, "ar")) AND
- (LIMIT-TO (LANGUAGE, "English"))

This search yielded 31 relevant articles exported in CSV format for bibliometric analysis.

Stage Two: Analysis and Visualization

The study was executed using VOSviewer version 1.6.17, a program commonly used to create and visualize bibliometric networks (Bukar et al., 2023). Yu et al. (2020) stated that keyword co-occurrence analysis, the VOSviewer feature, can help find essential research subjects, organize relevant publications, and map scientific collaboration between institutions and across countries.

Co-occurrence analysis examines how frequently specific keywords appeared across the dataset. This technique helps to uncover thematic patterns in the literature, illustrating which areas of the digital economy have been most actively explored in the context of economic development during the COVID-19 pandemic and in the post-COVID-19 period (Klarin, 2024).

Stage Three: Results and Discussion

In the final stage, keyword clustering, publication mapping, and institutional/country-level collaboration results were synthesized to generate meaningful insights. These findings form the basis for answering the study's research questions and drawing implications for theory and practice.

The findings emphasize the digital economy's role in strengthening economic resilience, particularly through digital infrastructure and innovation advancements. They also reveal ongoing challenges, including disparities in digital access and inconsistencies in regulatory frameworks. Based on these insights, the discussion proposes actionable strategies for policymakers and development stakeholders to foster inclusive and sustainable digital transformation in the post-COVID-19 period.

Result and Discussion

During the COVID-19 Pandemic (2019–2022)

Publication by Country

From 2019 to 2022, the digital economy emerged as a significant driver of economic growth, especially as countries faced disruptions from the COVID-19 pandemic. As nations dealt with trade restrictions and shifts in consumer behavior, the adoption of digital tools, remote work solutions, and e-commerce platforms accelerated markedly. Consequently, the digital economy became a critical mechanism for resilience and recovery, fostering technological innovation, enabling new business models, and transforming industries to adapt to evolving economic landscapes during the COVID-19 pandemic. As traditional sectors contracted under pandemic pressure, digitalization offered alternative pathways for growth and stabilization.

The publication trends illustrated in Figure 1 show how different countries engaged in scholarly research concerning the digital economy's role in economic expansion during the pandemic. Russia, marked in red, leads with ten publications, indicating a concentrated academic interest in the topic. China and Ukraine, represented in pink and green with two publications each, also show emerging engagement, albeit on a smaller scale. Azerbaijan and the Czech Republic, shown in yellow and orange, contributed one publication each. This distribution reflects national priorities, technological capacities, and policy focus regarding digital transformation during the health crisis.

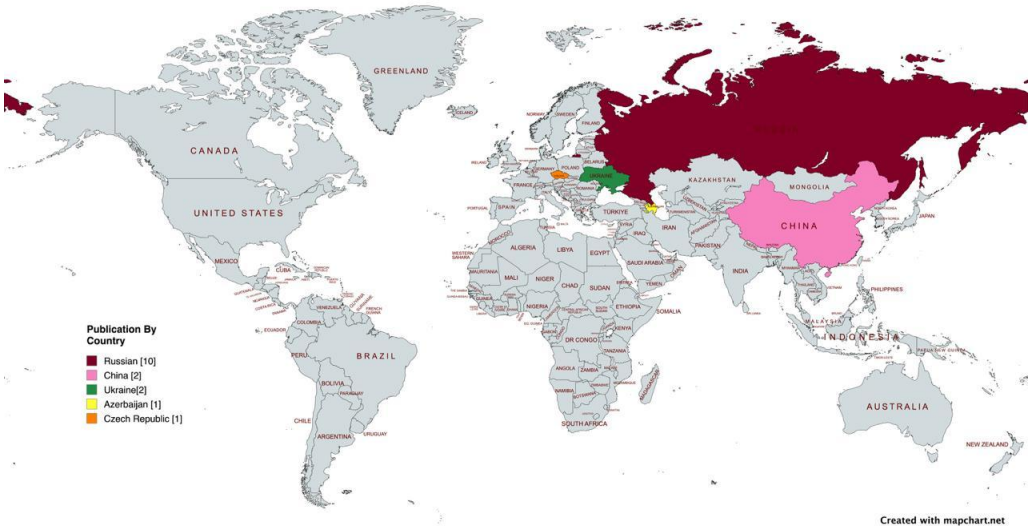

Figure 1 Publication by Country

Analysis of Keywords

There has been a notable surge in studies examining the digital economy's impact on economic development since the onset of the pandemic. As illustrated by the keyword mapping, the 2019–2021 research period was dominated by themes such as "economic and social impacts," "digital components," and "digital indices." Simultaneously, concepts like "cloud computing" and "innovation" gained traction as essential elements of digital strategies.

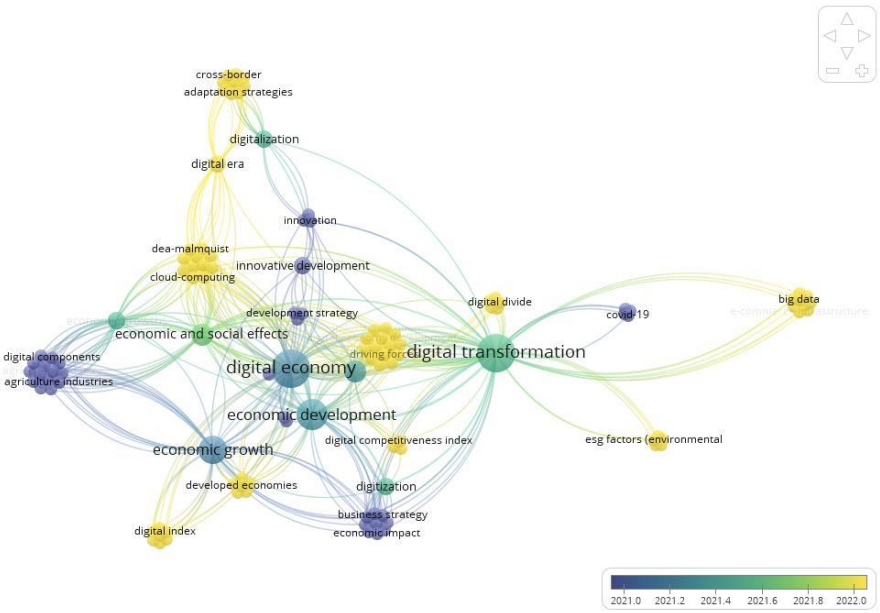

Figure 2 Analysis of Keywords

By 2022, research focus shifted towards more nuanced and targeted issues, including the "digital gap," "COVID-19," "big data," and "ESG factors (environmental, social, and governance)." This shift highlights a maturation in research priorities, from broad exploration to more specific challenges and opportunities within the digital transformation process. It underscores the adaptability of research agendas in response to global disruptions.

The Most Cited Publications

Table 1 shows that these highly cited works include four articles and one conference paper, indicating diverse publication types contributing to influential academic discussions. One of the most cited studies is that of Xue et al. (2022), which focuses on how China's energy consumption habits and structure have been impacted by the growth of the digital economy. The study examines the digital economy's short-term and long-term impacts on energy consumption. It analyzes various pathways, including economic development, efficient energy use, and technological advances in the industrial sector. Xue et al.'s research not only enhances understanding of energy consumption dynamics in the context of digitalization but also offers insights into how digital transformation can support energy efficiency and encourage shifts toward a more sustainable industrial structure in China. This in-depth analysis contributes significantly to energy policy and sustainability discussions in the rapidly evolving digital economy era.

Table 1 The Information of Top 5 Cited Publications

Rank	Authors	Title	Year	Type	Citation
1	Xue Y., Tang C., Wu H., Liu J., Hao Y.	The emerging driving force of energy consumption in China: Does digital economy development matter?	2022	Article	189
2	Garnov A.P., Garnova V.Y., Shabaltina L.V., Begishev I.R., Panferova L.V.	New opportunities for the digital economy: The implementation of an effective state innovation policy	2020	Article	20
3	Borovkov A., Rozhdestvenski y O., Pavlova E., Glazunov A., Savichev K.	Key barriers of digital transformation of the high-technology manufacturing: An evaluation method	2021	Article	18
4	Timchuk O.G., Evloeva M.V.	Difficulties in transforming the construction industry under the digital economy	2020	Conference Paper	10
5	Bessonova E., Battalov R.	Digitalization as a tool for innovative economic development	2021	Article	8

The Digital Economy's Impact on Economic Development During the COVID-19 Pandemic

Based on the keyword clustering and publication mapping results, several central themes emerged in the literature during the pandemic period. The COVID-19 pandemic acted as a powerful catalyst for accelerating digital transformation across the globe, significantly influencing patterns of economic activity. With mobility restrictions and limited physical interaction, businesses and societies were compelled to transition rapidly toward digital platforms to ensure continuity of operations (Ganichev & Koshovets, 2021). The digital economy, encompassing online transactions, remote work arrangements, and digital learning, became indispensable in sustaining economic functions (Kaftan et al., 2023). This shift stimulated the expansion of sectors such as e-commerce and digital services, positioning the digital economy as a cornerstone for economic resilience and recovery during the COVID-19 pandemic.

Bibliometric analysis of relevant studies shows key trends related to the impact of digitalization on economic development. Garnov et al. (2020) explore the digital transformation of the economy, addressing both its theoretical and practical dimensions while considering economic trends and political laws. The study highlights the need to align digital economy capabilities with population needs, noting that while digital transformation fosters development and progress, it also brings negative consequences, making its implementation complex. It examines the opportunities for Russia's digital economy within the Strategy for the Development of the Information Society. It offers insights on how Russia can model its regional innovation policies based on international best practices. Additionally, the research identifies growth-limiting factors in Russia's economy. It suggests creating a framework for effectively leveraging domestic technologies to manage the digital economy.

The association between digital transformation and economic development is investigated by Borovkov et al. (2021), with particular emphasis on the transition to the digital economy and its impact on sustainable development and quality of life. Despite government support, digital adoption remains slow across industries. The research evaluates readiness for adopting digital and advanced manufacturing technologies at both the industrial and organizational levels. The study finds low readiness at the industrial level (2.18 average score across industries). It focuses on developing a method for evaluating barriers to digital transformation at the organizational level. A new evaluation method, tested in two large industrial companies, identifies substantial barriers, particularly in the machine-building sector, supporting the effectiveness of the developed method.

Timchuk and Evloeva (2020) examine the evolution of the construction sector within the context of the digital economy, emphasizing the role of scientific potential, long-term innovation plans, and the adaptation of management systems. The study explores the structural elements of the construction industry and the digitalization process, identifying challenges and competencies needed for employees to thrive in the digital economy. The

research concludes that a shift to the digital economy is vital for the industry's competitiveness and future success.

Bessonova and Battalov (2020) discuss the strategic significance of digitalization in fostering innovation, economic growth, and competitiveness. Their study emphasizes the crucial function of digital technologies in enhancing interactions between the state, businesses, and society, facilitating large-scale processes that accelerate innovation. The authors suggest a model of inventive development based on digitalization. They investigate opportunities, dangers, and restrictions, focusing on the difficulties posed by the pandemic in 2020.

Despite these advancements, the COVID-19 pandemic further highlighted the digital gaps, especially among developing countries, where disparities in obtaining digital infrastructure and technology skills hinder full participation in the digital economy. This gap slows economic development in underdeveloped areas, exacerbating inequality and limiting digitalization's potential for growth (Raihan et al., 2024). While the digital economy contributes positively to development, its success depends on equitable access to technology, provided by both governments and the private sector.

The pandemic has also spurred innovation across sectors, with businesses incorporating data-driven solutions such as big data and AI to improve operational efficiency while adjusting to rapidly evolving consumer needs (Sharma et al., 2022; Sheng et al., 2021). This trend will likely continue post-pandemic, as the digital economy lays the foundation for sustainable development. To maximize this potential, governments must implement regulations that support technological development while ensuring data security and privacy.

Post-COVID-19 Period (2023–2024)

Publication by Country

In the post-COVID-19 period (2023–2024), the digital economy holds an ever-growing significance in supporting global economic recovery. While traditional sectors are still struggling to recover, the digital economy demonstrates resilience and flexibility, helping to accelerate economic growth. During this time, research increasingly highlights how digital technologies can overcome various economic barriers that emerged due to the pandemic. Multiple themes, including technological advancements in business, the application of financial technology (fintech), and the increasing role of e-commerce and digital platforms, have become key topics in many recent studies.

Figure 3 Publication by Country

The digital economy in post-COVID-19 research is seen as a new foundation for innovation and efficiency. Digital technologies across various sectors create new opportunities that enhance market access, facilitate cross-border transactions, and support broader financial inclusion, particularly in areas with limited access to traditional services. Additionally, e-commerce and digital platforms have become key drivers that help small and medium-sized enterprises (SMEs) survive and even thrive amid significant consumer patterns and preferences shifts.

Research conducted during this period not only assesses the short-term gains of the digital economy but also investigates its enduring role in shaping more resilient economic systems. Fundamentally, the digital economy acts as a key enabler of post-COVID-19 recovery and lays the groundwork for future economic structures that are more inclusive, adaptive, and efficient.

Analysis of Keywords

Figure 4 shows the advancement of the digital economy in the post-COVID-19 period (2023–2024). The digital economy continues to expand with innovation, digitalization, and economic transformation across various sectors. On the left side of the graphic, concepts such as digital transformation, digital technology, and innovation are closely linked to economic development and sustainability, focusing on solutions supporting sustainable growth and urban efficiency.

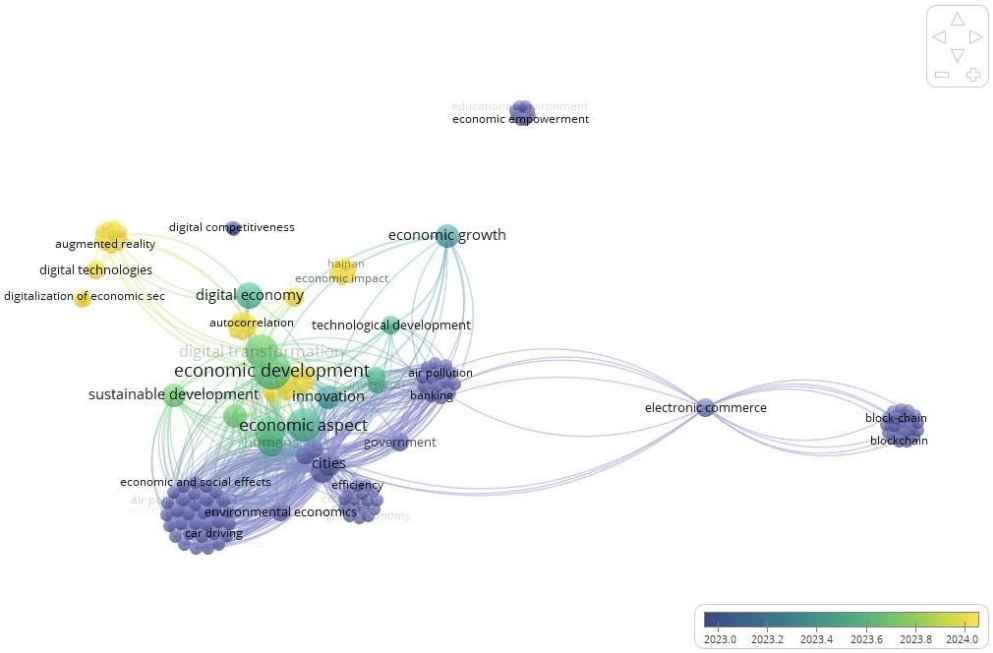

Figure 4 Analysis of Keywords

Over time, there is a noticeable shift in focus toward e-commerce and blockchain (located on the right side), which have become increasingly prominent in 2024. This indicates that electronic trading platforms and decentralized technologies like blockchain are crucial in strengthening the digital economy, particularly enhancing transaction efficiency and data security.

Moreover, the environmental economy and social effects at the bottom reflect efforts to ensure that economic development does not compromise sustainability and environmental considerations. Overall, these developments depict a rapid response to post-pandemic changes, where the focus is on economic recovery and long-term innovation and sustainability.

With colors shifting from purple to yellow, this graph indicates that digital transformation and sustainable development will dominate more in 2023, while topics such as blockchain and economic growth will become increasingly relevant by 2024.

The Most Cited Publications

Table 2 demonstrates that five articles stand out among the works most frequently cited. Hu (2023) focuses on the synergistic control of environmental pollution and carbon emissions (SCEPCE) in underdeveloped countries, particularly through the digital economy, and has received the most citations. The study evaluates the role of big data comprehensive experimental areas (BDCEAs) in reducing carbon emissions and air pollutants. The research concludes that BDCEAs effectively prevent pollution and emissions, creating sustainable policy effects. This is confirmed through panel data analysis spanning from 2009 to 2020. The study shows that BDCEAs are especially

effective in small and medium-sized cities and industrial-based communities, with regional variations in pollutant and CO2 emission reductions.

Table 2 The Information of Top 5 Cited Publications

Rank	Authors	Title	Year	Type	Citation
1	Hu J.	Synergistic effect of pollution reduction and carbon emission mitigation in the digital economy	2023	Article	136
2	Zhao C., Liu Z., Yan X.	Does the Digital Economy Increase Green TFP in Cities?	2023	Article	19
3	Ma F., Fahad S., Wang M., Nassani A.A., Haffar M.	Spatial Effects of Digital Transformation, PM2.5 Exposure, Economic Growth, and Technological Innovation Nexus: PM2.5 Concentrations in China during 2010–2020	2023	Article	3
4	Wang S., Maysa O., Khaskheli M.B., Yang W.	The Power of Digitalization, the Hainan Free Trade Port, and Regulations for Modern Economic Development in Turkmenistan Are Significant	2024	Article	1
5	Chen Y.	Research on the impact of the digital economy on the level of industrial structure: An empirical study of 280 cities in China	2024	Article	1

The Digital Economy's Impact on Economic Development Post-COVID-19 Pandemic

Following the COVID-19 pandemic, the internet economy emerged as a key driver of global economic growth. Business practices and consumer habits have been irrevocably altered due to the pandemic's acceleration of digital transformation in healthcare, education, and commerce (Anderson et al., 2021). This shift has prompted many countries and companies to integrate digital technologies into their economic recovery strategies. Notably, e-commerce and digital services have grown substantially. They are poised to continue expanding, driven by rising consumer demand for online shopping and remote services (Ahmed & Kumari, 2022).

Bibliometric analysis highlights various studies exploring the digital economy's impact on economic development. Zhao et al. (2023) examine the effects of digital economy expansion on environmentally friendly production practices. The study finds that a more developed digital economy boosts urban green total-factor productivity (GTFP) by improving manufacturing technology and encouraging green innovation. The authors recommend governments emphasize the digital economy to drive urban green growth.

Ma et al. (2023), utilizing a spatial Durbin model and city-level data from 2010 to 2020, examine how digital transformation in the commercial banking (DTCB) affects air pollution levels. Their findings reveal that DTCB tends to exacerbate air quality issues in regions

with underdeveloped digital economies. In contrast, in cities with more mature digital infrastructure, PM2.5 concentrations are significantly reduced. The study underscores the potential of adopting digital banking innovations to foster technological progress while contributing to environmental improvement.

Wang et al. (2024) focus on Turkmenistan's economic growth, highlighting the importance of legal frameworks and digital solutions such as cloud-based services. Chen (2024) explores the relationship between the digital economy and industrial structure optimization, emphasizing the intermediary role of human capital in driving digital transformation. The study uncovers significant spillover effects of digital advancements on neighboring regions, stressing the need for balanced digital growth.

The COVID-19 pandemic has underscored the pivotal role of the digital economy in global recovery efforts—offering both immediate economic relief and long-term pathways for sustainability through innovation and financial inclusion. These findings align with the objectives of this study, which aimed to map thematic developments in digital economy research, identify key clusters—such as sustainability, fintech, and infrastructure—and examine the emerging challenges and opportunities during and after the pandemic. The consistent prominence of these themes across bibliometric clusters highlights their centrality in advancing the global digital transformation agenda.

However, despite its transformative potential, the digital economy's growth raises critical concerns regarding inclusivity and equity. Not all regions—particularly those in the Global South—possess the digital infrastructure, technological capacity, or institutional frameworks necessary to harness the full benefits of digital innovation. This persistent digital divide risks exacerbating existing socio-economic inequalities unless addressed through strategic policy interventions, investment in human capital, and equitable digital governance.

These insights form the basis for the concluding section, which synthesizes key implications and outlines potential directions for future research. Given the evolving nature of digital technologies and their socio-economic ramifications, future studies should adopt a more interdisciplinary lens, integrating perspectives from economics, information systems, public policy, and development studies. There is also a pressing need to investigate the long-term effects of digital transformation on labor markets, environmental sustainability, and governance structures, particularly in low- and middle-income countries.

By uncovering major research themes and existing gaps, this study equips policymakers and academics with valuable insights to guide the trajectory of digital economic development in the post-COVID-19 era. Furthermore, it presents a conceptual foundation for examining how digital transformation can be effectively leveraged to promote more inclusive, resilient, and sustainable societies.

Conclusion

The digital economy has become a pivotal driver of economic progress and innovation, especially as a response to the global disruptions triggered by the COVID-19 pandemic. Between 2019 and 2022, the rapid growth of digital platforms—such as e-commerce, remote work technologies, and digital financial services—proved crucial in maintaining economic functions and enabling recovery efforts. Utilizing a bibliometric method, this study tracks the thematic progression of scholarly work on the digital economy during the COVID-19 pandemic and throughout the post-COVID-19 period (2023–2024), highlighting key thematic shifts including growing attention to sustainability, the rise of financial technology (fintech), and the development of digital infrastructure. These results offer data-driven perspectives on the evolving academic landscape and reinforce the critical role of digitalization in strengthening economic resilience. This research contributes to ongoing discourse by laying the groundwork for future interdisciplinary studies integrating perspectives from economics, information systems, development policy, and governance to support equitable and sustainable digital advancement. The practical contributions highlight the urgency of designing policy frameworks that ensure fair access to digital infrastructure—particularly for SMEs and underserved populations. However, this study is constrained by its focus on English-language, indexed sources and lacks causal inference. Therefore, further research is recommended to combine bibliometric techniques with qualitative investigations and international comparisons to enrich the understanding of how the digital economy influences diverse economic and social environments.

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