

Review

# Economic Development in the Digital Economy: A Bibliometric Review

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**Abstract:** This study aims to investigate economic development in the digital economy and uncover trends and insights that might contribute to future research. Furthermore, the study, examining English-language publications from 2000 to 2023 in the Web of Science Core Collection, employs bibliometric and content analysis to statistically evaluate the field of economic development in the digital economy. Co-citation, co-authorship, and bibliographical coupling analyses revealed China, the Chinese Academy of Sciences (CAS), and “Sustainability” as the leading influencers in terms of country, institution, and journal, respectively. Five key themes emerged: (1) the interplay between digital technologies and economic growth, (2) leveraging digital tools for businesses, (3) the applications and impacts of diverse digital technologies across sectors, (4) the broader social implications of the digital economy, and (5) government policies for fostering digital economic progress. The study concludes by proposing avenues for further investigation.

**Keywords:** digital economy; economic development; digital innovation; economic innovation; bibliometrics; digital era

## 1. Introduction

The digital economy’s footprint on global growth is undeniable, weaving an intricate web of interconnectedness across borders (Domnina et al. 2021; Pang et al. 2022). Information and communication technologies (ICTs) have revolutionised business, trade, investment, and collaboration, but beneath the glittering surface lie potential pitfalls that warrant our attention (Shen et al. 2022).

One major concern is the widening digital divide, where unequal access to technology creates chasms in economic participation, both between nations and within them (Domnina et al. 2021). Automation and Artificial intelligence (AI), while fuelling advancements, also raise the spectre of job displacement, potentially leaving workers behind (Pang et al. 2022). As vast troves of personal data swirl through digital ecosystems, concerns arise around privacy, security, and the very ownership of our information (Shen et al. 2022).

The interconnectedness, while beneficial, exposes us to cybersecurity vulnerabilities, from data breaches to economic disruptions (Shen et al. 2022). Dependence on digital systems introduces another layer of risk, where a technological hiccup can have cascading effects across sectors. Ethical dilemmas arise from biased algorithms and the potential misuse of technology, impacting fairness and justice (Guo et al. 2023). Electronic waste and the substantial energy footprint of digital infrastructure add a layer of environmental concerns that we must address (Ren and Zhang 2023).

To navigate this digital tide, policymakers, businesses, and societies must craft strategies that harness its potential while mitigating its risks. Ensuring inclusive, sustainable, and ethical economic development within the digital sphere requires a nuanced understanding of its many facets (Yu and Zhou 2021). Only then can we truly grasp the full potential of this digital revolution and steer it towards a brighter future for everyone.

Within the contemporary global context, the digital economy plays a pivotal role in transforming traditional notions of economic development. By facilitating unprecedented



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levels of interconnectedness across geographical boundaries, digital technologies usher in a new era of global economic dynamics (Domnina et al. 2021; Pang et al. 2022). The rapid advancements in ICTs have not only revolutionised how businesses operate but have also fundamentally altered the nature of international trade, investment, and collaboration (Shen et al. 2022). This marks a unique era characterised by innovation and efficiency, transcending traditional limitations, and presenting nations across the globe with an unprecedented opportunity for accelerated economic growth (Guo et al. 2023). Navigating and leveraging the possibilities presented by this interconnected and digitally driven world is, therefore, paramount (Ren and Zhang 2023). A nuanced understanding of the multifaceted dimensions of global economic growth within the digital sphere is essential to harnessing its full potential (Yu and Zhou 2021).

The interconnected world of economic development and the digital economy pulsates with innovation, connectivity, and burgeoning opportunities. Digital technologies act as potent catalysts, driving efficiencies, expanding markets, and nurturing entrepreneurial ecosystems. However, this promising landscape is not without its challenges. The digital divide, potential job displacement, and ethical considerations necessitate well-rounded strategies. Bridging these gaps while harnessing the transformative potential of digital innovation is paramount to fostering inclusive and sustainable economic development in this digital age (Alqudah et al. 2023; Li et al. 2018).

However, recognising these challenges should not blind us to the counterarguments and contrasting perspectives that offer a more nuanced view of the digital economy's impact on development. Proponents argue that access to digital technologies can empower individuals and businesses, particularly in developing regions, by fostering innovation and creating new opportunities. They contend that the rapid pace of technological advancement can drive economic growth by nurturing entrepreneurship, innovation, and job creation (Autor 2015). While acknowledging job displacement, they emphasise the role of digital education and training programmes in equipping the workforce for the digital landscape (Bessen 2019).

To gain a profound understanding of economic development in the digital economy, we embarked on a systematic review of past research, encompassing a vast array of interconnected themes. To provide a concise and well-organised overview of the most crucial topics, we conducted a bibliometric analysis. This involved meticulously categorising 1404 scholarly articles published between 2000 and 2023, all sourced from the respected Web of Sciences Database Core Collection (<https://clarivate.com/products/scientific-and-academic-research/research-discovery-and-workflow-solutions/webofscience-platform/web-of-science-core-collection/>, accessed on 16 February 2023). Utilising powerful tools, such as RStudio (version 2023.06.0+421, Posit PBC, Boston, MA, USA), and VOSviewer (version 1.6.20, Nexus Uni, Las Vegas, NV, USA), we meticulously dissected citation patterns, relationships, keyword frequencies, and research performance. This comprehensive evaluation not only organises existing research into relevant clusters but also identifies gaps and illuminates promising avenues for future exploration in the realm of economic development in the digital economy.

This study focuses on three key research questions that unravel the intricacies of economic development in the digital economy:

- Who are the leading voices shaping the discourse on economic development in the digital economy?
- What are the core research themes explored within this dynamic field?
- What insights does the existing literature offer into promising avenues for future research in economic development in the digital economy?

Our review offers several unique contributions that illuminate the path towards further exploration and advancement in the critical area of economic development in the digital economy. Through a thorough analysis of key writers, identification of regional patterns in research, establishment of connections between academia and policy, and development of a roadmap for future research, we strive to provide a comprehensive and insightful overview of existing knowledge. This paves the way for a deeper understanding of the complex

interplay between digital technologies and economic growth, ultimately leading to further exploration and advancement in this critical field.

The following sections delve deeper into our exploration of economic development in the digital economy. Section 2 meticulously details the methodology employed in our research. Section 3 presents the insightful findings gleaned from the bibliometric and content analyses of the chosen research works. Section 4 delves into the research streams unearthed by the bibliometric evaluation. Finally, Section 5 concludes the study by identifying promising areas for future research within the realm of economic development in the digital economy. This structured approach aims to provide a comprehensive and informative analysis, shed light on the current state of knowledge, and pave the way for further exploration in this dynamic field.

## 2. Methodology

The combined use of bibliometric and content analyses has gained increasing popularity among scholars, a trend highlighted by Spiegel-Rosing (1977). During the bibliometric review stage, researchers such as Hallinger (2021), Paul et al. (2021), and Khan (2022) have categorised previous research in this area into four categories: descriptive, integrative, systematic, and meta-analysis reviews. This multifaceted approach allows for a deeper understanding of existing research, its impact, and future directions.

### 2.1. Study Structure

Figure 1 schematically illustrates how our research methodology uses the Paltrinieri et al. (2019) framework. This approach unfolds in three distinct stages, each central to achieving a comprehensive and insightful analysis. The first stage involved meticulously formulating relevant research questions, which serve as the foundation and guiding force for the entire investigation. Subsequently, we rigorously identified and selected literature deemed pertinent for inclusion in the review, ensuring a comprehensive and representative sample that captures the key themes and nuances within the field of economic development in the digital economy.



Figure 1. Study model.

## 2.2. Sampling Methodology

For our research, we relied on the widely used Web of Sciences Database Core Collection, recognised for its comprehensive coverage of scholarly output across the social sciences (Alqudah et al. 2023; Li et al. 2018). Its intuitive functionalities facilitate efficient data aggregation, making it an ideal choice for our analysis. Within the Web of Sciences, we selected the Social Science Citation Index (SSCI) due to its extensive coverage compared to other databases. We deliberately chose the Web of Science (WOS) Core Collection as the data source, seeking a deep dive into high-impact research surrounding economic development in the digital economy. WOS offers a robust platform for bibliometric and content analysis by prioritising publications from respected, peer-reviewed journals across diverse disciplines. While other databases hold valuable resources, WOS stands out for its rigorous selection criteria, ensuring the reliability and quality of the included literature (Alqudah et al. 2023; Qudah et al. 2023; Momani et al. 2023). This focus on academic rigour translates to a carefully curated dataset, enabling a more nuanced understanding of the field through the lens of established scholarly works. By leveraging WOS, this study prioritised in-depth analysis and fostered a clear picture of economic development within the dynamic sphere of the digital economy. Table 1 provides a detailed comparison of Islamic microfinance information available across different databases, justifying our selection of the Web of Sciences SSCI for our research.

**Table 1.** Data collection strategy.

Query Formulation	Search Patterns in the Core Collection of Web of Sciences Database		
	TITLE-ABS-KEY	TITLE	KEY
("Economic Development" OR "High-Quality Development" OR "Sustainable Economic Development") AND ("Digital Economy" OR "Digital Ecosystem" OR "Information Economy" OR "Digitalization" OR "Artificial Intelligence" OR "Machine Learning" OR "ICT" OR "Information and Communication Technology")	1913	1893	1889
Combine #1 TITLE OR #1 KEYWORD	1853		
After manual filtration	1404		

**Note:** The column labelled "TITLE-ABS-KEY" indicates the number of publications containing at least one of the chosen keywords in their title, abstract, or keywords. The "Title" and "Key" columns, in contrast, indicate the number of publications that include any of the keywords in either their title or keywords section. During the second phase of our research, we opted to select publications that included at least one of the chosen keywords in either their title or keywords section. This initial selection ensured a broad range of relevant articles for further evaluation. Subsequently, each publication underwent a rigorous manual assessment to determine its specific relevance to our research focus and ensure the inclusion of only the most pertinent and insightful works. This two-stage process of keyword filtering and manual evaluation facilitated the development of a robust and representative sample for our review.

Following careful consideration, we chose the Web of Sciences Database Core Collection for our research, opting against other popular databases. This decision was driven by the significant difference in the number of publications relevant to economic development in the digital economy. Compared to Scopus, which offers a limited 155 articles, the Web of Sciences Core Collection provides access to a vast 1853 publications, an undeniable advantage for our research. Additionally, despite Google Scholar's extensive collection, its inclusion of 550 unaudited and low-quality articles, lacking scientific rigour, raised concerns and led us to exclude it from our selection.

To effectively identify relevant publications within the chosen database, we conducted a keyword analysis. Table 1 presents a comprehensive overview of the specific keywords, queries, and resulting search outputs before undergoing further refinement through human intervention. This multifaceted approach ensured a comprehensive and representative

selection of articles for our review. Afterwards, every publication was subjected to a thorough manual evaluation to ascertain its precise relation to our study topic and guarantee the inclusion of only the most relevant and enlightening publications. The approach had two stages: keyword filtering and manual assessment. This technique helped us create a strong and accurate sample for our review.

Following a meticulous review of each manuscript to confirm its alignment with our research focus, we selected 1404 publications for the bibliometric analysis. These selected publications encompass a timeframe of twenty years, spanning from 2000 to 2023. The window between 2000 and 2023 was not just any epoch—it was the crucible where the digital revolution forged a new economic landscape. This period saw a tidal wave of digital advancements—the internet’s rise to ubiquity, e-commerce blossoming, and information and communication technologies (ICTs) leaping forward—fundamentally reshaping the global economic order. By focusing on this dynamic timeframe, researchers gained a privileged vantage point to witness the digital economy’s meteoric rise and its multifaceted impact on development, innovation, and even the way we live and work. This targeted analysis allowed us to untangle the complex web of how digital forces have transformed not just economies but entire societies (Alqudah et al. 2023). In short, studying this specific era is akin to dissecting the DNA of the digital revolution, offering invaluable insights for navigating the uncharted territory that lies ahead. Table 5 provides a comprehensive analysis of the 20 most frequently cited articles, offering valuable insights into the foundational works shaping the field of economic development in the digital economy. This carefully curated selection served as the basis for our bibliometric analysis, enabling us to delve deeper into the key themes, trends, and future directions within this rapidly evolving field.

### 2.3. Research Tools

To delve into the complexities of economic development in the digital economy, we employed a robust set of software tools that empowered us to tackle our research questions with precision and insight.

RStudio, an integrated development environment (IDE) specifically built for R, served as our platform for statistical analysis. R’s powerful programming language allowed us to perform intricate calculations, generate informative visualisations, and automate repetitive tasks, ensuring efficiency and accuracy throughout our research process. While the chosen software tools—RStudio 2023.06.0+421 (Posit PBC, Boston, MA, USA), VOSviewer 1.6.20 (Nexus Uni, Las Vegas, NV, USA), and Excel—deserve credit for their reliability and efficiency, acknowledging a potential technical bias is crucial. These tools, while powerful, naturally cater to specific analytical approaches. This could inadvertently limit the inclusion of alternative perspectives or methodologies in the research process. Diverse viewpoints fuel rich discussions and can lead to a more comprehensive understanding of the subject matter.

VOSviewer took our analysis to the next level by enabling the creation and visualisation of bibliometric networks, also known as “maps.” These interactive maps illustrate the intricate connections between authors, sources, nations, and keywords within the field. Van Eck and Waltman (2010, 2011, 2013, 2017) and Waltman et al. (2010) described how to use sophisticated algorithms to examine collaboration patterns (co-authorship), emerging keywords (co-occurrence), and significant publications (co-citations). This functionality, as demonstrated in recent studies by Qudah et al. (2023) and Momani et al. (2023), allowed us to identify key players, uncover hidden patterns, and gain valuable insights into the evolving landscape of research in economic development in the digital economy.

Excel, the quintessential spreadsheet programme, played a crucial role in organising and manipulating numerical data. We utilised Excel’s powerful formulas and functions to meticulously arrange and analyse data, perform calculations, and create editable graphs and charts. This functionality ensured a clear and concise presentation of our findings, enhancing the accessibility and impact of our research.

Through the combined application of these three software tools, we were equipped to conduct a comprehensive and insightful analysis of the existing body of research on economic development in the digital economy. This multifaceted approach allowed us to extract valuable insights, uncover hidden trends, and pave the way for future research and policy decisions that contribute to the advancement of knowledge and the development of sustainable and equitable digital economies.

#### 2.4. Analytical Methods

Our analysis unfolded in three distinct phases, each illuminating a crucial facet of the research landscape: overall performance, citations, and networks and content.

Overall performance analysis provided a comprehensive overview of the literature's growth over time, highlighting prominent authors, nations, and institutions contributing to the field. This analysis allowed us to assess the evolution of the research focus and identify key players shaping the discourse on economic development in the digital economy.

Citation analysis delved deeper into the most influential publications, authors, and journals within the field. Through the identification of the most frequently referred publications, we obtained significant insights into the fundamental knowledge and major topics that drive study in this field.

Network and content analysis leveraged powerful techniques, such as bibliographic coupling, co-citation, and co-occurrence, to uncover hidden relationships and identify clusters of interconnected research. Using the clustering methods explained by [Alqudah et al. \(2023\)](#), [Qudah et al. \(2023\)](#), [Momani et al. \(2023\)](#), and [Al-Qudah et al. \(2022\)](#), this analysis allowed us to map the intellectual structure of the field, showing new trends and possible areas for further research.

Through this multifaceted approach, our study aims to provide a thorough and detailed understanding of the current landscape of research on economic development in the digital economy. Our objective is to contribute to the growth of knowledge and the creation of sustainable and equitable digital economies by extracting useful insights, identifying key actors and emerging trends, and supporting future progress in this crucial subject. The methodology lacks explicit consideration of potential limitations stemming from resource constraints, including time, budget, or expertise. Recognising these constraints is crucial, as they may influence the extent and comprehensiveness of the analysis, raising questions about the study's overall scope and depth.

### 3. Results

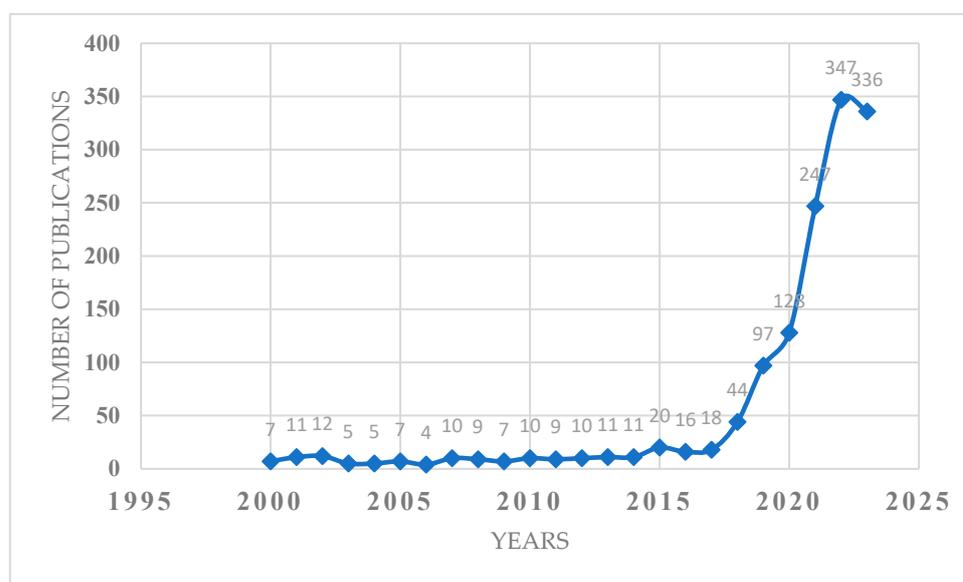
Table 2 delves deep into the dataset, offering a comprehensive snapshot of the selected publications on economic development and the digital economy. Stretching from 2000 to 2023, the analysis encompassed a vibrant community of 277 collaborative sources contributing to the field. This impressive collection boasts 1404 individual publications, with each document averaging a sprightly 0.86 years since publication. Moreover, the field is experiencing explosive growth, evidenced by an annual rate of 40.25%. Each publication resonates with the scholarly community, garnering an average of 16.12 citations, culminating in a collective total of 25,570 references across the dataset. This vibrant landscape paints a picture of a field brimming with activity and ripe for further exploration.

The database identified 1090 distinct "Keywords Plus (ID)" in the content analysis, and the individual authors themselves assigned a further 1680 "Author's Keywords (DE)" to it. The research effort involved a total of 3478 authors, of whom 110 contributed to single-authored publications. Collaboration remains prevalent, with an average of 3.28 co-authors per document and 24% of documents featuring international co-authorships. The document collection predominantly consists of regular articles (1611), with 220 additional articles currently available for early access.

**Table 2.** Overview of selected publications in economic development and digital economy.

	Data Element	Description	Results
Main Information About Data	Timespan	Range of publication dates	2000–2023
	Sources	Number of unique publication sources	277
	Documents	Total number of documents analysed	1404
	Annual growth rate	Average annual increase in publications	40.25%
	Average document age	Mean age of documents in years	0.86 years
	Average citations per document	Mean number of times each document is cited	16.12 citations
	Total references	Overall number of reference citations	25,570
Document Contents	Keywords Plus (ID)	Number of unique keywords identified by the database	1090
	Author’s Keywords (DE)	Number of unique keywords assigned by authors	1680
Authors	Total authors	Number of unique authors identified	3478
	Single-authored documents	Number of documents with sole author	110
Authors Collaboration	Single-authored documents	Number of documents with sole author	110
	Average co-authors per document	Mean number of authors per document	3.28
	International co-authorships (%)	Percentage of documents with international co-authors	24%
Document Types	Articles	Number of documents classified as articles	1611
	Early access articles	Number of articles published as early access	220

Figure 2 shows the annual distribution of 1404 papers that were published on the subject of economic development and the digital economy from 2000 to December 2023. During this period, there was a remarkable yearly growth rate of 30.78%. While the study of this subject began in the early 2000s, the number of published works was very small until 2017. Prior to 2017, the prevalence of this literature topic was not significant. However, it did not include the term “digital economy” in its title, abstract, or keywords. Nevertheless, there has been a notable upswing in scholarly attention since 2019, demonstrating the growing significance and acknowledgment of this discipline. The observed increase is significantly different from what is typically seen in traditional economics. A search for relevant publications using specific keywords and titles in the Web of Sciences Database Core Collection resulted in over 5400 pages, indicating that research in economic development and the digital economy is still in its early stages.



**Figure 2.** Annual evolution of literature on economic development and digital economy.

3.1. Major Contributors, Associated Universities, Impactful Countries, and Significant Journals

Figure 3 delves into the most prolific authors within the fields of economic development and digital economy. Yannelis N.C. leads the pack with an impressive 14 publications, followed closely by Wu H.T. with 13 contributions. Interestingly, both of these authors currently reside in China, highlighting the country’s growing prominence in this field. Chen Y, Hao Y, and Li Y each boast a respectable 11, 11, and 10 publications, respectively. This analysis provides valuable insights into the individuals who have significantly shaped the discourse on economic development and the digital economy through their prolific research output.

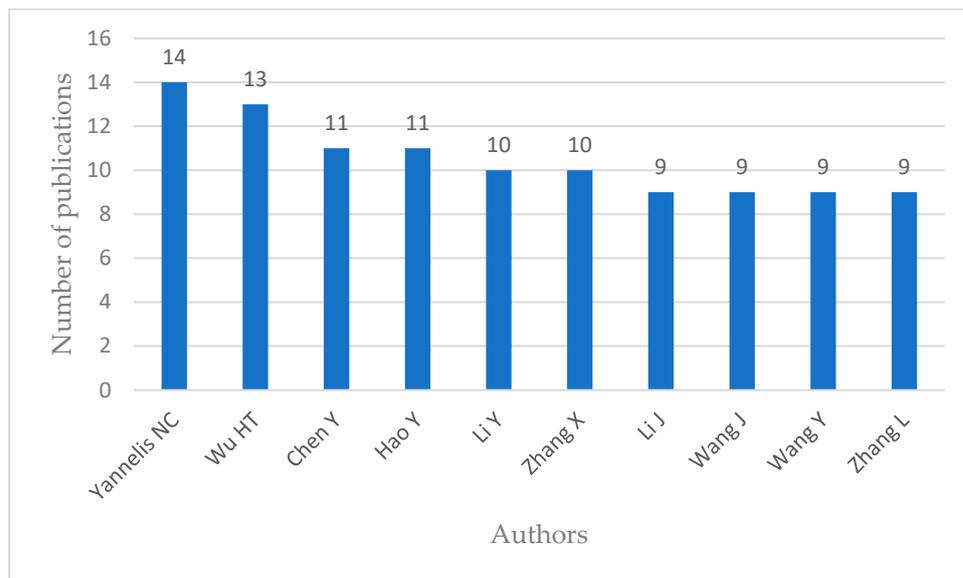
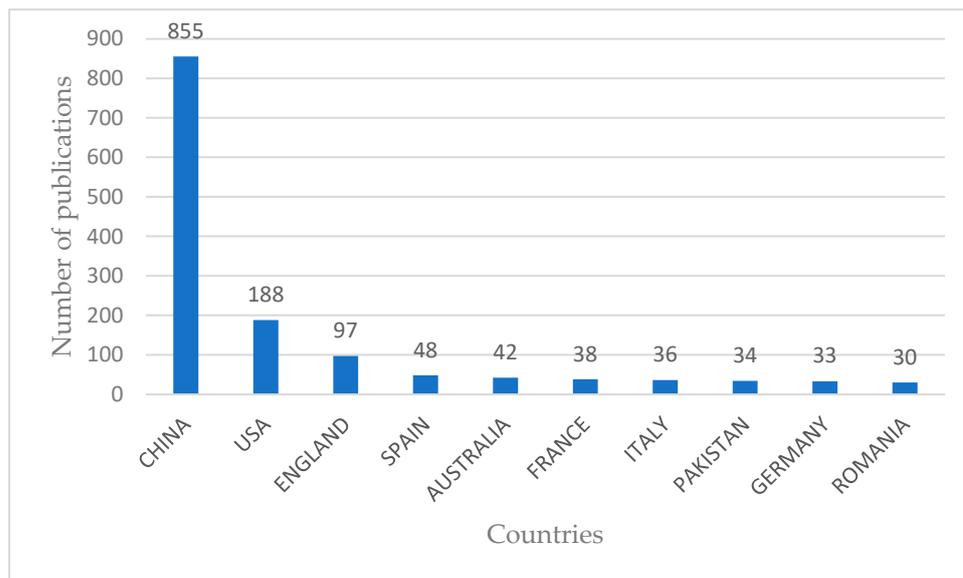


Figure 3. Top author productivity in economic development and digital economy.

Table 3 presents the most frequent collaborations between researchers in the fields of economic development and digital economy, ranked by their occurrence. This analysis shed light on the networks and collaborations shaping the research landscape. Figure 4, on the other hand, focuses on the countries that have been the subject of previous research on economic development and digital economies. This geographical analysis revealed the areas of focus within this field, highlighting regions that have received greater attention from researchers.

Table 3. Authors’ institutional universities.

No.	Universities	Articles
1	Chinese Academy of Sciences	35
2	Beijing Institute of Technology	23
3	Ocean University of China	22
4	Shandong University of Finance Economics	22
5	University Of London	22
6	Wuhan University	22
7	China University of Geosciences	20
8	Xinjiang University	20
9	Hohai University	19
10	Jiangsu University	18



**Figure 4.** Global presence in economic development and digital economy research.

Discussions surrounding economic development and the digital economy frequently highlight countries with larger populations, such as China, the United States, and England. The critical need for economic expansion and digital transformation in these regions is most likely what is driving this focus. Notably, China is recognised as a leading hub for education in the digital economy. The United States, a global economic powerhouse, along with nations such as England, Spain, and Australia, all of which prioritise scientific research, contribute significantly to the publication of research on economic development and the digital economy.

Sustainability emerged as a key theme, with prominent journals such as the *International Journal of Environmental Research and Public Health*, *Environmental Science*, and *Pollution Research* dedicating substantial attention to this topic. Table 4 offers a detailed breakdown of the frequency of articles on economic development and the digital economy published in various academic journals, providing valuable insights into the specific research areas receiving the most attention within this field.

**Table 4.** Frequency of Islamic microfinance publications, by journal.

No.	Journals	Articles
1	<i>Sustainability</i>	407
2	<i>International Journal of Environmental Research and Public Health</i>	76
3	<i>Environmental Science and Pollution Research</i>	40
4	<i>Technological Forecasting and Social Change</i>	39
5	<i>Journal of Cleaner Production</i>	33
6	<i>Resources Policy</i>	29
7	<i>Economic Theory</i>	19
8	<i>Journal of Business Research</i>	18
9	<i>Energy Policy</i>	17
10	<i>Energy Economics</i>	15

### 3.2. Analysis of Citations

Citation analysis, a technique for analysing bibliographic references (Hjørland 2013), establishes connections between scholarly works.

Concerns about potential bias have been raised, particularly regarding the inclusion of negative citations (references to flawed research requiring criticism), self-citations, and outdated references (Boyack and Klavans 2010). Despite these criticisms and ongoing discussions, citation analysis remains a crucial tool for assessing research impact (Garfield 1979).

Through the identification of significant publications, it provides vital insights into the present level of knowledge about a certain topic or subject.

Therefore, while acknowledging the limitations inherent in any analytical technique, citation analysis continues to serve as a valuable tool for researchers seeking to understand the impact of their work and gain insights into the fields of economic development and the digital economy.

Our study focused on analysing citations specifically within the works of authors who publish in reputable journals. This targeted approach allowed us to identify the impact of top researchers within the fields of economic development and the digital economy.

Table 5 provides a comprehensive list and detailed analysis of the most highly cited publications in this field. A closer examination revealed that the most frequently referenced publications explore themes such as the digital economy, technological innovation, and inclusive economic growth, often with a specific focus on spatial impacts and mediating effects.

**Table 5.** Highly referenced publications.

No.	Author(s)	Title	Year	Source Title	Local Citations	Global Citations	LC/GC Ratio (%)	Normalised Local Citations	Normalised Global Citations
1	Ding, Liu, Zheng, Li	Digital economy, technological innovation, and high-quality economic development: Based on spatial effect and mediation effect	2021	<i>Sustainability</i>	9	97	9.28	12.38	5.14
2	Ren, Li, Han, Hao, Wu	The emerging driving force of inclusive green growth: Does digital economy agglomeration work?	2022	<i>Business Strategy and the Environment</i>	5	87	5.75	3	1.91
3	Su, Su, Wang	Does the digital economy promote industrial structural upgrading? A test of mediating effects based on heterogeneous technological innovation	2021	<i>Sustainability</i>	3	95	3.16	4.13	5.04
4	Guo, Wang, Zhang, Liang, Feng, Hu	Impact of the digital economy on high-quality urban economic development: Evidence from Chinese cities	2023	<i>Economic Modelling</i>	2	44	4.55	1.2	0.96
5	Li, Li, Wen	Digital economy and environmental quality: Evidence from 217 cities in China	2021	<i>Sustainability</i>	2	32	6.25	1.2	0.7
6	Hosan, Karmaker, Rahman, Chapman, Saha	Dynamic links among the demographic dividend, digitalization, energy intensity, and sustainable economic growth: Empirical evidence from emerging economies	2022	<i>Journal of Cleaner Production</i>	1	72	1.39	0.6	1.58
7	Zhou, Lan, Zhao, Zhou	Haze pollution levels, spatial spill-over influence, and impacts of the digital economy: Empirical evidence from China	2021	<i>Sustainability</i>	1	9	11.11	1.38	0.48
8	Jiang, Wang, Ren, Xie	The Nexus between digital finance and economic development: Evidence from China	2021	<i>Sustainability</i>	1	17	5.88	1.38	0.9

Table 5. Cont.

No.	Author(s)	Title	Year	Source Title	Local Citations	Global Citations	LC/GC Ratio (%)	Normalised Local Citations	Normalised Global Citations
9	Jiao, Sun	Digital economic development and its impact on economic growth in China: Research based on the perspective of sustainability	2021	<i>Sustainability</i>	1	4	25	1.38	0.21
10	Wu, Yang	Empirical test of the impact of the digital economy on China's employment structure	2022	<i>Finance Research Letters</i>	1	11	9.09	1.38	0.58
11	Guo, Wang, Zhang, Liang, Feng, Hu	Impact of the digital economy on high-quality urban economic development: Evidence from Chinese cities	2023	<i>Economic Modelling</i>	1	84	1.19	21	15.89
12	Sun, Jiao, Ren	Regional informatization and economic growth in Japan: An empirical study based on spatial econometric analysis	2014	<i>Sustainability</i>	0	6	0	N/A	1
13	Li, Yang	The effects of tax reduction and fee reduction policies on the digital economy	2021	<i>Sustainability</i>	0	6	0	0	0.13
14	Jiang, Wang, Ren, Xie	The nexus between digital finance and economic development: Evidence from China	2021	<i>Sustainability</i>	0	33	0	0	0.72
15	Yang, Jia	Digital economy, technological innovation, and environmental quality improvement	2022	<i>Sustainability</i>	0	4	0	0	0.21
16	Wang, Geng, Lin, Li, Wang, Wang	The coupling coordination degree and spatial correlation analysis of the digital economy and sports industry in China	2022	<i>Sustainability</i>	0	2	0	0	0.11
17	Zhao, Dong, and Gong	The digital economy and carbon productivity: Evidence at China's city level	2022	<i>Sustainability</i>	0	12	0	0	0.64
18	Chen, Zhang	Insurance density and the digital economic development: A China perspective	2022	<i>Economic Research-Ekonomska Istraživanja</i>	0	2	0	0	0.11
19	Wu, Yang	Empirical test of the impact of the digital economy on China's employment structure	2022	<i>Finance Research Letters</i>	0	25	0	0	1.33
20	Liu, Gu, Wang	The coupling coordination between digital economy and industrial green high-quality development: Spatio-temporal characteristics, differences, and convergence	2022	<i>Sustainability</i>	0	5	0	0	0.27

**Note:** Local citations (LC) represent the number of times the research is cited within the specified dataset or region, while global citations (GC) encompass citations from the broader academic community. The LC/GC ratio (%) indicates the proportion of local to global impact. Normalised local citations and global citations offer a standardised comparison, accounting for variations in dataset size or regional influence.

Moving beyond individual publications, Table 6 delves into the influence of authors, revealing S. Abendin as the most frequently referenced scholar within the field of economic development and the digital economy. This analysis provided valuable insights into the individuals who are shaping the research landscape and making significant contributions to our understanding of this evolving field.

**Table 6.** Impact of the authors.

No.	Author Name	H_Index	G_Index	M_Index	TC	NP	PY_Start
1	Abendin S	1	1	0.5	3	1	2022
2	Bao Z	1	1	0.5	11	1	2022
3	Bo L	1	1	1	3	1	2023
4	Chang Xy	1	1	0.5	2	1	2022
5	Chapman Aj	1	1	0.5	64	1	2022
6	Chen Hm	1	1	1	2	1	2023
7	Chen J	1	2	1	4	2	2023
8	Chen Qx	1	1	0.5	14	1	2022
9	Chen W	1	1	1	1	2	2023
10	Chen Xh	1	1	0.5	2	1	2022

**Notes:** Author impact is assessed through various metrics, such as the H-index (which focuses on highly cited publications), G-index (which considers the entire publication record), and M-index (which incorporates publication years). These metrics, accessible through resources such as Google Scholar Citation, collectively offer a comprehensive understanding of an author's contribution to their field.

To obtain a thorough comprehension of the influence of research on economic growth and the digital economy, we concentrated on citations from credible journals and analysed both highly referenced works and significant authors. This sophisticated technique enabled us to discern crucial patterns, acknowledge prominent scholars, and enhance our understanding in this ever-changing and crucial domain.

Table 7 highlights the impact of various sources within the fields of economic development and the digital economy. The *International Journal of Environmental Research and Public Health* and the *Asia Pacific Business Review*, both of which exhibit a similar level of impact, follow the journal *Sustainability* as the most significant and influential publications. This suggests that these journals play a pivotal role in disseminating research and shaping the discourse within this field.

**Table 7.** Impact of the journals.

No.	Journal Name	H_Index	G_Index	M_Index	TC	NP	PY_Start
1	<i>Sustainability</i>	10	22	1	493	31	2014
2	<i>International Journal of Environmental Research and Public Health</i>	2	3	1	28	3	2022
3	<i>Asia Pacific Business Review</i>	1	1	0.5	2	1	2022
4	<i>Business Strategy and The Environment</i>	1	1	0.5	95	1	2022
5	<i>Economic Analysis and Policy</i>	1	1	1	1	1	2023
6	<i>Economic Modelling</i>	1	1	1	84	1	2023
7	<i>Economic Research-Ekonomiska Istrazivanja</i>	1	1	0.5	2	1	2022
8	<i>Energy and Environment</i>	1	1	0.5	2	1	2022
9	<i>Finance Research Letters</i>	1	1	0.5	25	1	2022
10	<i>Journal Of Cleaner Production</i>	1	1	0.5	64	1	2022

**Notes:** This study utilised a combination of software tools (software tools—RStudio 2023.06.0+421, Boston, MA, USA, VOSviewer 1.6.20, Nexus Uni, Las Vegas, NV, USA, and Excel), bibliometric metrics (H-index, G-index, and M-index), and data sources (Web of Science Core Collection and Google Scholar) to analyse the research landscape of economic development and the digital economy. This multi-pronged approach allowed for a comprehensive and nuanced understanding of the field, encompassing both quantitative and qualitative data and facilitating the identification of key trends, leading researchers, and future research directions.

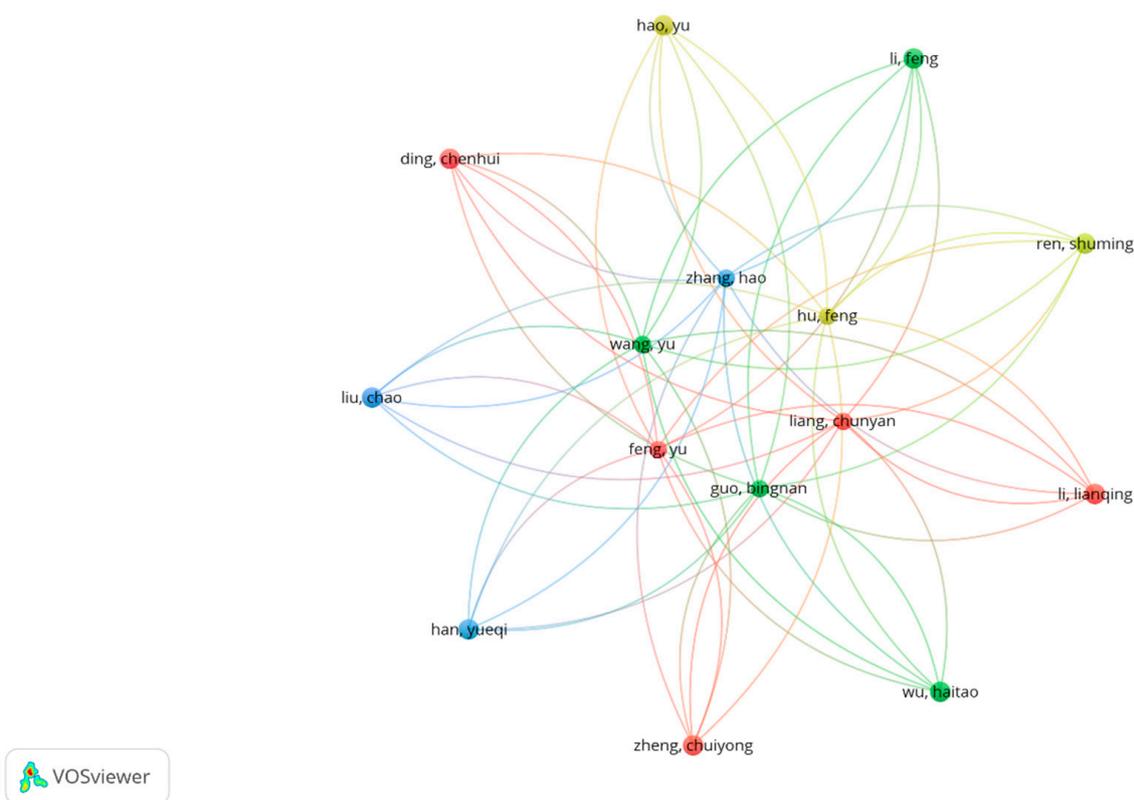
### 3.3. Mapping Tools for Network and Content Analysis

This section delves deeper into the research landscape of economic development and the digital economy. We found five different study streams in the field by looking at co-authorship patterns, bibliographical coupling, co-citation relationships, keywords, theme progression, and using hierarchical clustering methods. This analysis not only provides valuable insights into the existing research landscape but also sheds light on potential avenues for future investigation.

#### 3.3.1. Co-Authorship Analysis

Co-authorship, defined as the collaboration of multiple authors or organisations in creating a research publication (De Stefano et al. 2011), plays a crucial role in advancing knowledge and accelerating scientific progress. In our study, utilising a minimum citation threshold of 1, we identified 15 source papers with a combined connection strength of 54, signifying a moderate association between them. A higher connection strength denotes a stronger relationship between publications, as Van Eck and Waltman (2010) highlighted.

Figure 5 visually depicts the four distinct co-authorship clusters identified using VOSviewer 1.6.20 (Nexus Uni, Las Vegas, NV, USA). Each cluster is colour-coded for easier identification. The orange cluster, which Liu and Chao are in charge of, had an asterisk-like formation, indicating that the authors in this group were highly in agreement and worked together. This cluster further exhibited remarkable consistency, with an average citation range of 90–97. Beyond this specific cluster, the remaining co-authorship connections exhibited moderate strength, indicating collaborative efforts between authors from diverse geographical regions exploring various aspects of economic development and the digital economy.

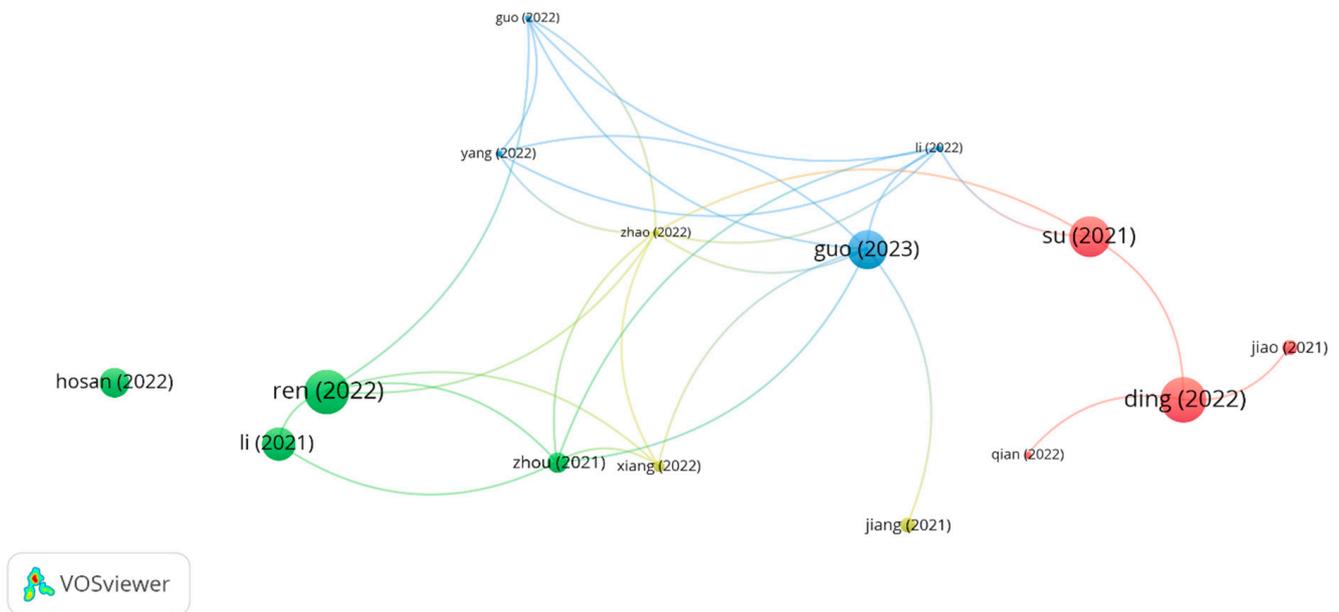


**Figure 5.** Co-authorship.

#### 3.3.2. Bibliographic Coupling Analysis

Utilising VOSviewer 1.6.20 (Nexus Uni, Las Vegas, NV, USA), we employed bibliographic coupling analysis to identify the key themes within our dataset (Shah et al.

2020). This technique, frequently used for automated clustering in large datasets, identifies instances where two publications cite the same third source in their bibliographies. By applying this methodology to the collection of research papers on economic development and the digital economy, we were able to visualise the interrelationships between these publications and identify four distinct research clusters (Figure 6).



**Figure 6.** Bibliographical coupling of documents.

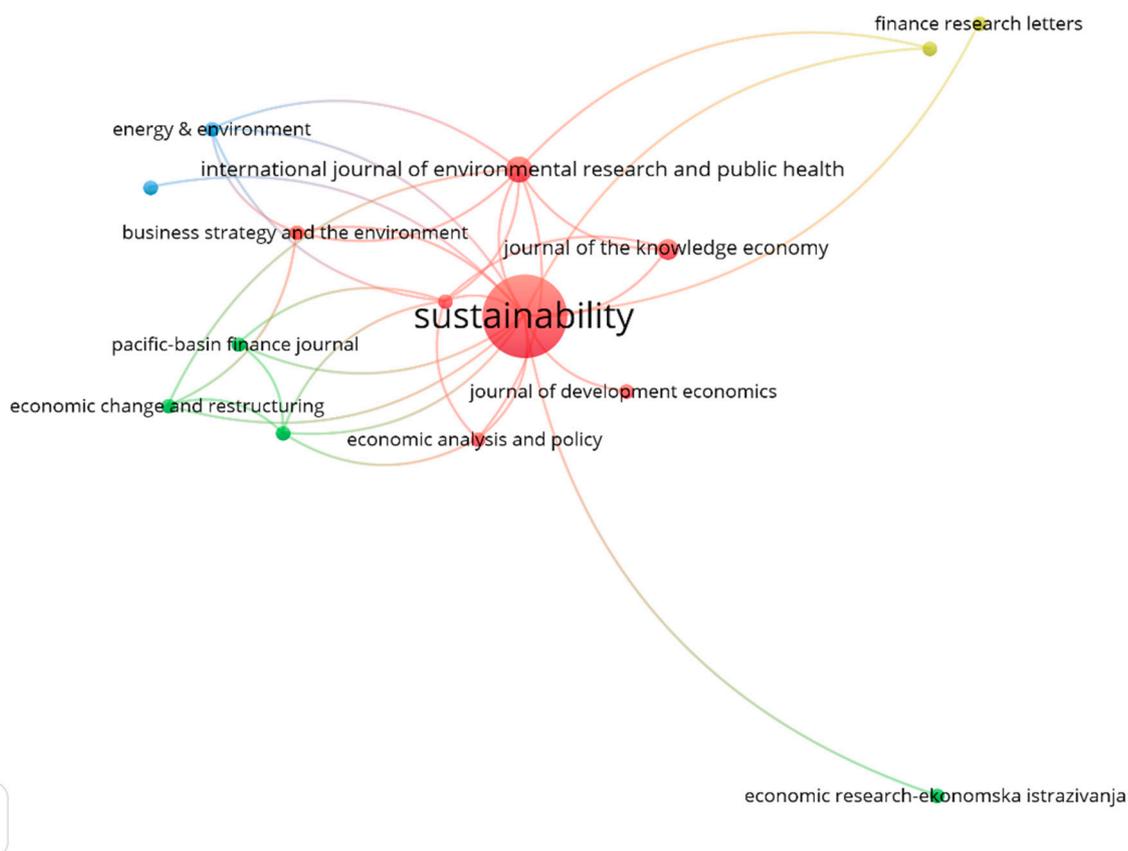
A closer examination of the most commonly cited articles within our dataset revealed that [Ding et al.’s \(2021\)](#) study on “Digital Economy, Technological Innovation, and High-Quality Economic Development: Spatial and Mediation Effects,” and [Su et al.’s \(2021\)](#) research on “The Impact of the Digital Economy on Industrial Structural Upgrading: Testing Mediating Effects of Heterogeneous Technological Innovation,” hold prominent positions. This suggests that a significant portion of research within the field of economic development and the digital economy focuses on the interplay between these key themes, highlighting the importance of digitalisation, technological innovation, and high-quality economic growth in this domain.

Figure 7 presents distinct clusters of journals publishing research on economic development and the digital economy, identified using VOSviewer 1.6.20 (Nexus Uni, Las Vegas, NV, USA), with criteria outlined by [Paltrinieri et al. \(2019\)](#). This approach limits the number of citations per source to five, ensuring robust cluster formation within the visualisation.

The red cluster prominently featured the journal *Sustainability*, highlighting its strong connection with the *Journal of Cleaner Production* as the leading publication in the blue cluster. Notably, *Sustainability* not only occupied a distinct cluster but also formed connections with all other clusters, demonstrating its pervasive influence within the field.

The purple cluster, led by the journal *Business Strategy and the Environment*, exhibited a strong connection with *Sustainability*, mirroring the link between *Sustainability* and the *Journal of Cleaner Production* in the red cluster. This further emphasises the thematic coherence within these clusters.

The yellow cluster, comprising only two publications: *Finance Research Letters* and the *Journal of Innovation and Knowledge*, exhibited significant connections with *Economic Modelling* in the red cluster but had weaker links with other clusters. This suggests a more specialised focus within this cluster compared to the others.



**Figure 7.** Bibliographical coupling of journals.

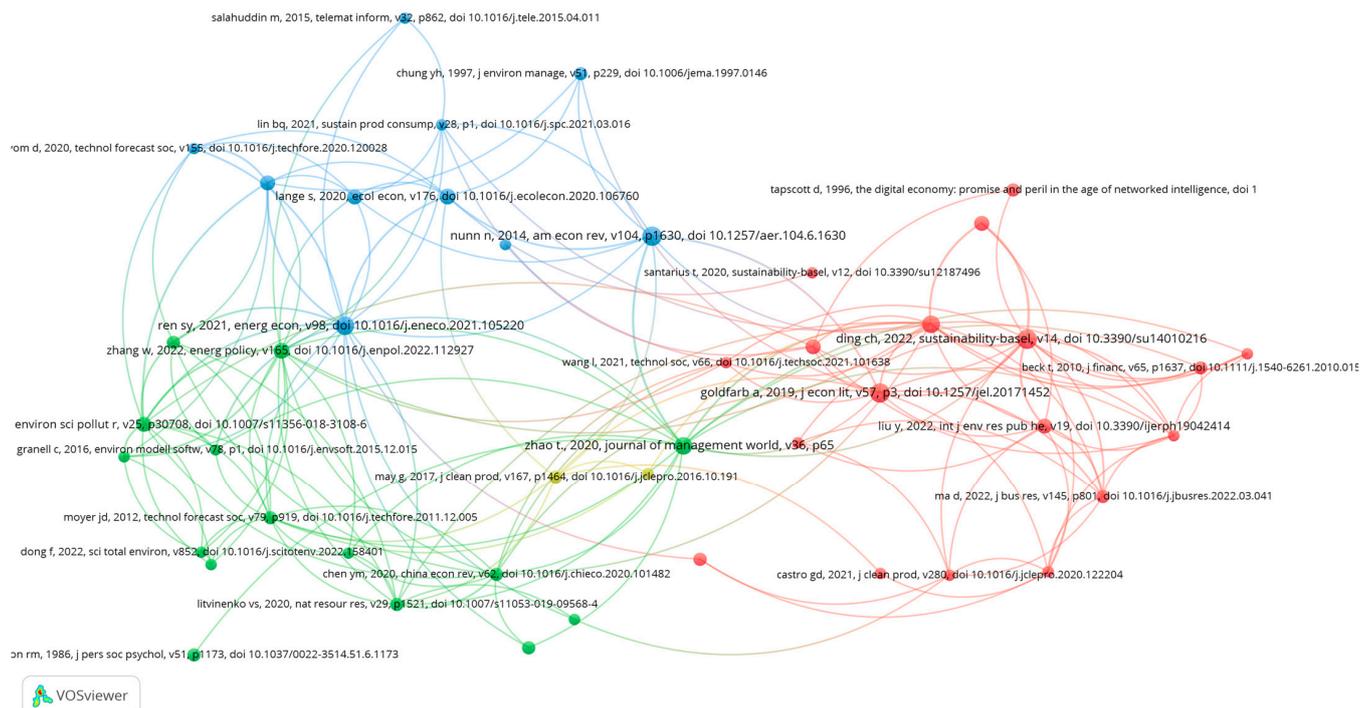
Figure 7 underscores the substantial influence of the journal *Sustainability* in the research landscape of economic development and the digital economy, highlighting its strong connections with a diverse range of academic journals in this field. This analysis provided valuable insights into the major publication outlets and thematic relationships within the field, allowing researchers to identify relevant sources and explore potential collaborations.

### 3.3.3. Analysis of Co-Citation

Co-citation analysis, a technique described by Boyack and Klavans (2010), involves examining pairs of papers cited together in a single source. This approach helps identify research streams by assessing the strength of connections between different articles. By applying a threshold of 3 citations, we identified 4 distinct clusters within a network of 45 publications exploring the field of economic development and the digital economy (Figure 8).

The visualisation highlights the interconnectedness of these clusters. While the red and yellow clusters demonstrated weaker connections with the blue and green clusters, a strong correlation existed between the latter two, indicating significant thematic overlap and research collaboration within those particular areas. This analysis provides valuable insights into the existing research landscape and helps identify key research streams within the field.

Further investigation into the specific themes and methodologies employed within each cluster can provide researchers with a deeper understanding of the current trends and priorities within the economic development and digital economy research landscapes. This knowledge can be crucial for strategically directing future research efforts towards areas with the most significant potential for advancement and impact.



**Figure 8.** Co-citation of references.

### 3.3.4. Analysis of Keywords

The initial keyword analysis we conducted, with a threshold of three occurrences, yielded limited results. As a result, we adjusted the three threshold in order to identify more evident patterns in the data. Figure 9 exhibits the refined clusters that arose from this investigation, revealing five distinct research fields within the fields of economic development and the digital economy. This extensive analysis, including both keyword examination and cluster identification, offers valuable insights into the several research areas that now dominate this field. The research on economic development and the digital economy can be categorised into five main areas: economic dynamics of digital innovation, revitalising business operations in the digital era, tech-driven economic innovation: applications and impacts, societal dimensions of digital economic understanding, and crafting strategic policies for digital economic advancement.

### 3.3.5. Analysis of Thematic Evolution

To improve the accuracy of our analysis, we conducted two additional analyses using the bibliometric R-package. By employing the thematic map feature within the package, we categorised topics according to their centrality and density, revealing four quadrants (Figure 10). As outlined by [Cobo et al. \(2011\)](#), the upper right and left quadrants represent motor and highly specialised themes, respectively, while the bottom right and left quadrants denote underlying and emergent themes. Figure 10 demonstrates that economic development and digital economy publications encompass fundamental subjects, such as economics and finance, alongside specific themes such as sustainable development and the digital economy itself.

We further confirmed these themes through dendrogram analysis, which similarly yielded five groups based on keywords present in the source materials. This corroborated our findings concerning the thematic distribution of research within the field of economic development and digital economy.



#### 4. Research Domains and Anticipated Research Questions

##### 4.1. Research Domain 1: Economic Dynamics of Digital Innovation

The first cluster focuses on digital innovation and its influence on research and practice, including several crucial subjects. [Bogers et al. \(2022\)](#) explored the complex terrain of digital innovation, whereas [Yoo and Yi \(2022\)](#) concentrated on the economic consequences of digital transformation on social systems. [Zhang et al. \(2022\)](#) provided valuable insights on the correlation between the digital economy and low-carbon growth, while [Ma and Zhu \(2022\)](#) elucidated the impact of digitalisation on driving high-quality green development in emerging nations.

[Kreiterling \(2023\)](#) led a distinct line of inquiry that highlighted the intricacy of competitive marketplaces and the obstacles encountered in digital innovation and entrepreneurship. [Samara et al. \(2023\)](#) used system dynamics analysis to elucidate the delicate interplay between digital technology and regional development, providing unique insights into this sophisticated system. [Ding et al. \(2021\)](#) conducted a comprehensive study on the various impacts of the digital economy on technological innovation and high-quality economic development. They specifically examined the spatial and mediation effects. The literature also investigates developing tendencies, as shown by [Ren et al. \(2022\)](#), who analysed the increasing impact of inclusive green development and raised doubts about the efficacy of digital economy agglomeration. [Su et al. \(2021\)](#) emphasised the intermediary function of the digital economy in promoting improvements in industrial structure, whereas [Guo et al. \(2023\)](#) provided empirical data from Chinese cities that demonstrate the impact of the digital economy on facilitating better economic development in urban areas. [Li et al. \(2021\)](#) examined the relationship between the digital economy and environmental quality in Chinese towns, taking into account the environmental aspects. [Hosan et al. \(2022\)](#) investigated the interdependence between demographic dividends, digitalisation, energy intensity, and sustainable economic growth in emerging countries. In addition, [Zhou et al. \(2021\)](#) provided actual observations on haze pollution, the geographical spread of its impacts, and the implications of the digital economy in China.

In the Chinese context, researchers have conducted studies on the correlation between digital finance and economic growth ([Jiang et al. 2021](#)), the impact of digital economic development on China's economic growth ([Jiao and Sun 2021](#)), and the practical consequences of the digital economy on China's employment structure ([Wu and Yang 2022](#)).

This cluster meticulously unpacked the various dimensions linking economic development and the digital economy ([ALShanti et al. 2024](#)). Key areas of study included, firstly, the influence of digital innovation on economic dynamics, specifically analysing its effect on green development and advancements in industrial structures. Secondly, investigations explored the symbiotic relationship between digitalisation and sustainable economic growth, along with examining the correlation between digital finance and economic expansion. Additionally, research specific to China has delved into the practical implications of the digital economy on employment structures and its overall contribution to the nation's economic growth.

##### 4.2. Research Domain 2: Economic Revitalising Business Operations in the Digital Era

In the second cluster, researchers and practitioners have grappled with several issues and diverse perspectives when exploring the impact of digital transformation on company dynamics. [Belitski et al. \(2022\)](#) highlighted the economic challenges faced by entrepreneurs and small businesses amidst global crises, such as the COVID-19 pandemic, providing valuable insights into the resilience and self-efficacy required for survival. [Kraus et al. \(2022\)](#) offered a comprehensive analysis of the current state of digital transformation in business and management research, emphasising the evolving nature of organisational operations. [Sharma and Rautela \(2022\)](#) specifically explored these themes in the context of emerging economies, focusing on the resilience and self-efficacy of entrepreneurs in small enterprises.

Menne et al. (2023) delved into the intersection of Sharia economics and Islamic financial success within the framework of digital-era commercial operations, utilising empirical data from Indonesia. Capello et al. (2023) examined the growth of the digital service economy across European regions, highlighting the transformative patterns that are reshaping the business landscape. Ding et al. (2021) investigated the intricate relationship between the digital economy, technical innovation, and high-quality economic growth, exploring its geographical and mediation effects.

Furthermore, Ren et al. (2022) raised critical questions about the efficacy of digital economy agglomerations in promoting sustainable corporate practices, highlighting the need for inclusive green growth strategies. Su et al. (2021) explored the mediating role of the digital economy in facilitating industrial structural upgrading, revealing its transformative influence on diverse sectors. Guo et al. (2023) offered empirical data from Chinese cities, illustrating the influence of the digital economy on promoting high-quality urban economic growth.

Li et al. (2021) emphasised the environmental dimension by examining the correlation between the digital economy and environmental quality in Chinese cities, while Hosan et al. (2022) explored the dynamic connections between demographic dividends, digitalisation, energy intensity, and sustainable economic development. These studies shed light on the interconnectedness of these issues in the digital age. Zhou et al. (2021) provided empirical findings on the levels of haze pollution, its geographic spread, and the consequences of the digital economy in China.

Jiang et al. (2021) explored the relationship between digital finance and economic growth within the Chinese context, while Jiao and Sun (2021) examined the influence of digital economic development on economic growth, with a specific focus on sustainability. Wu and Yang (2022) analysed the impact of the digital economy on China's employment structure, contributing to the ongoing discussion about the diverse ramifications of digital innovation in the economic sphere.

This cluster investigated the transformative impact of digitalisation on business operations, tackling the challenges faced by entrepreneurs during global crises and dissecting the ever-evolving dynamics within organisations. Researchers analysed the wave of change reshaping the business landscape, delving into the crucial intersection of digital economics and sustainable corporate practices. Their investigations further explored the link between the digital economy and environmental well-being, along with its influence on demographic dividends and employment structures within the economic development framework.

#### 4.3. Research Domain 3: Tech-Driven Economic Innovation: Applications and Impacts

In the third cluster, within the dynamic field of technology-driven economic innovation, researchers have faced a myriad of complexities and diverse perspectives related to the multifaceted impact of technology. Zhou et al.'s (2021) work explored the intricate dynamics of China's platform-based gig economy, shedding light on the challenges faced by workers, particularly in relation to migration and job insecurity. Kester and Ojedeji's (2022) research delved into the African context of worker education, highlighting the potential of advanced technology, such as cloud platforms, to enhance human resource development. Maalsen et al. (2023) analysed the gender dynamics within Australia's innovation ecosystem, offering valuable insights and recommendations for building inclusive smart cities.

Brandl and Dieterich's (2023) study examined the unique characteristics of global payment infrastructures, emphasising the crucial role played by major banks and technology-driven firms. Ding et al. (2021) provided a comprehensive analysis of how the digital economy influences technical innovation and high-quality economic growth, exploring the geographical and mediating effects of this intricate relationship. Ren et al. (2022) raised critical concerns about the efficacy of digital economy agglomeration as a catalyst for promoting inclusive green development.

Su et al.'s (2021) research investigated the mediating role of the digital economy in facilitating industrial structural upgrading, underscoring the significance of diverse forms of technological innovation. Guo et al. (2023) leveraged empirical data from Chinese cities to examine the impact of the digital economy on advancing high-quality urban economic growth. Li et al. (2021) delved into the correlation between the digital economy and environmental quality in 217 Chinese cities, while Hosan et al. (2022) explored the interconnectedness of demographic dividends, digitalisation, energy intensity, and sustainable economic development within developing countries. Zhou et al. (2021) offered empirical findings on the levels of haze pollution, its geographical spill-over effects, and the broader consequences of the digital economy in China.

Jiang et al. (2021) investigated the relationship between digital finance and economic growth, drawing upon empirical data from China. Jiao and Sun (2021) specifically focused on the sustainability aspect, examining the influence of digital economic development on economic growth, with a particular emphasis on China. Wu and Yang's (2022) research explored the impact of the digital economy on China's employment structure, contributing to the ongoing dialogue about the multifaceted consequences of technology-driven innovation in the economic sphere.

The nexus of economic development and the digital economy pulsates with diverse and interconnected issues. Scholars have meticulously dissected a range of topics, including the challenges faced by gig economy workers on platforms, the potential of advanced technology to empower human resource development in Africa, and the intriguing interplay of gender within innovation ecosystems. Additionally, research probes the unique intricacies of global payment infrastructures, the digital economy's imprint on sustainable development, and its multifaceted impact on employment structures.

#### 4.4. Research Domain 4: Societal Dimensions of Digital Economic Understanding

In the fourth cluster, researchers have faced significant challenges and diverse perspectives when exploring the complex relationship between digital innovations and their impact on society. Xing et al. (2023) investigated the potential for the low-carbon digital economy to drive significant societal change, specifically examining its influence on regional economic and social growth in China. Si et al. (2023) delved into the intricate connections between technology, entrepreneurship, innovation, and social change within the context of the digital economy, emphasising the multifaceted societal effects arising from these interconnections. Sanina et al. (2023) specifically focused on the socioeconomic effectiveness of transitioning government services to digital platforms, providing valuable insights into the broader societal consequences of digitalisation on public administration.

Sestino et al. (2023) conducted a comprehensive analysis of existing literature, unravelling the intricacies of the data economy, and investigating its impact on businesses, society, and the overall digital transformation process. Bühler et al. (2023) proposed a novel perspective on harnessing the potential of digital commons, suggesting that data cooperatives can serve as a tool for establishing data-sovereign, creative, and equitable digital communities.

Ding et al. (2021) emphasised the social implications of the digital economy by examining its influence on technical innovation and high-quality economic growth through geographical and mediation effects. Ren et al. (2022) questioned the effectiveness of digital economy concentration in promoting sustainability, particularly in the context of inclusive green growth. Su et al. (2021) explored the mediating role of the digital economy in facilitating industrial structural upgrading, highlighting the significance of diverse technical innovation in this process.

Guo et al. (2023) examined the influence of the digital economy on urban economic growth, drawing upon empirical data from Chinese cities and exploring its social aspects. Li et al. (2021) investigated the correlation between the digital economy and environmental quality in 217 Chinese cities, emphasising the interconnectedness of environmental and socioeconomic factors. Hosan et al. (2022) examined the dynamic connections between

demographic dividends, digitalisation, energy intensity, and sustainable economic development, highlighting the broader societal consequences of these interrelated aspects. Zhou et al. (2021) provided empirical data on the levels of haze pollution, its regional spread, and the effects of the digital economy in China, offering insights into the broader social implications.

Jiang et al. (2021) investigated the relationship between digital finance and economic growth in China, providing data that have widespread societal implications. Jiao and Sun (2021) specifically examined the sustainability aspect by investigating the influence of digital economic development on China's economic growth, with a particular emphasis on the social dimension. Wu and Yang (2022) conducted an empirical study to examine the influence of the digital economy on China's employment structure, contributing to the ongoing discussion on the diverse social consequences of technology-driven innovation.

The intricate interplay between economic development and the digital economy provides relief for the diverse and far-reaching issues. Researchers have delved into the transformative potential of a low-carbon digital economy, exploring its ability to drive societal change and foster regional growth. They further dissected the societal ripple effects of technology, entrepreneurship, and innovation. Additionally, studies have scrutinised the effectiveness of transitioning government services to digital platforms and the role of data cooperatives in building equitable digital communities. By focusing on China, researchers have assessed the digital economy's influence on urban economic growth, environmental quality, demographic dividends, and employment structures, highlighting the multifaceted societal implications of technological innovation and digital transformation.

#### 4.5. Research Domain 5: Crafting Strategic Policies for Digital Economic Advancement

In the fifth cluster, researchers have faced complex challenges and diverse perspectives while formulating strategic plans for the digital economy's evolution, aiming to promote sustainable growth and development. Wu et al. (2021) assessed China's recent infrastructure development initiatives to establish sustainable and future-oriented next-generation infrastructure supporting future economic growth. Guan et al. (2023) shed light on China's environmental strategy for achieving sustainable development, highlighting the crucial role of digital transformation in responsible natural resource management.

Jemal et al. (2023) focused on promoting circular economy practises through digital construction technologies, proposing a framework aligned with sustainability goals. Dellyana et al. (2023) provided valuable insights into the digital governance of the Indonesian creative economy from a governmental perspective, emphasising the need for strategic policies propelling digital advancement across diverse sectors. Wang et al. (2023) explored novel pathways towards achieving sustainable economic growth by integrating resource efficiency, technological innovation, and environmental resilience in resource-abundant regions.

Ding et al. (2021) also emphasised the challenges and policy implications of the digital economy's impact on high-quality economic growth, exploring its geographical and mediating effects. Ren et al. (2022) examined the efficacy of digital economy agglomeration as a new driver for inclusive green development. Su et al. (2021) contributed significantly by investigating the mediating impacts of the digital economy on industry structural upgrading, highlighting the need for nuanced policies that encompass diverse technological innovations.

Guo et al. (2023) drew upon empirical data from Chinese cities to examine the influence of the digital economy on superior urban economic growth, providing valuable insights for formulating strategic urban policies. Li et al. (2021) explored the correlation between the digital economy and environmental quality in 217 Chinese cities, emphasising the importance of measures that achieve a harmonious balance between economic growth and environmental concerns. Hosan et al. (2022) delved into the interconnected relationships between demographic dividends, digitalisation, energy intensity, and sustainable economic development, offering essential insights for informed policy decisions. Zhou

[et al. \(2021\)](#) provided empirical data on haze pollution levels, its regional spread, and the effects of the digital economy, offering valuable input for formulating policies that address environmental challenges associated with digital progress.

[Jiang et al. \(2021\)](#) investigated the relationship between digital finance and economic growth, presenting findings from China and proposing viable policy approaches. [Jiao and Sun \(2021\)](#) focused on the sustainability aspect, examining the influence of digital economic development on economic growth in China and suggesting governmental interventions. [Wu and Yang \(2022\)](#) conducted an empirical analysis to examine the influence of the digital economy on China's employment structure. Their findings provided valuable insights for developing policies that effectively address employment issues in the evolving digital environment.

This cluster examined how digitisation has transformed corporate operations, exploring entrepreneurs' concerns amid global crises and organisational dynamics. Researchers have studied the interactions between digital economics and sustainable corporate practices as companies change ([ALShanti et al. 2024](#)). Their research has examined how the digital economy affects demographic dividends, employment arrangements, and environmental well-being in economic growth. These studies illuminate the complicated relationship between digital innovation and economic regeneration, underlining the challenges of the digital age.

## 5. Future Research Agendas

Scholars are advised to investigate the changing dynamics of digital innovation and its influence on economic systems when determining future research priorities in various fields. Examining the consequences of digital transformation on social systems ([Yoo and Yi 2022](#)) and comprehending the complex connection between the digital economy and low-carbon development ([Zhang et al. 2022](#)) continue to be important subjects for investigation. In addition, gaining a comprehensive understanding of the intricacies of competitive markets and the difficulties encountered in digital innovation and entrepreneurship ([Kreiterling 2023](#)), as well as utilising system dynamics analysis to uncover the interplay between digital technology and regional development ([Samara et al. 2023](#)), offer opportunities for detailed investigations. Further investigation is required to explore the comprehensive influence of the digital economy on technological innovation and high-quality economic development, as well as its spatial and mediation impacts ([Ding et al. 2021](#)).

Investigating the economic obstacles encountered by entrepreneurs during crises ([Belitski et al. 2022](#)) and comprehending the changing nature of organisational operations in the digital age ([Kraus et al. 2022](#)) are important topics of study in the field of business operations. The convergence of Sharia economics and digital-era commercial activities in developing nations ([Menne et al. 2023](#)), and the influential trends influencing the digital service economy in European areas ([Capello et al. 2023](#)), provide opportunities for more investigation. Researchers could look into how well digital economy clusters support environmentally friendly business practices and green growth for everyone ([Ren et al. 2022](#)). They could also investigate how the digital economy helps make changes to the structure of industries ([Su et al. 2021](#)).

Further research could look into how platform-based gig economies affect worker dynamics ([Zhou et al. 2021](#)), how advanced technologies can be used to teach workers in Africa ([Kester and Ojedeji 2022](#)), and how gender affects innovation ecosystems ([Maalsen et al. 2023](#)). Moreover, gaining a comprehensive grasp of the importance of global payment infrastructures ([Brandl and Dieterich 2023](#)) and exploring the intricate connections between the digital economy, technological advancements, and robust economic development ([Ding et al. 2021](#)) provide encouraging opportunities. Additional research might investigate the impact of the digital economy on promoting high-quality urban economic development ([Guo et al. 2023](#)) and its relationship with environmental quality in various settings ([Li et al. 2021](#)).

To understand the digital economy from a societal point of view, we need to look at the low-carbon digital economies (Xing et al. 2023), the complicated connections between technology, entrepreneurship, innovation, and social change (Si et al. 2023), and the social and economic benefits of digitising government (Sanina et al. 2023). Additional studies may elucidate the influence of the data economy on firms and society (Sestino et al. 2023) and explore the possibilities of data cooperatives for creating fair digital communities (Bühler et al. 2023). Further investigation is required to explore the social consequences of digital economic development, such as its impact on upgrading industrial structures (Su et al. 2021), promoting superior urban economic growth (Guo et al. 2023), and its relationship with environmental quality (Li et al. 2021).

Developing strategies for the progress of the digital economy is a crucial research priority. Subsequent research endeavours may evaluate the long-term viability of advanced infrastructure (Wu et al. 2021), examine the impact of digital transformation on environmental strategies for sustainable progress (Guan et al. 2023), and investigate models for advancing circular economy strategies using digital construction tools (Jemal et al. 2023). Future research should focus on examining the digital governance of creative economies (Dellyana et al. 2023) and investigating approaches to achieve sustainable economic growth by including resource efficiency, technological innovation, and ecological resilience (Wang et al. 2023). Continued investigation into the difficulties and policy ramifications of the digital economy's influence on robust economic growth, urban expansion, and ecological integrity (Ding et al. 2021; Guo et al. 2023; Li et al. 2021) will be essential for formulating strategic measures that harmonise economic progress with environmental sustainability and societal welfare.

These studies provide detailed insights into the complex connections between the digital economy and many aspects of economic growth. They offer empirical information on the difficulties encountered, possibilities available, and consequences for various stakeholders. The evidence emphasises the necessity of adaptive strategies in response to digital disruption, ranging from the impact of platform-based gig economies on worker precarity (Zhou et al. 2021) to the transformative potential of digital technologies in reshaping businesses and management operations (Kraus et al. 2022). In addition, the studies highlight the societal implications of digital economic development, including its impact on social systems and low-carbon development (Yoo and Yi 2022; Zhang et al. 2022), as well as the complex interplay between technology, entrepreneurship, and social transformation (Si et al. 2023). Digitalisation affects environmental quality, demographic dividends, and long-term economic growth in many places around the world (Hosan et al. 2022; Li et al. 2021; Ren et al. 2022). This shows that digital innovation has a big effect on environmental balance and social welfare.

The studies offer useful information about the pros and cons of next-generation infrastructure (Wu et al. 2021), circular economy strategies (Jemal et al. 2023), and the role that digital transformation plays in using natural resources responsibly (Guan et al. 2023), which can help us make plans for the future of the digital economy. The study also suggests that data cooperatives and digital governance frameworks have the ability to promote fair and creative communities (Bühler et al. 2023; Dellyana et al. 2023). The empirical data from Chinese cities provide concrete proof of the significant influence of the digital economy on urban development, economic growth, and environmental quality (Guo et al. 2023; Li et al. 2021; Wu and Yang 2022). Overall, the combined data from these several study fields emphasises the need for multidisciplinary cooperation and a comprehensive understanding of the diverse effects of digital innovation. The studies contribute to an ongoing discussion on the consequences of digitalisation, influencing not just the academic conversation but also providing information to policymakers, corporations, and society in general about the difficulties and possibilities in the constantly changing digital economy.

Across the globe, governments are waking up to the transformative power of digitalisation, recognising its potential to fuel economic growth and societal progress. Their initiatives are laser-focused on creating fertile ground for digital innovation, with a three-

pronged approach: developing cutting-edge infrastructure, nurturing digital literacy, and encouraging widespread technology adoption. The transformative potential of the digital economy is not lost on governments. They are crafting policies to nurture entrepreneurship, pump funds into research and development, and fortify cybersecurity measures. Sustainability and inclusivity are rising stars in these strategies, ensuring everyone gets a seat at the digital table and aligning with global goals. These initiatives illustrate a global chorus of governments working in unison to harness the immense benefits of digital advancements while mitigating potential pitfalls. It is a cooperative journey with the help of digitalisation towards a better future.

On the other hand, artificial intelligence (AI) development is booming, impacting various aspects of economic development. Studies highlight both challenges and opportunities. AI can disrupt industries, potentially displacing workers in platform-based gig economies. However, it also sparks innovation, reshaping businesses and driving growth. Societal concerns include AI's impact on social systems, low-carbon development, and environmental quality. Research suggests the need for adaptive strategies, fair digital communities, and sustainable practices. Governments worldwide are actively fostering digital innovation through infrastructure, literacy, and adoption, aiming to harness AI's potential for inclusive economic progress. This complex landscape demands multidisciplinary research and collaboration to effectively navigate the digital future.

## 6. Conclusions

This study delved into the complex dynamics of economic growth within the digital economy over the past two decades. Through the examination of 1404 articles published from 2000 to 2023, we have provided insight into the complex characteristics of digital transformation, which encompasses its economic ramifications as well as its social consequences. Our research was conducted using RStudio, VOSviewer, and Excel, and involved three stages: a comprehensive evaluation of overall performance, citation analysis, and network and content analysis. This approach allowed us to gain a deep understanding of the current research landscape, including evolving research priorities, prominent authors and publications, and hidden connections within the literature (see Table 8).

To propel future research in this field, we propose focusing on the emerging themes and unanswered questions identified within our study. These include:

- Navigating the complex landscape of digital advancement. Further investigation into the evolving challenges and opportunities presented by digital transformation is crucial.
- Supporting entrepreneurs through global crises. Understanding and addressing the specific challenges faced by entrepreneurs during emergencies is essential for fostering resilience.
- Bridging the gap between Sharia economics and digital-era business practices. Research in this area can contribute to the development of successful business models in developing nations.
- Investigating the role of gender dynamics within innovation ecosystems. Recognising and addressing gender inequalities in innovation is necessary for fostering inclusive growth.
- Examining the social consequences of digital government transformation. Understanding the impact of shifting government services to digital platforms on various stakeholders is essential for ensuring equitable access and societal well-being.
- Promoting sustainable digital economic growth. Research efforts should continue to focus on developing effective strategies that integrate sustainability, circular economy principles, and responsible resource management.

**Table 8.** Future of the research agenda.

Cluster	# of Studies	Future Trends	Key Sources
Economic Dynamics of Digital Innovation	14	Evolving impact of inclusive green development	Bogers et al. (2022); Yoo and Yi (2022); Zhang et al. (2022); Ma and Zhu (2022); Ren et al. (2022); Su et al. (2021); Guo et al. (2023); Li et al. (2021); Hosan et al. (2022); Zhou et al. (2021); Jiang et al. (2021); Jiao and Sun (2021); Wu and Yang (2022)
Economic Revitalising Business Operations in the Digital Era	10	Resilience and self-efficacy of entrepreneurs in small businesses	Belitski et al. (2022); Kraus et al. (2022); Sharma and Rautela (2022); Menne et al. (2023); Capello et al. (2023); Ding et al. (2021); Ren et al. (2022); Su et al. (2021); Guo et al. (2023); Li et al. (2021); Hosan et al. (2022); Zhou et al. (2021); Jiang et al. (2021); Jiao and Sun (2021); Wu and Yang (2022)
Tech-Driven Economic Innovation: Applications and Impacts	14	Challenges and opportunities for platform-based gig economies	Zhou et al. (2021); Kester and Ojedeji (2022); Maalsen et al. (2023); Brandl and Dieterich (2023); Ding et al. (2021); Ren et al. (2022); Su et al. (2021); Guo et al. (2023); Li et al. (2021); Hosan et al. (2022); Zhou et al. (2021); Jiang et al. (2021); Jiao and Sun (2021); Wu and Yang (2022)
Societal Dimensions of Digital Economic Understanding	14	Digitalisation's impact on regional socioeconomic development	Xing et al. (2023); Si et al. (2023); Sanina et al. (2023); Sestino et al. (2023); Bühler et al. (2023); Ding et al. (2021); Ren et al. (2022); Su et al. (2021); Guo et al. (2023); Li et al. (2021); Hosan et al. (2022); Zhou et al. (2021); Jiang et al. (2021); Jiao and Sun (2021); Wu and Yang (2022)
Crafting Strategic Policies for Digital Economic Advancement	14	Sustainable resource management through digital transformation	Wu et al. (2021); Guan et al. (2023); Jemal et al. (2023); Dellyana et al. (2023); Wang et al. (2023); Ding et al. (2021); Ren et al. (2022); Su et al. (2021); Guo et al. (2023); Li et al. (2021); Hosan et al. (2022); Zhou et al. (2021); Jiang et al. (2021); Jiao and Sun (2021); Wu and Yang (2022)

This study uniquely contributed to the realm of economics by undertaking a comprehensive analysis of 1404 articles spanning two decades within the digital economy. Employing a multifaceted methodology involving RStudio, VOSviewer, and Excel, we unveiled the nuanced landscape of digital transformation. Our categorisation of future research trends into clusters, ranging from economic dynamics to societal dimensions, offers a structured guide for scholars and practitioners. Notably, we proposed a research agenda, emphasising themes such as navigating digital advancement challenges and supporting entrepreneurs in crises. The study's distinctive inclusive approach has emphasised sustainable digital economic growth, integrating principles of circular economy and responsible resource management. While acknowledging the limitations, including potential citation data inconsistencies, this research lays a foundation for deeper understanding and policy formulation in the dynamic field of digital economics.

While our research provides valuable insights, it is important to acknowledge certain limitations. The analysis relied on the accuracy and completeness of citation data, which may be subject to inconsistencies across databases. Additionally, the chosen timeframe may not capture the most recent advancements in the field. Furthermore, the selection of analytical tools and procedures, while robust, introduces a degree of subjectivity. Therefore, careful interpretation of the findings is recommended, and further research employing alternative methodologies may validate our conclusions.

This study contributes to a deeper understanding of economic growth within the digital economy, laying the foundation for future research in this dynamic field. Scholars and practitioners may significantly contribute to growing knowledge and implementing policies that support sustainable and equitable digital economy by concentrating on the indicated areas of study.

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