

Bibliometric Exploration of Trends in the Digital Economy, E-Commerce, and ICT (2015-2025)

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Abstract: The digital economy, e-commerce, and Information and Communication Technologies (ICT) have profoundly reshaped business models and socioeconomic interactions over the last decade. This study conducts a bibliometric analysis of 135 publications indexed in Scopus (2015–2025) using Bibliometrix and VOSviewer. Results reveal sustained growth in scientific interest and a strong regional concentration of academic production. The ICT–innovation–productivity triad is consolidated as the dominant conceptual axis, with emerging lines focusing on sustainable digital transformation. Future research priorities include accurately measuring the impact of digitisation on sectoral productivity, assessing e-commerce supply chain sustainability, and designing digital well-being indicators adapted to low- and middle-income contexts.

Keywords: digital economy; e-commerce; ICT; bibliometrics

^{ES} Exploración bibliométrica de las tendencias en la economía digital, el comercio electrónico y las TIC (2015-2025)

Resumen: La economía digital, el comercio electrónico y las tecnologías de la información y la comunicación (TIC) han transformado profundamente los modelos de negocio y las interacciones socioeconómicas durante la última década. Este estudio realiza un análisis bibliométrico de 135 publicaciones indexadas en Scopus (2015–2025) utilizando Bibliometrix y VOSviewer. Los resultados revelan un crecimiento sostenido del interés científico y una fuerte concentración regional de la producción académica. La tríada TIC–productividad–innovación se consolida como el eje conceptual dominante, con líneas emergentes centradas en la transformación digital sostenible. Las prioridades de investigación futura incluyen medir con precisión el impacto de la digitalización en la productividad sectorial, evaluar la sostenibilidad de las cadenas de suministro del comercio electrónico y diseñar indicadores de bienestar digital adaptados a contextos de ingresos bajos y medios.

Palabras clave: economía digital; comercio electrónico; TIC; bibliometría

JEL codes: O3, L8

Sumario: 1. Introduction. 2. Methodology. 3. Results. 4. Conclusions. References.

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1. Introduction

Over the last decade, digitalisation has ceased to be an emerging phenomenon and has become one of the pillars of the contemporary global economy. In 2024, digital goods and services accounted for approximately 15 per cent of global GDP – equivalent to some USD 16 trillion – and their rate of expansion continues to outpace that of traditional sectors (World Bank, 2024). This growth is particularly rapid in e-commerce, whose sales exceeded USD 6.09 trillion in the same year, with an estimated annual growth rate of 8.4 percent (Shopify, 2024). These figures reveal a structural transformation in production, distribution, and consumption patterns,

driven by the widespread use of mobile devices, internet access, and the rise of digital platforms (Bukht & Heeks, 2017; Scholz, 2021).

This process has been accompanied by a parallel evolution in the Information and Communication Technology (ICT) sector, which has grown almost three times faster than the OECD average between 2013 and 2023 (OECD, 2024). As ICT redefines value chains, labour markets, and business models - supported by artificial intelligence, automation, and fintech platforms - structural challenges related to environmental sustainability, data governance, digital equity, and cross-border regulation are also emerging (UNCTAD, 2024).

The digital economy is not only a technological revolution, but also a process with profound economic, social, and territorial implications. From this perspective, its analysis is essential to understanding new sources of growth, competitiveness, and inclusion. Academic literature has begun to address these issues from multiple perspectives: it has been shown, for example, that digitisation strengthens business competitiveness (Bacca-Acosta et al., 2023), boosts the regional economy, and improves access to financial services in historically excluded sectors (Xi & Wang, 2023). Likewise, e-commerce is consolidating its position as a key vector of productive transformation, facilitating the formalisation of markets and the integration of small and medium-sized enterprises (SMEs) into global value chains (UNCTAD, 2021).

On the other hand, ICTs have acted as catalysts for this transformation, providing the technological infrastructure that enables the digitisation of processes, the modernisation of business management, and the provision of more efficient public services (ITU, 2018). However, significant inequalities persist between developed and developing countries, raising questions about equity in access to and use of digital opportunities (ITU, 2020).

Despite growing academic interest (Al-Zoubi, 2024; Hendricks & Mwapwele, 2023), the available evidence remains fragmented, with studies focusing on specific regions or success stories in advanced economies. This gap prevents obtaining a comprehensive view of the evolution and global challenges of the digital economy. Therefore, this article aims to analyse the status and evolution of scientific production on the digital economy, e-commerce, and ICT between 2015 and 2025, identifying its main thematic focuses, leading regions, analytical gaps, and emerging lines of research. In particular, it seeks to answer the following questions: How has scientific output in this field evolved in terms of volume, sources, and geographic distribution? What are the most established conceptual cores, and what emerging topics or gaps remain?

To answer these questions, a bibliometric exploration was conducted of 135 documents indexed in Scopus (2015–2025), retrieved using the query: (“digital economy” OR “e-commerce”) AND (“ICT” OR “TIC”). The data were processed using the *Bibliometrix* and *VOSviewer* tools, which allowed the generation of production indicators, co-occurrence networks, and thematic maps.

This study offers contributions on four fronts: (1) it provides a structured and updated overview of the evolution of the field over the last decade; (2) it identifies geographical gaps that limit the dissemination of knowledge, particularly in Latin America and Africa; (3) it presents a thematic map that distinguishes between consolidated hubs, emerging clusters, and critical research gaps; and (4) it proposes a future agenda that integrates mixed methodological approaches and emphasises sustainability. These contributions are relevant for both researchers and public policy makers interested in building a more equitable, resilient, and sustainable digital economy.

The article is organised into four sections: the second section describes the methodology used; the third section presents the main results and discussion of the bibliometric analysis; and the last section presents the discussion, conclusions, and recommendations for future research.

2. Methodology

To meet the objectives of the study, a bibliometric exploration of scientific production on the digital economy, e-commerce, and Information and Communication Technologies (ICT) was carried out for the period 2015–2025. The records were retrieved exclusively from Scopus, whose multidisciplinary coverage guarantees the comprehensiveness necessary for this type of exploratory analysis. This bibliometric approach facilitates the identification, quantification, and synthesis of available evidence, while allowing the detection of trends, gaps, and opportunities for future research (Tranfield, Denyer & Smart, 2003; Paul & Criado, 2020). Regarding the latter, recent studies emphasise the urgency of such analyses to clarify the disjointed knowledge in the digital economy and guide future strategic business adaptations (Okpalaoka, 2023; Jobstreibizer et al., 2025).

To construct the search chain, an exhaustive list of synonyms for the descriptors “digital economy”, “e-commerce”, and “ICTs” was first compiled from the UNESCO and OECD thesauri, as well as from JEL codes related to the digital economy. This process yielded 76 terms in Spanish and English. The initial query in Scopus - all terms linked with OR - retrieved 476,275 records (1912–2025) from areas as diverse as veterinary medicine, chemistry, and computer science. Given that the objective was to analyse the evolution of economic and business research, the list was refined, retaining 16 key terms (e.g., digital economy, digital divide, digital transformation, technological change, electronic commerce). This second search reduced the corpus to 108,799 documents (1957–2025). In a third step, the strategy was refined to capture studies in which ICTs appeared as an analysed variable and not just as context. Therefore, the OR operator was replaced by AND between the digital economy-e-commerce and ICT blocks, using the string: TITLE-ABS-KEY (“digital economy” OR “e-commerce”) AND (“ICT” OR “TIC”). This combination yielded 1,530 multidisciplinary articles (1999–2025), to which temporal and thematic filters were subsequently applied to arrive at the final sample analysed.

Only peer-reviewed articles of an empirical or theoretical nature that addressed the digital economy, e-commerce, or ICT adoption and were available in open access, with full text in Spanish or English, were included. Newspaper articles, blogs, documents without academic review, studies prior to 2015, and works without access to the full text were excluded. The search was also restricted to the subject areas of Business, Management, Accounting, Economics, Econometrics, Finance, Social Sciences, and Computer Science. The combined application of these filters led to a final sample of 135 articles.

Although the final sample of 135 documents might appear limited in volume compared to broader systematic reviews, it represents the core high-impact literature specifically indexed in Scopus. As noted by Donthu et al. (2021), in bibliometric methodologies, the precision of the search string and quality filters prioritises the relevance and reliability of the corpus over mere quantity. This ensures that the analysis captures the verified intellectual structure of the field, avoiding the 'noise' often introduced by predatory journals or non-indexed grey literature.

Descriptive statistics were calculated - annual publication frequency, geographical distribution, and source type - and, using VOSviewer 1.6.20 and Bibliometrix 5.0.1, keyword co-occurrence and co-citation networks were generated to identify thematic clusters and influential authors (Van Eck and Waltman, 2010).

3. Results

Figure 1 traces the annual evolution of the documents included in the corpus (2015-2025) and allows us to distinguish three phases. In the initial stage (2015-2017), production remained virtually stable, with approximately 5 articles per year, reflecting a still incipient interest in the subject. In 2018, there was a slight increase, followed by a sharp jump in 2019, when production tripled to 18 articles, marking the first turning point of the period.

The trend reversed in 2020, when publications fell to 9 (-50 per cent compared to 2019), possibly due to editorial delays caused by the pandemic (Raynaud et al., 2021). However, 2021 marked the peak with 23 documents, reflecting the explosion of research on e-commerce and digital transformation in the midst of lockdown. From that point on, production gradually declined: 21 articles in 2022, 20 in 2023, and 14 in 2024, indicating a consolidation phase after the pandemic boom. Preliminary data for 2025 (January-April) shows 7 publications, so the annual total could equal or exceed the 2024 figure if the pace continues. In aggregate terms, the series shows a compound annual growth rate of 12 per cent for 2015-2024, with two notable milestones: the acceleration in 2019 and the peak in 2021. These patterns provide context for both the dynamism and relative maturity that research in digital economy, e-commerce, and ICTs has achieved over the last decade.

Therefore, the bibliometric analysis shows that the literature on the digital economy has followed a structured evolution in three phases: an initial take-off stage (2015-2018), a pandemic expansion phase (2020-2021), and a recent stage of thematic consolidation (2022-2023). This pattern is confirmed in studies such as that by Mikhaylova (2021), which identifies the pandemic as a catalyst for institutional and organisational digitisation, and that by Gomes et al. (2022), which demonstrates sustained growth in scientific production linked to the economic impact of digitisation.

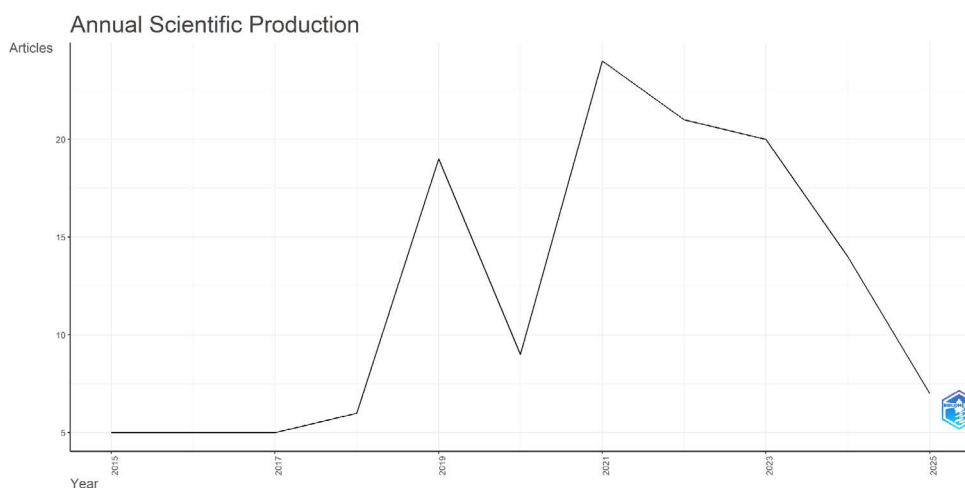


Figure 1. Scientific output by year

Source: Elaborated by the authors using data from Scopus (2025)

Figure 2 shows, using a blue-scale choropleth map, the geographical origin of the 135 publications analysed. There is a marked concentration in Asia, where China stands out, followed by Malaysia and India, whose intense shades reveal significant production. In Western Europe, Spain, the United Kingdom, and Finland stand out, while Ukraine stands out in Eastern Europe. In the Americas, the United States and Colombia show moderate contributions, but much lower than the output of Asia and Europe. African research is in its infancy, limited mainly to Nigeria and Algeria, with even lower output than the Americas, and no output is observed in Oceania. In total, fifty-three countries contribute to the corpus, but around 59 per cent of the articles are

concentrated in eleven leading countries—Ukraine, China, Spain, Malaysia, the United Kingdom, Slovakia, India, Romania, Finland, Indonesia, and Kazakhstan—evidencing a global interest in the digital economy, albeit with marked regional asymmetry.

The leadership of Asia and Europe is confirmed, with special emphasis on China, which coincides with the analysis of Lin (2019), who highlights how e-commerce has reconfigured urban planning and productive structures in Taobao villages. This global leadership, however, implies a structural bias in the empirical evidence toward high-income countries, to the detriment of emerging regions. Despite this disparity, research such as that by Lalaleo-Analuia et al. (2021) shows progressive growth in Latin America, where ICTs are beginning to have an impact on productivity, even in rural or intermediate contexts.

Ali (2020) highlights that the impact of digitisation in emerging countries is conditioned by institutional maturity, digital human capital, and public-private cooperation. This is consistent with studies that recommend applying systemic approaches to capture regional heterogeneities, especially in Latin America, Eastern Europe, and Southeast Asia. Although the emerging participation of Latin American studies—Colombia, Mexico, Ecuador, Argentina—is promising, it is still insufficient to balance the regional scale. These results show the potential for analysis in developing regions.

Country Scientific Production

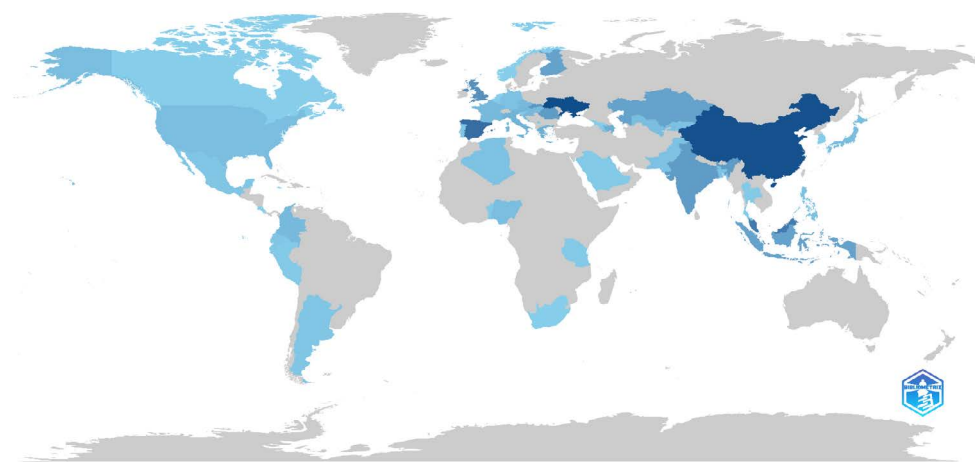


Figure 2. Geographic distribution of scientific output

Source: Elaborated by the authors using data from Scopus (2025)

A joint reading of Figures 3a (volume) and 3b (influence) highlights both publication clusters and citation nodes within the corpus. By number of articles, *Technology in Society* tops the list with eight papers, followed by *Humanities and Social Sciences Communications* with five. A second tier is occupied by two specialised journals—*AGRIS On-Line Papers in Economics and Informatics* and *Economic Annals-XXI*—with four articles each. The group immediately below is made up of *Cogent Business and Management*, *Financial and Credit Activity: Problems of Theory and Practice*, and the *Journal of Telecommunications and the Digital Economy*, with three documents per title. Although it has a low output (2), the Latin American journal *Contaduría y Administración* also appears on the list of journals with the highest number of publications.

Moving from quantity to impact, measured by the local h-index (citations within the corpus itself), the leadership of *Technology in Society* is reinforced ($h=7$), which means that its articles have received seven or more citations in the sample. It is followed by *AGRIS On-Line Papers* and *Economic Annals-XXI* with $h=4$, maintaining a proportionally high influence despite publishing half as many papers as the dominant journal. In contrast, *Humanities and Social Sciences Communications* drops to $h=3$, a sign that its higher productivity does not yet translate into the same citation density.

Overall, the data describe a moderately oligopolistic structure: a small group of multidisciplinary journals concentrates both production and citations. This pattern suggests that research on the digital economy is disseminated simultaneously through established broad-spectrum channels and specialised windows that amplify emerging or contextualised debates.

Figure 4 presents the co-citation network composed of documents that accumulate ten or more internal citations. Each node reflects the volume of citations (diameter) and the year of publication (colour gradient: purple=2018, green=2022, yellow=2024). The diagram confirms that 2019 is the epicentre of studies for the period: works such as Bilan et al. (2019), Lin (2019), and Dincă, Dima, and Rozsa (2019) form the largest nodes, highlighting their status as seminal 2019 references in the discussion on the digital economy. Around them are grouped other contributions of medium impact published between 2018 and 2021 - for example, Ruiz-Rodríguez, Lucendo-Monedero, and González-Relaño (2018), Williams et al. (2016), and Murthy, Kalsie, and Shankar (2021) - which, although somewhat less cited, form the backbone of the co-citation network.

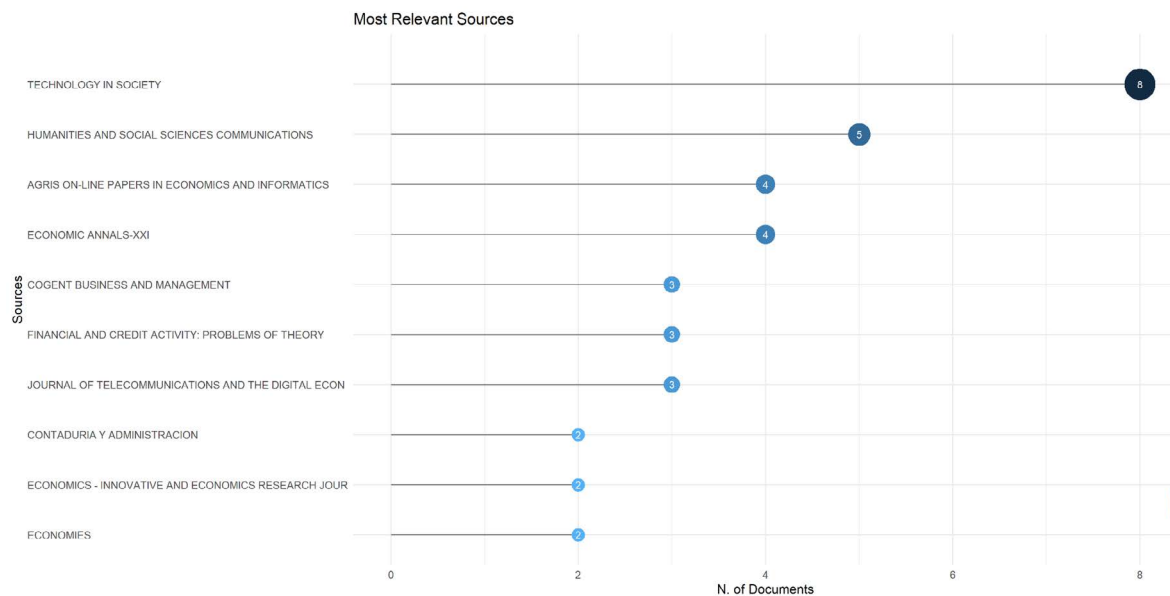


Figure 3a. Most influential journals and sources in terms of output

Source: Elaborated by the authors using data from Scopus (2025)

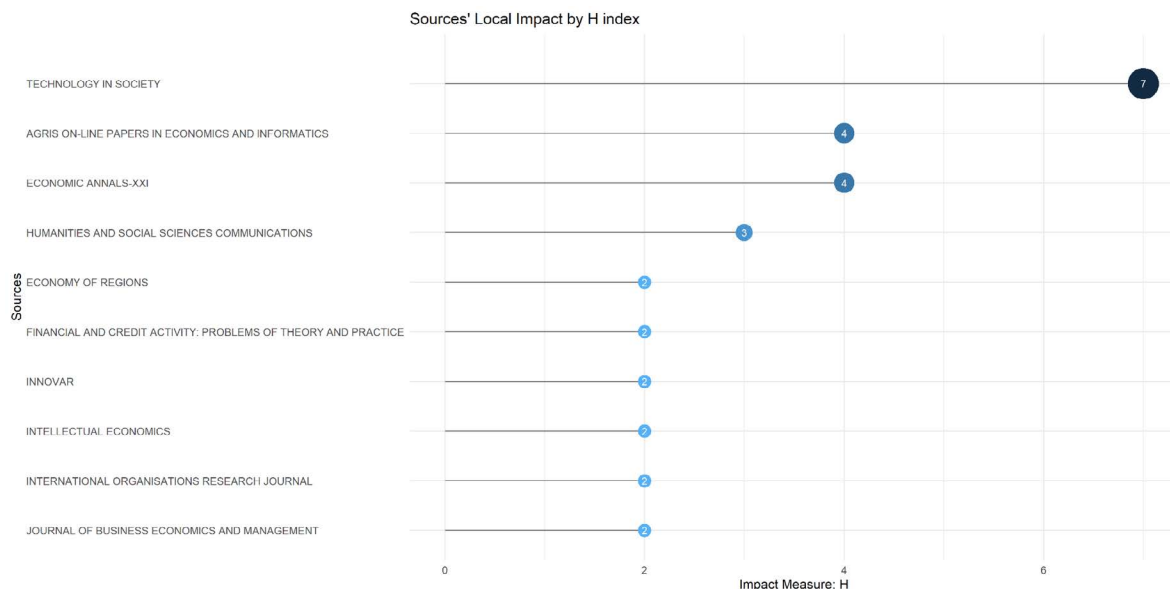


Figure 3b. Most influential journals and sources in terms of impact according to the H-index

Source: Elaborated by the authors using data from Scopus (2025)

In the upper and right areas, green and yellow nodes appear, corresponding to more recent works - Wang and Zhu (2022), Lorente-Barroso, Sánchez-Valle, and Viñarás-Abad (2023), and Magoutas et al. (2024) - whose smaller diameter illustrates the usual temporal disadvantage: they have not yet had enough time to accumulate a comparable volume of citations. Similarly, the purple nodes (2018-2019) surround the central core, suggesting a high degree of thematic coherence that has favoured their dissemination. Overall, the figure shows how later literature draws on the corpus published around 2019 and demonstrates that influence is concentrated in a few key works, with no notable clusters of collaborative authorship.

Figure 5 summarises the most frequently occurring keywords (Keywords-Plus) within the corpus and confirms the centrality of the technology (e - commerce) - innovation - productivity triad in digital economy studies. The most frequent term is “information and communication technology” (ICT), with 16 occurrences, followed closely by “electronic commerce” (15). Both concepts act as articulating axes: the first refers to the technological infrastructure and the second to the market in which it materialises. At a notable distance appear “productivity” (8) and “innovation” (6), suggesting that the literature places special emphasis on the economic returns of digitisation.

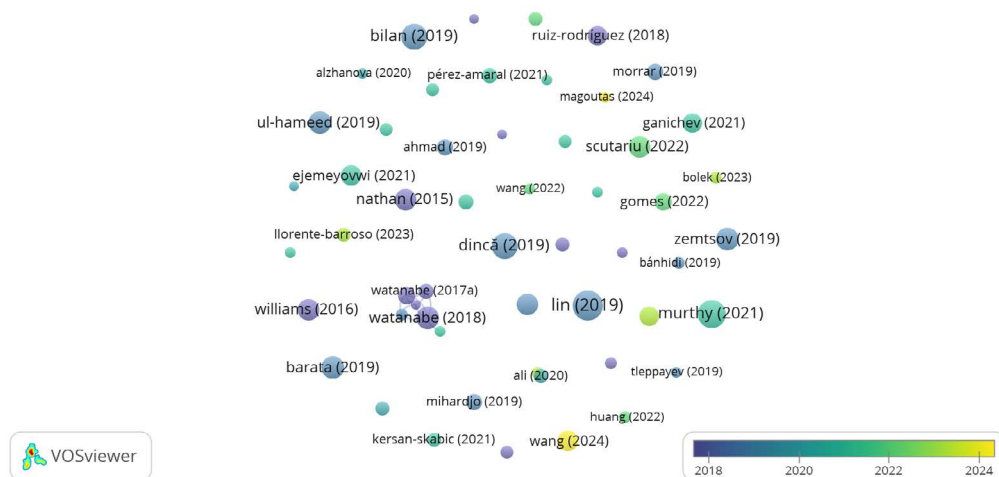


Figure 4. Author productivity and collaboration

Source: Elaborated by the authors using data from Scopus (2025)

The label “digital economy” accumulates 5 records, while macroeconomic terms such as “economics”, “gross domestic product”, and the plural variant “information and communication technologies” each have 4 occurrences, indicating a consistent interest in quantifying the contribution of digitisation to aggregate growth. The ranking is completed by “research and development” (4) - which links the digital economy to investment in R&D - and “China” (3), reflecting the weight of that country in both academic production and market size. Overall, the list confirms the thematic convergence towards measuring economic impacts, ICT adoption, and e-commerce, with China emerging as a recurring empirical context.

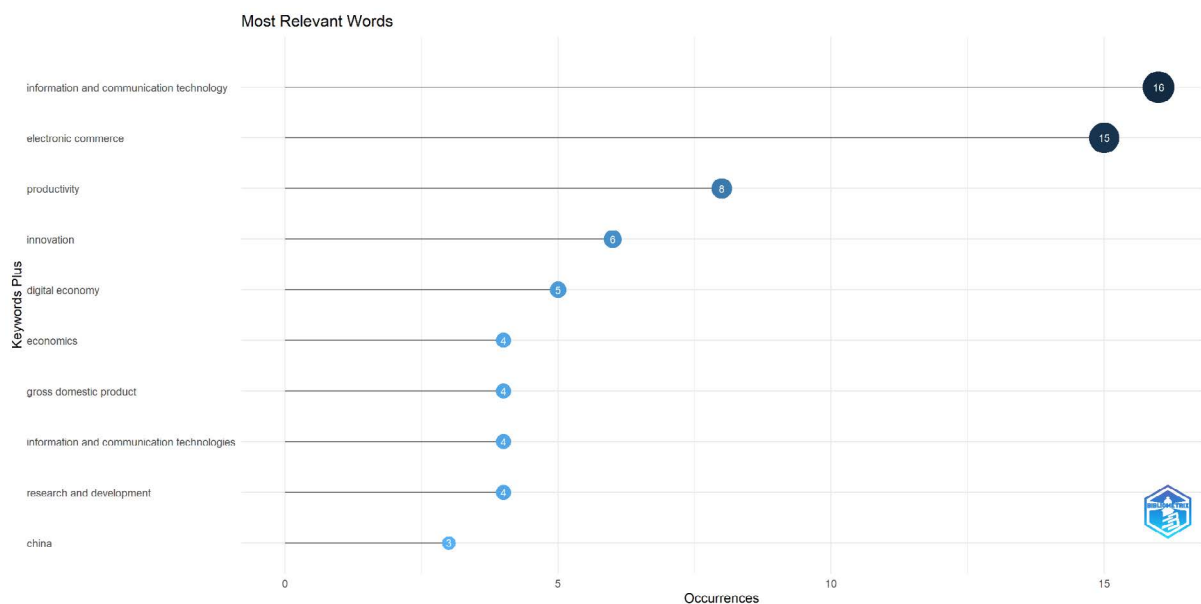


Figure 5. Most frequent words

Source: Elaborated by the authors using data from Scopus (2025)

The word cloud highlights, at a glance, the concepts that articulate the academic conversation on the digital economy. The term electronic commerce stands out in the foreground with a larger size, indicating that e-commerce is the most cited thematic centre of the corpus. Surrounding it, on the second level, are information and communication technologies and productivity, suggesting that the literature links ICT infrastructure with the productive effects of digitisation. These are followed by innovation and the expression digital economy itself, reinforcing the idea that studies explore the link between technology adoption, new business models, and macroeconomic impacts. Words such as research and development, technology adoption, and gross domestic product indicate an interest in quantifying R&D and GDP in relation to digital technology, while the presence of China, India, and the European Union points to specific geographical analyses. Taken together, the mosaic reflects a research agenda that combines economic measurement, technology diffusion, and the study of online commerce, with productivity and innovation as the common threads (see Figure 6).



Figure 6. Word cloud (Keywords-Plus) of the literature on the digital economy

Source: Elaborated by the authors using data from Scopus (2025)

In the co-occurrence network with a threshold of three or more matches (Figure 7), the conceptual axes that structure the literature are clearly distinguished. The largest and most voluminous node is “digital economy”, surrounded by dense links connecting it to “ICT”, “e-commerce/electronic commerce”, and “innovation”. This confirms that studies approach the digital economy as a network where technological infrastructure feeds new business models and, in turn, drives innovation processes.

The upper quadrant contains “digital transformation” and the European indicator “DESI”, along with “European Union”, reflecting comparative studies that monitor digital maturity at the regional level. To the right are “sustainable development” and “investment” suggesting a line of research that links digitisation policies with sustainability goals and capital allocation. In the lower area, “internet”, “productivity”, and “technology adoption” converge, reinforcing the concern for measuring the economic returns of digitization—also evidenced by the presence of “gross domestic product” and “economic development” near the centre.

The colour of each node represents the average year of appearance (bar 2020–2023): the bluer shades correspond to concepts consolidated before 2021 (e.g., innovation, ICT), while green and yellow mark emerging focuses in 2022–2023, such as “digital transformation”, “sustainable development”, and “DESI”. In this way, the temporal gradient reveals a thematic shift: from infrastructure and e-commerce to digital transformation geared toward sustainability outcomes and digital divide measurement. Overall, the network shows five well-connected subsets—digital economy-e-commerce, ICT adoption-productivity, digital transformation-ICT, sustainability-investment, and macroeconomic measurement—that capture the plurality of approaches and recent developments in the digital economy research agenda.

The thematic maturation, focused on ICT and e-commerce, is evident in the co-occurrence network where innovation, productivity, and growth appear as central nodes, which is supported by the findings of Mansour (2022), who confirms the contribution of ICT capital to economic growth through multifactor productivity effects. This thematic maturity is accompanied by an emerging concern for sustainability and inclusion, in line with Abdul Wahab et al. (2021), who highlight how tax incentives have promoted business digitisation, albeit with distributional and technological concentration risks.

Among the emerging thematic clusters, the one related to sustainable development stands out, whose relevance has increased due to tensions between digital growth and energy consumption. This point is clearly addressed by Wang and Zhu (2022), who show that digitisation can increase energy consumption, posing challenges in terms of ecological transition and regulatory efficiency. Similarly, Ferracane and van der Marel (2020) address an often-ignored dimension: digital trade barriers. Their study reveals that restrictions on platforms have negative effects on cross-border e-commerce, suggesting that the digital economy does not expand automatically, but depends on strategic regulatory decisions.

Figure 8 represents the thematic map of the corpus, where each bubble synthesises a cluster of keywords and its position reflects two dimensions: centrality (X-axis), which indicates the relevance of the topic to the global knowledge network, and density (Y-axis), which measures the degree of internal development of the cluster.

The upper right quadrant – “motor themes” – shows the topics that underpin current research and exhibit strong internal cohesion. The largest group includes information and communication technologies, productivity, and innovation, indicating that the literature considers digital infrastructure and innovative processes to be decisive drivers of economic outcomes. Not far away, but with slightly less density, is the electronic commerce–internet–India cluster, which highlights the centrality of the Indian market as an empirical laboratory for studying online commerce.

The upper left quadrant contains “niche themes”: topics that are highly developed in themselves but less connected to the rest of the field. Noteworthy here is the trio of China–econometrics–economic development, which suggests specialised studies on the macroeconomic impact of Chinese digitisation using advanced econometric techniques. Alongside this, subtopics on agriculture, consumption behaviour, and jasminum (an exported flower variety) emerge, reflecting specific sectoral applications. The lower right quadrant – “basic themes” – includes areas that are well connected but still have low intellectual density. International trade, forecasting, and the internet act as conceptual pillars on which more in-depth future research can be built.

Finally, the lower left quadrant brings together “emerging or declining themes”, characterised by low centrality and density. Concepts such as “web services”, “investments”, and the “European Union” appear here, suggesting that they are either emerging lines that have not yet consolidated critical mass or areas that have

lost traction in recent years. Overall, the map confirms that the research agenda revolves around the ICT e-commerce –innovation – productivity triad, while studies on international trade, forecasting, and web services offer fertile ground for further exploration or revitalisation in future research.

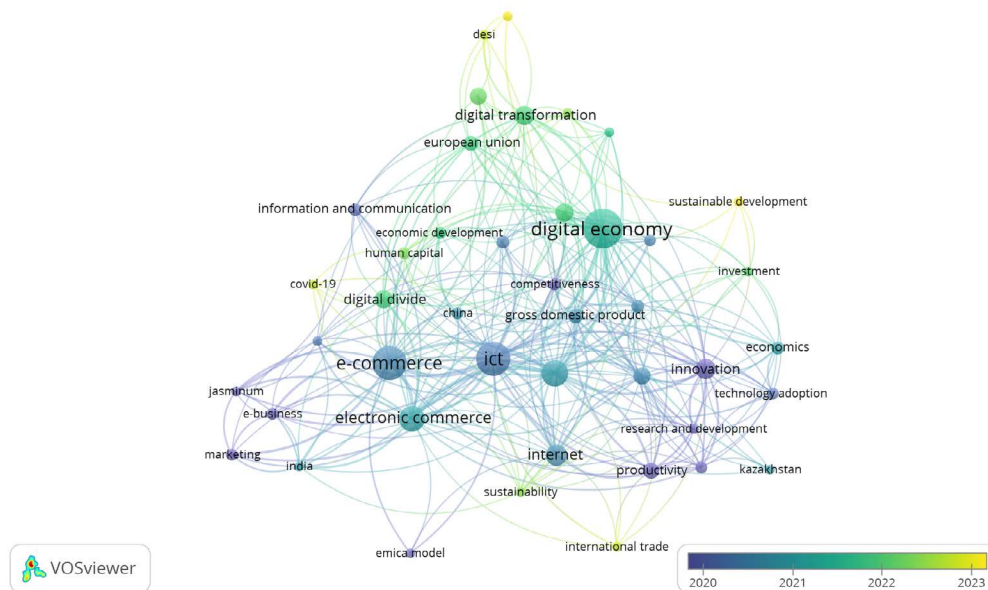


Figure 7. Keyword co-occurrence network with a threshold of ≥ 3 matches: conceptual structure of research in digital economics
Source: Elaborated by the authors using data from Scopus (2025)

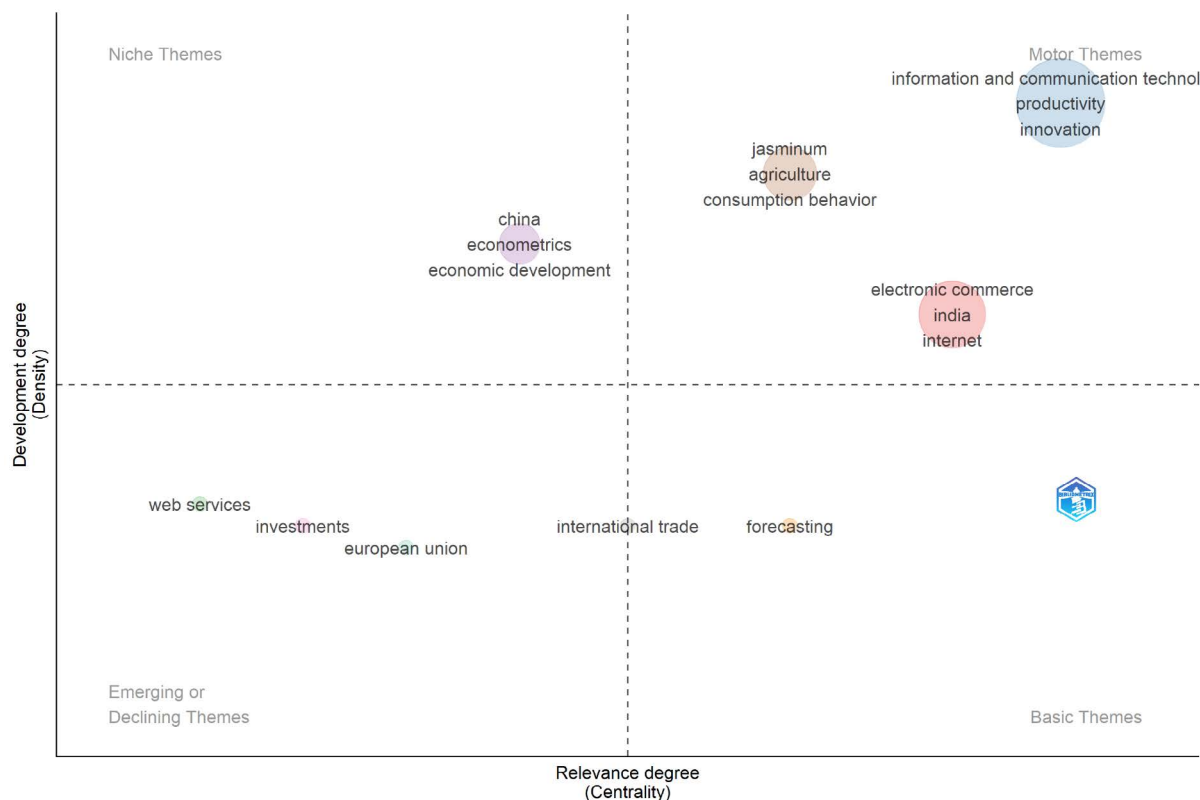


Figure 8. Thematic map of research in the digital economy (centrality × keyword cluster density)
Source: Elaborated by the authors using data from Scopus (2025)

The results obtained allow us to identify common patterns and analytical gaps in recent literature on the digital economy. Based on the set of studies analysed, it is confirmed that digitisation has had a positive impact on economic growth, although with significant variations depending on context, economic model, and institutional capacities. The study by Gomes et al. (2022) shows how the development of the digital economy drives efficiency, growth, and competitiveness, especially when information and communication

technologies (ICT) are integrated into public policies and organisational processes. This work highlights the need for digital strategies to be aligned with each country's macroeconomic objectives.

Ali (2020), for his part, analyses emerging economies and argues that digitisation acts as a catalyst for development, but only when there is a minimum technological base and coherent regulation. This reinforces the idea that digital transformation is neither linear nor universal: its effectiveness depends on institutional, educational, and cultural variables that must be considered in any empirical analysis. In line with this view, Wang and Zhu (2022) address a little-discussed aspect: the relationship between the digital economy and energy consumption. Their research shows that digital progress can have an ambivalent impact: while it improves efficiency, it also increases energy demand, posing challenges for the ecological transition. This finding introduces a key element that must be incorporated into future analytical frameworks: energy sustainability as a cross-cutting dimension of digital development.

On the other hand, Ferracane and van der Marel (2020) provide evidence on the impact of trade restrictions on digital platforms, concluding that digital protection or isolation policies have negative effects on international online trade. This analysis is essential for understanding how regulatory decisions can enhance or limit the integration of countries into digital value chains. The study by Abdul Wahab et al. (2021) focuses on the publishing sector and finds that digitisation can strengthen the profitability and positioning of publishers, provided that strategies adapted to digital channels are used. This result suggests that ICTs transform different types of industries. The findings converge on the idea that the digital economy should not be understood solely as a technical phenomenon, but rather as a structural reconfiguration of the economy and society. This reconfiguration requires methodologies that integrate economic, energy, regulatory, and cultural dimensions.

4. Conclusions

The objective of this study was to analyse the evolution and thematic focus of research in the digital economy during 2015–2025, constructing a synthetic overview of the field based on articles indexed and analysed with bibliometric tools. To this end, indicators of scientific production, collaboration, and citation were systematized, and co-occurrence maps were developed to identify consolidated conceptual nuclei and emerging lines of research.

The results show sustained growth in production throughout the period, with a visible jump during the pandemic years and a subsequent phase of consolidation. The research is geographically concentrated in a limited set of countries and institutions, suggesting asymmetries in scientific capabilities and data availability. Thematically, the agenda is organised around the triad of ICT–innovation–productivity, reflecting a causal sequence where technology adoption acts as a lever for organisational innovation, which ultimately drives economic productivity. This evolution shows that the literature has shifted from descriptive approaches (access, adoption) to the economic assessment of digitisation. Alongside these core areas, lines of research with recent traction are emerging, linked to the sustainability of digital transformation, measurements and comparative indices of digitisation, inclusion, and the digital divide.

This evidence provides an organised basis for researchers and policymakers: it allows them to prioritise questions with high social returns (e.g., adoption and productivity in SMEs, or the distributional effects of digitisation) and facilitates international comparisons using replicable criteria. In practical terms, keyword mapping and co-occurrence analysis help guide project design, indicator selection, and inter-institutional collaboration strategies.

From a theoretical perspective, this study confirms that the digital economy is moving from a fragmented stage of definition towards a consolidated theory of value creation based on data. Practically, these findings have clear implications for policymakers and managers. For policymakers, the strong link between ICT and productivity identified in the clusters suggests that infrastructure investment alone is insufficient without parallel programmes fostering digital skills. For business managers, the emergence of the business model adaptation cluster indicates that the next wave of competitiveness will not come from adopting technology, but from restructuring organisational logic to fully exploit digital capabilities.

This work has limitations that must be considered when interpreting the findings: the use of a single indexing base, relying exclusively on Scopus may introduce coverage and language biases, as it excludes literature indexed in other databases (e.g., Web of Science) or published in languages other than Spanish and English. Furthermore, the open access and 2015–2025 period filters limit the sample to recent studies available in full text, leaving out potentially relevant contributions in other formats (books, chapters, grey literature). These limitations are inherent to the exploratory nature of the analysis and become opportunities for future research.

This opens up several avenues for future research: expanding the scope of sources and years of analysis; integrating mixed approaches that combine bibliometrics with econometric techniques and case studies; deepening comparative measurements of digitisation and inclusion; and exploring in greater detail the mechanisms that link technology adoption with productivity and sustainability. These extensions will allow us to move from mapping the field to a more precise understanding of the effects and conditions under which the digital economy drives economic performance and well-being.

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Appendix 1. List of open access articles

Authors	Title	Year	Source title	Volume	Issue	Cited by	DOI
Gomes S.; Lopes J.M.; Ferreira L.	The impact of the digital economy on economic growth: The case of OECD countries;	2022	Mackenzie Management Journal	23	6	28	10.1590/1678-6971/eRAMD220029.en
All M.M.	Digitization of the emerging economy: An exploratory and explanatory case study	2020	Journal of Governance and Regulation	9	4	19	10.22495/jgrv9i4art2
Wang L.; Zhu T.	Will the Digital Economy Increase Energy Consumption? - An Analysis Based on the ICT Application Research	2022	Chinese Journal of Urban and Environmental Studies	10	1	12	10.1142/S2345748122500014
Ferracane M.F.; van der Marel E.	Patterns of trade restrictiveness in online platforms: A first look	2020	World Economy	43	11	10	10.1111/twec.13030
Abdul Wahab N.S.; Ling T.W.; Abdurrahman A.P.; Keong O.C.; Nik Abdullah N.H.	Effects of digital economy involvement on book-tax differences in Malaysia	2021	Cogent Business and Management	8	1	1	10.1080/23311975.2020.1870806
Lalaleo-Analuisa F.R.; Bonilla-Jurado D.M.; Robles-Salguero R.E.	Information and Communication Technologies exclusively for consumer behavior from a theoretical perspective;	2021	Challenges (Ecuador)	11	21	17	10.17163/RET.N21.2021.09
Polozhentseva Y.; Klevtsova M.; Leontyev E.	Effects of the economic space digitalization in the context of modern society transformation	2019	Economic Annals-XXI	180	11-12	6	10.21003/EA.V180-09
Mansour H.	The impact of ICT capital growth on economic growth: the case of Egypt	2022	Proceedings of Rijeka Faculty of Economics	40	2	1	10.18045/zbefri.2022.2.375
Lin Y.	E-urbanism: E-commerce, migration, and the transformation of Taobao villages in urban China	2019	Cities	91		90	10.1016/j.cities.2018.11.020
Mikhaylova A.A.	Valuating the appropriation of digital technologies across Russian regions	2021	Baltic Region	13	3	2	10.5922/2079-8555-2021-3-9
Huang J.; Su L.; Huang Q.; Liu X.	Facilitating inclusive ICT application and e-Commerce development in rural China	2022	Agricultural Economics (United Kingdom)	53	6	14	10.1111/agec.12728
Kanevskaia O.	ICT Standards Bodies and International Trade: What Role For The WTO?	2022	Journal of World Trade	56	3	3	10.54648/trad2022017
Kudbiyev D.X.; Muxamadjonova D.A.; Sherkuziyeva N.A.; Chetverikova N.A.	State regulation of the management of knowledge and information systems in the digital economy	2024	Proceedings on Engineering Sciences	6	3	0	10.24874/PES06.03A.010
Chen W.-H.; Chen S.; Lin Y.-C.; Chen C.-L.; Ng W.-K.; Ding Y.; Shih Y.-S.; Chen H.-N.	Achieving social innovation in the digital age: A case study of microbusiness	2025	International Journal of Innovation Studies	9	1	0	10.1016/j.ijis.2024.12.003
Alzhanova F.G.; Kireyeva A.A.; Satpayeva Z.T.; Tsoy A.A.; Nurbatsin A.	Analysis of the Level of Technological Development and Digital Readiness of Scientific-Research Institutes	2020	Journal of Asian Finance, Economics and Business	7	123	12	10.13106/JAFEB.2020.VOL7.NO12.1133
Kireyeva A.A.; Satpayeva Z.T.; Urdabayev M.T.	Analysis of Digital Readiness and the Level of ICT Development in Kazakhstan's Regions	2022	Economy of Regions	18	2	4	10.17059/ekon.reg.2022-2-12
Tarjani J.A.; Kalló N.; Dobos I.	Evaluation of Digital Development Based on the International Digital Economy and Society Index 2020 Data	2023	Statistics	103	3	4	10.54694/STAT.2023.21

Authors	Title	Year	Source title	Volume	Issue	Cited by	DOI
Ignatov A.	The Digital Economy of BRICS: Prospects for Multilateral Cooperation	2020	International Organizations Research Journal	15	1	20	10.17323/1996-7845-2020-01-02
Košovská I.; Hallová M.; Váryová I.; Šilerová E.; Hennyeyová K.; Cihelka P.	The Digital Economy in the Context of Digital Transformation and Their Impact on the Electronification of Accounting Processes in the Slovak Republic	2022	Agris On-line Papers in Economics and Informatics	14	4	4	10.7160/aol.2022.140405
Dalloshi P.; Kyqyku D.	Digital skills as an impetus for the acceleration of economic digitalization: eu perspective	2023	Corporate Governance and Organizational Behavior Review	7	3 (special issue)	1	10.22495/cgobrv7i3sip11
Han L.; Zhang D.; Hua X.	Assessing the coordinative and coupling development of China's green economic growth: role of sports economics	2023	Economic Research- Ekonomika Istrazivanja	36	3	1	10.1080/1331677X.2022.2164037
Dzhumakova A.A.; Nosirov I.A.; Rakhmatova O.K.; Popkova E.G.	Fight against climate change in the digital economy based on green management of knowledge and information systems	2024	Proceedings on Engineering Sciences	6	3	0	10.24874/PES06.03A.018
Aumeboonsuke V.	Digital convergence and divergence in eu and asean economies	2025	ECONOMICS - Innovative and Economics Research Journal	13	1	0	10.2478/eoik-2025-0002
Grau-Sarabia M.; Fuster-Morell M.	Gender approaches in the study of the digital economy: a systematic literature review	2021	Humanities and Social Sciences Communications	8	1	17	10.1057/s41599-021-00875-x
Scutariu A.-L.; Şuşu Ş.; Huidumac-Petrescu C.-E.; Gogonea R.-M.	A cluster analysis concerning the behavior of enterprises with e-commerce activity in the context of the COVID-19 pandemic	2022	Journal of Theoretical and Applied Electronic Commerce Research	17	1	44	10.3390/jtaer17010003
Ivanová E.; Grmanová E.	Digital transformation and ICT sector performance in EU countries	2023	Problems and Perspectives in Management	21	1	2	10.21511/ppm.21(1).2023.05
Rodríguez J.G.; Rodríguez C.E.; Rosas E.G.	Influence of ICT and Household Assets in the Penetration of Digital Economy in Mexico	2024	Journal of Telecommunications and the Digital Economy	12	1	3	10.18080/jtdev12n1.876
Khan M.Z.; Khan Z.U.; Hameed A.; Zada S.S.	On the upside or flipside: Where is venture capital positioned in the era of digital disruptions?	2021	Technology in Society	65		23	10.1016/j.techsoc.2021.101555
Abdullayev K.; Abbaszade M.; Aliyeva A.; Ibrahimova K.	Regulation of the Digital Economy in Modern Conditions of Competitiveness	2022	WSEAS Transactions on Business and Economics	19		4	10.37394/23207.2022.19.115
Pizhuk O.; Lazebnyk L.; Mamonova H.	Digitalization's Effect on the Sectoral Structure Change in the Economy: a Comparative Analysis of Ukraine and Selected Countries	2022	Comparative Economic Research	25	2	1	10.18778/1508-2008.25.11
Polychronidou P.; Zoumpoulidis V.; Valsamidis S.	Labor digitization in Europe	2022	Intellectual Economics	15	2	6	10.13165/IE-21-15-2-01
Larionova M.; Shelepov A.	Emerging Regulation for the Digital Economy: Challenges and Opportunities for Multilateral Global Governance	2021	International Organizations Research Journal	16	1	12	10.17323/1996-7845-2021-01-02
Strlichuk Y.; Krasnova I.; Khodakevich S.; Metsger I.; Stryzhak A.; Dubas A.	Sustainable development determinants in the context of digital transformation	2024	Financial and Credit Activity: Problems of Theory and Practice	3	56	2	10.55643/fcaptive.3.56.2024.4367

Authors	Title	Year	Source title	Volume	Issue	Cited by	DOI
Paun C.; Ivascu C.; Olteteanu A.; Dantis D.	The Main Drivers of E-Commerce Adoption: A Global Panel Data Analysis	2024	Journal of Theoretical and Applied Electronic Commerce Research	19	3	3	10.3390/jtaer19030107
Watanabe C.; Akhtar W.; Tou Y.; Neittaanmäki P.	Amazon's initiative transforming a non-contact society - Digital disruption leads the way to stakeholder capitalization	2021	Technology in Society	65		11	10.1016/j.techsoc.2021.101596
Akintoye I.R.; Ajayi M.; Joshua A.; Okunlola A.F.	Business sustainability through e-commerce: a myth or reality in Nigeria	2022	Business: Theory and Practice	23	2	3	10.3846/btp.2022.16657
Alania Atoc N.R.; Orosco-Fabian J.R.	Use of ICT in fast food service companies in the context of the pandemic	2023	Venezuelan Management Journal	28	9	0	10.52080/rvgluz.28.e9.35
Korgun I.; Hoti A.	Dynamics of Bilateral Digital Trade: The Case of a Korea–EU Digital Partnership	2023	Economies	11	10	1	10.3390/economies11100248
Wang Q., Li Y.; Li R.	Rethinking the environmental Kuznets curve hypothesis across 214 countries: the impacts of 12 economic, institutional, technological, resource, and social factors	2024	Humanities and Social Sciences Communications	11	1	42	10.1057/s41599-024-02736-9
Akhtar W.H.; Watanabe C.; Tou Y.; Neittaanmäki P.	A New Perspective on the Textile and Apparel Industry in the Digital Transformation Era	2022	Textiles	2	4	21	10.3390/textiles2040037
Murthy K.V.B.; Kalsie A.; Shankar R.	Digital economy in a global perspective: is there a digital divide?	2021	Transnational Corporations Review	13	1	76	10.1080/19186444.2020.1871257
Kireyeva A.A.; Nurbatsin A.S.; Mussabalina D.S.	Exploring the impact of information and communication technology in regions of Kazakhstan	2021	Economy of Regions	17	2	2	10.17059/ekon.reg.2021-2-2
Tleppayev A.	Digitalization and energy: World experience and evidence of correlation from Kazakhstan	2019	Economic Annals-XXI	176	3-4	13	10.21003/ea.V176-06
Charles G.; Kanani R.	Antecedents of social commerce purchase intention: evidence from Tanzanian social media users	2025	Cogent Business and Management	12	1	0	10.1080/23311975.2024.2447409
Bhuiyan M.R.I.; Uddin K.M.S.; Milon M.N.U.	Prospective Areas of Digital Economy in the Context of ICT Usages: An Empirical Study in Bangladesh	2023	FinTech	2	3	15	10.3390/fintech2030035
Tiong K.M.; Cheng M.Y.; Choong C.K.	The roles of ict telecommunication infrastructure on foreign direct investment in Malaysia	2022	Asian Academy of Management Journal	27	2	3	10.21315/aamj2022.272.1
Ejemeyovwi J.O.; Osabuohien E.S.; Bowale E.I.K.	ICT adoption, innovation, and financial development in a digital world: empirical analysis from Africa	2021	Transnational Corporations Review	13	1	40	10.1080/19186444.2020.1851124
D'souza D.J.; Joshi H.G.	Exploring consumers' willingness to use e-commerce to purchase crops with geographical indications: a case study of Udupi jasmine	2020	Agris On-line Papers in Economics and Informatics	12	2	4	10.7160/aol.2020.120206
Jaković B.; Čurlin T.; Miloloža I.	Enterprise Digital Divide: Website e-Commerce Functionalities among European Union Enterprises	2021	Business Systems Research	12	1	12	10.2478/bsrj-2021-0013
Bessonova E.; Battalov R.	Digitalization as a tool for innovative economic development	2021	Economic Annals-XXI	186	11-12	8	10.21003/EA.V186-08
Zhu M.; Zhu L.	Digital economy and coal consumption in emerging Asian economies	2025	Humanities and Social Sciences Communications	12	1	0	10.1057/s41599-025-04445-3
Menaouer B.; Khalissa S.; El Amine Belayachi M.; Amine B.	The role of drop shipping in e-commerce: The Algerian case	2021	International Journal of e-Business Research	17	4	8	10.4018/IJEBR.2021100104

Authors	Title	Year	Source title	Volume	Issue	Cited by	DOI
Rizov M.; Vecchi M.; Domenech J.	Going online: Forecasting the impact of websites on productivity and market structure	2022	Technological Forecasting and Social Change	184		6	10.1016/j.techfore.2022.121959
Kiseleva E.G.	The impact of digital transformation on the investment potential of Russian cities	2020	Finance: Theory and Practice	24	5	9	10.26794/2587-5671-2020-24-5-72-83
Aseeva I.; Budanov V.	Digitalization: Potential risks for civil society	2021	Economic Annals-XXI	186	11-12	6	10.21003/EA.V186-05
Masoura M.; Malefaki S.	Evolution of the Digital Economy and Society Index in the European Union: A Socioeconomic Perspective	2023	TalTech Journal of European Studies	13	2	5	10.2478/bjes-2023-0020
Wenyang D.; Zhang Y.; Dzhamakulov B.	The Impact of Economic Growth and Foreign Investment on the Advancement of E-commerce	2024	Qubah Academic Journal	4	4	1	10.48161/qaj.v4n4a1024
Suhendra I.; Istikomah N.; Anwar C.J.; Supriadi A.; Wakhid A.A.; Purwanda E.; Salim A.	Influence of the digital economy on economic growth: empirical study of a region in Indonesia	2025	Cogent Economics and Finance	13	1	0	10.1080/23322039.2025.2457477
Fedirko O.; Zatonatska T.	Development strategies for national economies after the Covid-19 pandemic	2020	Ekonomika	99	2	2	10.15388/EKON.2020.2.6
Kim B.-H.	Development of Online Fraud Detection and Sales Prediction Model using Supply Chain Dataset	2023	Journal of System and Management Sciences	13	2	1	10.33168/JSMS.2023.0234
Marek L.; Doucek P.; Nedomová L.	Wages of information technology professionals - A Czech and Slovak Republic case	2021	Quality Innovation Prosperity	25	1	1	10.12776/QIPV/2511.1468
Lai S.; Chen H.; Zhao Y.	Measurement and prediction of the development level of China's digital economy	2024	Humanities and Social Sciences Communications	11	1	1	10.1057/s41599-024-04352-z
Yerina A.M.; Honchar I.A.; Zaiets S.V.	Statistical indicators of cybersecurity development in the context of digital transformation of economy and society	2021	Science and Innovation	17	3	9	10.15407/scine1703.003
Ayédon E.B.; Ayédon C.O.S.	The Impact of Information and Communication Technologies on International Trade: A Case of Sub-Saharan Africa	2024	Review of Business and Economics Studies	12	3	0	10.26794/2308-944X-2024-12-3-40-59
Islam K.S.; Muthaiyah S.; Fie D.Y.G.	Isomorphic drivers of institutional pressure and importance of environmental management system implementation towards the adoption propensity of green ICT	2020	International Journal of Energy Economics and Policy	10	6	5	10.32479/ijeep.10618
Zhang H.; Millan E.; Money K.; Guo P.	E-commerce development, poverty reduction, and income growth in rural China	2025	Journal of Strategy and Management	18	1	4	10.1108/JSMA-06-2023-0148
D'souza D.J.; Joshi H.G.; Prabhu R.	Assessment of Consumers Acceptance of E-Commerce to Purchase Geographical Indication Based Crop Using Technology Acceptance Model (TAM)	2021	Agris On-line Papers in Economics and Informatics	13	3	6	10.7160/aol.2021.130303
Larina Y.; Zelisko I.; Holitsyn A.; Havrysh O.; Yesmakhanova A.; Nedopako N.	Financial aspects of digital marketing ecosystems formation in the sphere of information and communication technologies	2024	Financial and Credit Activity: Problems of Theory and Practice	3	56	0	10.55643/fcaptop.3.56.2024.4339
Alderete M.V.; Álvarez N.; Jones C.	Estimation of the sales channels' digitalization level of firms from Bahía Blanca, Argentina facing the pandemic	2023	Accounting and Administration	68	4	0	10.22201/fca.244488410e.2023.3344

Authors	Title	Year	Source title	Volume	Issue	Cited by	DOI
Zhu Z.-Y.; Xie H.-M.; Chen L.	ICT industry innovation: Knowledge structure and research agenda	2023	Technological Forecasting and Social Change	189		35	10.1016/j.techfore.2023.122361
Anand S.; Enayati M.; Raj D.; Montresor A.; Ramesh M.V.	Internet over the ocean: A smart IoT-enabled digital ecosystem for empowering coastal fishing communities	2024	Technology in Society	79		3	10.1016/j.techsoc.2024.102686
Tahat L.; Almasri N.; Tahat T.; Ismail D.; Al-Ahmad A.S.	Assessing the influence of mobile direct social media advertising on consumer attitudes: a study of Kuwaiti consumers	2024	Cogent Business and Management	11	1	1	10.1080/23311975.2024.2351107
Tosza S.	Internet service providers as law enforcers and adjudicators. A public role of private actors	2021	Computer Law and Security Review	43		12	10.1016/j.clsr.2021.105614
Bayudan-Dacuycuy C.; Dacuycuy L.B.	Harnessing the potential of online marketplaces in the Philippines: Insights from the National Information and Communications Technology Household Survey	2022	Asia and the Pacific Policy Studies	9	3	1	10.1002/app5.365
Shostak L.; Goi V.; Timchenko O.; Yastrubetska L.; Derhaliuk M.	The Impact of Digital Transformation on the Economy: Technological Innovation and Efficiency	2023	Economic Affairs (New Delhi)	68	4	0	10.46852/0424-2513.4.2023.19
Katuščáková M.; Capková E.; Grečnár J.	How to Measure Knowledge Economy	2023	Electronic Journal of Knowledge Management	21	2	1	10.34190/ejkm.21.2.3025
Kang J.W.O.O.; Ramizo D.M.	Nexus of Technology Adoption, E-commerce, and Global Value Chains: The Case of Asia	2022	Asian Development Review	39	2	7	10.1142/S0116110522500147
Kersan-Skabic I.	Digital trade enablers and barriers in the European Union	2021	Montenegrin Journal of Economics	17	4	19	10.14254/1800-5845/2021.17-4.9
Busnetty I.; Tambunan T.T.H.	Gap between regions in the use of e-commerce by MSEs	2020	Journal of Telecommunications and the Digital Economy	8	4	1	10.18080/jtdev8n4.303
Shang K.; Asif M.	The Design of a Compound Neural Network-Based Economic Management Model for Advancing the Digital Economy	2023	Journal of Organizational and End User Computing	35	1	4	10.4018/JOEUC.330678
Pérez-Amaral T.; Valarezo A.; López R.; Garín-Muñoz T.	Digital divides across consumers of internet services in Spain using panel data 2007–2019. Narrowing or not?	2021	Telecommunications Policy	45	2	24	10.1016/j.telpol.2020.102093
Bubnov V.; Kopilevich V.; Istomina A.	The Evolution of Digital Capital in Organizations: A Quantitative Assessment	2021	Journal of Telecommunications and the Digital Economy	9	4	2	10.18080/JTDEV9N4.435
Jia S.; Tseng H.-T.; Shanmugam M.; Rees D.J.; Thomas R.; Hajji N.	Using new forms of information and communication technologies to empower SMEs	2022	British Food Journal	124	12	8	10.1108/BFJ-01-2021-0066
Llorente-Barroso C.; Sánchez-Valle M.; Viñarás-Abad M.	The role of the Internet in later life autonomy: Silver surfers in Spain	2023	Humanities and Social Sciences Communications	10	1	20	10.1057/s41599-023-01536-x
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