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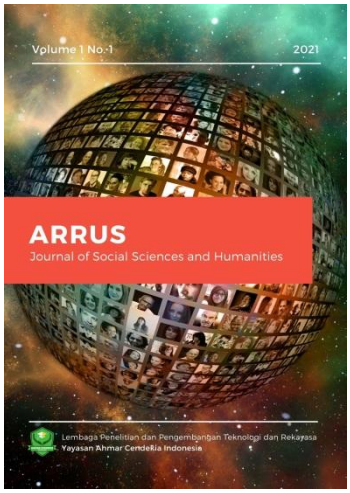

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RESEARCH ARTICLE

E-Commerce, Digital Economy, and Economic Development: An Analysis of Global Research Trends

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Abstract: This study maps the global scholarly landscape connecting e-commerce, the digital economy, and economic development, and identifies the field's intellectual structure, geographic centres, leading contributors, dominant themes, and emerging research frontiers over the period 2010–2026. A bibliometric analysis was conducted on 2,097 documents retrieved from Scopus, using metadata that included author affiliations and cited references. Performance analysis (annual output, productivity of authors, sources, and countries, and citation impact) was combined with science-mapping techniques: country collaboration networks, document co-citation, bibliographic coupling, keyword co-occurrence, thematic mapping, thematic evolution, a three-field plot, and trend-topic detection. Authors were disambiguated by Scopus identifier, and countries were extracted from affiliations. Annual output grew at roughly 15% per year, accelerating after 2019. The field is highly fragmented at author level (no author exceeds five documents) yet sharply concentrated geographically: China alone accounts for 937 of 2,097 documents, ahead of India, Indonesia, Russia, and the United States, although Chinese output is predominantly domestic (15% internationally co-authored) whereas US and UK output is majority-international and far more highly cited per paper. Co-citation analysis reveals three intellectual bases a behavioural/methodological base (technology-acceptance and survey-method classics), a digital-economy concept base, and an empirical e-commerce/rural-China base while bibliographic coupling identifies a single dominant research front of tightly linked digital-economy studies. Keyword and thematic analyses confirm a transversal e-commerce/digital-economy core surrounded by digital-transformation, rural-China, and artificial-intelligence clusters, with the field migrating toward cross-border, sustainable, and AI-enabled commerce. The paper offers an integrated, reproducible synthesis of a rapidly expanding literature, combining geographic, intellectual, and conceptual structure in a single study, and articulates a structured agenda for future inquiry.

Keywords: E-Commerce, Digital Economy, Economic Development, Bibliometric Analysis, Science Mapping, Co-Citation, Scopus

1. Introduction

The diffusion of digital technologies over the past three decades has fundamentally reorganised how value is created, exchanged, and distributed across the world economy. What began as the electronic exchange of documents between firms and the earliest online storefronts has grown into a pervasive infrastructure of platforms, marketplaces, payment systems, logistics networks, and data services that now mediate a substantial and rising share

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of global commerce(Al-Qirim, 2007; Jatmika et al., 2024). E-commerce the conduct of commercial transactions through digital channels sits at the visible centre of this transformation. Around it has grown the broader construct of the digital economy, encompassing not only online retail but the wider ecosystem of digital platforms, algorithmic intermediation, data flows, and digitally enabled services that increasingly underpin production, distribution, and consumption in both advanced and developing economies.

Although the two terms are often used interchangeably in public discourse, they are analytically distinct, and the distinction matters for how their economic consequences are studied. E-commerce is a relatively bounded activity transactional, measurable, and largely observed at the level of firms and consumers whereas the digital economy is a systemic phenomenon that resists a single agreed definition and spans macroeconomic, sectoral, and institutional levels of analysis(Jimoh & Kee, 2022; Lisaria Putri et al., 2023; Yousafzai et al., 2003). This conceptual breadth is one reason the surrounding literature has grown so heterogeneous: scholars enter the field from very different starting points, some concerned with consumer adoption and firm strategy, others with national productivity, international trade, or the governance of data and platforms. The result is a body of research that is at once rich in empirical detail and difficult to survey as a coherent whole.

The third construct that animates this study economic development supplies the normative and policy stakes. A recurring and consequential question for scholars, governments, and international organisations is whether, and under what conditions, the spread of e-commerce and the digital economy translates into measurable development outcomes: productivity growth, employment creation, market access for small and medium-sized enterprises, financial inclusion, poverty reduction, and rural revitalisation("Consumer Behaviour in the Digital Age," 2023; Niankara & Traoret, 2023; Xue et al., 2024; Zhao et al., 2023). The optimistic account holds that digital channels lower transaction costs, widen markets, and allow previously excluded producers smallholder farmers, rural artisans, and micro-entrepreneurs to reach distant buyers on more favourable terms. A more cautious literature emphasises digital divides, the concentration of platform power, uneven infrastructure and logistics, and the risk that gains accrue disproportionately to already-advantaged regions and firms. Adjudicating between these accounts requires cumulative, comparable evidence, and it is precisely this accumulation that a bibliometric map can help to characterise.

The policy relevance of these questions has intensified markedly over the past decade. National governments have made the digital economy a centrepiece of development strategy, from China's rural e-commerce and cross-border digital-trade programmes to the digital-economy roadmaps of Southeast Asian economies such as Indonesia, Malaysia, and Vietnam, and the data-governance and platform-regulation agendas pursued in the European Union and elsewhere(LEE, 2025; Wang et al., 2024). The COVID-19 pandemic then acted as a powerful accelerant, compressing years of anticipated digital adoption into a matter of months and prompting a surge of scholarship on the resilience, reach, and limits of digital commerce. As a consequence, research output at the intersection of e-commerce, the digital economy, and development has expanded rapidly and now spans economics, information systems, development studies, marketing, geography, public policy, and computer science each discipline contributing its own vocabularies, theories, methods, and preferred publication venues.

This disciplinary breadth is intellectually productive, but it creates a practical difficulty: it is hard to obtain a synoptic view of the field. A researcher entering the area cannot easily determine who its leading contributors are, from which countries and institutions the work originates, in which outlets it appears, which foundational ideas anchor it, how its thematic emphases have evolved, or where its current frontiers lie. Traditional narrative reviews, however valuable for interpretive depth, struggle to cover a corpus of several thousand documents without selection bias, and they seldom make their inclusion criteria and coverage fully transparent. Systematic reviews improve on this but remain labour-intensive and typically address comparatively narrow questions. There is, therefore, a clear and

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complementary role for a quantitative approach capable of mapping the structure of a large literature in a transparent and reproducible way.

Bibliometric analysis meets this need by applying quantitative methods to the metadata of publications authorship, sources, citations, cited references, keywords, and affiliations to characterise both the performance of a research field and its underlying intellectual structure(Mas-Tur et al., 2020; Pereira & Bamel, 2021; Zainal Abidin et al., 2025). Performance analysis quantifies productivity and impact across authors, institutions, countries, and outlets, while science mapping reconstructs the relationships among documents, authors, and concepts through techniques such as document co-citation analysis, bibliographic coupling, keyword co-occurrence (co-word) analysis, and thematic mapping. Grounded in bibliometric regularities and methods developed over several decades among them Bradford's law of scattering(Desai et al., 2018; Hjørland & Nicolaisen, 2005), Lotka's law of author productivity(Aytac et al., 2026; Sahu & Jena, 2022), Small's co-citation analysis, Kessler's bibliographic coupling(Kessler, 1963b, 1963a), and the co-word approach of Callon and colleagues and supported by mature software and increasingly explicit procedural guidelines, bibliometrics has become a standard instrument for taking stock of the fast-moving, multidisciplinary fields of exactly the kind considered here.

Building on this tradition and following established guidelines for the conduct of bibliometric studies, this paper analyses 2,097 documents indexed in the Scopus database and published between 2010 and 2026, using metadata that include author affiliations and cited references. The analysis combines performance indicators with a comprehensive suite of science-mapping techniques to address four guiding questions: (i) How has scholarly production evolved over time, and where is it concentrated geographically? (ii) Who among authors, sources, and countries are the most prolific and influential contributors, and how do productivity and impact relate to one another? (iii) What are the conceptual and intellectual structures of the field, as revealed by keyword co-occurrence, document co-citation, and bibliographic coupling? (iv) Which themes are currently emerging, and what research directions do the observed patterns imply?

In answering these questions the study makes three contributions. First, it provides an integrated and reproducible synthesis of a large and rapidly expanding literature, bringing geographic, intellectual, and conceptual structure together within a single analytical frame rather than examining them in isolation. Second, because it draws on affiliation and cited-reference metadata, it is able to characterise not only what is studied and by whom, but from where and on what intellectual foundations dimensions that are frequently omitted when such fields are unavailable in an export. Third, it translates the descriptive findings into a structured agenda for future research, identifying specific gaps such as the need for causal evidence beyond a single dominant national setting, and the integration of well-developed technological niches with the field's development-oriented core that follow directly from the observed structure rather than from prior expectation.

2. Data and Methods

2.1. Data source and corpus

The analysis draws on a single, internally consistent export from the Scopus database, chosen for its broad coverage of peer-reviewed journals, conference proceedings, and book series across the social sciences, business, and computing. The export included the full bibliographic record together with author affiliations and cited references, enabling country-level and citation-relational analyses. After de-duplication on the Scopus electronic identifier (EID), the working corpus comprised 2,097 documents published between 2010 and the partial year 2026, spanning 1,154 sources and 5,537 unique authors (after identifier-based disambiguation), with 17,944 accumulated citations (8.56 per document). Table 1 summarizes the principal indicators.

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Table 1. Main information about the corpus.

Indicator	Value
Timespan	2010–2026
Documents	2,097
Sources	1,154
Unique authors (ID-disambiguated)	5,537
Contributing countries	120
Single-authored documents	460
Co-authors per document	2.82
Collaboration index	3.34
International co-authorship	16.4%
Annual growth rate, 2010–2025	15.21%
Average citations per document	8.56
Total citations	17,944
Author keywords	5,530
Open-access share	35.9%

2.2. *Analytical procedures*

Following the standard distinction, the study combines performance analysis (productivity and impact of authors, sources, and countries; citation indicators including the corpus h-index) with science mapping (country collaboration networks; document co-citation; bibliographic coupling; keyword co-occurrence; thematic mapping and evolution; a three-field plot; and trend-topic detection). All indicators were computed directly from the exported metadata.

Authors were disambiguated using the numeric Scopus author identifiers embedded in the export rather than display names, avoiding the homonym inflation that affects common surnames. Countries were extracted from the affiliation field, taking the country component of each affiliation and consolidating standard variants. Cited references were parsed into first author/year/title-token keys to support co-citation and coupling; this normalization is approximate, and aggregation by surname-and-year may merge distinct works with very common surnames, a caveat carried into the interpretation. Author keywords were normalized through lower-casing and synonym consolidation; thematic clusters were obtained by greedy modularity optimization, and theme centrality and density were estimated with the Callon co-word indices.

Coverage is high but not complete: affiliations were present for 97.7% and cited references for 94.6% of documents. The small remainder without these fields is excluded only from the analyses that require them. The year 2026 is partial and is flagged wherever it appears.

3. Results and Discussion

3.1. *Annual Scientific Production*

Annual output rose from a handful of documents per year at the start of the 2010s to several hundred per year by the mid-2020s, a compound annual growth rate of about 15% over the complete years 2010–2025. The trajectory is not smooth: a first inflection occurs around 2019–2020, when annual output roughly doubled, and a second, steeper acceleration appears in 2024–2025. The 2026 figure reflects only a partial year and is shown separately in Figure 1.

Two contextual forces plausibly underline this pattern. The 2020–2021 acceleration coincides with the COVID-19 pandemic, which expanded the empirical relevance of e-commerce and generated a dedicated stream of pandemic-and-platform studies. The later surge reflects the growing centrality of digital-economy framings in national policy debates China's and the entry of adjacent communities (rural development, sustainability, and artificial intelligence) into the conversation. The cumulative curve confirms that most of the corpus has appeared in the last five years, marking the field as young and fast-moving.

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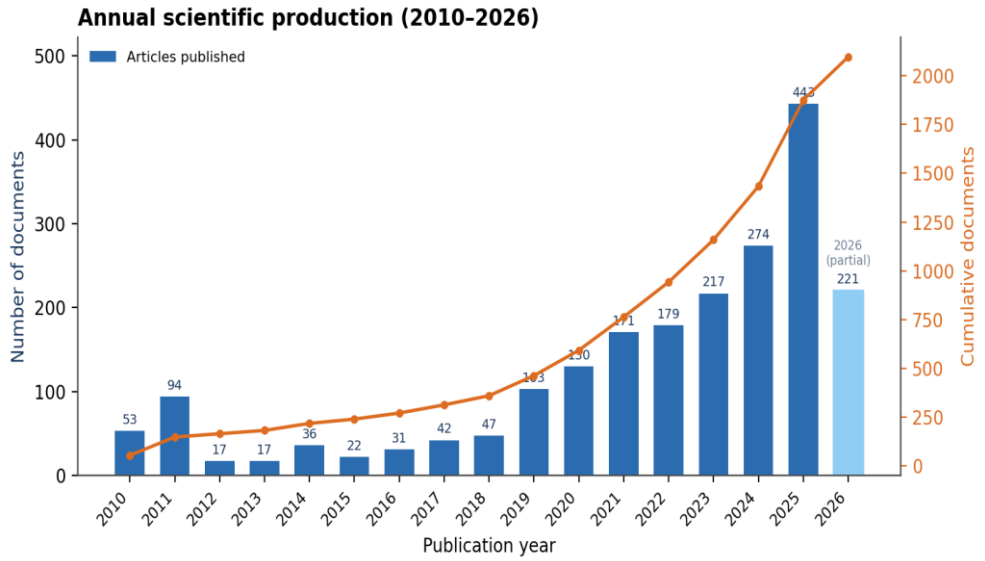

Fig 1. Annual scientific production and cumulative output, 2010–2026. The 2026 bar is hatched to denote a partial year.

3.2. Most Productive Authors

After disambiguation by Scopus identifier, the field proves strikingly fragmented. The most productive author contributes only five documents, and the next tier four each; the great majority of the 5,537 authors appear only once. This long-tailed distribution is consistent with Lotka's law and signals a field that has not consolidated around a stable core of specialists contributions arrive from many scholars who touch the topic once. It also cautions against over-interpreting any single author's prominence.

Productivity and influence do not coincide. Several of the most prolific authors have accumulated few citations, whereas a smaller number combines moderate output with comparatively high citation counts and corpus h-indices. Table 2 and Figure 2 report the leading authors by document count, with citations and corpus h-index, using disambiguated identities.

Table 2. Most productive authors (Scopus author-ID disambiguated).

Author	Docs	Citations	h-index	First yr
1. Burri, Mira	5	26	2	2016
2. Gui, Xuewen	4	0	0	2011
3. Watanabe, Chihiro	4	111	4	2018
4. Neittaanmäki, Pekka	4	111	4	2018
5. Vuppalapati, Chandrasekar	4	33	2	2020
6. Ilapakurti, Anitha	4	33	2	2020
7. Kedari, Sharat	4	33	2	2020
8. Vuppalapati, Raja	4	33	2	2020
9. Vuppalapati, Jaya	4	33	2	2020
10. Kedari, Santosh	4	33	2	2020
11. Qiu, Hailan	3	31	2	2024
12. Makhmudov, Samariddin	3	0	0	2026

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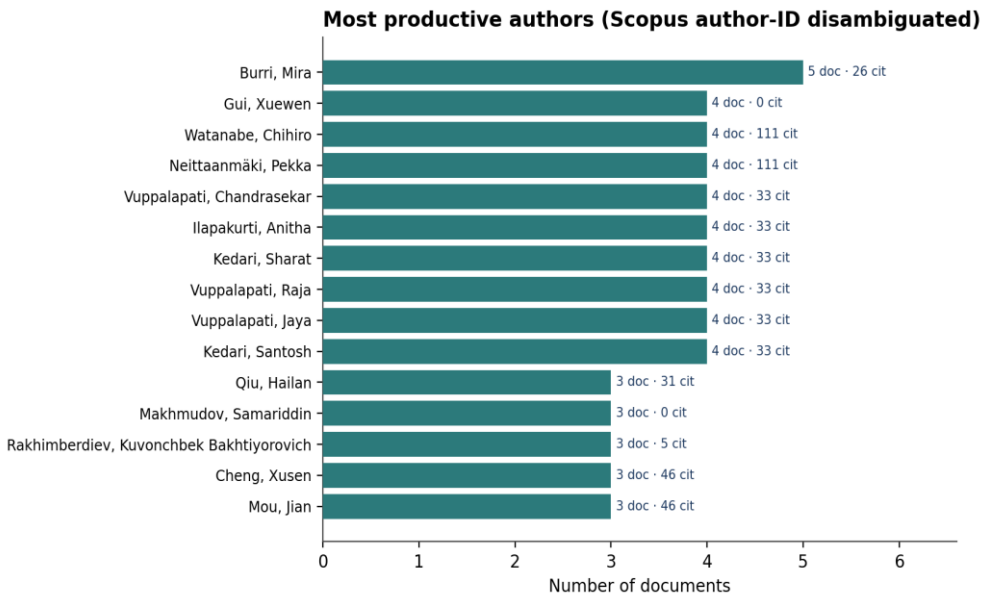

Fig 2. Most productive authors by document count, with corpus citation totals.

3.3. Most Relevant Sources

Publication outlets are similarly dispersed across 1,154 sources. The most active venues are large multidisciplinary conference series and proceedings led by the ACM International Conference Proceeding Series and a cluster of e-business and information technology conferences reflecting the field's computing roots. Among journals, Sustainability (Switzerland) is the most prolific and one of the most cited, indicating the alignment of digital-economy research with sustainability agendas.

Concentration follows Bradford's law: a core of only 57 sources accounts for about one-third of all documents, while the remaining two-thirds are spread across more than 1,000 outlets, many contributing a single paper. There is thus no small set of flagship journals that a reader can monitor to remain current relevant work is scattered, which itself argues for periodic bibliometric synthesis. Table 3 and Figure 3 list the leading sources.

Table 3. Most relevant sources by document count.

Source	Docs	Citations
1. ACM International Conference Proceeding Series	68	154
2. Sustainability (Switzerland)	49	752
3. 2011 2nd International Conference on Artificial Intelligence, Management Science and Electronic Commerce, AIMSEC 2011 - Proceedings	38	16
4. Lecture Notes in Networks and Systems	37	48
5. 2011 International Conference on E-Business and E-Government, ICEE2011 - Proceedings	30	10
6. Proceedings of the International Conference on E-Business and E-Government, ICEE 2010	25	31
7. PLoS ONE	16	184
8. Advances in Intelligent Systems and Computing	16	26
9. Proceedings of the International Conference on Electronic Business (ICEB)	15	2
10. Progress in Geography	14	94
11. Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	14	1270
12. Electronic Commerce Research	13	144

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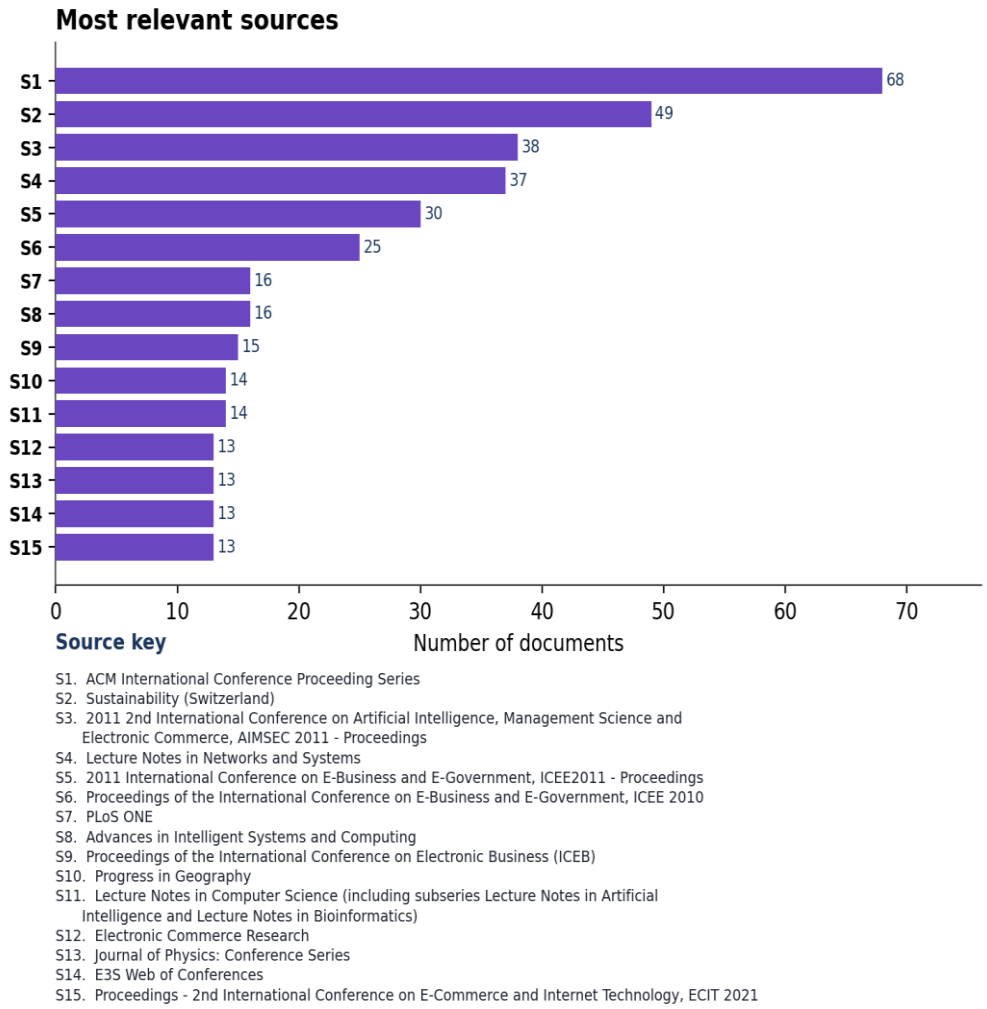

Fig 3. Most relevant sources by number of documents.

3.4. Most Productive Countries

Country-level productivity, derived from author affiliations, reveals a degree of geographic concentration that is unusual even by the standards of an emerging field. Of 120 contributing countries, China alone accounts for 937 of the 2,097 documents roughly 45% of the entire corpus an order of magnitude ahead of the next group: India (144), Indonesia (118), Russia (117), and the United States (104), followed by the United Kingdom (72) and Malaysia (63). The strong showing of Indonesia and several other South and Southeast Asian countries is notable and reflects the regional salience of digital-commerce and digital-economy policy debates.

Productivity, internationalization, and impact diverge sharply, however. Chinese output is overwhelmingly domestic only about 15% of its documents are internationally co-authored whereas most United States (53%) and United Kingdom (65%) documents involve international collaboration. Impact per paper follows the same divide: the United Kingdom and United States average well above eighteen and sixteen citations per document respectively, roughly double China's average, despite China's far larger volume. The field's centre of gravity, in other words, is numerically in East Asia but its most internationally visible work still flows substantially through Western and collaborative channels. Table 4 and Figure 4 report the leading countries with their single- and multiple-country publication split.

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Table 4. Most productive countries (by author affiliation), with single-country (SCP) and multiple-country (MCP) publications.

Country	Docs	Citations	SCP	MCP	MCP ratio
1. China	937	8108	801	136	0.15
2. India	144	604	111	33	0.23
3. Indonesia	118	520	96	22	0.19
4. Russia	117	388	101	16	0.14
5. United States	104	1724	49	55	0.53
6. United Kingdom	72	1324	25	47	0.65
7. Malaysia	63	524	22	41	0.65
8. Ukraine	43	532	29	14	0.33
9. South Korea	34	341	15	19	0.56
10. Vietnam	31	480	27	4	0.13
11. Uzbekistan	30	111	21	9	0.30
12. Romania	28	236	23	5	0.18

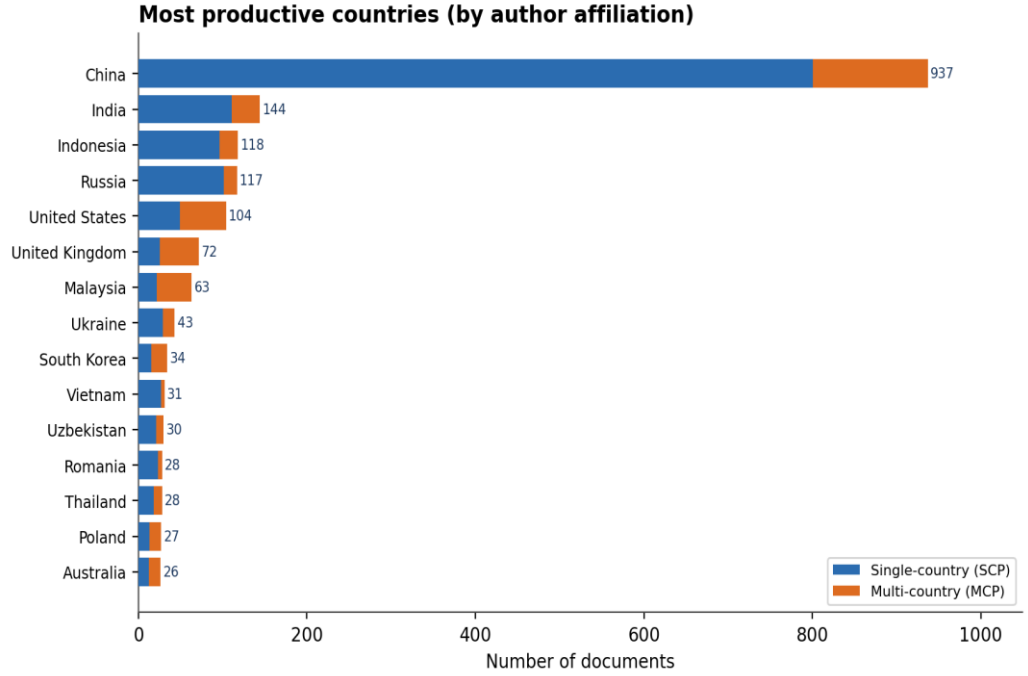

Fig 4. Most productive countries by document count, split into single-country (SCP) and multiple-country (MCP) publications.

3.5. Country Collaboration Network

International co-authorship links 16.4% of the corpus, and the collaboration network in Figure 5 shows a clear hub-and-spoke structure centred on China. The strongest single tie is China–United States (26 joint documents), followed by China–United Kingdom (19), China–Malaysia (17), China–South Korea (16), and China–Hong Kong (13). The United States functions as the principal Western bridge, with its own secondary tie to India (10); regional Asian ties (Indonesia–Malaysia, India–Malaysia, China–Thailand, China–Singapore) form a further layer.

The structure is therefore one of a dominant national producer that collaborates selectively and bilaterally primarily with the United States, the United Kingdom, and its East and Southeast Asian neighbours rather than a densely interwoven multipolar community. For most peripheral countries, a tie to China or the United States is the main route into the international network.

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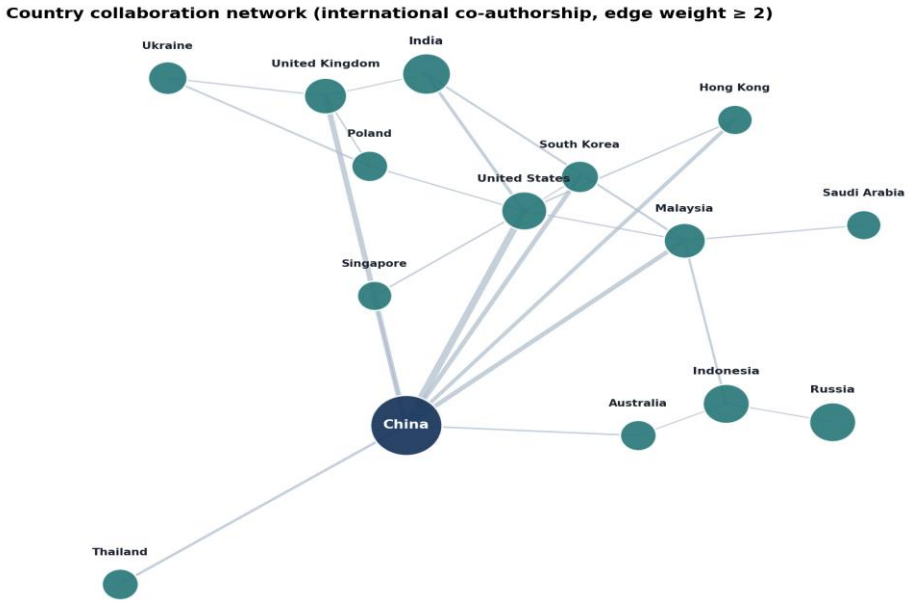

Figure 5. Country collaboration network based on international co-authorship (edges with at least two joint documents). Node size reflects national output; the navy hub is China.

3.6. *Citation Analysis*

Citations within the corpus are highly skewed. The median document has received a single citation and 39.0% remain uncited, yet 408 documents have at least ten citations, 69 at least fifty, and 29 at least one hundred. A small number of works therefore carry a disproportionate share of the field's visible influence. The most-cited document, Schaffers and colleagues' 2011 study of smart cities and the future internet, has accumulated 937 citations, far ahead of the field.

The thematic composition of the citation leaders is informative. Alongside the smart-cities papers (which connect the digital economy to urban infrastructure and the internet of things), they include Li and colleagues' 2020 critical assessment of the Asian digital economy, Beck and colleagues on payment instruments, finance and development, Tran's pandemic-era study of e-commerce platform effectiveness, and several China-focused studies linking e-commerce to rural poverty alleviation, carbon-emission reduction, and rural economic restructuring. Development- and sustainability-oriented framings thus sit among the field's most influential contributions. Table 5 and Figure 6 summarise the citation leaders and the citation distribution.

Table 5. Most cited documents in the corpus.

First author (year)	Title	TC	TC/yr
1. Schaffers H. et al. (2011)	Smart cities and the future internet: Towards cooperation frameworks for open innovation	937	62.5
2. Li K. et al. (2020)	How should we understand the digital economy in Asia? Critical assessment and research agenda	317	52.8
3. Hernández-Muñoz J.M. et al. (2011)	Smart cities at the forefront of the future internet	316	21.1
4. Beck T. et al. (2018)	Payment instruments, finance and development	277	34.6
5. Tran L.T.T. et al. (2021)	Managing the effectiveness of e-commerce platforms in a pandemic	265	53
6. PENG C. et al. (2021)	Poverty alleviation through e-commerce: Village involvement and demonstration policies in rural China	241	48.2
7. Wang H. et al. (2023)	How does digital technology promote carbon emission reduction? Empirical evidence based on e-commerce pilot city policy in China	211	70.3

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8. Zhang Y. et al. (2022)	Analysis of rural economic restructuring driven by e-commerce based on the space of flows: The case of Xiaying village in central China	203	50.8
9. Nanda A. et al. (2021)	How would the COVID-19 pandemic reshape retail real estate and high streets through acceleration of E-commerce and digitalization?	172	34.4
10. Maimaiti M. et al. (2018)	How we eat determines what we become: opportunities and challenges brought by food delivery industry in a changing world in China	162	20.2

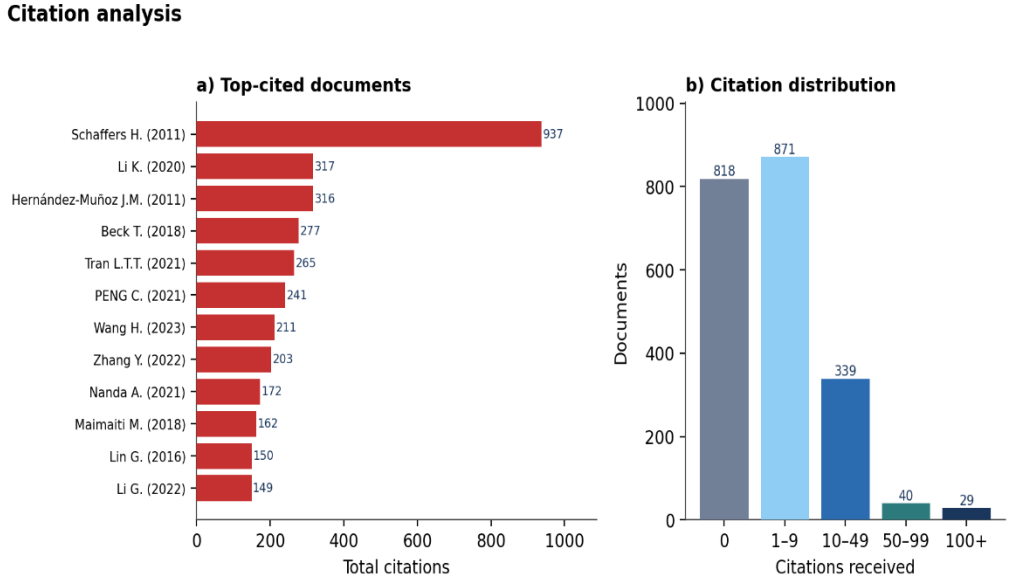

Fig 6. Citation analysis: (a) most-cited documents; (b) distribution of citations across the corpus.

3.7. Co-Citation Analysis

Document co-citation analysis measuring how often pairs of earlier works are cited together by the corpus reconstructs the field's intellectual foundations from the cited-reference lists. The most co-cited references and their grouping appear in Figure 7. Three coherent intellectual bases emerge.

The first is a behavioural and methodological base: the classics of technology acceptance and survey research, including Davis's 1989 technology-acceptance model, Ajzen's theory of planned behaviour, Fornell and Larcker on construct validity, and Podsakoff and colleagues on common-method bias. Their prominence indicates that a substantial sub-stream studies consumer and firm adoption of e-commerce using structural-equation methods. The second is a digital-economy concept base foundational conceptualisations of the digital economy and digital trade, anchored by works such as Tapscott's early framing and Heeks's definitional contributions, together with influential recent reviews. The third, and most active, is an empirical e-commerce and rural-China base: a cluster of recent studies on rural e-commerce, poverty alleviation, and digital-economy effects, within which the recurrent co-citation of econometric identification references (for example, difference-in-differences methodology) signals a strong policy-evaluation orientation.

The relative independence of these three bases behavioural, conceptual, and empirical-developmental reinforces the picture of a field integrating several previously separate conversations, and the heavy methodological co-citation distinguishes this literature from purely descriptive reviews.

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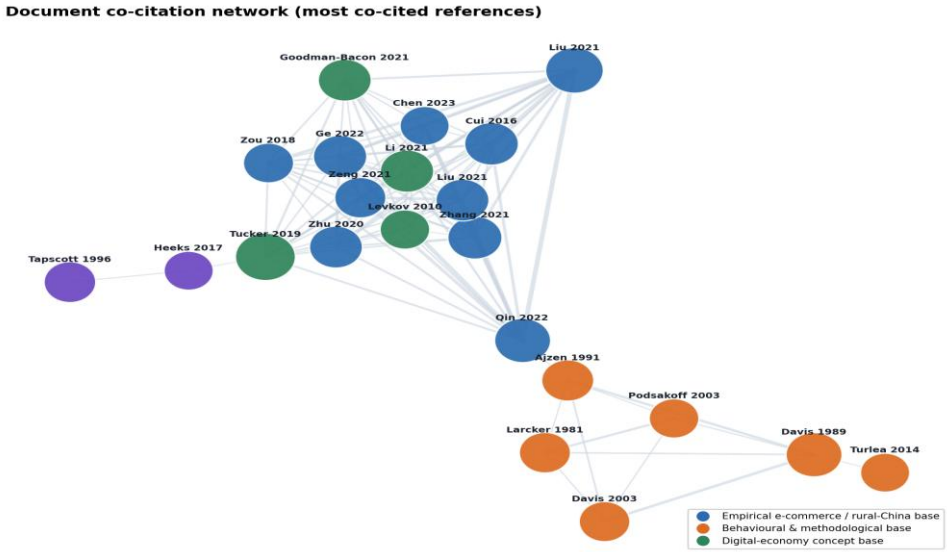

Fig 7. Document co-citation network of the most co-cited references. Node size reflects co-citation frequency; colour denotes the intellectual base.

3.8. Bibliographic Coupling

Bibliographic coupling links documents that share references in common, capturing the field's current research fronts rather than its historical foundations. Computed over the documents with available reference lists, coupling reveals one overwhelmingly dominant front: a tightly connected component of roughly one hundred high-impact documents accumulating several thousand citations organised around the shared vocabulary of digital economy, e-commerce, and rural e-commerce. This single large front, visible in Figure 8 among the most-cited documents, indicates that the contemporary core of the field is unusually cohesive at the level of shared sources, even as it remains fragmented at author level.

Beyond this core, only small and weakly connected fronts appear a digital-trade group and a digital-transformation/e-business lineage (including earlier works on organisational adoption and open innovation) that couples internally but links only loosely to the digital-economy core. The coupling structure thus mirrors the co-citation reading: a large, coherent empirical-economic front, flanked by smaller specialist groups that have not yet fully merged with it.

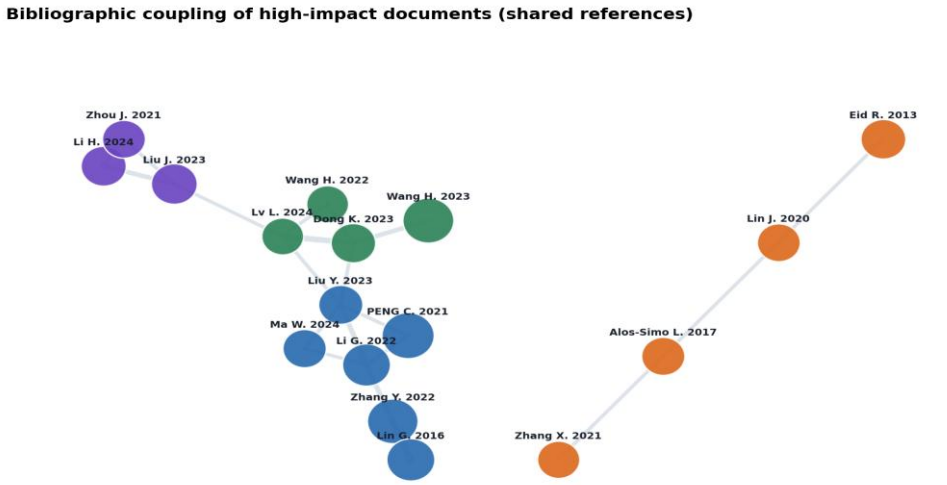

Fig 8. Bibliographic coupling of high-impact documents by shared references. Node size reflects citations; colour denotes coupling community.

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3.9. *Keyword Co-occurrence Network*

The conceptual structure of the field is most directly revealed by author-keyword co-occurrence. Two terms dominate e-commerce (526 occurrences) and digital economy (430) followed at a distance by digitalisation (84), artificial intelligence (65), digital transformation (63), China (57), cross-border e-commerce (56), and SMEs (51). The network in Figure 9 places these terms by their co-occurrence relationships and colours them by community.

Modularity clustering identifies four coherent communities: a transversal core linking e-commerce and the digital economy to economic development, cross-border e-commerce, SMEs, and sustainable development; a macro-level cluster of digitalisation, digital transformation, and economic growth; a distinctively Chinese rural cluster (China, rural e-commerce, platform economy, logistics, Alibaba, rural revitalisation); and a technology cluster (artificial intelligence, machine learning, big data, blockchain, fintech). These four communities recur, in different guises, throughout the remaining analyses.

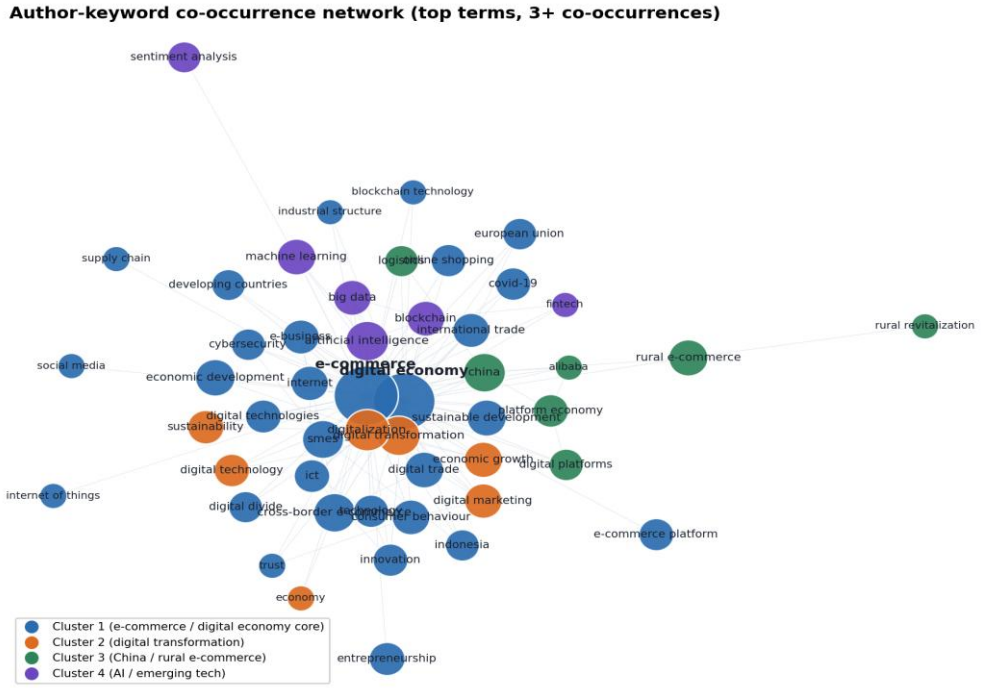

Fig 9. Author-keyword co-occurrence network; node size reflects term frequency and colour denotes cluster membership.

3.10. *Thematic Map*

Positioning the keyword clusters on the strategic diagram centrality against density clarifies the role each plays. The e-commerce/digital-economy core occupies the basic-and-transversal quadrant: high centrality but comparatively low density, the expected signature of the field's defining concepts, which connect to everything but are not, in themselves, a tightly developed specialism.

The artificial-intelligence cluster and the China/rural-e-commerce cluster both sit high on density, in the niche/developed region: internally coherent and methodologically mature, but less central to the overall conversation. The digitalisation/digital-transformation cluster lies near the centre. The strategic reading is that the field's growth potential lies in raising the centrality of the well-developed AI and rural-commerce niches integrating them more fully with the economic-development core rather than in further developing the already-central but loosely knit core. Figure 10 presents the map.

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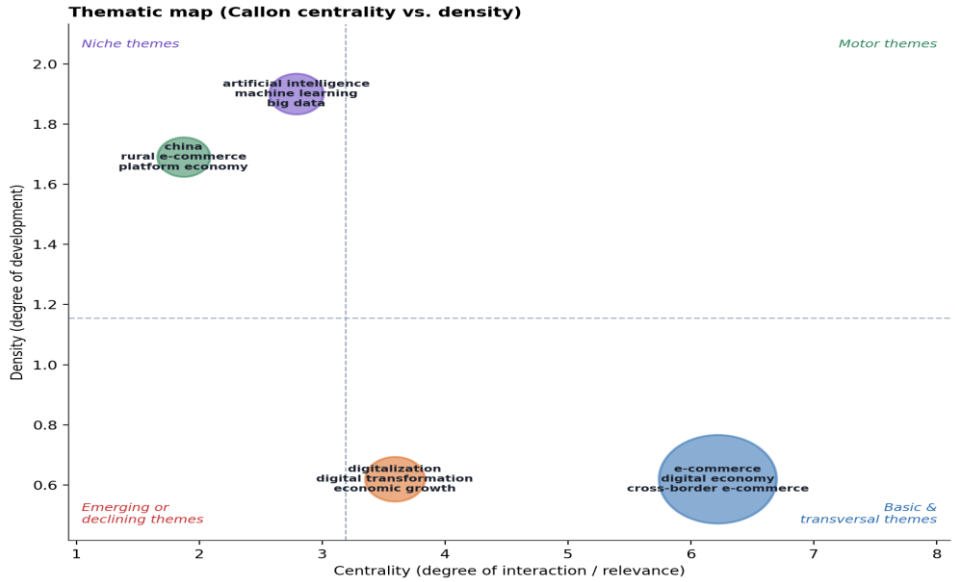

Fig 10. Thematic map of author-keyword clusters (Callon centrality vs. density). Bubble size is proportional to cumulative keyword frequency.

3.11. Thematic Evolution

Dividing the timeline into three sub-periods 2010–2016, 2017–2021, and 2022–2026 exposes a clear thematic migration. The earliest period is organised around foundational concerns: e-business, the internet, SMEs, innovation, and economic growth, with e-commerce and the digital economy already established as anchors. The middle period sees the entry of cross-border e-commerce, big data, China, and artificial intelligence, signalling both an internationalisation of the research and the arrival of data-intensive methods.

In the most recent period the emphasis shifts toward digital transformation, artificial intelligence, sustainable development, and continued attention to cross-border and rural commerce. The persistence of e-commerce and the digital economy across all three periods confirms their status as stable anchors, while the turnover around them from infrastructure, to internationalization and data, to transformation and sustainability traces the field's maturation. Figure 11 visualises these flows.

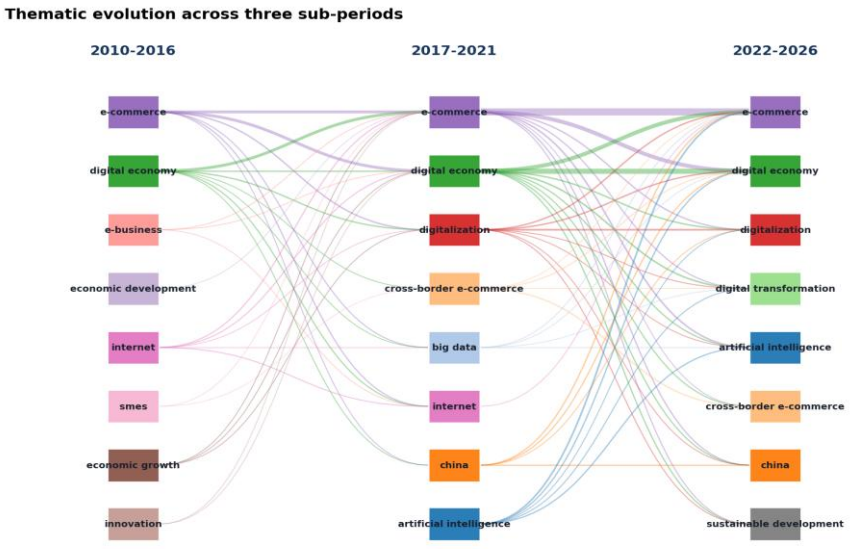

Fig 11. Thematic evolution of leading author keywords across three sub-periods; ribbon width reflects the strength of thematic continuity.

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3.12. *Three-Field Plot (Authors–Keywords–Sources)*

The three-field plot in Figure 12 links the leading authors (left) to the leading keywords (centre) and on to the leading sources (right), making visible the conduits through which topics flow from researchers to outlets. The central column is dominated by e-commerce and the digital economy, to which most leading authors connect, confirming the gravitational pull of the field's core concepts.

The plot also exposes specialisation: authors associated with the China/rural cluster route through keywords such as rural e-commerce and China toward geography and rural-studies outlets; authors working on macro-level digitalisation connect to sustainability and economics venues; and computing-oriented contributors link AI and machine-learning keywords to conference proceedings and computer-science series. The plot thus reconciles the actor, concept, and venue dimensions within a single view, reinforcing the four-cluster structure.

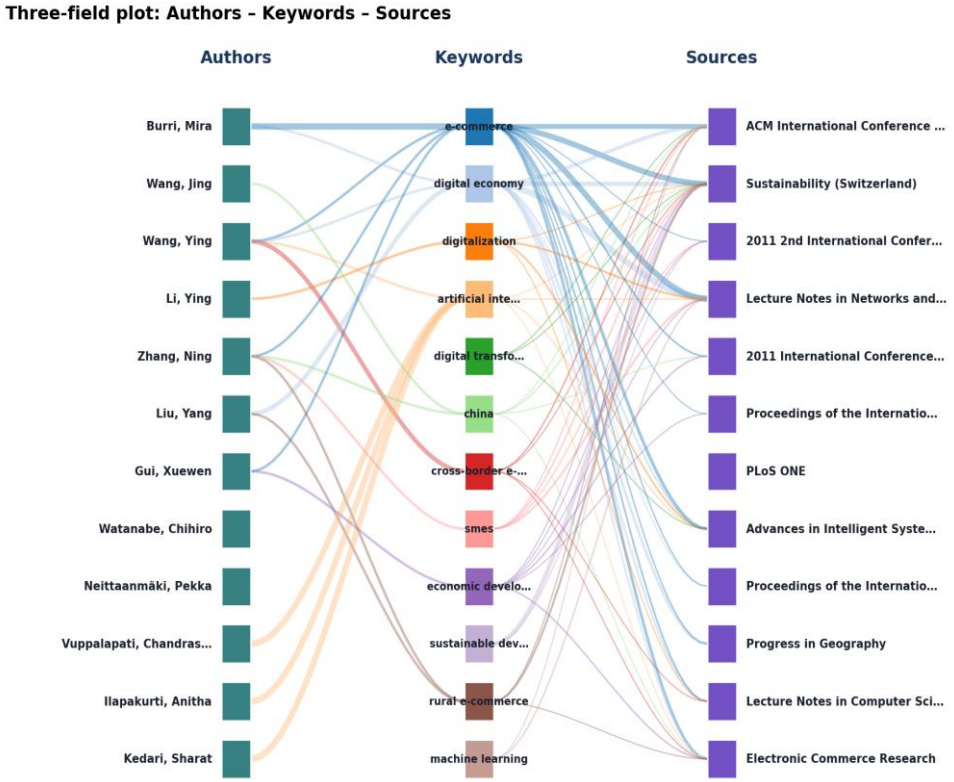

Fig 12. Three-field (Sankey) plot linking authors, author keywords, and sources.

3.13. *Trend Topics*

Trend-topic analysis dates each keyword by the median year of the documents in which it appears, with the interquartile range indicating the span of active use. The temporal ordering in Figure 13 reads as a compact history of the field. Early terms (median around 2018–2019) include e-business, information technology, the internet, and GDP the vocabulary of a field still framing digital commerce in infrastructural terms.

A middle band (around 2020–2021) brings economic growth, ICT, e-government, big data, and COVID-19, marking both the methodological turn and the pandemic shock. The most recent terms (median 2024–2025) artificial intelligence, machine learning, digital marketing, cross-border e-commerce, digital transformation, sustainable development, and rural e-commerce identify the current research frontier. The clustering of high-frequency terms at the recent end of the timeline is a further sign of a field whose vocabulary is still actively expanding.

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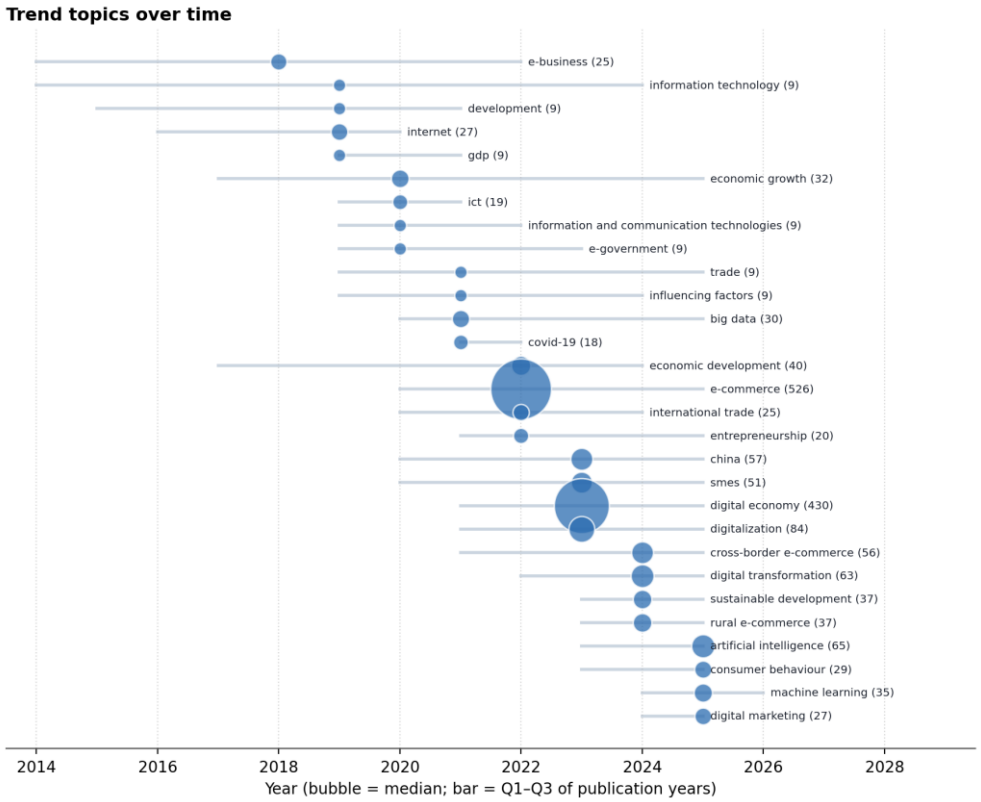

Fig 13. Trend topics over time. Bubble position marks the median publication year of each term; the bar spans the first-to-third quartile; bubble size reflects frequency.

Four cross-cutting findings emerge from the converging evidence of the performance and mapping analyses. First, the field is young, fast-growing, and structurally fragmented at author level. The ~15% annual growth rate, the dispersion across 1,154 sources and 5,537 authors, the absence of any author with more than five documents, and the Bradford core of just 57 sources describe a domain that has attracted broad interest but has not consolidated into a stable community with recognised flagship venues.

Second, that fragmentation coexists with extreme geographic concentration. China's 45% share, combined with its low international-collaboration rate, means a large part of the global literature is produced within a single national research system and policy context particularly the rural e-commerce and poverty-alleviation programmes that recur throughout the citation and coupling structures. This is a strength in empirical depth but a risk for generalisability: the field's most active research front is, to a substantial degree, the study of one country's experience. The higher per-paper impact and internationalisation of United States and United Kingdom output suggest that cross-national integration remains an opportunity rather than an achievement.

Third, the field nonetheless rests on identifiable and partly shared foundations. Co-citation resolves into a behavioural/methodological base, a digital-economy concept base, and an empirical-developmental base, while bibliographic coupling reveals a single dominant contemporary front. The strong methodological co-citation technology-acceptance models on one side, causal-inference techniques on the other indicates a literature that is becoming more rigorous, even as its substantive clusters remain only loosely connected.

Fourth, the thematic trajectory is unmistakably toward transformation, intelligence, and sustainability. Thematic evolution and trend topics jointly trace a movement from infrastructure and e-business, through internationalisation and big data, to AI-enabled commerce, cross-border trade, and sustainable and rural development. The strategic diagram

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suggests the greatest scientific opportunity lies in connecting the well-developed but peripheral AI and rural-commerce niches to the central development agenda.

4. Conclusion

This bibliometric analysis of 2,097 Scopus-indexed documents charts the global research landscape connecting e-commerce, the digital economy, and economic development from 2010 to 2026. The field is young, expanding at roughly 15% per year, fragmented across authors and outlets yet sharply concentrated in China, which alone accounts for almost half of all output. Its intellectual foundations resolve into behavioural, conceptual, and empirical-developmental bases; its contemporary research front is a single, cohesive digital-economy core; and its thematic trajectory runs clearly from early infrastructural concerns toward AI-enabled, cross-border, and sustainability-oriented commerce.

Beyond describing the field, the study locates its scientific opportunities: supplying causal evidence on development outcomes beyond a single national setting, integrating cross-national collaboration, and connecting mature but peripheral technological and rural niches to the central agenda. As bibliometric work, the analysis inherits the usual constraints dependence on Scopus coverage, the approximations of name- and reference-based disambiguation, and a partial final year but its convergent indicators offer a robust and reproducible map of where the field stands and where it is heading.

Limitations. Results reflect Scopus-indexed literature and would shift modestly under a different database or query. Author and reference disambiguation are heuristic: identifier-based author matching is reliable, but reference keys built from first author, year, and a title token may still merge or split a minority of works, so individual co-citation nodes for very common surnames should be read as approximate. Affiliations and references were available for the large majority but not all documents, and 2026 is incomplete. None of these affects the principal, mutually reinforcing patterns reported here.

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