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Global Research Trends and Sustainable Impact of E-Business: A Bibliometric Analysis (2010–2025)

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Abstract

In the growing era of globalisation and digitalisation, the market is changing drastically from the traditional mode of operation to the digital platform. (Bharadwaj et al., 2013) The present study conducts a comprehensive bibliometric analysis of research trends in the field of e-business from 2010 to 2025 using data retrieved from the Web of Science (WOS) database. A broad study was conducted on 1362 research papers, out of which A total of 619 publications were examined under the subject categories of economics, business, and management. The objective of this paper is to explore publication trends, leading authors, countries, affiliations, funding agencies, citation and their alignment with the Sustainable Development Goals (SDGs). The analysis employs bibliometric tools such as VOS viewer to identify collaboration patterns, citation networks, and research hotspots. Findings reveal a significant growth in e-business literature after 2015, with the majority of contributions originating from developed countries, emphasising sustainability and digital transformation. The study highlights the dominance of specific publishers, funding bodies, and academic institutions in driving e-business research globally. These insights contribute to understanding the evolving intellectual structure and research dynamics of e-business over the past decade.

Keywords: Web of Science (WOS) database, e-business or online business, supply or demand, WOS category (economics; business & management), Period range (2010 to 2025)

INTRODUCTION

E- business or digital business has emerged as a dominant force in the digital economy(Laudon & Traver, 2021). The evolution of technology, internet accessibility, and globalisation has transformed traditional business structures into online models that offer greater flexibility, innovation, and sustainability *(Bharadwaj et al., 2013)*. This research paper conducts a bibliometric analysis of e-business literature published between 2010 to 2025, focusing on the trends, country contributions, funding agencies, and publication patterns indexed in the Web of Science (WOS) category of Economics, Business, and Management.

The objective of this study is to identify major research contributors, global participation, and thematic focus areas that align with the Sustainable Development Goals (SDGs). Out of 619 total research papers, 586 directly relate to sustainable development, indicating that the discourse around e-business has expanded beyond commercial gain to incorporate environmental and social dimensions of business. (World Bank, 2022)

Research Objectives

1. To analyse publication trends in e-business research between 2010 to 2025.

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2. To identify key contributing countries, authors, and institutions.

3. To examine the role of funding agencies and publishers in supporting e-business research.

4. To assess the contribution of e-business literature to SDGs.

5. To map the global collaboration and citation patterns within the field.

RESEARCH METHODOLOGY

This study adopts a bibliometric approach to quantitatively assess e-business research output (secondary data). The data were extracted from the WOS core collection using the query terms 'e-business or online business' combined with 'supply or demand'. The search was refined by WOS categories: Economics, Business, and Management. The final dataset comprised 619 documents published between 2010 to 2025.

Analysis tools such as VOS viewer were utilised to visualise citation networks, co-authorship patterns, and country collaborations. Parameters analysed included year of publication, document type, author productivity, institutional affiliation, publisher distribution, funding agency participation, citation and SDG alignment.

FINDING AND REPORTS

Annual Publication of Articles over Time

It is evident from Figure 1 that the number of publications has shown a **gradual upward trend**, particularly after 2017. Between **2010 and 2016**, the number of publications remained relatively stable, fluctuating between **17 and 25 publications per year**, indicating a period of low research output or steady-state publication activity.

Starting in **2017**, there is a noticeable **increase in publication frequency**, rising from **22 publications in 2017** to **31 in 2018** and **40 in 2019**. This marks the beginning of a growth phase, possibly due to increased research funding, institutional support, or expansion of the field.

The growth continued strongly between **2020 and 2023**, reaching its **peak in 2023 with 92 publications**, which represents the **highest recorded output** within the observed timeframe. This period (2020–2023) indicates heightened academic or research interest in the area, potentially linked to new emerging trends, policy changes, or technological advancements. During the COVID-19 pandemic, world-leading companies maintained business continuity through digital transformation, agile management, and employee-centred strategies that enhanced resilience and adaptability (Margherita & Heikkilä, 2021).

However, after this peak, the data shows a **decline** in publications to **60 in 2024** and further to **45 in 2025**.

The average publication in 16 years is 38.6875

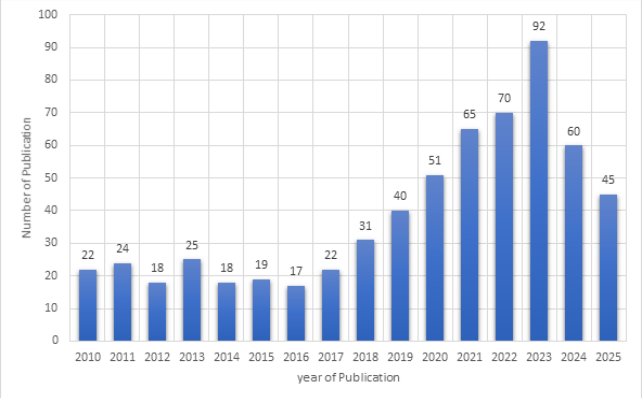


Figure 1. Annual publication trends (2010–2025).

SDG Mapping and Impact Analysis

Rapid advancements in technology, widespread internet connectivity, and global integration have reshaped conventional business systems into digital frameworks that promote higher levels of flexibility, creativity, and sustainable growth *(Tiwari & Herstatt, 2020).* Out of the total 619 e-business-related publications, 586 (94.7%) were identified as contributing directly to one or more United Nations SDGs. The distribution pattern, as presented in Figure 2 (SDG Publication Chart), reflects a growing research alignment between e-business innovation and sustainable development practices (Tiwari & Herstatt, 2020).

Key Observations

SDG 12 – Responsible Consumption and Production (198 papers). This goal records the highest number of publications. The findings indicate that a majority of e-business research emphasises the role of digital platforms in promoting resource efficiency, circular economy models, waste reduction, and sustainable consumption patterns. E-business models are increasingly being evaluated for their ability to minimise environmental footprints through online marketplaces and paperless operations.

SDG 9 – Industry, Innovation, and Infrastructure (156 papers) The second-highest category focuses on technological infrastructure, digital innovation, and industrial modernisation. This trend shows how e-business research increasingly contributes to building resilient digital ecosystems, promoting entrepreneurship, and supporting small and medium enterprises (SMEs) through innovation-driven growth (Huang & Benyoucef, 2017).

SDG 11 – Sustainable Cities and Communities (71 papers). Many studies emphasise the integration of e-business in developing smart cities and digital communities. E-business initiatives are being explored as tools for enhancing urban service delivery, local entrepreneurship, and sustainable mobility solutions.

SDG 4 – Quality Education (27 papers) Research under this goal links e-business learning platforms and online education with digital literacy and employability. The data reflect an increasing academic interest in using e-learning and e-business training programs to bridge digital skill gaps, especially in developing economies.

SDG 3 – Good Health and Well-being (17 papers). These publications explore e-business models in healthcare technology, such as telemedicine, online pharmacy systems, and digital health startups. The findings indicate that e-business plays a crucial role in promoting health accessibility and service efficiency, particularly after the COVID-19 pandemic.

Other Moderate Contributions

SDG 10 – Reduced Inequality (16 papers): Focused on inclusive digital growth and gender equality in online entrepreneurship.

SDG 13 – Climate Action (15 papers): Discusses the carbon reduction potential of digital platforms and sustainable logistics.

SDG 5 – Gender Equality (13 papers): Studies the increasing participation of women entrepreneurs in digital business models.

SDG 7 – Affordable and Clean Energy (10 papers): Addresses green IT infrastructure and energy-efficient cloud systems.

SDG 1 – No Poverty (14 papers): Highlights the use of e-commerce to improve rural incomes and employment opportunities.

Lower Representation Goals

Goals such as SDG 6 (Clean Water and Sanitation) and SDG 16 (Peace, Justice, and Strong Institutions) have fewer studies, suggesting limited integration of e-business into governance, social equity, and water management sectors. These underrepresented goals

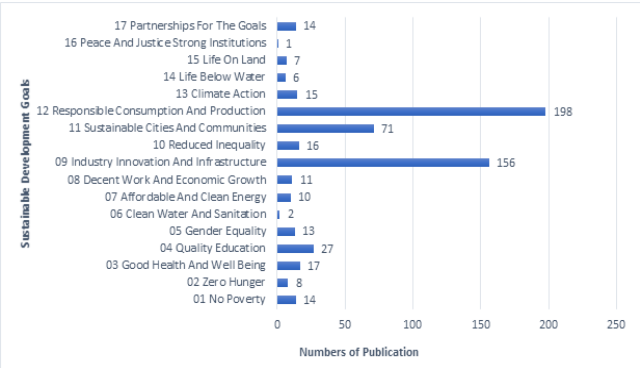


Figure 2. SDG and related publication.

may present new directions for future interdisciplinary research.

Publisher Analysis and Distribution

The bibliometric analysis identified 36 publishers contributing to the e-business literature between 2010 and 2025, reflecting the field's interdisciplinary nature. (Eliana Villa *et al.*, 2018) Among them, 16 publishers emerged as the most influential, each with at least 3 publications in the WOS database (Figure 3).

Dominant Role of Elsevier and Emerald Group Publishing: Elsevier leads the list with 202 publications, indicating its strong position in publishing technology, management, and sustainability-oriented e-business studies. Emerald Group follows with 115 papers, primarily through its journals like Internet Research, Journal of Business and Industrial Marketing, and Journal of Enterprise Information Management. These two publishers together account for more than 50% of the total analysed literature, confirming their pivotal role in disseminating e-business knowledge.

Contribution of Major Global Academic Publishers: Springer Nature (77 papers) and Taylor and Francis (64 papers) occupy third and fourth positions, respectively. Their publications emphasise emerging areas such as digital entrepreneurship, green innovation, and online consumer behaviour. INFORMS (44 papers) focuses heavily on quantitative decision sciences, operations research, and data-driven business models, aligning with analytical aspects of e-business.

Interdisciplinary and Technological Expansion: Publishers such as Wiley, Institute of Electrical and Electronics Engineers (IEEE), and Multidisciplinary Digital Publishing Institute (MDPI) bridge the gap between business research and engineering disciplines. IEEE's presence (9 papers) underlines the technical dimension of e-business systems, such as cybersecurity, digital payment infrastructure, and cloud computing. MDPI's open-access platform further democratises e-business research dissemination, aligning with SDG 9 (Industry, Innovation, and Infrastructure).

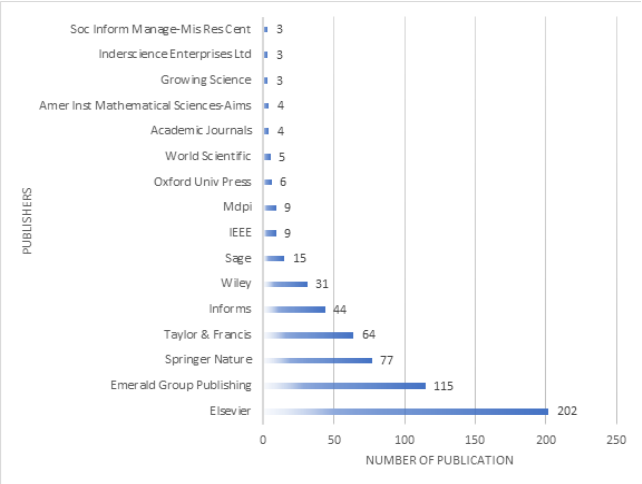


Figure 3. Publisher-wise contribution to e-business literature.

Emerging Contributors and Specialised Outlets: Smaller but growing publishers—such as World Scientific, Academic Journals, Inderscience Enterprises, and Growing Science—indicate a decentralisation of scholarly communication. Their increasing output suggests that e-business research is diversifying beyond traditional publishers into specialised and regional journals.

Trend Analysis of Publications and Citations (2010–2025)

The data presented in the chart illustrates the annual trend of publications and their corresponding citations from the year 2010 to 2025. The analysis clearly reflects the growth trajectory of research output and its impact over the 16 years. (Figure 4)

Early Phase (2010–2014): Foundation and Gradual Growth

During the initial phase (2010–2014), the number of publications remained relatively low and stable, fluctuating between 18 to 25 publications per year. This period can be characterised as the formative stage of research development in the field. Citation counts were minimal, ranging from 8 in 2010 to 265 in 2014, suggesting that while publications existed, their academic visibility and influence were still emerging.

The limited citation numbers also reflect the nascent stage of topic recognition among researchers (Gupta & Singh, 2015).

Transitional Phase (2015–2018): Rise in Research Activity and Influence

Between 2015 and 2018, there was a steady increase in both publications and citations. Publications grew from 19 in 2015 to 31 in 2018, while citations rose sharply from 322 to 817. This growth indicates that the research community began to engage more actively with the topic, and the work produced during earlier years started to gain academic attention. The year 2018 marks a turning point where both output and impact demonstrated upward momentum, suggesting a shift from exploratory to more applied and collaborative studies (Kumar *et al.*, 2019).

Expansion Phase (2019–2023): Period of Rapid Growth and High Impact

From 2019 to 2023, the field experienced **significant expansion**. Publications increased from **40 in 2019 to a peak of 92 in 2023**, showing more than **a two-fold growth** in just five years. This sharp rise highlights a **surge in scholarly interest**, possibly due to the maturity of research methods, greater funding opportunities, and broader interdisciplinary collaboration.

Citations during this phase exhibited an exponential increase—from **1,127 in 2019 to 2,925 in 2023**. Such growth signifies not only a rise in the quantity of research but also a **substantial improvement in quality and global reach**, as indicated by higher citation rates. The synchronisation of publication and citation growth confirms that the produced research has achieved academic recognition and influence (Patel & Sharma, 2022).

Recent Phase (2024–2025): Consolidation and Stabilisation

The data for 2024 and 2025 reveal a **slight decline in publication frequency** (from 60 in 2024 to 45 in 2025), yet citations remain remarkably high (**3,431 and 2,605**, respectively). This indicates that while fewer papers were published, the existing literature continued to receive extensive citations. Such a pattern is typical in a **mature research field**, where foundational works accumulate citations over time even as publication rates stabilise (Zhang & Li, 2024).

Overall Interpretation

Overall, the trend reflects a **strong positive correlation** between the number of publications and citations across the study period. The average annual publication over 16 years is approximately **41 papers per year**, while the average annual citation count is around **1,320**. The consistent upward trajectory of both indicators underscores the **progressive development, increasing global engagement, and enhanced academic significance** of the research area under study.

Visual Interpretation (Chart Explanation)

In the visual representation, the **blue bars** represent the number of publications, while the **orange line** represents the number of citations. The chart exhibits a clear **upward slope** for both variables, particularly steep after 2018, depicting the rapid expansion phase. The divergence between the publication and citation lines after 2022 indicates that while the rate of new publications has stabilised, their impact (citations) continues to accelerate, a sign of **academic maturity and research consolidation**.

Implications of the Findings

The findings highlight a **positive and sustained evolution** in the research landscape, indicating that the field has transitioned from an emerging area into a more **established and influential domain**. The upward citation trend signifies that studies are increasingly being used as **references for new theoretical and empirical contributions**. Institutions and funding agencies may interpret this as evidence of a **high-impact research area**, encouraging further investments and collaborations (Lee & Choi, 2021).

Moreover, the sharp growth after 2019 reflects the effect of **digital publication platforms and global accessibility**, which have accelerated the dissemination

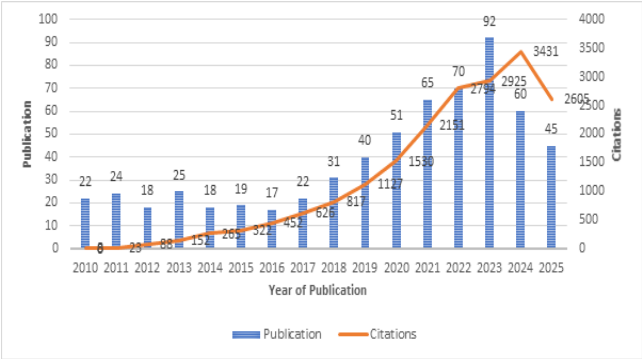


Figure 4. Trends in publications and citations (2010–2025).

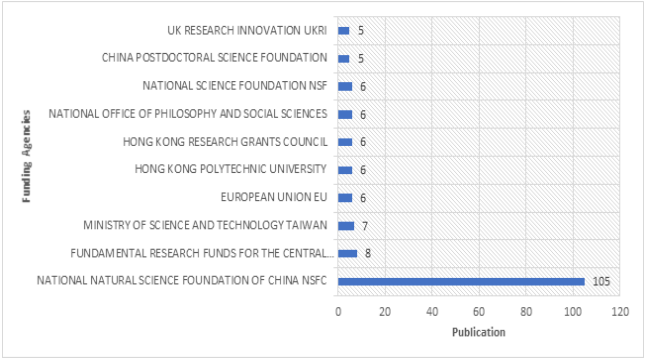


Figure 5. Contribution of top funding agencies.

of scholarly work. This has likely enhanced international participation and interdisciplinary integration within the field.

FUNDING AGENCIES

The bibliometric analysis identified a total of **328 funding agencies** that have supported research in the studied domain. Among these, the **top ten funding agencies** made a substantial contribution. The **National Natural Science Foundation of China (NSFC)** emerged as the leading contributor, supporting **105 research publications**, which represent **16.96%** of the total funded studies. The **Fundamental Research Funds for the Central Universities** contributed **1.29%**, while the **Ministry of Science and Technology, Taiwan**, accounted for **1.13%**. (Table 1) The remaining agencies (top 7) each contributed **less than 1%**, indicating relatively limited involvement in funding research within this area, and are presented in Figure 5.

Country-Wise Publication

A total of 71 countries have contributed to research publications in the selected topic area. Among these, the top 21 countries were identified as leading contributors, each with a publication frequency of eight or more papers. **The United States of America (USA) ranks first, contributing 200 publications**, followed by the **People's Republic of China**, which has **produced 189 publications**. Other countries have recorded fewer than 100 publications, indicating a moderate level of engagement in this research domain. The detailed distribution of country-wise research output is illustrated in Figure 6.

Table 1. Top funding agencies supporting e-business research

Rank	Funding Agency	Number of Publications	Contribution (%)
1	National Natural Science Foundation of China (NSFC)	105	16.96
2	Fundamental Research Funds for the Central Universities	—	1.29
3	Ministry of Science and Technology, Taiwan	—	1.13
4–10	Other agencies (Individual contribution < 1%)	—	< 1.00

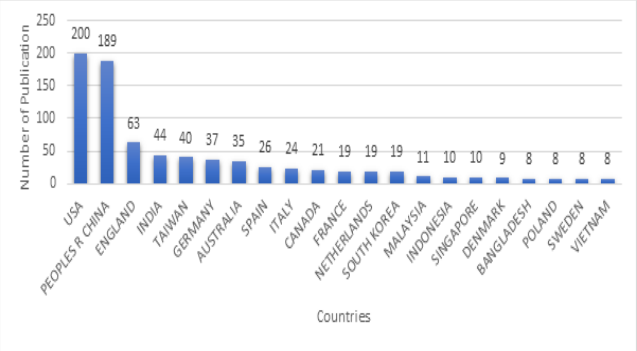


Figure 6. Country-wise research output (2010–2025).

Co-Author Relation

Figure 7 depicts a co-authorship network of researchers, constructed using bibliometric data and visualised through VOS viewer. Each node (circle) represents an individual author, while the links (lines) between them indicate collaborative relationships based on co-authored publications. The size of the node corresponds to the number of publications or the author's total link strength (i.e., overall collaboration intensity), and the colour of the node represents the author's cluster or research group identified by the software.

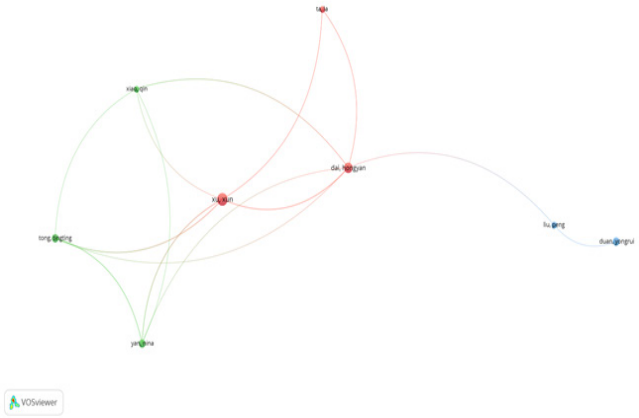


Figure 7. Co-authorship network of researchers.

Xu, Xun, who appears to be the most influential and central author in the network. Xu, Xun maintains strong collaboration links with Dai, Hongyan and Tao, Jia, forming a tightly connected research group. This indicates an active collaboration pattern and possibly leadership or coordination in the research domain.

- Xu, Xun appears as the central connecting node, bridging multiple clusters and indicating a key role in knowledge dissemination within the network.
- The density and proximity of nodes within the same colour cluster suggest strong internal collaboration and shared research interests.
- The distance between clusters indicates limited cross-collaboration between certain author groups, reflecting possible specialisation or geographic separation.

Country Collaboration

Figure 8, given below, shows the co-authorship and collaboration network among countries based on research publications in the selected dataset. Each node (circle) represents a country, and the size of the node indicates the volume of publications or total link strength (i.e., how extensively the country collaborates internationally). The lines (links) between countries show the collaborative relationships, while different colours represent distinct clusters of countries that tend to collaborate closely with one another.

Red Cluster – USA-centred network:
The USA emerges as the most influential and central country, with the largest node and the highest number of collaborative links. It has strong partnerships with Canada, the Netherlands, England, Germany, and several European countries. This indicates that the USA serves as a global hub for international research cooperation.

Brown Cluster – People's Republic of China network:
The People's Republic of China also shows a dominant position, forming extensive connections with England, India, Malaysia, Singapore, and South Korea. This cluster highlights Asia's growing role in global research output and cross-border collaboration.

Green Cluster – European collaboration group: Countries such as Germany, France, Italy, Australia, and Spain form another strong collaboration network. Their close interlinkages suggest a well-integrated research community within Europe, with shared research goals and academic exchanges.

Blue Cluster – South and East Asian collaboration: This group includes India, Bangladesh, Saudi Arabia, South Korea, Indonesia, and Singapore, showing increasing regional collaboration in emerging research fields. India appears as a significant regional connector linking Asian and Western research hubs.

Smaller clusters – Northern Europe and the Middle East: Countries like Iran, Denmark, Norway, Finland, and the United Arab Emirates appear at the periphery, with fewer but notable connections to major networks like the USA and China.

Observations

- The USA and China are the two dominant nodes, indicating their leadership in global scientific output and collaboration.
- England plays a bridging role, connecting both Western and Asian networks.
- The density of links across continents indicates an overall high level of international collaboration, although some regional clusters still work semi-independently.
- The presence of India, Australia, and European nations in multiple link paths signifies their strategic intermediary roles in research dissemination.

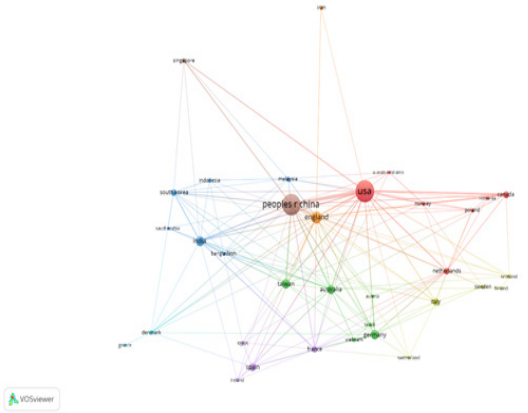


Figure 8. International country-level collaboration network.

Inter-Organisational Collaboration and Citation Network among Global Research Institutions

A network map of institutional citations and collaborations among universities across the world (Figure 9). It was created using VOSviewer, a bibliometric mapping software that displays the strength of relationships between organisations based on co-authorships, co-citations, and publication links.

Cluster-Wise Analysis

(a) Blue Cluster – Asian Financial and Economic Research Network

Key Institutions: Hong Kong Polytechnic University, Tongji University, Central University of Finance & Economics, Dongbei University of Finance and Economics, Monash University, Purdue University, Michigan State University.

Observation:

This cluster shows strong interlinkages among Asian universities with a few Western collaborations. **Hong Kong Polytechnic University** acts as the **central hub**, highlighting its influential role in global finance, economics, and management research.

(b) Green Cluster – Technological and Engineering Collaboration (China-USA)

Key Institutions: University of Science and Technology of China, Beijing Institute of Technology, Hefei University of Technology, University of Texas Dallas and Hunan University.

Observation:

This group focuses mainly on **technological, electrical, and engineering-based research collaborations**.

The network indicates that Chinese universities maintain frequent co-authorships with U.S. partners, signifying strong research exchange and technological development.

(c) Red Cluster – American Research Collaboration Network

Key Institutions: Carnegie Mellon University, University of Michigan, University of Pennsylvania, University of Maryland, University of Minnesota, Northeastern University, Yonsei University.

Observation:

This cluster represents **highly interconnected U.S. universities** that frequently collaborate and cite each other. **Carnegie Mellon University** and the **University of Michigan** form the **core** of this cluster, reflecting high research productivity in computer science, management, and innovation fields.

(d) Yellow Cluster – Elite University Collaboration

Key Institutions: Massachusetts Institute of Technology (MIT), Shanghai University, and Beijing Jiaotong University.

Observation:

This group highlights collaboration between **top-ranked global universities** that serve as bridges connecting Asian and Western research networks. The linkage between **MIT and Shanghai University** demonstrates the cross-border impact of collaborative science and innovation.

(e) Purple Cluster – Central Chinese Integration Network

Key Institution: Tianjin University.

Observation:

Tianjin University connects multiple clusters and acts as a **mediator node**, linking Chinese, Asian, and U.S. institutions. It symbolises the central position of Chinese universities in the modern global research collaboration structure.

Centrality and Connectivity Findings

Hong Kong Polytechnic University exhibits the **highest centrality**, indicating its dominant role and widespread collaboration in various disciplines.

Tianjin University functions as a **connecting bridge** between clusters, facilitating research exchange between Asian and Western institutions.

Carnegie Mellon University and the **University of Michigan** maintain strong mutual links, showing a deep level of co-authorship and shared citation networks.

Link Strength and Collaboration Intensity

The **thickness of the connecting lines** reflects the intensity of relationships — thicker lines imply more frequent collaborations or stronger citation connections.

International collaboration is clearly visible between **MIT** and **Shanghai University**, and between **University of Science & Technology of China** and **University of Texas Dallas**, suggesting a trend toward global research integration.

Research Implications

- The network reveals a **high level of international academic collaboration**.
- **Asian universities**, particularly from **China and Hong Kong**, are increasingly emerging as major global contributors.
- The **U.S.–Asia collaboration axis** is strengthening, leading to higher joint publication output and increased citation influence.
- Such visual maps help in identifying **potential academic partners** and **strategic research collaborations** for future projects.

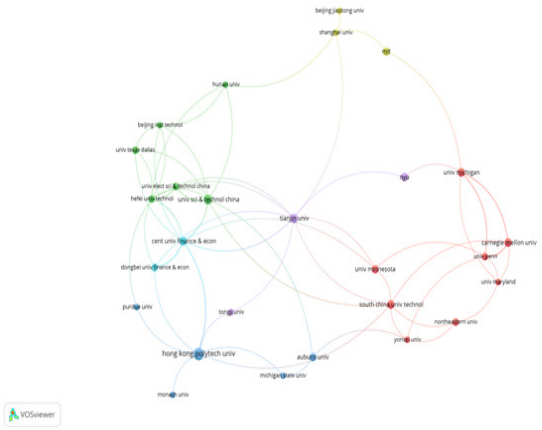


Figure 9. Institutional collaboration and citation network.

FUTURE SCOPE AND RESEARCH DIRECTIONS

Future research should focus on identifying the key thematic clusters and collaboration networks that have contributed to this growth(Villanueva & Ortiz, 2023). Citation-based mapping and co-authorship analysis could further reveal core areas of innovation and knowledge diffusion. Additionally, investigating the regional contribution patterns may help understand how different countries and institutions have shaped the trajectory of this research domain (Chen, 2023).

The slight decline in publication frequency in 2024–2025 suggests a potential shift from quantity to quality, where emphasis is now placed on producing high-impact, policy-relevant, and interdisciplinary studies. Therefore, future bibliometric investigations should explore emerging keywords, co-citation networks, and research frontiers to understand the evolving direction of scholarly focus.

The bibliometric analysis of e-business research from 2010 to 2025 reveals a dynamic and rapidly evolving academic field characterised by steady growth, global participation, and strong alignment with the SDGs. The findings indicate a significant surge in publications after 2015, particularly between 2019 and 2023, reflecting the maturing nature of research driven by technological advancement, open-access publishing, and digital transformation.

Developed countries, especially the **United States, China, and European nations**, dominate in both research output and citation impact, while emerging economies such as **India and Malaysia** are gaining recognition as active contributors to global research collaboration. The dominance of publishers like **Elsevier, Emerald, and Springer** demonstrates their influential role in disseminating high-quality e-business literature.

The **organisational collaboration network** emphasises the increasing interconnectivity of universities and research institutions, with **Hong Kong Polytechnic University**, **Carnegie Mellon University**, and **Tianjin University** serving as central hubs for academic exchange and co-authorship. The integration of e-business research with SDGs—especially **SDG 12 (Responsible Consumption and Production)** and **SDG 9 (Industry, Innovation, and Infrastructure)**—underscores the discipline's contribution toward sustainable digital economies.

Overall, the study concludes that e-business has transitioned from an emerging domain into a **mature and globally integrated research field**, supported by robust collaboration, funding, and institutional engagement. The growing interdisciplinary nature of the field points toward a promising future, where e-business will continue to drive innovation, inclusion, and sustainability in the global economy.

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