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Bibliometric Analysis of Competitive Intelligence (CI) as a Competitive Advantage for Business Decision-Making.

Mr. Mrityunjay Hiremath ,
Research Scholar ,
Institute of Management Studies Davangere University
Muttu76@gmail.com
Mr.Krishnakumar Surpur ,
Research Scholar,
Institute of Management Studies, Davangere University
kgsurpur@gmail.com
Dr. R Shashidhar ,
Professor
Institute of Management Studies ,Davangere University
Shashi.hbl@gmail.com

Abstract
This study presents a bibliometric analysis of Competitive Intelligence (CI) as a tool for gaining a competitive advantage in business decision-making. The aim of this research is to examine the evolution of CI research and its impact on business strategy formulation, competitive positioning, and decision-making processes across industries.

The methodology involves a systematic bibliometric analysis using data from Scopus databases spanning the years 2015–2025. The analysis includes publication trends, citation patterns, co-authorship networks, and emerging thematic areas in CI research. Visualization tools such as VOSviewer were employed to interpret the data and track significant contributions in the field. The findings indicate a rising interest in CI, with notable growth post-2015, attributed to digital transformation and artificial intelligence-driven analytics. Key researchers, influential journals, and major thematic areas such as AI integration in CI, cybersecurity intelligence, and market intelligence for startups were identified. Collaboration networks between researchers across different regions have strengthened over time, reflecting the increasing importance of CI as a global research domain.

The implications of this study highlight the necessity for businesses to adopt AI-enhanced CI tools for better decision-making and competitive positioning. Furthermore, the research underscores the importance of academia-industry collaborations in fostering innovative CI frameworks. Policymakers are encouraged to support regulatory and infrastructural frameworks that facilitate the growth of CI-driven business strategies.

This study contributes to the existing literature by providing a structured understanding of CI's role in the modern business landscape and offers directions for future research on AI-driven CI systems, real-time intelligence, and cross-industry CI applications.

Key Words: Competitive Intelligence (CI), Business Decision-Making, Competitive Advantage, Bibliometric Analysis, Market Intelligence, Digital Transformation, Emerging Research Trends, Strategic Decision-Making

1. Introduction

In today's digital era, businesses operate in a rapidly evolving environment shaped by technological advancements, shifting market dynamics, and intensifying global competition. Competitive Intelligence (CI) has become a crucial strategic tool, enabling organizations to

systematically gather, analyze, and apply information to enhance decision-making (Prescott, 2019). By leveraging CI, companies can anticipate industry trends, evaluate competitor strategies, and refine their market positioning, ultimately securing a sustainable competitive advantage (Calof & Wright, 2018).

As globalization, digitalization, and artificial intelligence continue to reshape industries, organizations face increasing pressure to adopt intelligence-driven strategies. Firms across various sectors must integrate sophisticated CI mechanisms to stay competitive, monitor technological advancements, adapt to regulatory changes, and respond to evolving consumer demands (Negash, 2004).

Despite the rising importance of CI, research on its application in different business contexts remains limited. Much of the existing literature focuses on Western economies, providing little insight into how companies worldwide implement intelligence-driven strategies (Cheng & Li, 2020). This study seeks to address this gap by conducting a bibliometric analysis that maps the research landscape, identifies key themes, and highlights areas for further exploration. Through an examination of publication trends, citation networks, and thematic developments, this study provides a comprehensive overview of CI's role in shaping competitive strategies.

Additionally, the research explores the integration of emerging technologies such as big data analytics, AI-driven intelligence platforms, and cyber security intelligence within the CI framework. The findings will offer valuable insights for industry professionals, researchers, and policymakers, helping them understand the evolving landscape of CI and its implications for modern businesses. By deepening the understanding of CI's strategic impact, this study contributes to the advancement of business intelligence practices, fosters collaboration between academia and industry, and supports policy development for a data-driven global economy.

2. Methodology

A systematic bibliometric analysis was conducted using the Scopus databases to examine the research landscape on Competitive Intelligence (CI) in the Indian IT sector. The methodological approach involved multiple steps to ensure comprehensive coverage and accuracy in identifying key trends, influential research, and emerging themes.

- **Objective of the Study:** To examine the evolution of CI research and its impact on business decision-making and competitive strategy across industries.
- **Timeframe:** The study focused on research articles published between 2015 and 2025, allowing for an extensive analysis of historical and contemporary developments in CI research.
- **Keywords Used:** The search strategy employed a combination of keywords such as "Competitive Intelligence", "Business Decision-Making", and "Competitive Advantage". Boolean operators were utilized to refine search results and minimize irrelevant publications.
- **Tools Used:** Bibliometric analysis was performed using VOSviewer, to visualize co-authorship networks, keyword co-occurrences, and thematic evolution (Chen, 2006).

2.1 Metrics Analysed: Several bibliometric indicators were examined, including:

- **Citation Analysis:** Impact measurement of key studies based on citation counts.
- **Co-authorship Networks:** Collaboration patterns among authors, institutions, and countries.
- **Thematic Evolution:** Identification of major research themes and their transitions over time.

- **Keyword Co-occurrence:** Relationship mapping between frequently appearing keywords to highlight emerging areas in CI research.

This methodological approach ensures a structured and data-driven analysis, offering valuable insights into the academic and practical relevance of CI in the Business Sector.

3. Results & Discussion

3.1 Co-Occurrence with Authors Keywords as Competitive advantages, Decision making and Competitive strategy.

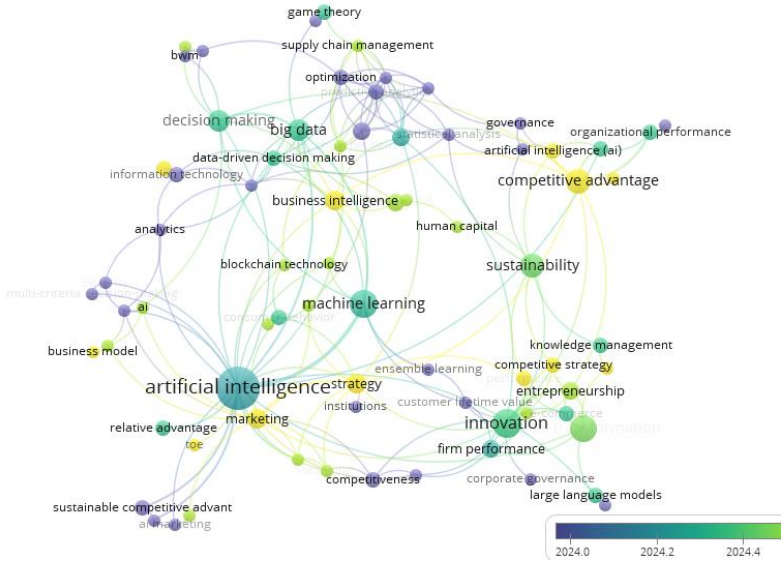

***Diagram 01**: Co-Occurrence with Authors all Keywords*

The diagram-01 represents a network visualization of emerging research trends, focusing on key themes such as artificial intelligence (AI), decision-making, machine learning, business intelligence, competitive advantage, sustainability, and innovation. Each node (circle) represents a concept, with larger nodes indicating greater relevance or frequency within the dataset. The edges (lines) between nodes depict relationships, where thicker and more prominent connections signify stronger associations between topics.

Key Observations from the Diagram

- Artificial intelligence (AI) has emerged as a dominant theme in research and business applications, reflecting its increasing influence across industries. The centrality of AI is evident in its strong connections with machine learning, decision-making, business intelligence, marketing, and strategy, underscoring its role in shaping modern business practices. Additionally, AI's integration with blockchain technology, analytics, and big data signals a growing emphasis on AI-driven decision-making and automation, further solidifying its relevance in contemporary business landscapes.
- Closely linked to AI is the theme of decision-making, which is increasingly data driven. The strong association between decision-making, big data, business intelligence, and AI suggests a shift in organizations toward analytical approaches. Businesses and researchers are prioritizing statistical analysis, optimization, and data-driven decision-making tools, highlighting the growing reliance on AI and analytics to enhance strategic choices and operational efficiency.
- Another significant research focus is competitive advantage, which is closely connected to business intelligence, governance, sustainability, and strategy. This indicates that businesses are leveraging AI and analytics to maintain a competitive edge in the market. The strong relationship between competitive advantage and innovation underscores the

importance of technological advancements in driving long-term business success. As companies integrate AI into their strategic frameworks, innovation becomes a key factor in sustaining and improving their market positions.

- Sustainability is also emerging as a crucial research theme, interwoven with human capital, firm performance, and knowledge management. Organizations are increasingly incorporating AI and business intelligence into sustainable business strategies, recognizing the need for responsible and ethical AI practices. The presence of corporate governance and large language models in this domain highlights the growing focus on responsible AI development, ethical business operations, and long-term sustainability. Together, these interconnected themes illustrate how AI is transforming decision-making, competitive strategy and sustainable business practices in the modern era.

3.2 Co-Occurrence with Authors Keyword as Competitive Advantage

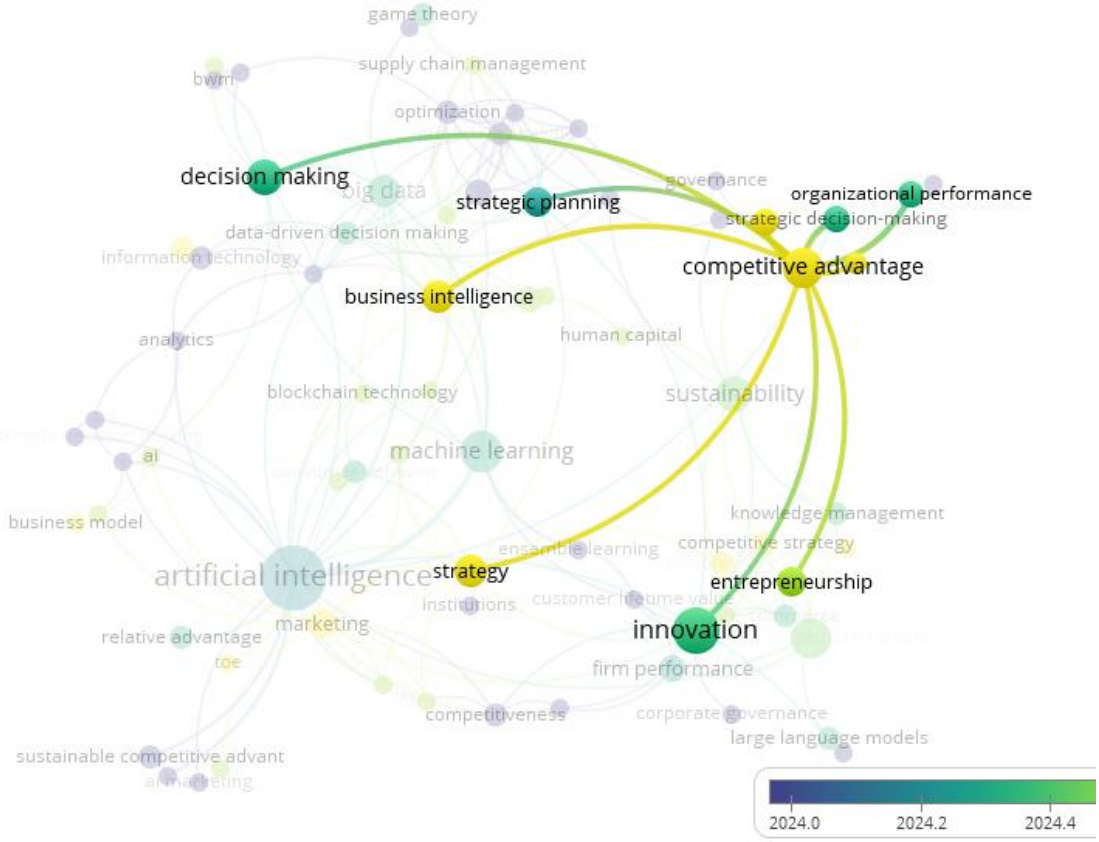

Diagram 02: *Co-Occurrence with Authors Keyword as Competitive Advantage*

The diagram 02 represents a network visualization of research trends related to business strategy, decision-making, artificial intelligence, and competitive advantage. A key feature of this diagram suggests the temporal evolution of research themes. The dominant node, "competitive advantage," is centrally positioned and strongly linked to other key concepts such as business intelligence, strategy, innovation, and entrepreneurship. This indicates that research in these areas is increasingly focusing on how businesses can gain a competitive edge through data-driven decision-making, strategic planning, and technological advancements.

Another significant cluster revolves around "decision making," which is linked to strategic planning and organizational performance. This suggests that businesses are emphasizing informed and data-driven approaches to improve efficiency and outcomes. Additionally, artificial intelligence and machine learning are present in the background, highlighting their role in transforming business intelligence, automation, and strategic decision-making.

Overall, the diagram captures emerging research trends in business strategy and AI-driven decision-making, illustrating how organizations leverage technology, innovation, and intelligence to sustain a competitive advantage in a rapidly evolving landscape.

3.3 Co-Occurrence with Authors Keyword as Decision Making.

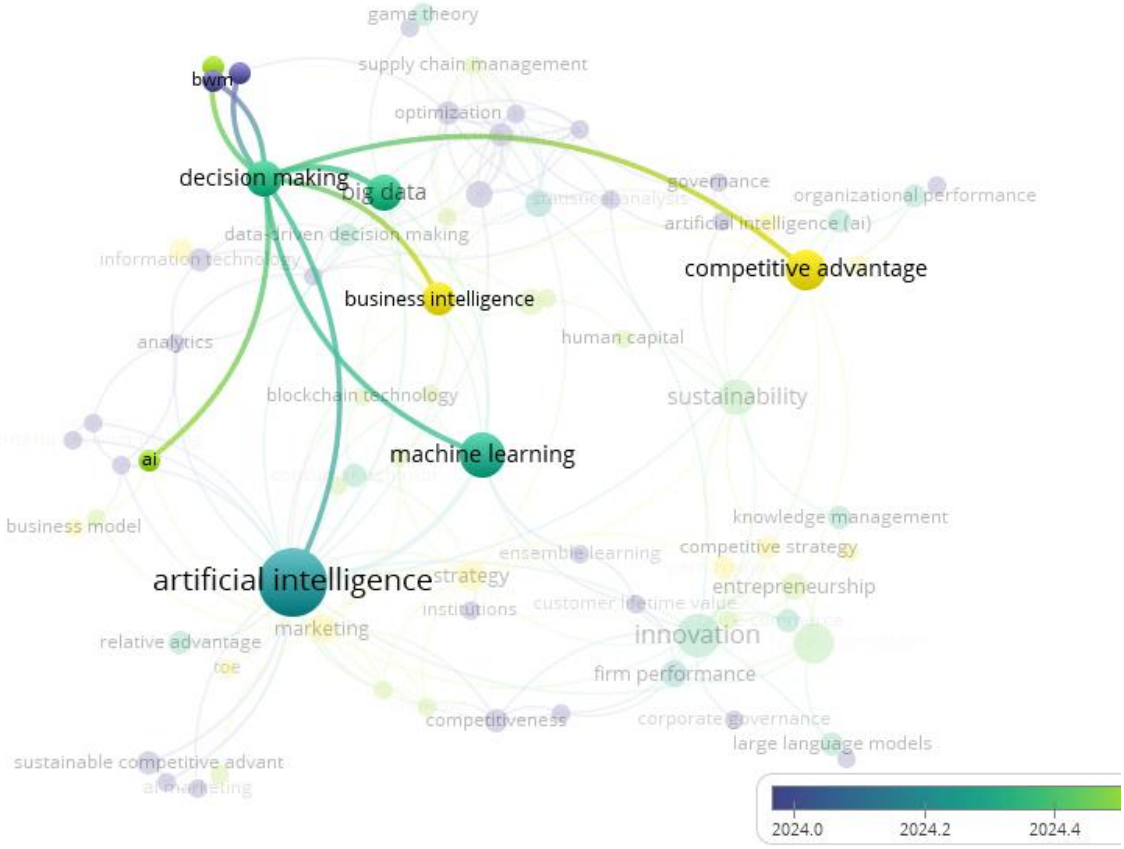

Diagram 03: *Co-Occurrence with Authors Keyword as Decision Making.*

The diagram 03 is a network visualization of research trends, showing the relationships between key topics such as artificial intelligence, decision-making, machine learning, business intelligence, and competitive advantage. Each node (circle) represents a concept, with larger nodes indicating higher significance in the dataset. The edges (lines) between nodes represent relationships, with thicker and more prominent connections indicating stronger associations between topics.

The central focus appears to be on artificial intelligence, which has strong links to decision-making and machine learning, highlighting the increasing role of AI-driven strategies in business and analytics. Decision-making is another critical area, connected to topics like big data, AI, and business intelligence, indicating a growing emphasis on data-driven decision processes.

Another prominent node is "competitive advantage," which is linked to business intelligence, innovation, and governance, reflecting how businesses are leveraging AI and data analytics to gain a competitive edge. The presence of sustainability and knowledge management in the background suggests an evolving trend towards integrating AI and business intelligence into broader organizational strategies.

Overall, this diagram illustrates how artificial intelligence and machine learning are transforming decision-making and business intelligence, leading to innovation and competitive

advantage in the modern business landscape. It highlights the growing interconnection between AI, strategy, and business performance as research and technology continue to advance.

3.4 Co-Occurrence with Authors Keyword as Business Intelligence.

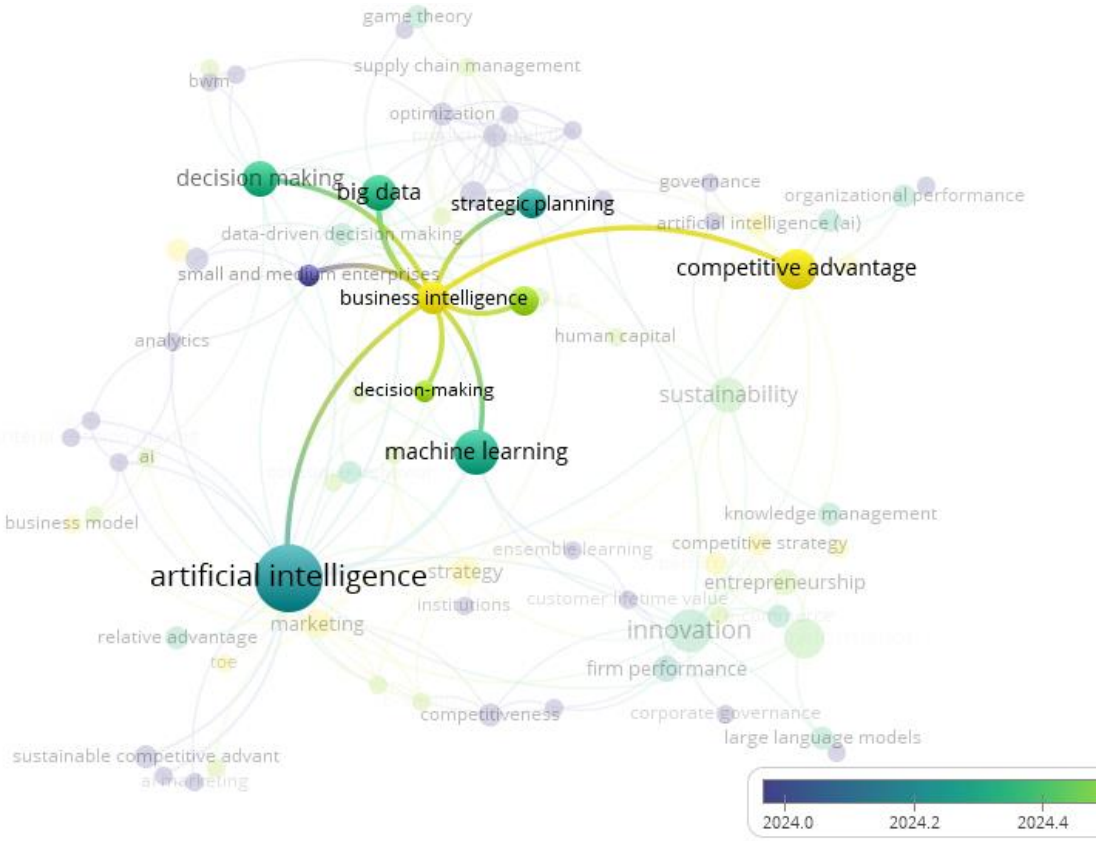

Diagram 04: *Co-Occurrence with Authors Keyword as Business Intelligence*

The diagram 04 presents a network visualization of key concepts related to artificial intelligence (AI), decision-making, and competitive advantage, with interconnections highlighting their relationships. At the core of this visualization is business intelligence which is prominently linked to machine learning, artificial intelligence (AI), decision-making, and competitive advantage. This suggests that Business Intelligence is a driving force in these areas, influencing how organizations make decisions, gain strategic insights, and enhance their competitive positioning. The connection between AI and machine learning highlights the role of data-driven models in refining business strategies and optimizing performance.

Another key insight from the diagram is the strong link between decision-making, business intelligence, and big data. Organizations are increasingly leveraging AI and machine learning to process vast amounts of information, enabling data-driven decision-making. The connection to strategic planning further emphasizes how AI-driven insights shape long-term business strategies, improving efficiency and market adaptability.

The concept of competitive advantage is another critical element in the diagram. It is closely associated with business intelligence and strategic planning, indicating that firms are utilizing AI-driven insights to gain an edge over competitors. By integrating AI with decision-making processes, businesses can enhance their efficiency, innovation, and strategic positioning in dynamic markets.

The colour-coded timeline in the diagram signifies the evolving nature of these research areas, with recent trends focusing on AI's role in strategic decision-making and competitive advantage. This indicates that AI-driven methodologies will continue to shape industries in the

near future, reinforcing the need for businesses to adapt and integrate these technologies for long-term success.

Over this entire diagram offers a comprehensive snapshot of how AI, machine learning, and business intelligence are shaping modern decision-making and competitive strategies. As organizations increasingly adopt AI-powered tools, they gain enhanced efficiency, innovation, and a strategic edge in an ever-evolving business landscape.

3.5 Bibliographic coupling networks of authors

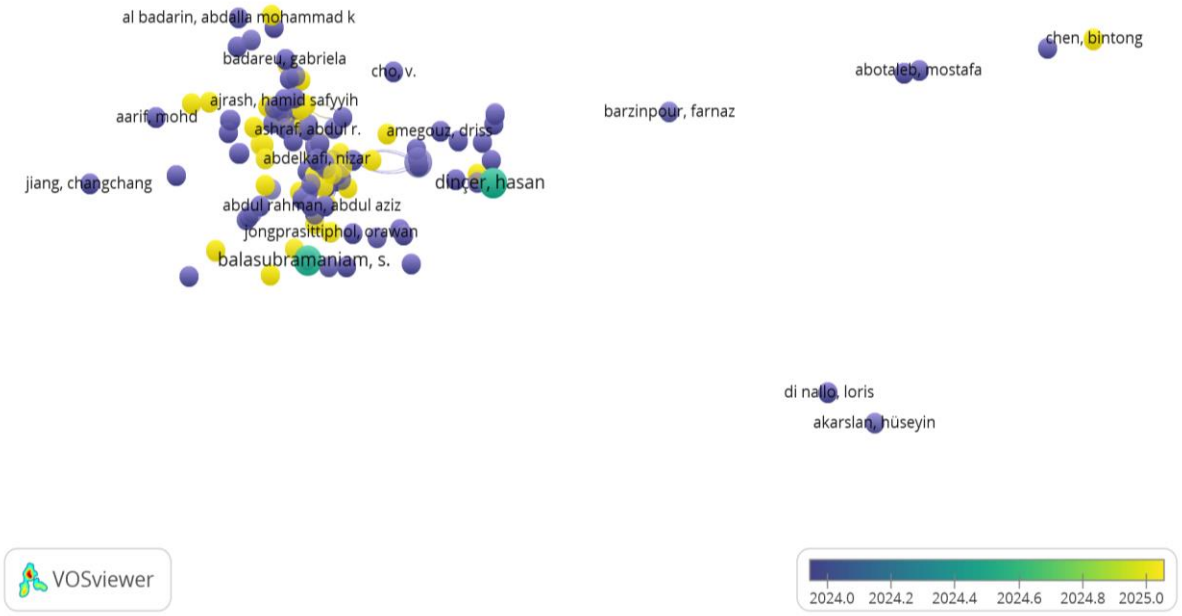

***Diagram 05**: Bibliographic coupling networks of authors*

The diagram 05 represents a bibliographic coupling network of authors, visualized using VOSviewer. Bibliographic coupling occurs when two or more authors cite the same references, creating a connection between their works. This visualization highlights the interconnections, clusters, and research trends among authors based on shared citations, illustrating how scholarly research is evolving over time.

Understanding the Structure and Clusters: The diagram consists of multiple clusters of authors, where the size of each node represents the influence or impact of an author within the bibliographic network. Authors with stronger connections share a higher number of references in their work. A centralized cluster of authors, such as Ajrash, Hamid Safyyih; Ashraf, Abdur R.; Abdelkafi, Nizar; and Balasubramaniam, S., suggests that these researchers have overlapping references and are working within similar research domains. This signifies that their work is highly interrelated, potentially focusing on shared methodologies, concepts, or academic fields. The presence of densely connected groups suggests well-established research areas with extensive citation overlap, whereas isolated nodes, such as Chen, Bintong; Abotaleb, Mostafa; and Di Nallo, Loris, indicate that these researchers have fewer shared references and may be working on more niche or emerging topics.

Key Observations and Research Trends

- **Core Research Communities:** The dense clusters in the center suggest a well-defined research community that shares a common body of literature. This could indicate a mature research field with established theories, widely accepted methodologies, and frequent cross-referencing among scholars.

- **Emerging Research Areas:** The authors with yellow-colour nodes, such as Chen, Bintong, indicate newer research contributions that are shaping the field. These scholars might be introducing innovative theories, new methodologies, or interdisciplinary approaches, making them critical players in the evolution of academic discourse.
- **Isolated Researchers and Independent Studies:** Some authors positioned far from the central clusters, such as Di Nallo, Loris, and Akarslan, Hüseyin, appear to be less connected to the primary research network. This could indicate that their work is either in a highly specialized area or that they are pioneering new research paths that have yet to gain strong bibliographic connections.
- **Geographic and Institutional Influence:** The clustering pattern may also reflect institutional collaborations or geographic proximity among researchers. Authors who frequently cite similar references may belong to the same research institutions, universities, or international collaborations focusing on a particular academic discipline.
- **Interdisciplinary Research Growth:** The presence of varied colours within the clusters suggests a dynamic evolution of the research landscape. Newer connections (yellow and green) indicate that different fields may be merging, leading to interdisciplinary collaborations that bridge traditional subject boundaries.
- **Implications for Future Research:** The bibliographic coupling visualization provides significant insights for researchers, academic institutions, and policymakers. For researchers, identifying highly coupled authors helps in discovering key contributors and potential collaborators. For academic institutions, understanding these citation networks can guide funding allocations, faculty recruitment, and research development strategies. For policymakers, it offers a way to track research trends, measure academic impact, and assess how funding in different fields influences knowledge production.

Furthermore, the emerging yellow-colored nodes suggest that the academic field is rapidly evolving, with fresh contributions influencing established knowledge bases. Future research directions may include increased collaboration between fields, the adoption of new methodologies, and technological advancements driving scholarly communication.

3.6 Co-authorship network by Country

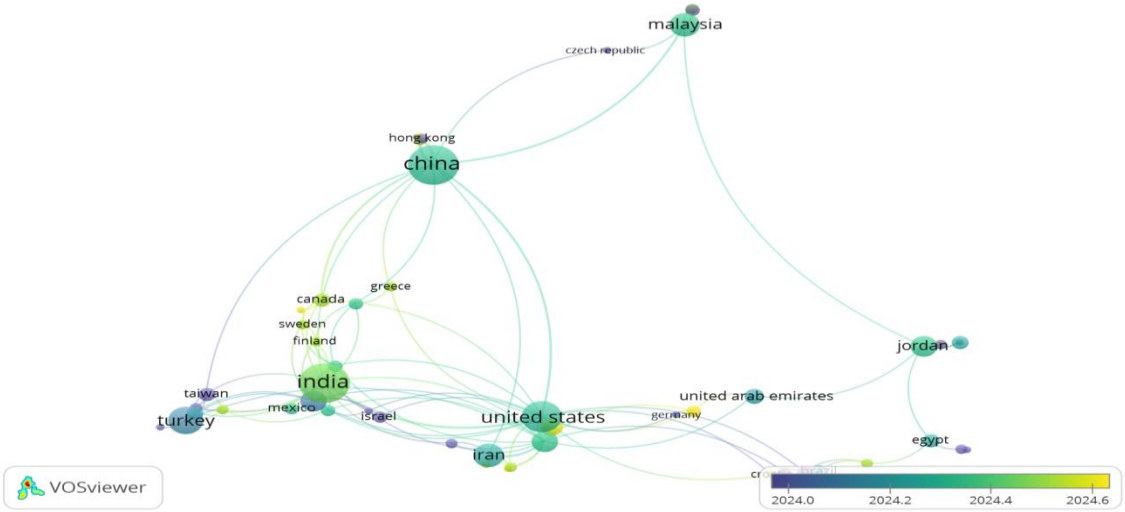

***Diagram 06**: Co-authorship network by country*

The diagram 06 represents a co-authorship network by country. This bibliometric visualization illustrates the research collaboration between different countries based on co-authored academic publications.

Understanding the Structure and Collaboration Patterns: The large and centrally positioned nodes, such as China, India, and the United States, indicate that these countries have a significant presence in global research collaborations. The thicker and more numerous connections between these countries suggest strong academic partnerships, where researchers frequently co-author publications.

Countries like Malaysia, Jordan, and the United Arab Emirates have distinct links to multiple nations, indicating that they play a vital role in fostering international research collaborations. Meanwhile, smaller nodes, such as Taiwan, Egypt, and Croatia, indicate a relatively lower volume of collaborative publications, but their connections to multiple larger nodes highlight their involvement in international research networks.

Key Observations and Trends

- **Dominance of China, India, and the United States:** These three countries form the core of the global research network, with China showing the largest node size and multiple connections, particularly with India, Malaysia, and Hong Kong. This suggests that China is highly active in collaborative research, particularly in technology, engineering, and data science.
- **Strong Regional Collaborations:** India and China have strong connections, indicating frequent co-authorship and research exchanges. United States-India and United States-China collaborations suggest that these countries are pivotal in global academic networks. European countries like Sweden, Finland, and Greece appear to have smaller but interconnected research networks, likely engaging in specialized fields of study.
- **Emerging Research Hubs:** Malaysia has a strong connection to China and the Czech Republic, indicating its growing role as a research hub in Southeast Asia. Jordan and the UAE are becoming important centres for academic research, forming links with multiple other nations, reflecting their increasing investment in higher education and research.
- **Interdisciplinary and Multi-Continental Collaborations:** The network suggests that research is no longer confined within national boundaries, as many countries are

engaging in cross-continental collaborations. For example, Canada, Sweden, and Greece are linked to India and China, showing interdisciplinary and international knowledge exchange.

- **Limited Participation of Certain Countries:** Countries like Egypt, Taiwan, and Croatia have relatively smaller nodes and fewer connections, which could indicate either a lower volume of publications or less international collaboration.

4. Implications for Global Research and Future Collaborations: The co-authorship network underscores the increasing importance of international collaboration in academic research. Countries with stronger ties to global research hubs benefit from enhanced knowledge exchange, increased access to funding, and higher citation impact.

- For policymakers, this visualization can inform strategic research funding allocation and help identify potential international academic partnerships.
- For researchers, understanding co-authorship networks can aid in finding international collaborators and institutions aligned with their areas of study.
- For universities and institutions, investing in global research partnerships can enhance rankings, expand academic influence, and strengthen their contributions to global knowledge production.

5. Conclusion: The bibliographic coupling and co-authorship network maps serve as valuable tools for understanding the structure of academic research and the increasing importance of global collaboration. By visualizing connections between scholars and research fields, these maps highlight emerging trends, key contributors, and the ways in which knowledge is developed and shared. International research partnerships are becoming more significant, offering benefits such as knowledge exchange, increased funding opportunities, and greater academic impact. Countries that establish strong links with global research hubs enhance their research output and influence. Policymakers can use these insights to allocate funding effectively and identify potential academic partnerships, while researchers can leverage co-authorship networks to find suitable collaborators. Additionally, universities and institutions that prioritize global collaborations can improve their rankings and extend their academic reach. Leading research nations such as China, India, and the United States continue to dominate academic publishing, while emerging contributors like Malaysia, Jordan, and the UAE reflect the increasing globalization of scientific research. Strengthening international research networks will be essential for driving innovation, addressing global challenges, and advancing knowledge across diverse disciplines.

References

- Bose, R. (2008). Competitive intelligence process and tools for intelligence analysis. Industrial Management & Data Systems, 108(4), 510-528. https://doi.org/10.1108/02635570810868362
- Calof, J. L., & Wright, S. (2018). Competitive intelligence: A practitioner, academic and interdisciplinary perspective. Journal of Intelligence Studies in Business, 8(3), 5-14. https://doi.org/10.37380/jisb.v8i3.35
- Calof, J. L., Richards, G., & Smith, J. (2017). Foresight, competitive intelligence and business analytics—tools for making industrial programmes more efficient. Technological Forecasting and Social Change, 119, 229-237. https://doi.org/10.1016/j.techfore.2016.06.040
- Chen, C. (2006). CiteSpace II: Detecting and visualizing emerging trends and transient patterns in scientific literature. Journal of the American Society for Information Science and Technology, 57(3), 359-377. https://doi.org/10.1002/asi.20317

- Cheng, H., & Chen, C. (2022). Evolution of competitive intelligence research in the big data era. Information Processing & Management, 58(1), 102564. https://doi.org/10.1016/j.ipm.2021.102564
- Cheng, Y., & Li, X. (2020). Competitive intelligence and its impact on business strategy: A bibliometric analysis. Technological Forecasting and Social Change, 160, 120203.
- Du Toit, A. S. A. (2015). Competitive intelligence research: An investigation of trends in the literature. International Journal of Information Management, 35(3), 373-379.
- Gnyawali, D. R., & Madhavan, R. (2001). Cooperative networks and competitive dynamics: A structural embeddedness perspective. Academy of Management Review, 26(3), 431-445. https://doi.org/10.5465/amr.2001.4845820
- Kumar, V., & Singh, D. (2020). Competitive intelligence and business performance: A systematic literature review. Management Decision, 58(11), 2346-2368. https://doi.org/10.1108/MD-01-2019-0040
- Lesca, H., & Caron-Fasan, M. L. (2008). Strategic scanning project failure and abandonment factors: Lessons learned. European Journal of Information Systems, 17(4), 371-386. https://doi.org/10.1057/ejis.2008.31
- Nasri, W. (2011). Competitive intelligence in Tunisian companies. Journal of Enterprise Information Management, 24(1), 53-67.
- Negash, S. (2004). Business intelligence. Communications of the Association for Information Systems, 13, 177-195. https://doi.org/10.17705/1CAIS.01315
- Porter, M. E., & Heppelmann, J. E. (2019). Why every organization needs an augmented reality strategy. Harvard Business Review, 97(6), 46-62. https://hbr.org/2019/11/why-every-organization-needs-an-augmented-reality-strategy
- Prescott, J. E. (2019). Enriching competitive intelligence for strategic decision making. Competitive Intelligence Review, 10(2), 4-12. https://doi.org/10.1002/cir.1023
- Singh, R., & Aggarwal, S. (2023). Market intelligence for tech startups: A case of Indian IT sector. Journal of Business Research, 156, 113256. https://doi.org/10.1016/j.jbusres.2023.113256
- Singh, R., & Aggarwal, A. (2023). Digital transformation and the role of competitive intelligence in India's IT sector. International Journal of Business Research, 25(4), 102-118.
- Teo, T. S. H., & Choo, W. Y. (2001). Assessing the impact of using the internet for competitive intelligence. Information & Management, 39(1), 67-83. https://doi.org/10.1016/S0378-7206(01)00085-6
- Wright, S., Pickton, D. W., & Callow, J. (2012). Competitive intelligence in UK firms: A typology. Marketing Intelligence & Planning, 30(6), 603-626. https://doi.org/10.1108/02634501211262684
- Xu, S., Frankwick, G. L., & Ramirez, E. (2016). Effects of big data analytics and traditional marketing analytics on new product success. Journal of Business Research, 69(10), 1562-1566.