**West Science Interdisciplinary Studies**
Vol. 03, No. 12, December and 2025: pp. 2362-2371

# IoT and Competitive Advantage: A Bibliometric Analysis of Digital Business Strategy

**Loso Judijanto**
IPOSS Jakarta, Indonesia and losojudijantobumn@gmail.com

**ABSTRACT**

This study provides a comprehensive bibliometric analysis of scholarly research examining the relationship between the Internet of Things (IoT) and competitive advantage within the context of digital business strategy. Drawing on publications indexed in the Scopus database from 2010 to 2025, the study applies bibliometric techniques using VOSviewer to map the intellectual structure, thematic evolution, and collaboration patterns in this rapidly growing research domain. The analysis includes keyword co-occurrence, co-citation, co-authorship, and country-level collaboration networks to identify dominant research themes, influential contributions, and emerging trends. The findings reveal that digital transformation, competition, and business strategy constitute the core conceptual anchors of IoT-related research, indicating that IoT is increasingly framed as a strategic capability rather than a purely technological tool. Enabling technologies such as artificial intelligence, data analytics, cloud computing, and blockchain are shown to play a critical role in reinforcing IoT-driven competitive advantage. In addition, emerging themes related to sustainability and cybersecurity highlight a shift toward more holistic and responsible digital business strategies. This study contributes to the literature by synthesizing fragmented research streams and offering a structured overview of how IoT supports strategic value creation. The results provide valuable insights for academics and practitioners seeking to understand the strategic implications of IoT adoption in an increasingly digital and competitive business environment.

***Keywords:*** *Internet of Things, Competitive Advantage, Digital Business Strategy, Digital Transformation, Bibliometric Analysis*

## 1. INTRODUCTION

The rapid proliferation of digital technologies has profoundly transformed the business landscape, compelling organizations to rethink traditional strategies and embrace innovation-driven models. Among these technologies, the Internet of Things (IoT) has emerged as a pivotal enabler of digital business transformation. IoT refers to the interconnected network of devices, sensors, and systems that collect, transmit, and analyze data to support decision-making processes and operational efficiency [1]. The integration of IoT into business processes enables real-time monitoring, predictive analytics, and automated responses, allowing firms to optimize resources, reduce operational costs, and enhance customer experiences. Consequently, IoT is not merely a technological tool but a strategic asset with the potential to redefine competitive boundaries [2].

In recent years, the adoption of IoT has expanded beyond manufacturing and logistics into diverse sectors, including healthcare, retail, finance, and smart cities. For instance, in manufacturing, IoT facilitates predictive maintenance, real-time asset tracking, and process optimization, which collectively enhance productivity and reduce downtime [3]. In retail, IoT-enabled devices such as smart shelves, RFID tags, and connected customer interfaces provide insights into consumer behavior, enabling personalized marketing and inventory management. Similarly, in healthcare, IoT devices improve patient monitoring, streamline clinical workflows, and support remote care, ultimately enhancing service quality and patient outcomes. The cross-sectoral relevance of IoT underscores its potential as a cornerstone of digital business strategy, driving value creation and sustainable competitive advantage [4], [5].

The strategic value of IoT extends beyond operational efficiency to influence market positioning and innovation capabilities. Firms leveraging IoT can develop data-driven business models that differentiate them from competitors. For example, IoT facilitates the creation of new revenue streams through subscription-based services, predictive maintenance contracts, and real-time analytics offerings [6], [7]. Moreover, IoT-generated data enhances organizational learning and informs strategic decision-making, enabling firms to anticipate market trends and respond proactively to customer demands. In this sense, IoT adoption represents a convergence of technology and strategy, positioning organizations to achieve both short-term operational gains and long-term competitive sustainability.

The role of IoT in enhancing competitive advantage is closely aligned with the principles of digital business strategy, which emphasizes the integration of digital technologies into core business processes to create value and differentiate from competitors [8], [9]. A robust digital business strategy involves leveraging data, connectivity, and analytics to foster innovation, enhance customer engagement, and drive organizational agility. Within this context, IoT serves as a critical enabler, offering insights that support strategic decision-making and facilitate the development of agile, responsive business models. Consequently, understanding the relationship between IoT adoption and competitive advantage is essential for firms seeking to navigate the complexities of digital transformation and maintain relevance in rapidly evolving markets.

Despite the growing recognition of IoT's strategic importance, empirical studies investigating its impact on competitive advantage remain fragmented. The literature is characterized by case-specific analyses, technical assessments, and sector-focused studies, often neglecting a holistic understanding of how IoT contributes to value creation across industries. Furthermore, the rapid evolution of IoT technologies presents challenges for researchers seeking to synthesize knowledge and identify emerging trends. Bibliometric analysis offers a powerful tool for addressing these gaps by systematically mapping the intellectual structure of the field, identifying key research themes, influential studies, and potential avenues for future inquiry [10]. By employing bibliometric methods, researchers can gain a comprehensive view of the interplay between IoT adoption, digital business strategy, and competitive advantage, providing actionable insights for both scholars and practitioners.

Although the transformative potential of IoT in shaping competitive advantage is widely acknowledged, the existing body of research lacks an integrated, systematic understanding of its strategic implications. Current studies often focus on isolated technological implementations or sector-specific applications, leaving a gap in understanding how IoT adoption influences broader digital business strategies and long-term competitiveness. Additionally, the rapid expansion of IoT research has resulted in a fragmented knowledge base, making it difficult to identify critical trends, influential authors, and emerging research frontiers. This lack of a consolidated perspective hinders both academic inquiry and managerial decision-making, emphasizing the need for a bibliometric analysis that can synthesize the landscape and highlight the strategic intersections of IoT and competitive advantage. This study aims to conduct a comprehensive bibliometric analysis of the literature on IoT and competitive advantage, focusing on its implications for digital business strategy.

## 2. METHODS

This study employs a bibliometric research approach to systematically analyze the literature on IoT and competitive advantage within the context of digital business strategy. Bibliometric analysis is a quantitative method that examines patterns, trends, and relationships in scientific publications, allowing researchers to assess the development, impact, and structure of a particular field [10]. The data for this study were collected from the Scopus databases, which are widely recognized for their coverage of high-quality scholarly literature. A systematic search strategy was employed using keywords such as "Internet of Things," "IoT," "digital business strategy," and "competitive advantage" to ensure the retrieval of relevant publications. Inclusion criteria were set to include peer-reviewed articles, conference papers, and review papers published in English, spanning the period from 2010 to 2025, reflecting the significant growth of IoT research in the last decade. Duplicates and irrelevant records were removed, resulting in a curated dataset suitable for subsequent bibliometric analysis. Metadata such as authorship, publication year, keywords, citations, and affiliations were extracted for analysis. Data analysis was conducted using VOSviewer which are specialized tools for visualizing bibliometric networks and performing co-citation, co-authorship, and keyword co-occurrence analyses. Co-citation analysis was employed to identify the most influential articles and authors, while co-authorship analysis provided insights into collaboration patterns among researchers and institutions. Keyword co-occurrence analysis helped to detect prevailing research themes and emerging topics related to IoT and competitive advantage.

## 3. RESULTS AND DISCUSSION

### 3.1 Network Visualization

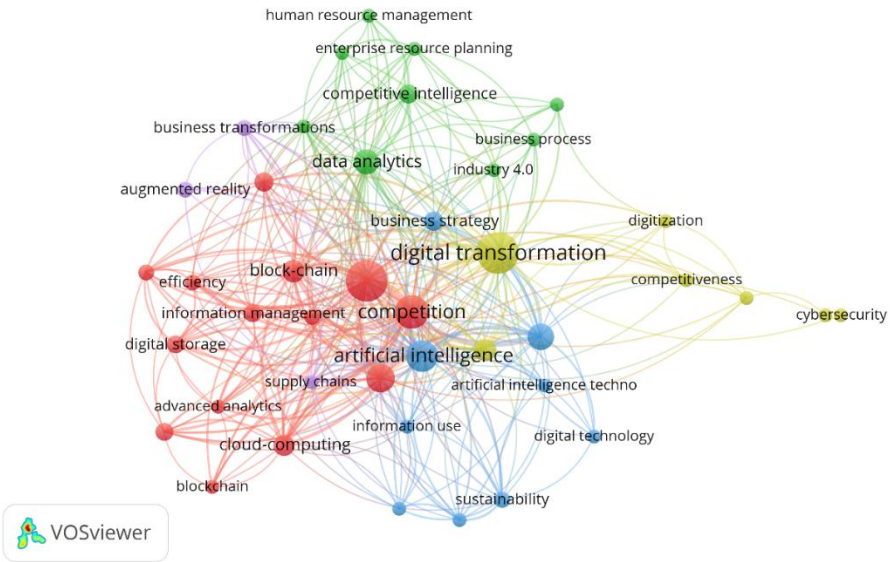


Figure 1. Network Visualization
*Source: Data Analysis Result, 2025*

The figure presents a keyword co-occurrence network generated with VOSviewer, showing how themes related to IoT-enabled digital business strategy and competitive advantage are intellectually structured. The size of nodes reflects keyword frequency, while links indicate co-occurrence strength. The map reveals a dense and interconnected knowledge domain rather than isolated streams, suggesting that research on digital technologies and competition is highly integrative and cross-disciplinary. At the core of the network are digital transformation and competition, which function as anchoring concepts connecting multiple technological and managerial themes. Their central positioning indicates that IoT-related discussions are rarely framed

as purely technical issues; instead, they are consistently linked to strategic renewal, value creation, and competitive positioning. This confirms that IoT is increasingly conceptualized as a strategic lever rather than an operational add-on.

One prominent cluster revolves around artificial intelligence, cloud computing, blockchain, data analytics, and supply chains. This cluster reflects a technology-centric logic in which IoT is embedded within a broader digital infrastructure enabling efficiency, advanced analytics, and real-time decision-making. The strong ties between these technologies and competition suggest that competitive advantage is often theorized through enhanced information processing, automation, and data-driven capabilities. Another major cluster links business strategy, business process, enterprise resource planning, human resource management, and competitive intelligence. This indicates a managerial and organizational perspective, where IoT and related digital tools are studied as enablers of process integration, strategic alignment, and organizational capability development. Here, competitive advantage emerges from the ability to reconfigure internal processes and align digital investments with strategic intent.

A smaller but distinct cluster includes digitization, competitiveness, cybersecurity, and sustainability. Its position at the periphery suggests these themes are emerging or complementary rather than fully integrated into the dominant discourse. Their presence signals a shift toward broader concerns about risk, resilience, and long-term value creation, indicating future research opportunities that connect IoT-based digital strategies with sustainable and secure competitive advantage.

### 3.2 Overlay Visualization

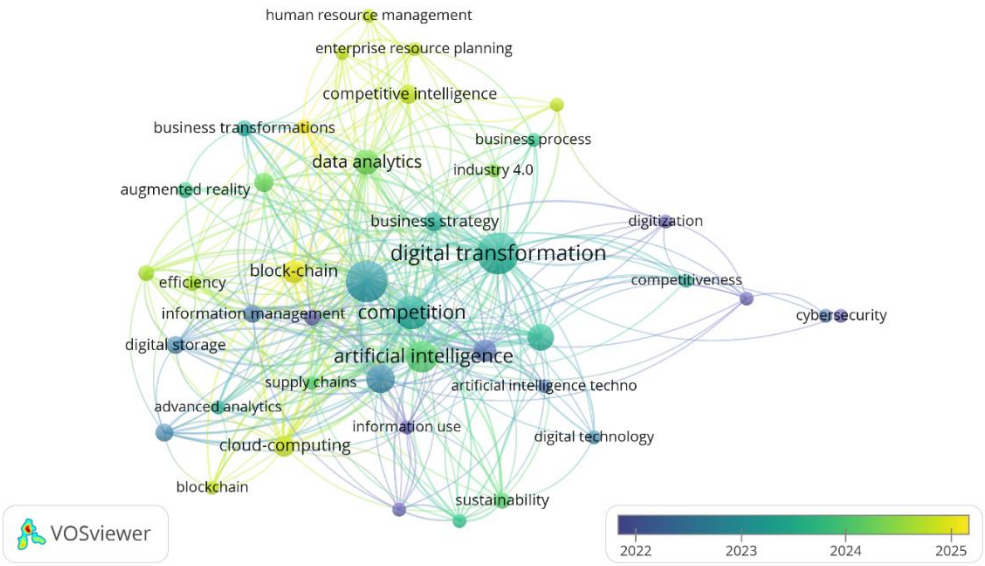


Figure 2. Overlay Visualization
*Source: Data Analysis Result, 2025*

This overlay visualization maps the intellectual landscape of research on digital transformation, IoT-related technologies, and competitive advantage while incorporating a temporal dimension. Node size reflects keyword prominence, link density indicates co-occurrence strength, and color represents average publication year. The figure shows a tightly connected research field in which digital transformation and competition occupy central positions, confirming their role as the core integrative concepts through which technological, strategic, and organizational discussions converge. Keywords colored toward the earlier end of the spectrum (blue–purple), such as cloud computing, advanced analytics, supply chains, and information use, represent foundational research streams. These studies primarily frame competitive advantage through efficiency gains, information

management, and operational optimization enabled by digital technologies. The strong connections between these terms and artificial intelligence suggest that early research emphasized technological capability building as the basis for digital competitiveness.

More recent research (green–yellow nodes) increasingly emphasizes digital transformation, business strategy, competitive intelligence, enterprise resource planning, industry 4.0, sustainability, and cybersecurity. This shift indicates a move from technology-centric explanations toward a strategic and systemic understanding of competitive advantage, where IoT and AI are embedded in organizational processes, governance, and long-term value creation. The appearance of sustainability and cybersecurity as newer themes signals growing concern with resilience, trust, and responsible digital strategy, pointing to key directions for future research.

### 3.3 Citation Analysis

Table 1. The Most Impactful Literatures

| Citations | Authors and year | Title |
|---|---|---|
| 893 | [11] | Artificial intelligence in sustainable energy industry: Status Quo, challenges and opportunities |
| 397 | [12] | Digital transformation: Five recommendations for the digitally conscious firm |
| 310 | [13] | Strategizing in a digital world: Overcoming cognitive barriers, reconfiguring routines and introducing new organizational forms |
| 277 | [14] | Small business awareness and adoption of state-of-the-art technologies in emerging and developing markets, and lessons from the COVID-19 pandemic |
| 88 | [15] | Theoretical Perspectives on Sustainable Supply Chain Management and Digital Transformation: A Literature Review and a Conceptual Framework |
| 47 | [16] | Supply chain digitisation and management |
| 38 | [17] | Digital ecosystems and their implications for competitive strategy |
| 28 | [18] | Artificial intelligence as a driver of business process transformation |
| 18 | [19] | Digital technologies and social sustainability in the digital transformation age: a systematic analysis and research agenda |
| 18 | [20] | Implementation of telecommunications cross-industry collaboration through agile project management |

*Source: Scopus, 2025*

### 3.4 Density Visualization

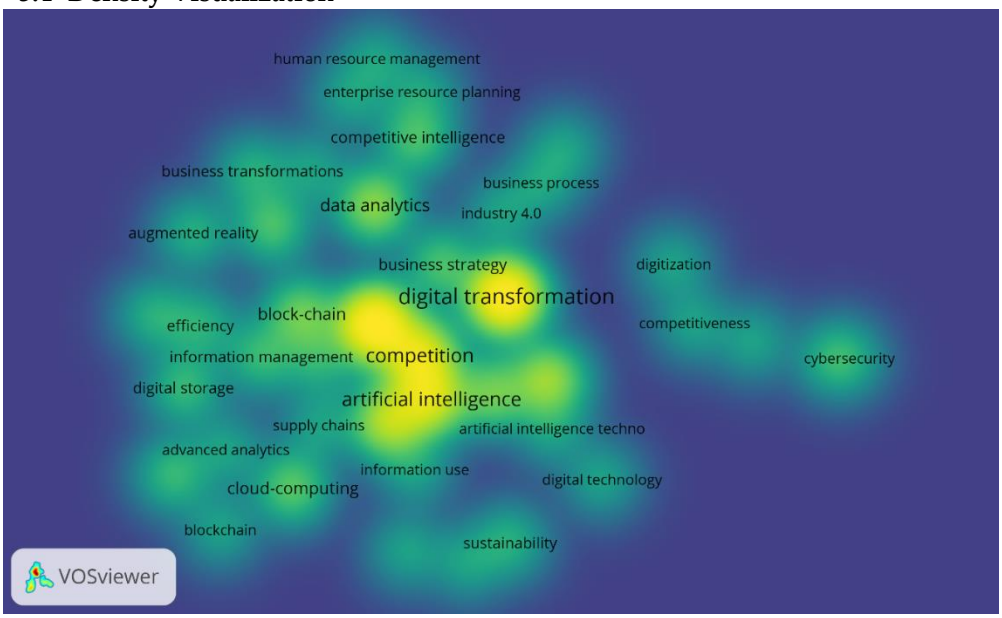


Figure 3. Density Visualization

*Source: Data Analysis Result, 2025*

The heatmap illustrates the density of research topics related to digital transformation and competitive advantage in IoT-driven business strategies. The brightest yellow and green areas at the center represent highly researched concepts such as digital transformation, competition, and business strategy. These topics are the focal points of the digital business strategy literature, signifying their prominent role in shaping competitive advantage through technology integration. The clustering of these themes reflects a well-established and mature body of research in the intersection of digital transformation and strategic competitiveness. Surrounding the central themes, areas like artificial intelligence, data analytics, blockchain, and cloud computing also show high research density, indicating their importance as enabling technologies for competitive advantage. These technologies are often explored in conjunction with digital transformation, as they provide the infrastructure and capabilities necessary for organizations to adapt and innovate in a competitive landscape. Meanwhile, topics such as sustainability and cybersecurity, though less central, are emerging as critical considerations in the context of future research, pointing to growing concerns about the resilience and ethical implications of digital strategies.

### 3.5 Co-Authorship Network

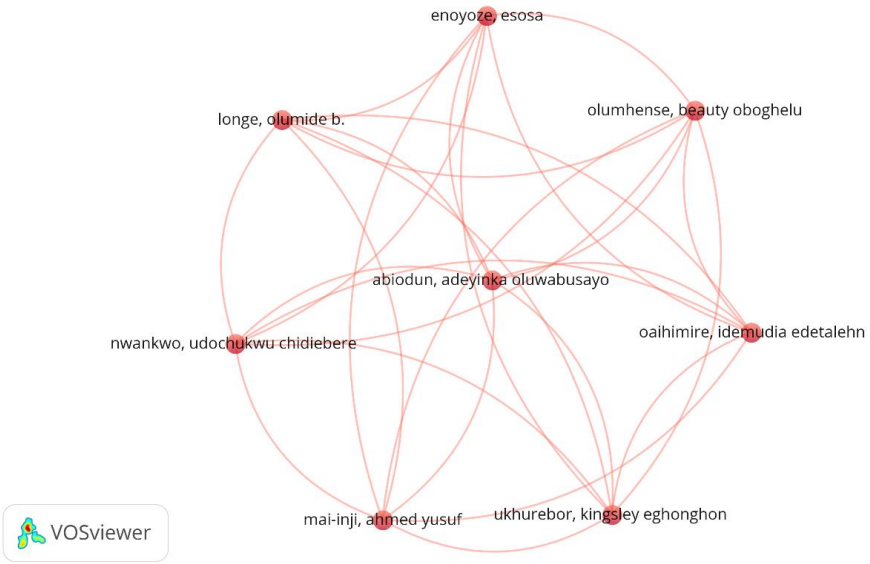


Figure 4. Author Visualization
*Source: Data Analysis Result, 2025*

This figure represents a co-authorship network visualized using VOSviewer, with nodes representing authors and edges indicating co-authorship between them. The size of the nodes reflects the number of publications each author has, while the intensity and width of the edges denote the strength of collaboration. The tightly connected group of authors at the center, including names like Enoyoze Esosa, Olumide B. Longe, and Adeyinka Oluwabusay, suggests a high level of collaboration among these individuals. The other authors such as Oaihimire Idemudia Edetalehn and Mai-Inji Ahmed Yusuf also show notable connections, though they are more peripheral in the network. The overall structure indicates a close-knit research community with collaborative ties that could signal a shared research focus or interest within a specific domain.

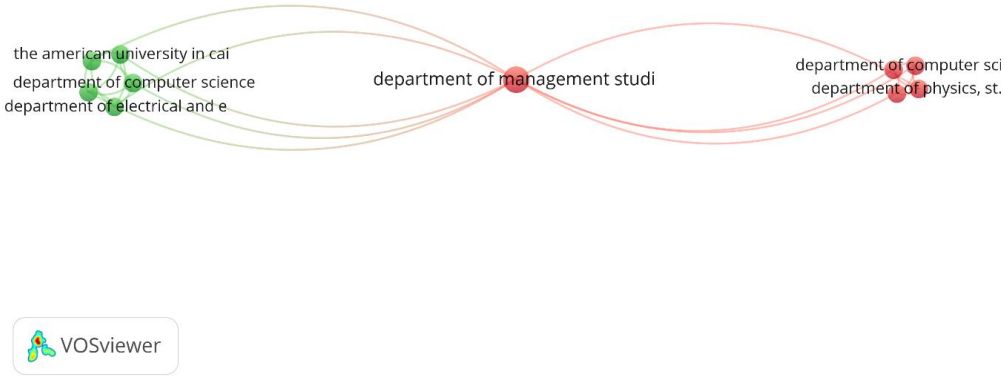


Figure 5. Affiliation Visualization
*Source: Data Analysis Result, 2025*

This figure represents a collaboration network between different university departments. The central node, labeled Department of Management Studies, is connected to other departments, such as Department of Computer Science, Department of Electrical and E, and Department of Physics, Statistics, indicating cross-disciplinary collaboration. The green-colored nodes on the left show departments that are more related to technical and engineering fields, while the red-colored nodes on the right reflect the management-oriented focus of the central department. The strength of the links between nodes suggests varying degrees of collaboration, with stronger ties indicated by thicker edges. The figure illustrates interdisciplinary research collaborations, particularly highlighting how management studies collaborate with technical and scientific disciplines.

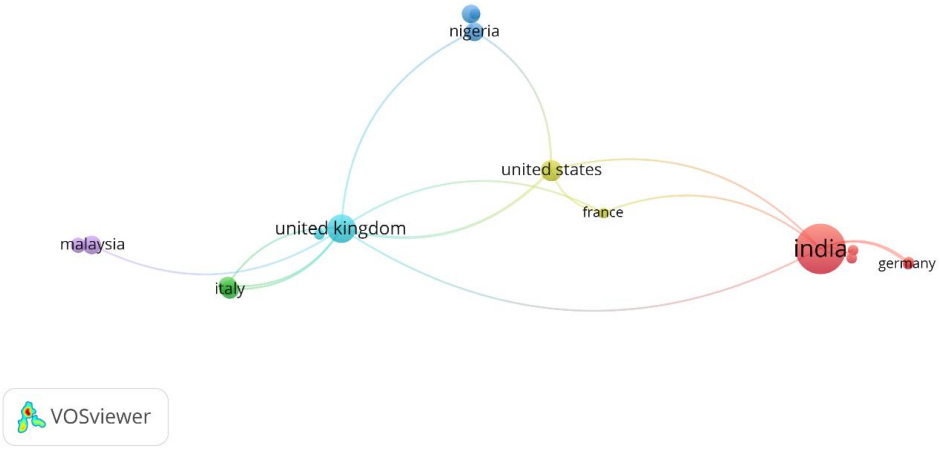


Figure 6. Country Visualization
*Source: Data Analysis Result, 2025*

This figure displays a collaboration network of countries based on their co-authorship or research collaboration in a given context. The countries are represented by nodes, with the size of each node indicating the extent of their involvement in the research network. The color gradient reflects the geographical grouping of countries, with India standing out as the most prominent node in the red section, indicating its central role in the research network. The connections between nodes, represented by lines, suggest collaborative ties. The United States, United Kingdom, and Germany also show significant collaboration with India, while countries like Malaysia and Italy are more peripheral, with weaker or fewer connections. The overall structure highlights the global nature of the research, with India emerging as a key hub connecting countries from various regions, including Europe and Africa.

## Discussion

### Practical Implications

The findings of this bibliometric analysis offer several important practical implications for organizations leveraging Internet of Things (IoT) technologies to gain a competitive advantage. Firstly, the centrality of digital transformation and competition in the literature signals that businesses must view IoT not merely as a technical upgrade but as a strategic lever. Organizations should integrate IoT with their business strategy to create differentiated value, improve operational efficiency, and enhance customer experiences. Furthermore, the high frequency of terms like data analytics, cloud computing, and artificial intelligence highlights the importance of combining IoT with advanced analytics and digital infrastructure. Companies aiming to gain a competitive edge

should prioritize the development of data-driven decision-making capabilities, real-time insights, and predictive analytics.

From an implementation standpoint, this study suggests that businesses should adopt a holistic approach, where IoT enables the transformation of business processes and informs strategic decisions at all levels. This also implies that managers should invest in the necessary skills, resources, and technologies, such as cloud infrastructure and AI-driven tools, to maximize the potential of IoT. Companies also need to foster a culture of continuous innovation, as IoT technology is evolving rapidly, and strategic alignment must continuously adapt to keep up with industry advancements.

**Theoretical Contributions**

This study contributes to the academic literature by mapping the evolution of IoT-related competitive advantage research using a bibliometric approach. It provides a comprehensive framework that connects key technological themes, such as IoT, artificial intelligence, and cloud computing, with broader strategic concepts like business strategy and digital transformation. This study advances the understanding of how IoT can be conceptualized as a strategic capability rather than just a technological tool. By synthesizing the diverse literature on IoT, this research consolidates various theoretical perspectives—including Resource-Based View (RBV), dynamic capabilities, and business ecosystem frameworks—to demonstrate how IoT drives competitive advantage by enhancing organizational capabilities.

Moreover, the study uncovers emerging research trends, such as the increasing emphasis on sustainability and cybersecurity, suggesting that future theoretical work should focus on integrating these concerns into the strategic use of IoT. The connection between IoT and digital strategy also contributes to the emerging field of digital business ecosystems, offering scholars a clearer lens to understand how interconnected technologies foster collaborative advantage and ecosystem-based competition. This study also sets the stage for further exploration into the intersection of technological innovation and strategic management in the context of IoT.

**Limitations**

While this study offers valuable insights, it has several limitations. First, the bibliometric analysis is based solely on the data extracted from databases like Scopus and Web of Science, which may not fully capture the entire body of relevant literature, particularly from regional sources or non-English publications. This limitation means that some significant research in specific geographical regions or niche areas might have been overlooked.

Second, while the study provides a broad overview of the IoT and competitive advantage literature, it does not delve deeply into the causal mechanisms through which IoT impacts competitive advantage in real-world business settings. Future research could address this gap by conducting empirical studies that test the theoretical frameworks identified in this study. Furthermore, the analysis focuses on the academic literature without considering the insights from practitioners or case studies. Incorporating industry-specific case studies could provide a more nuanced understanding of how different sectors adopt IoT and the tangible benefits they derive from it.

Lastly, the study's temporal focus on the available bibliometric data might overlook rapidly emerging trends or recent developments in the field of IoT. As IoT continues to evolve, the literature on its strategic application will likely shift, requiring future studies to reassess the findings of this study and explore new areas that may not have been as prominent in the literature during the time of this analysis.

## CONCLUSION

This study, provides a comprehensive overview of the evolving relationship between Internet of Things (IoT) technologies and competitive advantage in the context of digital business

strategy. By employing a bibliometric analysis, the study highlights the central role of digital transformation, competition, and business strategy in the strategic use of IoT. It underscores the importance of integrating IoT with advanced technologies like artificial intelligence, data analytics, and cloud computing to enhance organizational capabilities and create sustainable competitive advantages. The findings contribute to both academic and practical discussions, offering a clearer understanding of how IoT drives business strategy and transforms industries. However, limitations such as the reliance on specific academic databases and the absence of empirical case studies suggest opportunities for future research to explore the causal mechanisms and industry-specific applications of IoT in business strategy. Ultimately, this study sets the stage for further exploration into how businesses can leverage IoT technologies to thrive in an increasingly digital and interconnected world.

## REFERENCES

[1] W. Z. Khan, M. H. Rehman, H. M. Zangoti, M. K. Afzal, N. Armi, and K. Salah, "Industrial internet of things: Recent advances, enabling technologies and open challenges," *Comput. Electr. Eng.*, vol. 81, p. 106522, 2020.

[2] M. Soori, B. Arezoo, and R. Dastres, "Internet of things for smart factories in industry 4.0, a review," *Internet Things Cyber-Physical Syst.*, vol. 3, pp. 192–204, 2023.

[3] N. C. Luong, D. T. Hoang, P. Wang, D. Niyato, D. I. Kim, and Z. Han, "Data collection and wireless communication in Internet of Things (IoT) using economic analysis and pricing models: A survey," *IEEE Commun. Surv. Tutorials*, vol. 18, no. 4, pp. 2546–2590, 2016.

[4] U. Gupta, P. Somani, N. Behare, R. Mahajan, M. Singh, and C. A. V. Iyer, "Revolutionizing Retail: IoT Applications for Enhanced Customer Experience," in *Internet of Things Applications and Technology*, Auerbach Publications, 2024, pp. 60–80.

[5] S. Yousuf and D. Svetinovic, "Blockchain technology in supply chain management: preliminary study," in *2019 sixth international conference on internet of things: systems, management and security (IOTSMS)*, IEEE, 2019, pp. 537–538.

[6] B. Hammi, S. Zeadally, and A. J. Perez, "Non-fungible tokens: a review," *IEEE Internet Things Mag.*, vol. 6, no. 1, pp. 46–50, 2023.

[7] Z. Ye *et al.*, "IoT-enhanced smart road infrastructure systems for comprehensive real-time monitoring," *Internet Things Cyber-Physical Syst.*, vol. 4, pp. 235–249, 2024.

[8] E. Bertino, M. R. Jahanshahi, A. Singla, and R.-T. Wu, "Intelligent IoT systems for civil infrastructure health monitoring: a research roadmap," *Discov. Internet Things*, vol. 1, pp. 1–11, 2021.

[9] G. Lu and Y. J. Yang, "IoT and smart infrastructure," *Internet Things Data Anal. Handb.*, pp. 481–493, 2017.

[10] N. Donthu, S. Kumar, D. Mukherjee, N. Pandey, and W. M. Lim, "How to conduct a bibliometric analysis: An overview and guidelines," *J. Bus. Res.*, vol. 133, pp. 285–296, 2021.

[11] T. Ahmad *et al.*, "Artificial intelligence in sustainable energy industry: Status Quo, challenges and opportunities," *J. Clean. Prod.*, vol. 289, p. 125834, 2021.

[12] T. Saarikko, U. H. Westergren, and T. Blomquist, "Digital transformation: Five recommendations for the digitally conscious firm," *Bus. Horiz.*, vol. 63, no. 6, pp. 825–839, 2020.

[13] H. W. Volberda, S. Khanagha, C. Baden-Fuller, O. R. Mihalache, and J. Birkinshaw, "Strategizing in a digital world: Overcoming cognitive barriers, reconfiguring routines and introducing new organizational forms," *Long Range Plann.*, vol. 54, no. 5, p. 102110, 2021.

[14] I. J. Akpan, E. A. P. Udoh, and B. Adebisi, "Small business awareness and adoption of state-of-the-art technologies in emerging and developing markets, and lessons from the COVID-19 pandemic," *J. Small Bus. Entrep.*, vol. 34, no. 2, pp. 123–140, 2022.

[15] A. Stroumpoulis and E. Kopanaki, "Theoretical perspectives on sustainable supply chain management and digital transformation: A literature review and a conceptual framework," *Sustainability*, vol. 14, no. 8, p. 4862, 2022.

[16] M. K. Tiwari, B. Bidanda, J. Geunes, K. Fernandes, and A. Dolgui, "Supply chain digitisation and management," *International Journal of Production Research*, vol. 62, no. 8. Taylor & Francis, pp. 2918–2926, 2024.

[17] M. Subramaniam, "Digital ecosystems and their implications for competitive strategy," *J. Organ. Des.*, vol. 9, no. 1, p. 12, 2020.

[18] N. Svetlana, N. Anna, M. Svetlana, G. Tatiana, and M. Olga, "Artificial intelligence as a driver of business process transformation," *Procedia Comput. Sci.*, vol. 213, pp. 276–284, 2022.

[19] U. A. Qadri, M. B. A. Ghani, U. Abbas, and A. R. Kashif, "Digital technologies and social sustainability in the digital transformation age: a systematic analysis and research agenda," *Int. J. Ethics Syst.*, vol. 41, no. 1, pp. 142–169, 2025.

[20] L. R. Saragih, M. Dachyar, and T. Y. M. Zagloel, "Implementation of telecommunications cross-industry collaboration through agile project management," *Heliyon*, vol. 7, no. 5, 2021.