



THE EVOLUTION OF LOGISTICS INNOVATION RESEARCH: A BIBLIOMETRIC ANALYSIS OF GLOBAL TRENDS AND KNOWLEDGE STRUCTURE

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INFO ARTIKEL

Diterima 17 November
2025

Direvisi 23 November
2025

Diterima 25
November 2025
Tersedia online 2 Desember
2025

Kata Kunci:

*Logistics Innovation;
Bibliometric Analysis;
Scopus; Supply Chain
Management; Digital
Transformation; Knowledge
Mapping; Innovation
Logistics.*

Keywords:

*Logistics Innovation;
Bibliometric Analysis;
Scopus; Supply Chain
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Transformation; Knowledge
Mapping; Innovation
Logistics..*

ABSTRACT

The development of digital transformation, trade globalization, and the increasing complexity of supply chains have made logistics innovation a rapidly growing research theme in the field of logistics and supply chain management. Although the number of international publications on logistics innovation continues to increase, the development of knowledge in this field is still scattered across various disciplines, countries, authors, and publication media, thus not providing a complete picture of the intellectual structure or direction of research evolution. This condition indicates the need for a bibliometric study that can map research developments systematically and comprehensively. This study aims to analyze the development of research on logistics innovation using a bibliometric approach based on Scopus data by identifying publication trends by year, country distribution, scientific field, author productivity, and primary publication source. The analysis was conducted using the Analysis Results feature in Scopus to obtain an overview of the dynamics of research development over nearly five decades. The analysis results show that publications on logistics innovation experienced relatively slow growth in the initial period, then increased significantly since the 2010s and peaked in the 2020–2025 period along with the development of digital transformation, the Internet of Things, Artificial Intelligence, blockchain, big data analytics, and increasing attention to supply chain resilience and continuity. The distribution of publications shows the dominance of countries such as China, the United States, Italy, Germany, and the Netherlands as centers of knowledge production, while research fields are dominated by Business, Management and Accounting, Engineering, Computer Science, Social Sciences, and Decision Sciences, demonstrating the multidisciplinary character of logistics innovation. Analysis of author productivity shows that the development of this field is built through collaborative networks without strong dominance of a particular author, while analysis of publication sources shows that journals such as Sustainability, Journal of Business Logistics, Industrial Management and Data Systems, International Journal of Logistics Systems and Management, and Acta Logistica are the main media for research dissemination. The research findings also identify theoretical, methodological, empirical, and practical descriptions that indicate that bibliometric research on logistics innovation is still relatively limited compared to empirical research, so that the description of the intellectual structure, the evolution of research themes, and the direction of scientific development still require more in-depth study. Therefore, this research makes a theoretical contribution through the preparation of a knowledge map on the development of logistics innovation, a methodological contribution through the analysis of the application of bibliometrics as a systematic approach in the dissemination of scientific development, and a practical contribution as a reference for academics, practitioners, and policymakers in understanding the direction of logistics innovation development in the era of digital transformation and capabilities. The novelty of this research lies in the integration of publication trend analysis, geographic distribution, scientific field structure, author productivity, and publication sources within a comprehensive bibliometric framework, thereby providing a comprehensive overview of the evolution of logistics innovation research at the global level.

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1. Introduction

Global Background of Logistic Innovation Development

In recent decades, the transformation of the global business environment has fundamentally changed the way organizations manage logistics and supply chain activities (Arianto et al., 2025). Increasingly fierce competition, the development of digital technology, increasing customer expectations for the speed of service, and the complexity of international trade networks make the logistics function no longer seen as just an operational activity tasked with moving goods from one location to another. In contrast, logistics has developed to become one of the main sources of *value creation* that contributes directly to operational efficiency, organizational flexibility, customer satisfaction, and a company's competitive advantage. In this context, the organization's ability to carry out logistics innovation is increasingly important because innovation allows companies to develop processes, technologies, business models, and logistics services that are able to respond to changes in the business environment that are taking place very quickly.

The paradigm shift does not occur suddenly, but is the result of a long evolution influenced by the development of information technology, trade globalization, supply chain integration, and changes in market behavior. At the beginning of its development, logistics systems were more geared towards the efficiency of physical distribution through the optimization of transportation, warehousing, and inventory control. However, the increasing complexity of international business networks encourages organizations to view logistics as a system that is integrated with various other business functions. In this perspective, innovation is no longer understood as an activity that is only related to the development of new products, but also includes process innovation, organizational innovation, service innovation, and technological innovation that are able to improve the effectiveness of the logistics system as a whole. As a result, logistics innovation has developed into one of the research fields that has received wide attention from academics and practitioners.

2. Literature Review

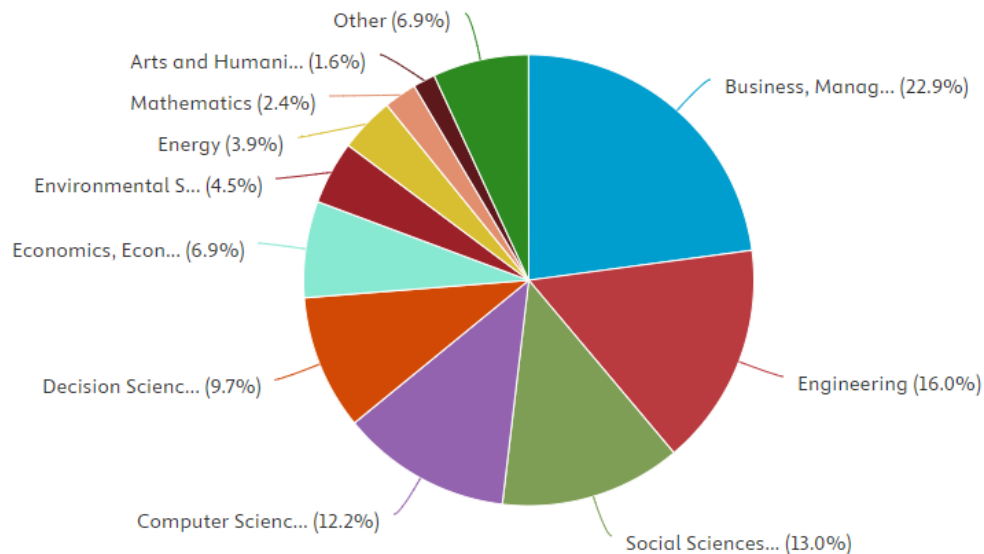
The development of digital technology has further accelerated this transformation. The emergence of the Internet of Things (IoT), Artificial Intelligence (AI), Machine Learning, Big Data Analytics, Blockchain, *cloud computing*, and *digital twin* technology has changed the way companies design, operate, and control logistics systems. The integration of these technologies allows the distribution process to be carried out in real-time, improving the accuracy of demand predictions, optimizing delivery routes, strengthening supply chain visibility, and improving the organization's ability to respond to operational disruptions. Thus, logistics innovation in the digital era no longer focuses solely on improving efficiency, but develops into a strategic instrument that supports data-driven decision-making, increasing *supply chain resilience*, and creating sustainable competitive advantages.

In addition to digital transformation, increasing attention to sustainability issues is also a major factor that encourages the development of research on logistics innovation. Logistics activities are one of the largest contributors to carbon emissions in the global economic system, so various organizations have begun to develop innovations oriented towards energy efficiency, waste reduction, the use of more environmentally friendly modes of transportation, and the application of the concept of *green logistics* and *circular economy*. The change in orientation shows that logistics innovation is no longer only geared towards increasing company productivity, but also at creating a balance between economic, social, and environmental goals. In other words, logistics innovation has become an integral part of efforts to realize a sustainable logistics system in accordance with the global development agenda.

The significance of logistics innovation is increasingly seen when the world faces various major disruptions in recent years, such as the COVID-19 pandemic, geopolitical conflicts, global economic instability, and increased risk of international supply chain disruptions. These events show that conventional logistics systems have limitations in dealing with very rapid changes. Organizations that are able to survive are generally those that have developed innovations in their logistics systems, either through process digitization, warehousing automation, data integration, and the development of more adaptive distribution models. This condition further confirms that logistics innovation has shifted from just a strategic choice to a fundamental necessity for organizations that want to maintain competitiveness in a business environment full of uncertainty.

Figure 1:

Documents by subject area



The rapid development of logistics innovation practices in the industrial world was followed by the increasing attention of the international academic community. Various studies have begun to examine logistics innovation from increasingly diverse perspectives, ranging from operations management, industrial engineering, information systems, computer science, social sciences, to environmental sustainability. The expansion of this perspective shows that logistics innovation is no longer a sectoral field of study, but has developed into a multidisciplinary field of science. Various disciplines contribute to explaining how innovation can improve logistics efficiency, strengthen supply chain integration, optimize the use of digital technology, and create a more resilient and sustainable distribution system.

The increasing academic attention to logistics innovation is reflected in the increasing number of scientific publications indexed in international databases. The growth of the publication shows that logistics innovation has become one of the rapidly growing research themes and has high relevance to modern business challenges. However, behind the increase in the number of researches, the development of knowledge about logistics innovation has become increasingly complex. New concepts, diverse methodological approaches, and the involvement of many disciplines have caused the intellectual structure of this field to develop dynamically and is difficult to understand only through the review of conventional literature. Therefore, an approach is needed that is able to map the development of research systematically so that the direction of science evolution, dominant themes, main actors, and future research opportunities can be identified more comprehensively.

In this context, bibliometric analysis is a very relevant approach. Bibliometrics not only calculates the number of publications, but also maps temporal development, geographical distribution, disciplinary structure, author productivity, and publication media that make up a field of research. By utilizing data from Scopus, bibliometric analysis allows researchers to obtain an empirical picture of how logistics innovation has developed over nearly five decades, which countries have become the centers of knowledge production, what fields of science are the most dominant, who are the researchers who make significant contributions, and which journals are the center of the dissemination of research results. This information is an important foundation for identifying research *gaps* and determining the direction of the development of logistics innovation studies in the future.

Dynamics of Logistic Innovation Research Development

The development of a field of science can basically be understood through the evolution of scientific publications produced by the international academic community. The more publications on a topic increase, the greater the attention researchers pay to the issue. In the context of logistics innovation, the increase in research activities not only reflects the increasing number of scientific papers, but also shows that logistics innovation has developed into one of the strategic issues that

has received wide attention from various disciplines. Therefore, bibliometric analysis using Scopus data is the right approach to describe how the development of logistic innovation research has progressed over the past almost five decades.

3. Result

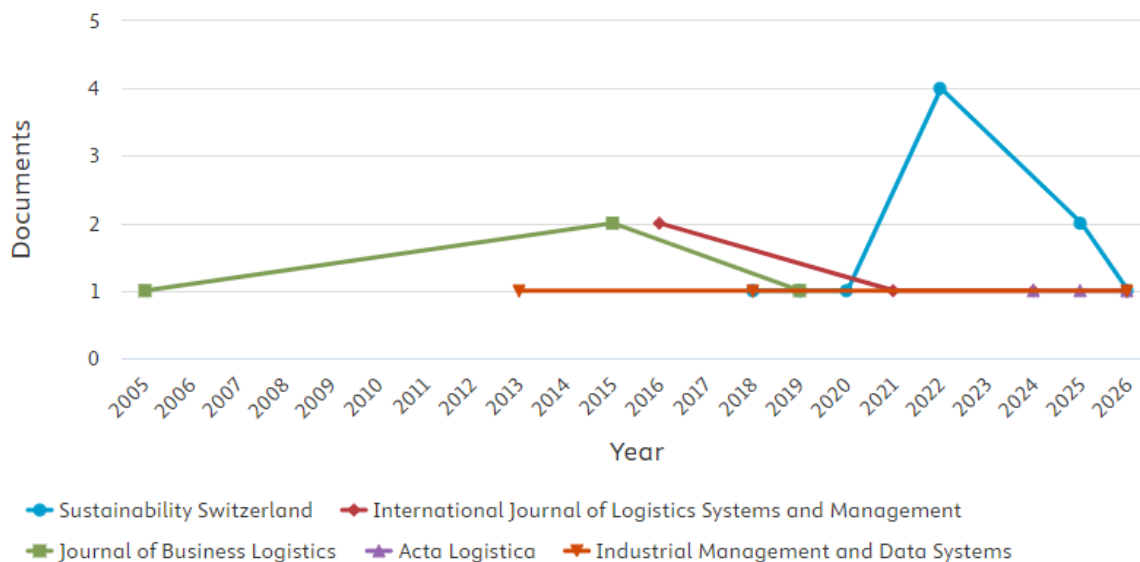
The results of the bibliometric analysis show that research on logistics innovation began to emerge in 1976, although in the early phase the number of publications was still very limited. For more than the first two decades, the development of publications was relatively slow with a very small number of papers each year. This condition shows that logistics innovation at that time was not positioned as a stand-alone research field. The focus of logistics research is still dominated by discussions on transportation efficiency, warehousing management, inventory control, and physical distribution. Meanwhile, the concept of innovation is more studied in the context of product innovation, technological innovation, and organizational innovation in general. Thus, the linkage between innovation and logistics systems has not received adequate attention in the international literature.

The change began to be seen in the early 2000s when the number of publications showed a gradual upward trend. This period marked a paradigm shift in logistics management, where logistics was no longer seen as a *support function*, but began to be positioned as a source of organizational competitive advantage. The development of the concept of Supply Chain Management, the increasing practice of *outsourcing logistics*, and the integration of supply chain activities have encouraged the emergence of various studies on logistics process innovation, service innovation, and logistics capability development. Although publication growth is still relatively moderate, this phase is an important foundation for the development of logistics innovation in the next period.

Documents per year by source

Compare the document counts for up to 10 sources.

[Compare sources and view CiteScore, SJR, and SNIP data](#)



The acceleration of research development was increasingly visible after entering the 2010s. The annual publication graph shows a more consistent increase in the number of documents compared to the previous period. This phenomenon is inseparable from the rapid development of digital technology that has begun to fundamentally change the logistics system. Organizations are no longer only trying to improve distribution efficiency, but also starting to develop logistics systems based on digital technology through the application of the Internet of Things (IoT), Big Data Analytics, Artificial Intelligence (AI), *cloud computing*, Blockchain, as well as a variety of other automation technologies. As a result, logistics innovation is evolving from an operational approach to a strategic approach that integrates technology, information, and data-driven decision-making.

The most significant increase occurred in the period 2020 to 2025, when the number of publications increased sharply and reached a peak in 2025. The surge shows that logistics innovation has entered the development acceleration phase. One of the factors driving this increase is the COVID-19 pandemic which exposed the vulnerability of global supply chains. Distribution disruptions, mobility limitations, changing demand patterns, and supply uncertainty are driving organizations to accelerate the transformation of logistics systems through various innovations. Research on *supply chain resilience*, logistics digitalization, warehousing automation, smart *logistics*, and the use of artificial intelligence is developing rapidly in response to these challenges. Thus, the pandemic has not only become a global crisis, but also a catalyst that accelerates the development of logistics innovation research.

When viewed from the perspective of the evolution of science, the results of bibliometric analysis show that logistics innovation has undergone a very significant change in orientation. In the initial phase, innovation is understood as an effort to improve operational efficiency through improving the distribution process. However, as digital technology develops and supply chain complexity increases, logistics innovation is evolving into a much broader concept, encompassing technological innovation, organizational innovation, service innovation, business model innovation, and sustainability-based innovation. This change shows that logistics innovation has undergone a transformation from a functional approach to a strategic and systemic approach.

In addition to showing temporal development, the results of bibliometric analysis also show that logistics innovation is a research field that is developing globally. The distribution of publications by country shows that China is the country with the highest number of publications, followed by Italy, the United States, Germany, the Netherlands, the United Kingdom, India, South Korea, and several other countries. China's dominance shows a shift in the center of research development towards the Asian region. These changes are in line with China's economic transformation supported by manufacturing advances, massive investments in logistics infrastructure, industrial digitalization, and government policies that encourage the development of innovative technologies. On the other hand, European countries continue to maintain an important role through the development of theoretical concepts, logistics system innovation, and technological integration in the supply chain.

The geographical distribution shows that the development of logistics innovation is greatly influenced by the level of economic progress, national innovation capacity, and technological readiness of a country. Countries with advanced logistics systems tend to have higher research

activities because they are supported by strong collaboration between universities, research institutions, governments, and the industrial sector. In contrast, the contribution of developing countries is still relatively limited. This condition shows that there is a geographical gap in knowledge production, so more research is still needed to examine the implementation of logistics innovation in the context of developing countries that have different infrastructure, regulation, and technological capacity characteristics.

Another important finding comes from an analysis based on the subject *area*. The results of the analysis show that logistics innovation research is dominated by the fields of Business, Management and Accounting, followed by Engineering, Social Sciences, Computer Science, and Decision Sciences. The distribution shows that logistics innovation is a field that has a multidisciplinary character. The dominance of the management field indicates that logistics innovation is still seen as a strategic instrument to increase organizational competitiveness. However, the high contribution of the fields of engineering and computer science shows that the development of logistics innovation is currently increasingly influenced by advances in digital technology and systems engineering. Meanwhile, the involvement of social sciences, economics, and environmental sciences shows that logistics innovation is also influenced by institutional factors, organizational behavior, public policy, and sustainability demands.

The multidisciplinary character shows that logistics innovation cannot be understood through only one scientific perspective. On the other hand, the development of the theory and practice of logistics innovation requires the integration of management science, engineering, information systems, economics, social sciences, and environmental science. The integration allows for a more comprehensive approach to explaining how innovation can improve the efficiency, flexibility, sustainability, and resilience of modern logistics systems. Therefore, research on logistics innovation in the future needs to prioritize an interdisciplinary approach in order to be able to produce more relevant solutions to increasingly complex global challenges.

The results of the bibliometric analysis as a whole show that logistics innovation has developed from a relatively narrow research topic to a field of science that has a very wide scope and involves various disciplines. The rapid growth of publications, the expansion of the participation of various countries, and the increasing diversity of scientific perspectives show that logistics innovation is now one of the important pillars in the development of modern supply chain management. However, these very rapid developments have also caused the structure of knowledge to become increasingly complex. Various new concepts, methodological approaches, and research focuses continue to emerge, so that more in-depth bibliometric mapping is needed to understand the direction of science evolution, the relationship between research themes, and opportunities for future study development.

4. Discussion

Evolution of Logistic Innovation Scientific Structure and Research Gap Identification

The development of a field of science is not only determined by the increasing number of publications, but also by the formation of intellectual structures that become the foundation for the development of theories, concepts, and research methodologies. The more mature a discipline is, the clearer the map of academic actors, main journals, collaboration networks, and research themes that dominate the development of the field. On the other hand, in the developing field of science, the structure of knowledge is generally still dynamic with the emergence of various new perspectives that complement each other and compete with each other. Based on the results of Scopus' bibliometric analysis, logistic innovation shows very interesting characteristics because it is experiencing rapid publication growth, but at the same time it is still in a phase of evolving conceptual evolution. This condition shows that this field has huge research opportunities to continue to be developed both from the theoretical, methodological, and applicative sides.

One of the important indicators that describes the intellectual structure of a research field is the media of scientific publications which is the center of knowledge dissemination. Analysis of Documents by Source shows that publications on logistics innovation are spread across various international journals, including Sustainability, Journal of Business Logistics, International Journal of Logistics Systems and Management, Industrial Management and Data Systems, and Acta Logistica. The absence of a very strong dominance of one particular journal shows that logistics innovation develops through various academic communities that have different research focuses. Some journals focus more on the perspective of supply chain management, others are oriented towards information systems, industrial engineering, sustainability, and organizational innovation. Thus, the dissemination of publications in various journals shows that logistics innovation has developed into a *cross-disciplinary field* and is no longer within the traditional boundaries of logistics science.

The dominance of Sustainability as one of the main sources of publications indicates that the current direction of logistics innovation development is increasingly closely related to sustainability issues. This shift shows a fairly fundamental paradigm shift. If in the previous decade logistics innovation was more directed at improving cost efficiency and speed of distribution, then cutting-edge research has begun to place aspects of the environment, energy efficiency, circular economy, and carbon emission reduction as integral parts of logistics innovation. In other words, the success of logistics innovation is no longer measured only by operational indicators, but also by its ability to create economic value while contributing to sustainable development.

On the other hand, the existence of the Journal of Business Logistics as one of the most productive journals shows that the management perspective remains the main foundation in the development of logistics innovation. Various studies published in the journal discuss logistics capabilities, service innovation, supply chain integration, collaboration between organizations, and the relationship between innovation and the company's competitive advantage. This shows that until now logistics innovation is still positioned as an organization's strategic ability to increase added value through more effective and adaptive management of logistics activities. Meanwhile, Industrial Management and Data Systems shows a stronger integration between logistics innovation with digital technology, data analytics, and information systems. The presence of the

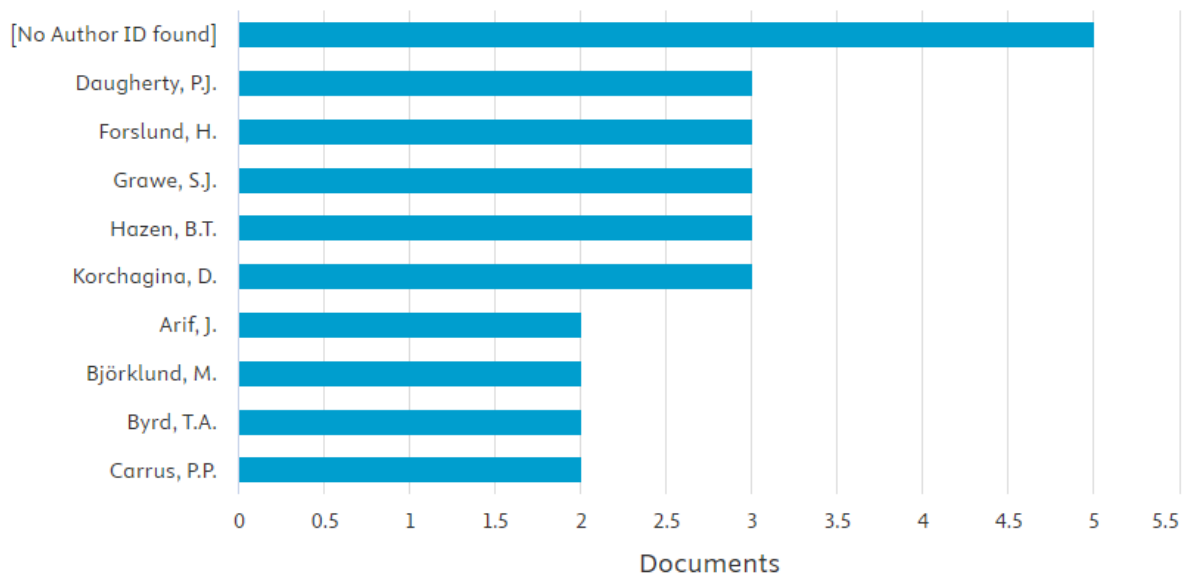
journal indicates that digital transformation has been one of the main drivers of the evolution of logistics innovation research in recent years.

In addition to the structure of the journal, the results of bibliometric analysis also show that the development of logistic innovation is built by the contributions of various authors who have relatively balanced productivity. There is no one researcher who dominates absolutely, as is often found in mature fields of science. Authors such as P.J. Daugherty, S.J. Grawe, B.T. Hazen, H. Forslund, and D. Korchagina were indeed major contributors to the analyzed Scopus dataset, but the number of their publications was still relatively close to that of other authors. This pattern shows that logistics innovation develops through collaborative networks involving various institutions, countries, and disciplines. Structures like this are a common characteristic of the expanding field of research, where various academic communities are simultaneously developing different conceptual and methodological approaches.

Figure 3:

Documents by author

Compare the document counts for up to 15 authors.

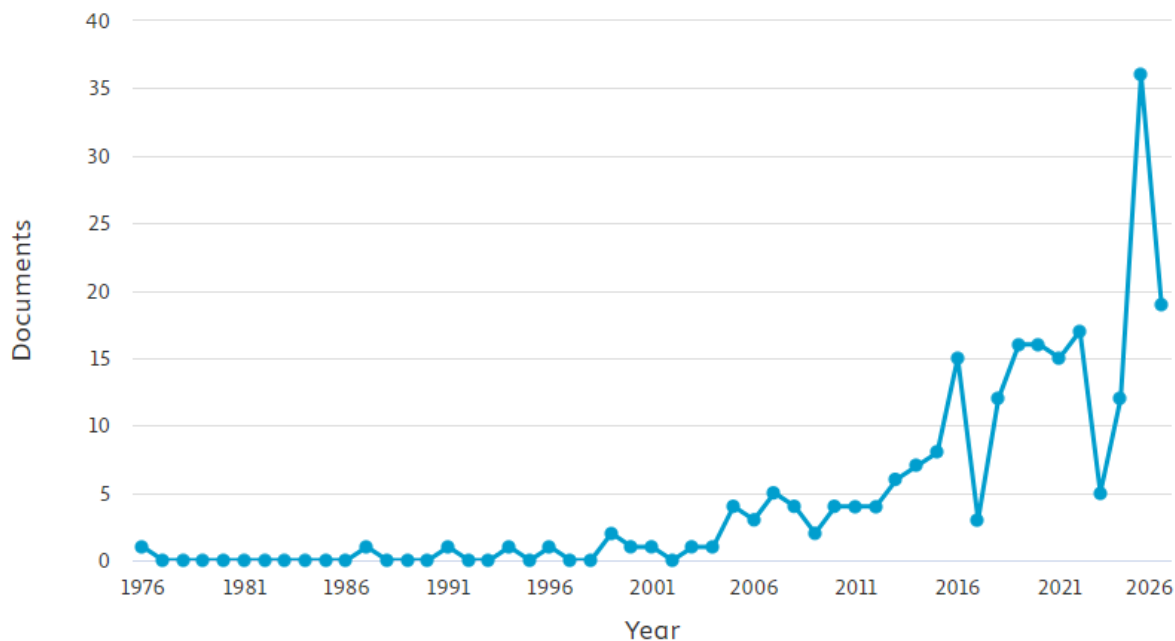


This condition has very important implications for the development of logistics innovation theory. The absence of dominance of thought from one academic group causes this field to develop openly by accommodating a wide range of perspectives. Management approaches, engineering, information systems, computer science, economics, and environmental science interact with each other in forming a knowledge structure of logistic innovation. On the one hand, these conditions enrich the development of theory because it allows the birth of various new concepts. However, on the other hand, the diversity of perspectives has also led to the lack of a fully established

conceptual integration. Many studies still focus on specific aspects, such as logistics digitalization, service innovation, warehouse automation, or sustainability, without connecting them into a more comprehensive conceptual framework. As a result, the literature on logistics innovation is developing widely but is still fragmented.

The bibliometric findings also show that the development of logistics innovation took place very quickly after 2015 and experienced extraordinary acceleration in the 2020–2025 period. The very high growth of publications shows the increasing academic attention to logistics innovation in response to industrial digitalization, the development of e-commerce, the COVID-19 pandemic, and the increasing demands on global supply chain resilience. However, the growth in the quantity of publications is not always followed by adequate integration of knowledge. Many new studies have emerged with very specific focuses, resulting in an increasingly complex diversity of themes. In these conditions, researchers need a mapping that is able to show how these themes are interconnected, how the evolution of concepts occurs, and what the direction of future research development.

Documents by year



Based on these conditions, there is a fairly clear research gap. Most research on logistics innovation is still oriented towards concept development or model testing in a specific context, while research that specifically maps the intellectual development of this field comprehensively is still relatively limited. Many studies conduct narrative *reviews*, but have not utilized the bibliometric approach to identify the pattern of publication development, geographical distribution, evolution of research themes, author collaboration networks, and conceptual structures that form the field of logistic innovation. As a result, researchers still face difficulties in understanding the direction of scientific development as a whole and determining research opportunities that really have *novelty* value.

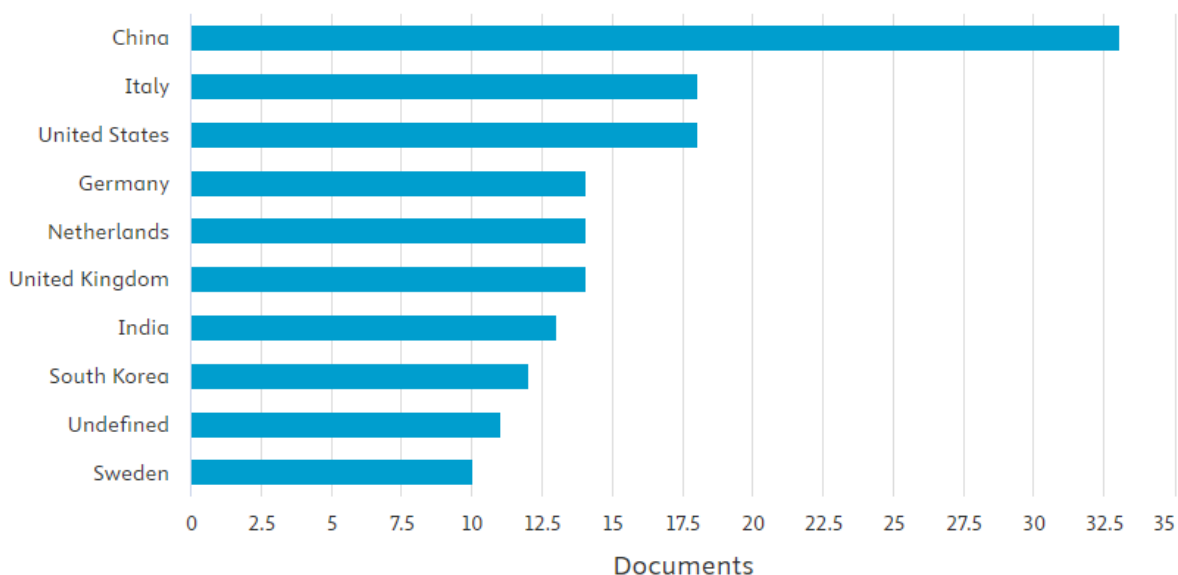
In addition, there is a knowledge gap that shows that most of the research on logistics innovation is still dominated by the context of developed countries such as China, the United States, Italy, Germany, and the Netherlands. The context of developing countries, especially in the Southeast Asian region, is still relatively under-appreciated in the international literature. In fact, the characteristics of logistics systems in developing countries differ significantly from developed countries, both in terms of infrastructure, technology adoption level, institutional capacity, and government policies. This gap opens up opportunities to generate a more contextual understanding of the implementation of logistics innovation in a variety of different economic and social conditions.

In terms of methodology, there is also a methodological gap. Most previous research has used a case study, survey, or empirical model testing approach on a specific organization. This approach does provide a deep understanding of specific phenomena, but it has not been able to describe the development of the field of logistics innovation on a macro level. Therefore, the bibliometric approach is very relevant because it allows researchers to map the intellectual structure of a field based on data from international publications in an objective, systematic, and measurable manner. Through bibliometric analysis, research developments can be understood not only in terms of the number of publications, but also from the relationship between authors, citation patterns, the evolution of research themes, and the relationship between fields of science.

Furthermore, there is a practical gap that is no less important. The development of digital technology, artificial intelligence, the Internet of Things, blockchain, and the concept of green logistics has taken place very quickly in the industrial world. However, the development of theories in the literature has not been fully able to integrate these innovations into a single complete conceptual framework. As a result, practitioners often face difficulties in determining the direction of logistics innovation development that is in accordance with technological dynamics and

Documents by country or territory

Compare the document counts for up to 15 countries/territories.



business needs. By mapping the development of research bibliometrically, this study is expected to be able to provide a more comprehensive picture of the themes that have developed, themes that are still rarely researched, and innovation opportunities that can be on the agenda of research and industrial practices in the future.

Based on the overall description, it can be understood that bibliometric research on logistics innovation has a very strong scientific urgency. The rapid growth of publications, the spread of research to various countries and disciplines, the development of collaborative academic communities, and the emergence of various new paradigms show that logistics innovation is in a very dynamic development phase. However, these dynamics also result in an increasing complexity of knowledge that requires comprehensive scientific mapping. Therefore, this study is directed to present a bibliometric analysis that is able to identify the development trends of publications, the most productive countries and authors, the distribution of scientific fields, the main sources of publications, and the direction of the evolution of logistic innovation research globally. The results of the research are expected not only to enrich the academic literature, but also to become a strategic reference for researchers, practitioners, and policymakers in designing future logistics innovation agendas.

Conceptual Foundations of Logistic Innovation in the Perspective of Theory and Digital Transformation

The development of research on logistics innovation cannot be separated from the evolution of innovation theory which explains how organizations respond to environmental changes through the creation of new values. In the modern management literature, innovation is no longer understood solely as the creation of a new product or technology, but is the ability of an organization to make updates to processes, services, systems, and business models to improve performance and maintain a competitive advantage. This perspective makes logistics innovation one of the manifestations of organizational innovation that develops along with the increasing complexity of the global supply chain, the acceleration of digital transformation, and changes in customer expectations for the quality of logistics services. Therefore, understanding logistics innovation requires the integration of various theoretical perspectives that can explain why innovation is a determining factor for the success of modern logistics systems.

One of the most widely used theories to explain the development of innovation is the Diffusion of Innovation Theory. This theory explains that an innovation will not have an impact if it is not adopted by individuals or organizations. The success rate of adoption is influenced by the perception of the benefits of innovation, the level of ease of implementation, the suitability to the needs of the organization, and the organization's ability to manage change. In the context of logistics innovation, this theory explains why companies that are able to adopt digital technology, automation, artificial intelligence, and data-based logistics systems tend to have higher capabilities in improving operational efficiency and service quality. In contrast, organizations that are slow to adopt innovation will run the risk of losing competitiveness because they are unable to keep up with the dynamics of the rapidly changing business environment.

The development of logistics innovation can also be explained through the perspective of Resource-Based View (RBV) which places strategic resources as the basis for creating competitive advantages. According to this perspective, an organization will gain an advantage if it has

resources that are valuable, scarce, difficult to imitate, and not easily replaced. In the modern logistics system, innovation is one of these strategic resources. Capabilities in developing digital distribution systems, building data integration, optimizing logistics networks, and creating service innovations are assets that are not easily replicated by competitors. Thus, logistics innovation not only generates operational efficiency, but also creates a sustainable competitive advantage through the development of the organization's internal capabilities.

However, the development of an increasingly dynamic business environment shows that resource ownership alone is no longer enough to maintain organizational competitiveness. Technological change is happening very quickly, customer needs are constantly evolving, and the risk of supply chain disruptions is increasingly difficult to predict. In these conditions, organizations need the ability to continuously update their resources to stay relevant to changing environments. This perspective is explained through Dynamic Capabilities Theory, which emphasizes the importance of an organization's ability to identify opportunities, capture change, and reconfigure resources on an ongoing basis. Logistic innovation is a tangible form of this dynamic capability because innovation allows organizations to adapt to changes in technology, markets, regulations, and global environmental conditions. Organizations with strong dynamic capabilities tend to be faster to develop new logistics solutions, increase distribution flexibility, and strengthen supply chain resilience in the face of crises.

The development of logistics innovation is also closely related to the evolution of the concept of Supply Chain Management (SCM). At the beginning of its development, logistics was more understood as a physical distribution activity oriented towards cost efficiency. However, the development of SCM changed this paradigm by placing logistics as part of an integrated system ranging from suppliers, manufacturers, distributors, to end customers. In such an interconnected system, innovation is no longer carried out partially, but must involve all actors in the supply chain. Therefore, logistics innovation develops into a collaborative process that includes information integration, synchronization of operational activities, development of shared services, and the use of digital technology to improve coordination between supply chain actors.

The results of bibliometric analysis showing the dominance of the fields of Business, Management and Accounting, Engineering, Computer Science, and Decision Sciences strengthen the view that logistics innovation is the result of integration between managerial and technological approaches. From a management perspective, innovation is directed towards improving service quality, strengthening relationships with customers, and creating a competitive advantage. From an engineering perspective, innovation is realized through the development of intelligent transportation systems, warehousing automation, robotics, and distribution network optimization. Meanwhile, computer science contributes through the development of artificial intelligence, the Internet of Things, blockchain, big data analytics, and digital platforms that enable logistics processes to run in real-time. Decision Sciences provides a variety of optimization methods, simulations, and decision support systems that assist organizations in determining the best alternatives to complex situations. The integration of these various disciplines shows that logistics innovation has developed into a multidisciplinary and systemic field of science.

Digital transformation is one of the most influential factors in the paradigm change of logistics innovation. The Industrial Revolution 4.0 has changed the characteristics of the logistics system from what was previously linear to a *connected logistics ecosystem*. Information about market

demand, vehicle position, warehouse capacity, and the condition of goods can be monitored in real time through digital sensors and cloud-based platforms. This condition allows companies to make decisions faster and more accurately than conventional logistics systems. Thus, logistics innovation is no longer only concerned with physical changes in the distribution process, but also includes digital transformation that connects all supply chain activities into one integrated information ecosystem.

In addition to digitalization, sustainability issues also increasingly dominate the development of logistics innovation. The results of the bibliometric analysis show that the Sustainability journal is one of the most active publication media in disseminating research on logistics innovation. This phenomenon indicates a shift in research orientation from operational efficiency to sustainable value creation. Today's organizations are not only required to reduce logistics costs, but also reduce carbon emissions, improve energy efficiency, minimize waste, and apply circular economy principles. Thus, logistics innovation develops into a strategic instrument that integrates economic, social, and environmental goals simultaneously.

This change in orientation further strengthens the position of logistics innovation as one of the important elements in the development of future logistics systems. Innovation is no longer understood as an additional activity carried out when the organization has adequate resources, but becomes a core capability that determines the resilience of the organization in the face of global uncertainty. The COVID-19 pandemic, geopolitical disruptions, climate change, and accelerated digitalization have shown that organizations that are able to survive are those that have a high capacity for logistics innovation. Therefore, logistics innovation is now seen as the main foundation in building a resilient, *adaptive*, and *sustainable* supply chain.

However, the results of bibliometric analysis also show that the development of logistics innovation theory is still going on in a fragmented manner. Some research focuses on technological innovation, others on organizational innovation, service innovation, or sustainability. The integration between these various perspectives is still relatively limited, so a truly comprehensive conceptual framework has not been formed. This condition is one of the important reasons why bibliometric research is needed. Through mapping the development of publications, author networks, distribution of fields of knowledge, and trends in research themes, bibliometric studies can provide a comprehensive overview of the intellectual structure of logistic innovation and help identify the direction of theory development in the future.

Thus, logistics innovation can be understood as a multidimensional concept that develops through the integration of innovation theory, organizational capabilities, supply chain management, digital transformation, and sustainability. This complexity makes logistics innovation one of the most dynamic research fields and continues to evolve along with changes in technology and the global business environment. Therefore, a systematic scientific mapping is needed so that the development of concepts, research actors, dominant themes, and new research opportunities can be understood more comprehensively. The bibliometric analysis carried out in this study is expected to be able to contribute by presenting a complete picture of the development of logistic innovation research at the international level.

Research Gap, Novelty, and Urgency of Bibliometric Research Logistic Innovation

The development of research on logistics innovation in recent decades shows very rapid dynamics. The results of the Scopus bibliometric analysis that have been previously presented show a significant increase in the number of publications, the expansion of research distribution to various countries, the development of the involvement of various disciplines, and the increasing diversity of publication media that become a forum for the dissemination of knowledge. This phenomenon shows that logistics innovation has developed into one of the research fields that has a high level of relevance to the transformation of the global logistics system. However, the very rapid growth of literature also has consequences in the form of an increasingly complex knowledge structure that forms this field. This complexity causes researchers to face challenges in understanding the direction of research development, the relationship between themes, and the position of each study in the overall intellectual structure of logistic innovation.

Although the number of publications continues to increase, most research is still oriented towards solving operational problems or testing relationships between variables in a specific organizational context. Many studies have examined the influence of digitalization on logistics performance, the implementation of the Internet of Things in distribution, the use of blockchain in the supply chain, the influence of service innovation on customer satisfaction, and the relationship between logistics capability and competitive advantage. These studies make a very important contribution to the development of theory and practice. However, most of the research is still at the micro level with a focus on specific phenomena, so it does not provide a complete picture of the development of the field of logistics innovation as a whole.

This condition shows that there is a fairly fundamental theoretical gap. Until now, there has been no fully established conceptual agreement on the scope of logistics innovation. Some researchers view logistics innovation as process innovation, others associate it with service innovation, digital transformation, organizational innovation, business model innovation, or sustainability. These differences in perspectives enrich the literature, but at the same time produce conceptual fragmentation that causes the boundaries of the study of logistics innovation to become increasingly blurred. As a result, theoretical development takes place partially and has not been fully integrated into one comprehensive conceptual framework.

The results of the analysis of Documents by Subject Area reinforce this condition. The dominance of the fields of Business, Management and Accounting, Engineering, Computer Science, Social Sciences, and Decision Sciences shows that logistics innovation has developed into a multidisciplinary field. However, the involvement of many disciplines has also led to the emergence of different terminological variations, theoretical approaches, and research methodologies. Each discipline tends to develop logistic innovation according to its own scientific characteristics. The management perspective focuses more on the creation of competitive advantage, the field of engineering on logistics system engineering, computer science on digitalization and artificial intelligence, while the social sciences emphasize more on the aspects of collaboration and governance. This diversity is a strength as well as a challenge because there is not much research that has been able to integrate these various perspectives into a systematic map of the development of science.

In addition to theoretical gaps, there is also an empirical gap that can be seen from the geographical distribution of the research. The results of the analysis of Documents by Country or Territory show that most publications are still dominated by China, the United States, Italy, Germany, the

Netherlands, and several other developed countries. This dominance shows that the development of logistics innovation theory is still greatly influenced by the economic characteristics, infrastructure, and technological maturity of these countries. On the other hand, research from developing countries, especially in Southeast Asia, Africa, and parts of Latin America, is still relatively limited. In fact, the logistical challenges faced by developing countries are often fundamentally different, such as limited infrastructure, high distribution costs, digital divides, and regulatory complexity. This condition indicates that the existing literature does not fully represent the diversity of the context of the implementation of logistics innovation in various parts of the world.

The next gap is the methodological gap. Most previous research used quantitative approaches based on surveys, case studies, optimization modeling, or simulations to explain the relationships between variables in a given context. This approach produces strong empirical findings, but it has not been able to provide a macro picture of how the field of logistics innovation develops over time. Bibliometric research is still relatively less than empirical research, so mapping of the evolution of publications, intellectual structures, collaboration patterns, citation networks, and the development of research themes is not widely available. As a result, researchers still have difficulty identifying themes that have been saturated, themes that are developing, and research areas that still have great opportunities to develop.

5. Conclusion

The results of the analysis of Documents by Author also provide an indication of interesting research opportunities. The author's productivity in the field of logistics innovation is relatively scattered and does not show a very strong dominance of one particular figure. This condition indicates that this field is developing through a wide network of collaborations and is open to new perspectives. However, the author's productivity analysis alone is not enough to explain the intellectual structure of the field of logistics innovation. Further analysis of the relationship between citations, *co-citations*, *bibliographic coupling*, and author collaboration networks is needed in order to understand how knowledge develops, who is the author who is the link between research streams, and how the scientific community shapes the evolution of the concept of logistic innovation.

On the other hand, the results of the analysis of Documents by Source show that logistic innovation research is published in various journals with different orientations. The dominance of journals such as *Sustainability*, *Journal of Business Logistics*, *Industrial Management and Data Systems*, and *International Journal of Logistics Systems and Management* shows that this field is developing through various complementary perspectives. However, the spread of publications in these journals also indicates that knowledge about logistics innovation is still widespread and has not been optimally integrated. Therefore, bibliometric research is important to connect the various research streams so that a more complete picture can be obtained about the development of the field of logistics innovation.

In addition to the academic gap, there is also a practical gap that is increasingly relevant in the context of global industrial development. Digital transformation, the increasing use of artificial intelligence, the development of the Internet of Things, blockchain, autonomous vehicles, warehousing robotics, and the concept of green logistics have fundamentally changed logistics

practices. However, theoretical developments often lag behind the pace of innovation in the field. Many organizations have implemented new technologies, but the academic literature has not been able to fully explain the relationship between these innovations and their implications for the development of future logistics systems. Thus, bibliometric mapping becomes important to identify how the focus of research has shifted over time and how the direction of research development can support the practical needs of the industrial world.

Based on these gaps, this research has a strong scientific urgency. The research not only aims to describe the number of publications regarding logistics innovation, but also to map the intellectual development of this field through the analysis of publication trends, country distribution, fields of science, authors, and sources of publications. The bibliometric approach allows the identification of patterns of knowledge development that cannot be obtained through a review of the narrative literature. Thus, this research is expected to be able to provide a comprehensive picture of the knowledge structure of logistics innovation as well as identify research opportunities that are still open in the future.

Based on this description, the main purpose of this study is to analyze the development of research on logistics innovation using the Scopus data-based bibliometric approach. The analysis is directed to identify publication trends based on year, country distribution, field of science, publication sources, and author productivity, so that the intellectual structure, development dynamics, and direction of evolution of logistic innovation research globally can be mapped. The results of the research are expected to be able to provide a scientific basis for the development of the next research agenda as well as a reference for academics, practitioners, and policymakers in understanding the development of logistics innovation in the era of digital transformation and sustainability.

Theoretically, this research contributes through the preparation of a *knowledge mapping* that illustrates how logistics innovation has evolved over almost five decades. The mapping is expected to be able to clarify the relationship between various research themes, identify knowledge production centers, and show the direction of development of the concept of logistics innovation in the future. From the methodological side, this study expands the use of the bibliometric approach as a tool to evaluate the development of the logistics field objectively and systematically. Meanwhile, from a practical perspective, the research results are expected to be a reference for organizations in understanding the trend of logistics innovation that is developing at the global level so that it can support strategic decision-making that is more adaptive to changes in the business environment.

Based on the overall argument, the novelty of this research lies in the effort to comprehensively map the development of logistic innovation research using Scopus bibliometric data by integrating the analysis of publication trends, geographical distribution, structure of the field of knowledge, author productivity, and publication media in one complete analysis framework. This approach is expected to be able to fill the theoretical, methodological, and empirical gaps that are still present in the literature while providing a scientific basis for the development of logistic innovation research in the future.

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