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Bibliometric Trends of Competitiveness Among Logistics Service Providers and Their Resources

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Abstract

Purpose: In the constantly changing landscape of global supply chains, Logistics Service Providers (LSPs) play a vital role in enhancing efficiency, flexibility, and cost-effectiveness. The growing complexity of customer demands, and the swift adoption of digital technologies have markedly transformed the competitive landscape for LSPs. This paper examines the emerging trends that influence LSP competitiveness. **Research design, data, and methodology:** Using R Studio and the biblioshiny package for bibliographic coupling analysis, the authors analyzed articles from Scopus published between 2000 and 2024. **Results:** Key trends include digital transformation, sustainability initiatives, and dynamic capacity for flexible service. The research also focuses that digital transformation as the key driver of LSPs' competitive strategy, enabling them to enhance efficiency and adapt to market changes. However, the study also identifies gaps, particularly in the limited adoption of advanced technologies (IoT, Blockchain...) in small- medium- size LPSs because of capital resources; human skills and low awareness of engagement among LSPs. **Conclusions:** This research highlights key thematic topics that enhance our understanding of the competitiveness of LSPs and offers actionable insights for scholars and practitioners aiming to manage logistics operations service under digital transformation. Future research, therefore, may focus on evaluating the level of digital technology application in services and the awareness of human resources at LSPs.

Keywords : Competitiveness, Bibliographic coupling, Logistics service providers, Resources

JEL Classification Code: L24, L87, M10

1. Introduction

Logistics outsourcing activities related to transport and storage management have gained significant transactions since the 1980s, leading to the emergence of a distinct business sector known as logistics service providers (LSPs). These companies play a vital role in strategic supply chain coordination, fostering competitiveness in the global market (Zacharia et al., 2011). With increasing globalization, technological advancements, and the demand for efficient supply chain solutions, the concept of competitiveness among LSPs has become a pivotal area of focus.

Competitiveness in the LSP sector is driven by service innovation, operational efficiency, and adaptability to technological disruptions like Industry 4.0 (Ralston & Blackhurst, 2020); Hofmann and Osterwalder's (2017) pioneering research highlights the potential for digitization to disrupt traditional LSP roles. Yet, there remains a gap in understanding how LSPs can proactively develop and renew their capabilities to navigate such disruptions (Chen et al.,

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2019). Additionally, evolving customer expectations and market dynamics place immense pressure on LSPs to deliver not only cost-effective solutions but also enhanced value propositions. With advancements in technology and changing environments, competition has evolved significantly over time (Wang et al., 2023) compelling LSPs to make strategic decisions that adapt to external factors while maintaining their competitive capabilities.

In the context of Logistics 4.0 (Barreto, 2010), challenges faced by LSPs stem from both external market demands and internal organizational complexities. The disruptive technologies of Industry 4.0 are widely utilized in the digital age, leading to the development of "digital thinking" as a critical domain of knowledge essential for managing logistics processes (Kannan et al., 2021). These challenges necessitate continuous innovation in technology and management to maintain relevance and sustain competitive advantages in a rapidly evolving business environment. Furthermore, the transition from traditional services (transportation and warehousing) to integrated supply chain services—such as inventory management, consulting, and real-time data analytics—has transformed the competitive landscape (Barker et al., 2021).

By bibliometric method, this article seeks to reflect the emerging trends of LSP's competitiveness through analysis of cited documents, relevant authors, scientific publications.

The structure of this paper is organized as follows: Part 1 presents the research subject and provides an overview of the research issues. Part 2 offers a brief review of the literature on LSP competitiveness, resources summarizing researchers' findings to guide the direction for future studies.

Part 3 explains the bibliometric methods and data analyzed in the research. Part 4 presents the results of the citation-based bibliometric analysis, highlighting overall trends and identifying key sources, documents, authors, and countries. Part 5 offers a thematic analysis of the competitiveness research area within LSPs, examining the evolution of research themes. It also discusses the study's findings and proposes emerging trends for deep research in future. Finally, part 6 summarizes its findings and suggests the study's limitations.

2. Literature Review on Logistics Service Providers (LSP) and Competitiveness

2.1. Logistics Service Providers (LSP)

Logistics service providers (LSPs) are legal entities that fulfill customer requests, including forwarding services, customs procedures, freight forwarders, consulting, transportation, insurance, supply chain management, and logistics solutions. Depending on the complexity and scope of the work outlined in the logistics service contract, the 3PL model may develop into a 4PL model. They function at different levels of the supply chain, addressing both third-party and internal logistics requirements (Sakas et al., 2023).

One of the primary advantages of LSPs is their capability to help businesses cut costs while enhancing performance, sustainability, and revenue. The process of assessing and choosing LSPs is a complex but crucial aspect of delivering value (Abbasi et al., 2024). LSP companies typically perform their duties based on the service contract agreed upon by both parties. The service contract serves as a guiding framework for the tasks to be carried out, outlining the rights and obligations of each party, as well as the expectations and criteria for evaluating service effectiveness. This contract ensures that both parties clearly understand the scope of work, the timeline for execution, and the terms related to costs and responsibilities.

Manufacturing and trading companies often emphasize their strengths, such as product quality and marketing. Consequently, they hire LSPs to handle logistics tasks based on service contracts. These logistics service contracts serve as a guiding framework for the tasks to be performed, outlining the rights and obligations of each party, as well as the expectations and criteria for evaluating service effectiveness. There are several factors to consider when choosing an LSP. According to Sakas et al. (2023), LSPs are evaluated based on their reliability, service efficiency, and trustworthiness. In today's digital landscape, in addition to traditional logistics services like transportation, delivery, and warehousing, there are increasing demands for higher service standards, such as rapid and accurate order processing or standardization. The integration of technology into these services is also an important aspect to consider.

According to the development of management scale in customer activities, the 3PL model evolves to a new level known as 4PL. The 4PL model is a comprehensive integrated service provider that offers strategic solutions and comprehensive end-to-end solutions aimed at enhancing the supply chain for optimal efficiency and cost reduction (Schramm et al., 2019).

2.2. Competitiveness of LSPs

Competitiveness has been widely studied, starting with the OECD's definition as the capacity of businesses to generate substantial income through effective utilization of production factors, thereby ensuring sustainable development in a competitive international landscape. Porter (1996) also underscored competitiveness as a vital aspect of strategic management, crucial for explaining consistent economic success (Mansouri et al., 2022).

Competitiveness in business goes beyond just offering products and services. According to Bambang et al. (2021)

achieving long-term market leadership necessitates the ability to effectively tackle challenges and capitalize on growth opportunities. This view is reinforced by Idris et al. (2020) who point out that a company's ability to adapt and innovate in the face of obstacles is essential for sustaining its competitive advantage. Additionally, Dhameria, V et al. (2021) emphasize that sustainable competitiveness is characterized by consistent performance that surpasses the industry average, highlighting the importance of strategies that ensure enduring superiority over competitors.

The assessment of LSP's competitiveness is based on criteria. Researchers Gupta, A. et al. (2018) and Desiderio, E. et al. (2020) highlight the importance of service quality in the logistics industry. In the study by Loi, N. T. et al. (2021), 16 essential sub-factors were identified, including reputation, timeliness, customs efficiency, and shipment arrangements, all of which impact the competitive capabilities of LSPs. In the context of Industry 4.0, which emphasizes digital technologies applied in logistics service activities, LSP's customers also require quality service with higher standard. This means that logistics services need to be sustainable, focusing on eco-friendly practices, efficient resource utilization, and fostering long-term relationships with stakeholders (Balkyte et al., 2010). Additionally, studies by Lyu et al. (2019) and Akoğlu et al. (2022) highlight the role of technology in delivering timely services, fulfilling orders accurately and quickly. Meanwhile, Karman and Savanevičienė (2020) focus on offering eco-friendly solution.

2.3. Resource

In today's VUCA business landscape—characterized by Volatility, Uncertainty, Complexity, and Ambiguity—Sinha, D and Sinha, S. (2020) emphasize that managers are increasingly focused on developing strategies to tackle fierce competition. LSPs should formulate strategies that resonate with the distinct features of their sector, as they serve a wide range of customers with diverse needs. LSPs must effectively assess and utilize their available resources. Beyond tangible resources such as fleets and warehouses, intangible resources also play a critical role. These include management practices, document handling processes, customer service teams, and advanced technologies like Electronic Data Interchange (EDI) and track-and-trace systems. These technologies not only enhance service quality and reduce costs but also improve operational efficiency and optimize process execution times (Lai et al., 2005; Albrecht et al., 2024). Furthermore, as Kashem, Shamsuddoha and Nasir (2024) highlight, the combination of fundamental resources with advanced technology enables LSPs to optimize service operations. However, information technology resources, the knowledge and skills of employees and specialists in utilizing these technologies must be prioritized (Li, 2024). Therefore, LSPs must implement comprehensive employee training strategies, as this not only creates a unique competitive advantage but also serves as a critical success factor for the company, regardless of the adoption of advanced technologies. In the context of digital transformation within LSPs, digital technologies act as the "backbone," driving innovation and improving operational performance. Notably, digital technologies have proven to be instrumental in helping LSPs recover from the disruptions caused by the Covid-19 pandemic and maintain their operational efficiency (Moldabekova et al., 2021; (Zhang et al., 2024).

3. Methodology

Bibliometric methods are structured approaches that focus on scientific publications, cited documents and relevant contributors to assess academic output within a specific condition. These techniques can assess research impact, identify gaps in literature, and provide insights into scientific communities (Ellegaard & Wallin, 2015). To achieve the research goals, the authors gathered publications from the Scopus database because of recognized database logistics. The primary keywords that the authors focused on were: 'ALL logistics AND service AND providers) AND TITLE-ABS-KEY (competitiveness) OR TITLE-ABS-KEY (competition) AND TITLE-ABS-KEY (resources)' AND (LIMIT-TO (LANGUAGE, 'English'). The results were refined based on specific criteria to ensure relevance and quality. First, we focused on studies examining competitiveness and resources. Second, only English-language publications were considered. Third, the study was limited to the fields of Business, Management, Accounting, and Social Sciences, ensuring that only rigorously evaluated journal articles were included to maintain research quality. On October 12, 2024, a search yielded 2,667 publications, which were then assessed based on titles and abstracts for relevant keywords. Ultimately, 359 publications were selected for bibliometric analysis. The data extracted from Scopus were imported into Biblioshiny, a web-based R tool designed for bibliometric analyses because of comprehensive analysis, effective visual representation, and user-friendly interface (Aria & Cuccurrullo, 2017).

4. Findings

4.1. Descriptive Statistics

Table 1 presents key details about the dataset. The analysis includes a total of 359 documents published in the

period from 2000-2025, sourced from 226 different sources such as journals, books, and other publications. Typically, the documents are 5.35 years old and have garnered 31.66 citations each, totaling 25452 references.

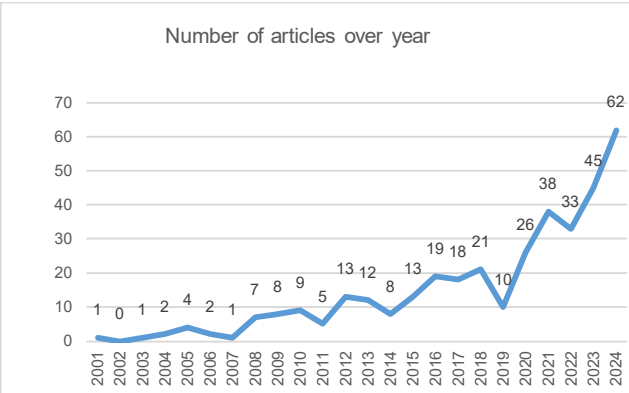
Table 1: Main Information of Data

Timespan	2001:2025
Sources (Journals, Books, etc.)	226
Documents	359
Documents average Age	5.3
Average citations per doc	31.66
References	25452
Keywords plus (ID)	1605
Author's Keywords (DE)	1390

Source: R Studio

4.2. Number of Articles over the Years

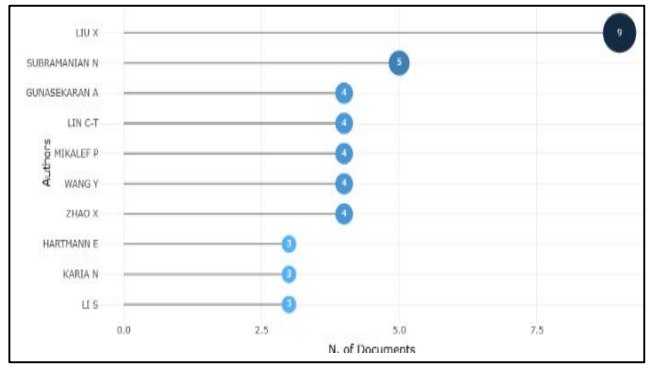
Figure 1 shows the annual scientific production on LSP competitiveness, revealing a steady increase from the early 2000s, followed by rapid growth from 2015 onward. Publications peaked at 33 articles in 2023, then sharply doubled to 62 in 2024, reflecting a growing research focus on LSP competitiveness, particularly in the last two decades.



Source: R Studio

Figure 1: Numbers of Articles over the Years

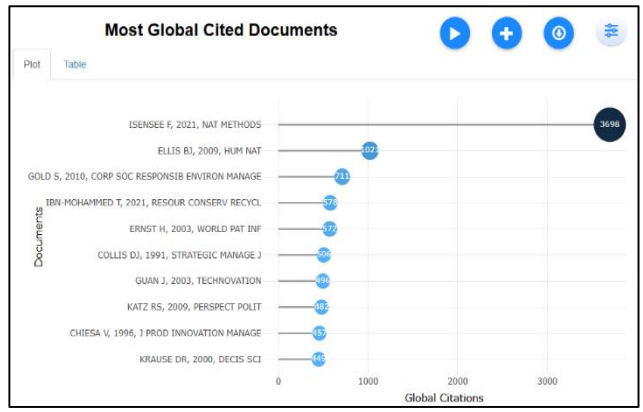
Figure 2 highlights the contributions of authors to research on LSP competitiveness, showing the number of publications by each author. Liu X leads with 9 publications, followed by Subramanian N with 5. Notable contributors include Gunasekaran A, Lin C-T, Mikalef P, Wang Y, and Zhao X, each with 4 publications, while Hartmann E, Karia N, and Li S have 3 each. This ranking reflects the significant efforts of these authors in advancing research within the field.



Source: R Studio

Figure 2: Most Relevant Authors

Figure 3 highlights the most globally cited documents in a specific research area, ranked by total citations. Leading the list is Isensee F (2021) in Nat Methods, with 3,698 citations, reflecting its substantial academic impact. Following is Ellis BJ (2009) in Hum Nat, with 1,021 citations, reflecting its significant contribution. Other prominent works include Gold S (2010) in Corp Soc Responsible Environ Manage with 711 citations, Ibn-Mohammed T (2021) in Resource Conserve Recycle with 578, and Ernst H (2003) in World Pat Inf with 572. Additional influential documents by Collis DJ, Guan J, Katz RS, Chiesa V and Krause DR have citations ranging from 506 to 445. These figures underscore the critical influence of these publications in shaping research and advancing the field globally.

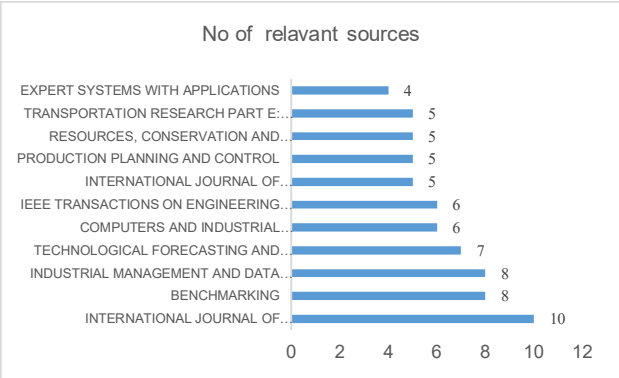


Source: R Studio

Figure 3: Most Cited Documents

Figure 4 offers a summary of the most important sources within a specific source, ranked by the number of published documents. The vertical axis lists key journals, while the horizontal axis shows their article contributions. Leading the field is the International Journal of Production Economics with 10 publications, followed by Benchmarking and

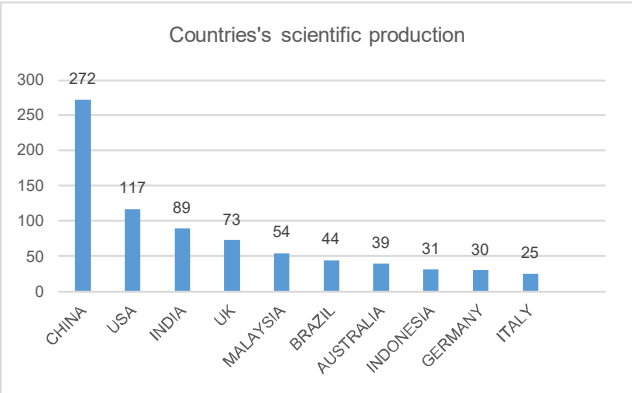
Industrial Management and Data Systems with 8 each. Technological Forecasting and Social Change contributed 7 articles, while Computers and Industrial Engineering and IEEE Transactions on Engineering Management each published 6. Other notable sources, including the International Journal of Logistics Management, Production Planning and Control, Resources, Conservation and Recycling, and Transportation Research Part E: Logistics and Transportation, each contributed 5 articles.



Source: R Studio

Figure 4: Most Relevant Sources

Figure 5 shows global scientific production on LSP competitiveness, with China leading at 272 articles, followed by the USA (117), India (89), and the UK (73). Malaysia has 54 articles, while Brazil, Australia, and Indonesia contribute 44, 39, and 31, respectively. Germany and Italy have lower outputs at 30 and 25 articles. This data indicates a significant disparity, with China's dominance reflecting its strong focus on LSP competition research due to rapid industrialization. The USA, India, and the UK show notable interest but at much lower levels, while Malaysia, Brazil, and Australia demonstrate moderate engagement, and Germany and Italy's involvement remains modest.



Source: R Studio

Figure 5: Countries' Scientific Production

4.3. Word Cloud

In bibliometric analysis, a "word cloud" serves as a visual representation of text data, where the size of each word reflects its frequency or significance within the dataset (Aria & Cuccurullo, 2017). Word clouds are effective tools for quickly identifying essential themes and concepts in research literature. In the context of the theme of "competitiveness," word clouds highlight the most frequently used terms in articles, revealing key themes and emerging trends. Certain words emphasize important characteristics and concepts related to the competitive landscape of LSPs. The most repeated phrases include "supply chain management", "resource-based view," "competitive advantage", and "sustainability." Additionally, terms like 'big data analytics,' 'technology adoption', 'digital transformation', 'knowledge management,' 'big data,' 'Industry 4.0,' 'service quality,' and 'firm performance' are displayed in varying sizes and colors, reflecting their frequency of occurrence related to competitiveness, thus providing a comprehensive view of the prevalent ideas in the field (Figure 6).

Source: R Studio

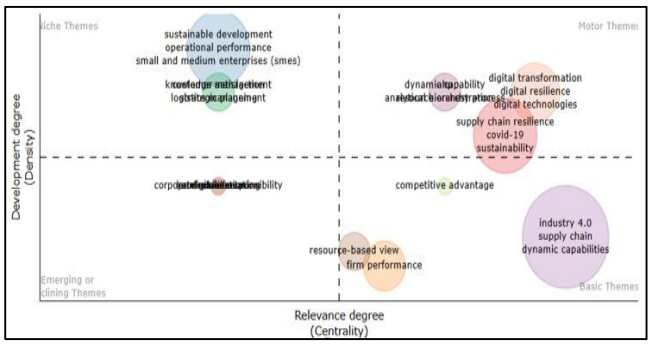
Figure 6: Word Cloud

5. Discussion and Future Research

5.1. Thematic Map of Trends in LSP's Competitiveness

The Thematic Map in Biblioshiny is a valuable data visualization tool that effectively displays research topics and trends within a specific field (Cobo et al., 2011). Figure 7 illustrates the relationships between different topics by analyzing their frequency and associations within research documents and identifies prominent topics evolving research trends over time. Niche themes (Quadrant 3) consist of well-established topics with high frequency and a long research presence. In contrast, emerging or declining themes (Quadrant 4) include classic topics that, while historically significant, are less frequently studied and no longer attract strong interest, though they may still inform newer research. On the other hand, the Basic themes (Quadrant 2) consist of less prominent and new topics that

have not yet garnered much attention in the research community.



Source: R Studio

Figure 7: Thematic Map

The core themes (Figure 7) suggest that sustainability, digital transformation, and dynamic capabilities are increasingly interconnected and central to research.

5.1.1. Sustainability

Positioned as a Niche Theme, sustainability emphasizes operational performance for small and medium enterprises (SMEs). Its thematic evolution increasingly connects to supply chain resilience and sustainable development, highlighting its relevance in addressing contemporary challenges. By adopting sustainable practices, LSPs can enhance cost efficiency, comply with regulations, meet customer preferences, drive innovation, improve brand reputation, and manage risks effectively. Those that prioritize sustainability are more likely to succeed in an increasingly competitive and environmentally conscious marketplace (Karia, 2022). The creation of metrics and tools for evaluating the environmental impact of logistics services has become a significant research focus. Researchers have been developing assessment frameworks that allow businesses to measure and improve their sustainability performance (Björklund & Forslund, 2018). According to Karia (2022), various policies and regulations concerning sustainable logistics services can either facilitate or obstruct the implementation of sustainable practices in companies. Other authors propose that methods such as green transportation and sustainable packaging not only mitigate environmental impacts but also create competitive advantages for businesses (Desiderio et al., 2022) or motivate the use of recycled materials in packaging, and optimizing delivery routes to reduce emissions (Zhou et al., 2023).

5.1.2. Digital Transformation

This theme, categorized as a Motor Theme, is linked to keywords like digital technologies and supply chain resilience, demonstrating high centrality and density in reshaping supply chains. Since 2018, digital transformation has emerged prominently, connected with Industry 4.0 and innovation. Digitization offers essential data that supports digitalization and transformation processes. However, digital transformation extends beyond mere digitalization; it represents a fundamental shift in how organizations utilize digital technologies to achieve significant improvements for all stakeholders. This shift may involve new digital platforms, methods, cultures, strategies, and structures (Yoo et al., 2012; Yaqub et al., 2023). In the context of Logistics 4.0 digital transformation plays a critical role in enhancing the competitiveness of logistics service providers. It does so by improving operational efficiency, enhancing customer experience, enabling data-driven decision-making, increasing agility, fostering innovation, and reducing costs (Chi et al., 2018; Papaevangelou & Tsarouhas, 2024), maintaining online and offline services and on site-products to the customer (Puriwat & Tripopsakul, 2021). This integration drives value creation, enhances competitive capabilities, and reshapes the management and service behavior of logistics service providers (LSPs) toward sustainability. Additionally, digital acts as a catalyst for innovation, helping to restructure business models and drive creativity (Vial, 2021), business strategy, fully integrated into the organization (Bharadwaj et al., 2013). Furthermore, digital technology enhances customer experience by creating digital tools and platforms that improve interaction and value for customers (Verhoef et al., 2021). Additionally, sharing effective information among channel members enhances collaboration, further increasing competitiveness and ultimately leads to better customer service. Technology resources are vital to achieve a higher level of LSPs performance, as they can raise logistics competitiveness, increase innovation capacity, reduce costs, and improve service levels (da Silva et al., 2023).

5.1.3. Dynamic Capabilities

This topic is identified as a "Motor Theme," emphasizing the adaptability and optimization of company resources in a dynamic business environment. In the context of logistics 4.0, particularly following the COVID-19 pandemic, resource management strategies for supply chains focus on dynamic capabilities and sustainable resource practices to maintain the competitive edge of LSPs. In a rapidly changing business landscape, LSPs must be flexible in their resource management, integrating resources and innovating towards strategic solutions (Karman & Savanevičienė, 2020; Zhang et al., 2022). Companies with strong dynamic capabilities are better positioned to thrive in a fluctuating market, as their innovative capacity enables them to quickly respond to emerging trends and customer

demands. Fostering a culture of innovation within the organization is essential for sustaining and enhancing this capability (Linden et al., 2018). Additionally, collaborating with stakeholders, such as technology providers and customers, is vital for enhancing innovative capabilities (Prataviera et al., 2023).

5.1.4. The relationship among themes

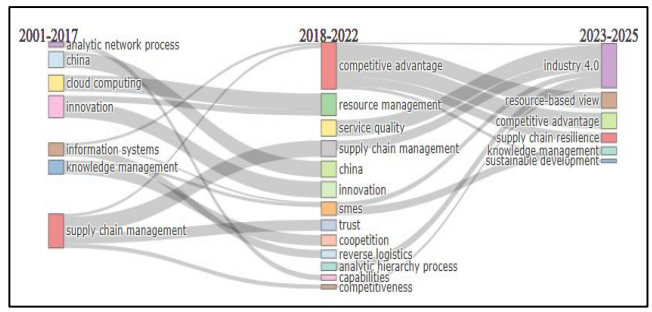
The topic of "sustainability and "digital transformation" is closely interconnected. Digital transformation, particularly in the context of Industry 4.0, involves the use of digital technologies such as AI and blockchain (Wamba et al., 2017; Niyawanont & Wanarat, 2021; Wang et al., 2023), which enhance the quality of logistics services and improve service processes while moving toward sustainable practices. Innovative technologies have also facilitated the acceptance of sustainable service models, such as green transportation and recyclable packaging, by customers (Zhao, 2020; Pan et al., 2021). These technologies streamline transaction processes with customers, reduce waste, and enhance quality, thereby improving overall company performance (Nagariya et al., 2021). To achieve these outcomes, it is essential to foster a culture of change and adapt technology to enhance the innovative capabilities of LSPs in a VUCA environment, enabling them to better meet customer demands. Therefore, cultivating a culture of innovation and shifting organizational mindsets are crucial (Linden & Teece, 2018).

5.1.5. Dynamic Capabilities and Digital Transformation

The topic of "Dynamic Capabilities and Digital Transformation" highlights a closely interconnected and reciprocal relationship. Following the COVID-19 pandemic, logistics service providers (LSPs) have recognized the necessity for adaptive and flexible innovation in a volatile environment to enhance supply chain agility. This involves incorporating digital tools that help organizations adapt to disruptions. Dynamic capabilities enable LSPs to respond effectively to changes by developing strategies that prevent service supply chain disruptions. For instance, the integration of emerging logistics technologies, particularly automation and digitalization (Lu & Ramamurthy, 2011), ensures seamless services and mitigates bottlenecks, thus improving the overall service supply chain. Thanks to their dynamic capabilities, LSPs can identify their strengths and limitations, allowing for appropriate resource allocation and the implementation of supply chain solutions that align with sustainable goals in a digital service context (Teece, 2007; Lee & Fu, 2024; Feng et al., 2024). Additionally, it is important to emphasize the role of dynamic capabilities in fostering collaborative learning and technological adaptation (Mansouri et al., 2022), which empowers LSPs to enhance their competitive edge.

5.2. Thematic Evolution

Thematic revolution (Figure 8) refers to the core themes and topics related to research on the competitiveness of LSPs over time (Aria & Cuccurullo, 2017). The analysis, using Biblioshiny, presents data across three distinct time periods: 2001–2017, 2018–2022, and 2023–2025.



Source: R Studio

Figure 8: Thematic revolution

From 2001 to 2017, the initial phase of supply chain management and logistics concentrated on foundational concepts and methodologies. Key themes included the Analytic Network Process, emphasizing decision-making frameworks and process optimization, the growing role of China in global supply chains; the emergence of cloud computing technologies for supply chain integration (Mathauer & Hofmann, 2019); and the exploration of innovation as a driver of competitive advantage. A related topic that supports the emphasis on supply chain management (Mansouri et al., 2022) is the integration of information systems and knowledge management, aimed at improving information sharing and enhancing process efficiency.

During 2018-2022, the core themes specialized and diversified, reflecting the growing complexity of global supply chains. According to Ozbekler and Ozturkoglu (2020), resource management and service quality emphasize the importance of operational efficiency and customer satisfaction. Additionally, following COVID-19, "supply chain resilience" emerged as a core theme, urging companies to adopt strategic measures to adapt to the challenges (Baştuğ & Yercan, 2021). Noorliza (2021) highlighted the quality of service in relation to the dynamics of trust and coopetition, particularly concerning reverse logistics and sustainability in terms of the environment.

Between 2023 and 2025, emerging trends are driven by technological advancements and global challenges. Industry 4.0, in relation to advanced digital technologies such as the Internet of Things (IoT), Artificial intelligence (AI), Blockchain and automation, has significantly impacted the transformation of supply chains (Barreto, 2010; Nagariya et

al., 2021). Themes such as supply chain resilience and sustainable development, which focus on integrating sustainability into supply chain practices, have garnered increasing attention from researchers (Desiderio et al., 2022). Furthermore, knowledge management emphasizes the importance of knowledge sharing and learning as essential enablers of innovation (Mao et al., 2016).

5.3. Future Research

Digital transformation drives competitive strategy for LSPs by connecting logistics services aimed at sustainability with dynamic capabilities. Given that LSPs are inherently tasked with delivering services tailored to diverse customer demands and a wide range of goods, digital transformation is essential for building their competitive edge. In the era of Logistics 4.0, the emergence of various digital technologies necessitates that LSPs adapt their services, management practices, and employee training to foster connections to supply chain resilience and Industry 4.0. The adoption of technological innovations must be considered at different levels and stages, depending on the scale of the services provided by LSPs. The challenge lies in achieving profitability while enhancing service quality at the lowest possible cost, making comprehensive digital transformation vital for companies—from shifting mindsets to creating actionable plans. LSPs need to identify service types that align with technologies such as artificial intelligence, blockchain, IoT, and big data analytics (Wamba et al., 2017). In a dynamic service provision environment where the service supply chain must remain uninterrupted (Akoğlu et al., 2022), LSPs must make informed decisions regarding operational software and management organization to reduce costs, improve service quality, and enhance customer satisfaction (da Silva et al., 2023).

Digital transformation is an inevitable trend for logistics service providers (LSPs) in the era of Logistics 4.0. For this transformation to be implemented, LSP managers must evaluate the level of service operations within their companies and their market share in the broader context. Digital transformation is not merely about new software or technologies applied to service delivery; it requires a comprehensive view that encompasses management, employees, and resources of the LSP. For small-to-medium enterprises (SMEs), applying the latest technologies such as artificial intelligence (AI) or blockchain presents challenges, as does integrating digital systems. According to Ben-Daya, Hassini and Bahroun (2019), resources of SMEs, such as capital and risk, pose obstacles to implementing digital technologies. Additionally, the digitization of services can impact on the workforce, the capacity to adopt digital technologies, and the skill levels of employees (Ajayi & Udeh, 2024), all of which are critical considerations for LSPs. Furthermore, the culture of accepting digital technology can also be a barrier (Cichosz et al., 2021).

6. Conclusions

Through bibliometric analysis (biblioshiny), the study has identified trends related to the competitiveness of LSPs in the context of Logistics 4.0. The main trends include the rise of digital transformation, an increasing focus on sustainability, and dynamic capabilities in supply chain resilience. The study highlights the importance of digital transformation in LSPs in adapting their services, management practices and human resources. However, the research has limitations and lacks comprehensive analysis from various data sources. This provides an opportunity for the authors to explore deeper into the factors affecting competitiveness in the logistics industry, helping companies develop effective strategies to manage a more complex and competitive environment in the future. Challenges remain, especially regarding the limited use of advanced technologies such as Internet of Thing (IoT), cloud computing, AI and Blockchain among small to medium-sized LSPs, primarily due to financial constraints, skill shortages, and lack of engagement awareness. The results offer important insights for researchers and practitioners aiming to optimize logistics operations amid digital transformation. Future studies should concentrate on evaluating the adopting of digital technologies in services and the level of awareness among human resources in LSPs.

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