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Overview of research on the decision to use and outsource logistics services

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Abstract
This paper offers a comprehensive overview of research on the decision to use and outsource logistics services, employing Vos-Viewer for bibliometric analysis. A systematic literature review was conducted to evaluate studies published between 2010 and 2023, gathering articles from databases such as EBSCO, Google Scholar, Web of Science (WoS), and Scopus. The review focused on keywords related to logistics service providers, outsourcing, and decision. Additionally, the paper presents and analyzes keyword maps related to logistics outsourcing research and maps identifying countries involved in logistics outsourcing research. The goal is to trace the evolution of research on logistics outsourcing decisions and provide insights into emerging areas for future exploration.

Keywords: Decision, outsource, logistics services

Introduction

The decision to use and outsource logistics services plays a crucial role in the supply chain management strategy of modern enterprises [1]. These decisions not only impact operational efficiency but also have significant effects on costs, service quality, and the sustainability of the entire logistics system. With the rapid growth of logistics services and the fast-paced changes in the global business environment, evaluating and selecting logistics service providers (LSPs) has become a key area of research in the field of logistics and supply chain management [2].

In this context, this paper aims to provide an overview of research related to the decision to use and outsource logistics services, utilizing Vos-Viewer for bibliometric analysis. A systematic literature review was conducted by surveying studies published between 2010 and 2023, drawn from databases such as EBSCO, Google Scholar, Web of Science (WoS), and Scopus. Selected papers focused on key keywords such as "logistics service provider," "logistics outsourcing," "third-party logistics" (3PL), and "sustainable logistics." The objective of this study is to trace the evolution of research on logistics outsourcing decisions, identify research gaps, and propose future research directions.

An organization's outsourcing decision is the process through which an organization selects, purchases, and consumes products or services to meet its business needs and goals. This decision is often the result of evaluating and comparing different options, particularly in choosing suppliers, products, or services that can effectively meet the established requirements and criteria [3].

An organization's outsourcing decision typically involves steps such as identifying specific needs and requirements, gathering information on available market options, evaluating and comparing suppliers, negotiating terms and conditions, and ultimately making the purchasing decision. This process may involve various departments and decision-makers within the organization and is often conducted according to specific processes and standards to ensure efficiency and transparency in procurement and resource utilization [4].

Globally, companies are increasingly adopting a variety of outsourcing services. In addition to services in the information technology sector, such as computer maintenance, network installation and management, and office equipment, there is also a focus on outsourcing part-time personnel, management consulting, human resource management, legal-economic consulting, construction, payroll services, accounting, customer services, tax reporting, training, healthcare, security services, office cleaning, translation services, warehousing,

asset and machinery outsourcing, and transportation services, particularly in the logistics sector.

Many authors argue that the perceived benefits of outsourcing are the strongest factors influencing attitudes and outsourcing decisions in companies [5]. Because each organization has limited resources, companies can leverage external resources-professional third-party logistics providers (3PLs)-to reduce operational costs. Indeed, cost savings are considered a primary reason for outsourcing, especially given the fierce competition, as it enhances a company's competitive advantage [6]. Companies can also take advantage of external resources to alleviate the burden of their internal workforce, streamline personnel, and optimize time, money, and other resources to focus on core activities. Research by Marr (2005) shows that over 82% of companies in Europe, Asia, and North America use these services, with around 10% of companies reporting satisfaction with the cost savings and a 50% reduction in management levels. According to Jennings (2002), companies can save an average of 15-25% compared to doing it in-house. Monica (2006) also found that companies save 10-20% in costs, with about 50% of companies reporting that their cost-saving goals were met and labor productivity improved [7, 8].

Outsourcing also helps companies reduce investment costs and increase the ability to convert fixed costs into variable costs [9]. Instead of companies having to upgrade machinery, equipment, and facilities, they can utilize outsourced resources. This reduction in investment significantly cuts costs for the company [10]. As a result, companies can convert these costs into variable expenses, thereby improving their business efficiency.

Additionally, outsourcing reduces time pressure for managers, allowing them to focus on strategic directions or core activities [9]. With the expertise of service providers, companies can improve operational processes and accelerate the completion of tasks [11]. Service providers can perform tasks more quickly than companies doing them in-house because they must meet specific requirements and deadlines. Moreover, service providers have the experience, tools, and resources necessary to carry out the tasks effectively. To ensure work speed, service providers typically invest more in their staff, providing them with better skills, knowledge, and specialized facilities [12].

Research method

A systematic literature review is the process of identifying and analyzing articles to draw conclusions, thereby identifying research gaps and future opportunities. The literature review is conducted through the following steps:

Step 1: The time frame from 2010 to 2023 is the scope of investigation.

Step 2: Articles are gathered from databases such as EBSCO, Google Scholar, Web of Science (WoS), and Scopus.

Step 3: Search for keywords such as 'logistics service provider', 'logistics service provider selection', 'logistics partner outsourcing', 'logistics service', 'logistics outsourcing', 'third-party logistics provider', 'third-party logistics', '3PL', 'green logistics', 'sustainable logistics', and 'triple bottom line sustainability' from these databases.

Step 4: Articles not related to the topic area are excluded. Articles related to evaluating and selecting logistics service providers are retained. This list is further refined by keeping only the articles published between 2010 and 2023. All articles are classified and analyzed to understand the progress over the past decade.

Step 5: In this final step, research gaps, findings, and directions for future work are identified.

Research results

In Figure 1, the focus is on terms related to the logistics field, with the "logistics service provider" (LSP) as the central keyword, reflecting its importance in both research and logistics practice. The image illustrates keyword clusters, color-coded to represent related thematic groups.

Green Cluster

Focuses on logistics service provider management, with keywords like "logistics service provider," "green logistics," and "system dynamics." This cluster emphasizes the necessity of sustainability and collaboration in logistics, along with optimizing systems to meet modern requirements. Keywords such as "collaboration" and "horizontal collaboration" highlight the importance of partnerships between logistics actors to enhance operational efficiency.

Red Cluster

Connects "supply chain management" to concepts like "innovation" and "technology," reflecting the growing linkage between supply chain management and the rapid development of technology and innovation in the industry. The connection to "sustainable logistics" underscores the environmental trends in logistics, with companies striving for sustainability in their operations.

Blue Cluster

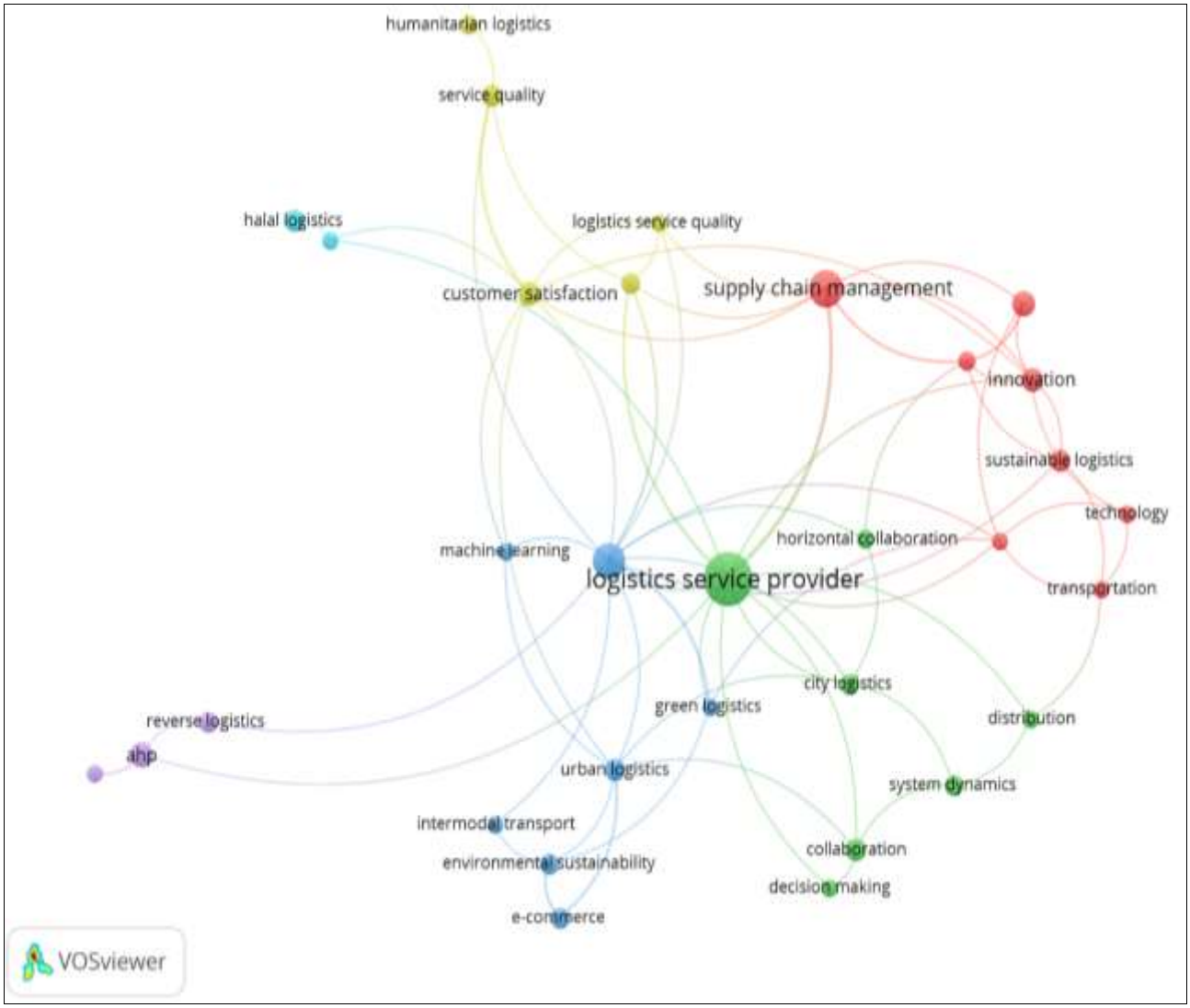
Focuses on urban logistics challenges and solutions, with keywords like "urban logistics" and "environmental sustainability." The application of technologies such as "machine learning" and "e-commerce" in logistics helps optimize supply chains and meet customer demand. These factors contribute to the logistics industry's adaptation and growth in the digital transformation era.

Yellow Cluster

Includes keywords like "humanitarian logistics" and "service quality," highlighting the importance of service quality and customer satisfaction. Humanitarian logistics emphasizes the role of supply chains in disaster relief and community support, where service quality is paramount in addressing urgent needs.

Purple Cluster

Featuring keywords like "reverse logistics" and "AHP" (Analytic Hierarchy Process), this cluster stresses the importance of decision-making processes and optimization in reverse logistics management. This highlights strategies for recycling, managing returns, and improving operational efficiency.



Source: VOS viewer Software Analysis Results

Fig 1: Keyword Map in Research on Outsourcing Logistics Services

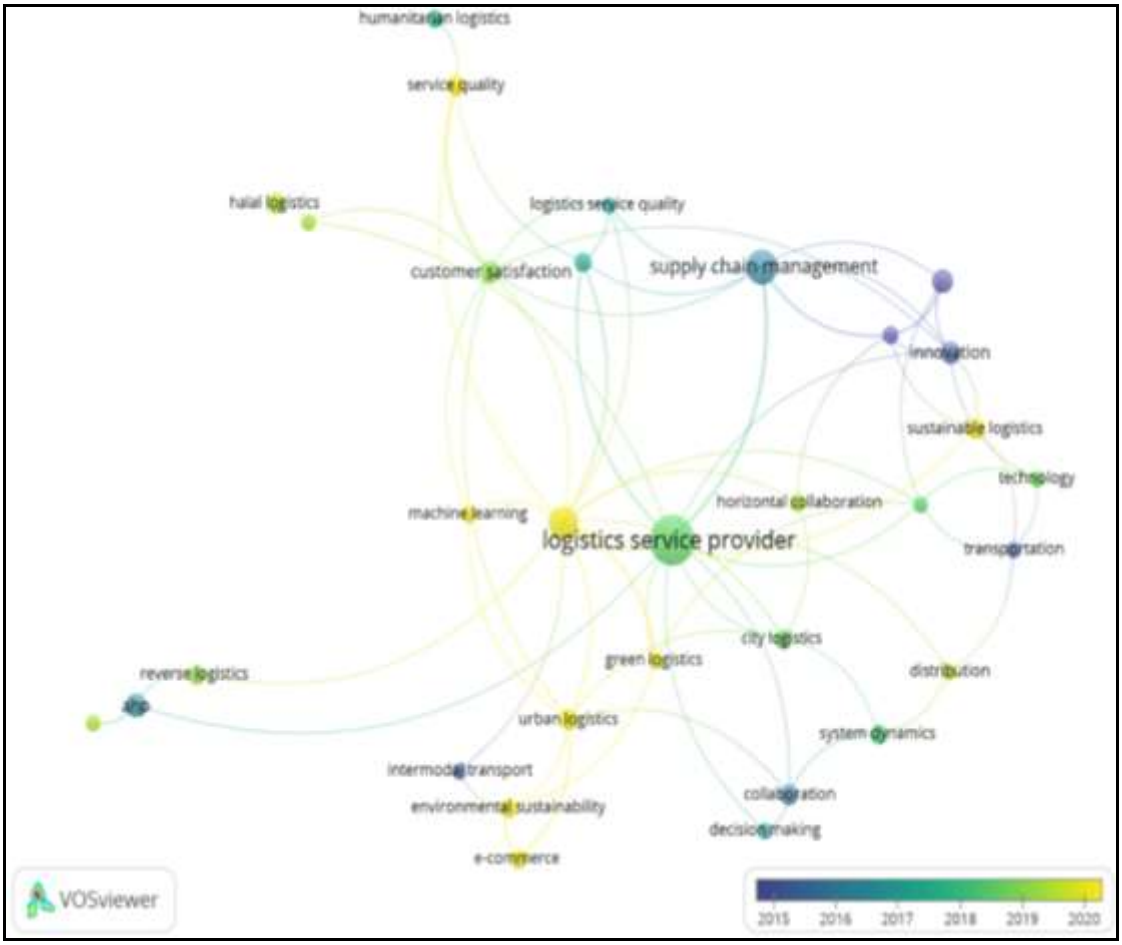
Overall, Figure 1. from VOS viewer clearly and visually illustrates the interconnected elements in the logistics industry. The relationships between logistics service providers, innovation, sustainability, and technology application reflect industry trends. This demonstrates that logistics is becoming increasingly complex and diverse, requiring comprehensive solutions and collaborative strategies for optimal outcomes.

The VOS viewer-generated image shows the evolution of logistics research from 2015 to 2020. Early research (2015-2016) focused on "reverse logistics" and optimization processes. From 2017 to 2024, keywords like "machine learning," "urban logistics," and "e-commerce" emerged, highlighting a shift towards digital technologies. From 2019 onward, there was a strong focus on "innovation" and "sustainable logistics." Additionally, between 2016 and 2018, research on "customer satisfaction" and "service quality" emphasized improving the customer experience in logistics.

Figure 2 not only shows the links between logistics research topics but also reflects the progression of trends over time. The shift in color from dark blue to yellow signals the emergence of new topics and growing interest in advanced technologies, innovation, and sustainability. Recognizing these temporal trends is vital for understanding the driving forces in the future development of the logistics industry.

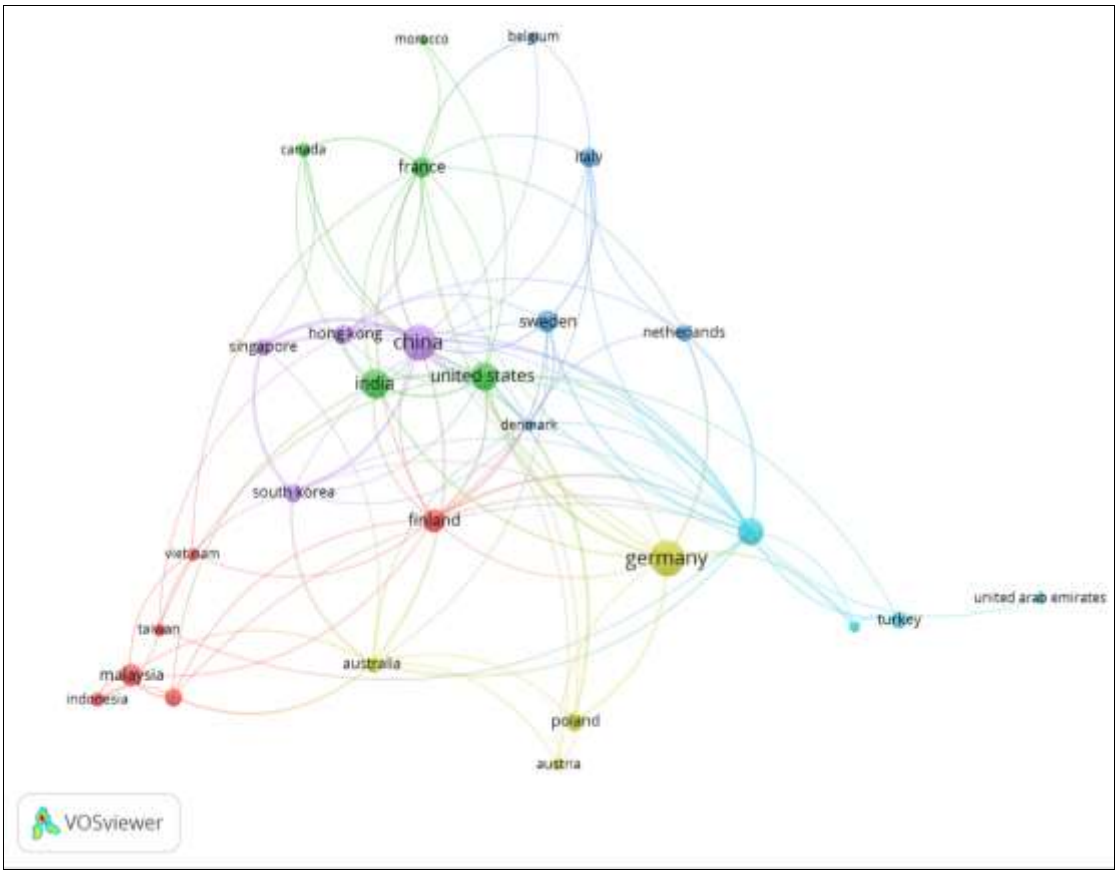
Figure 3 shows that Germany, the United States, and China are the leading countries in research on outsourcing logistics services. Germany stands out for its advanced logistics systems and numerous leading research institutions, focusing on supply chain improvement and cost optimization. Germany's research collaborations are primarily with other European countries such as Italy, the Netherlands, and Sweden.

The United States, with its strong economy and large market, plays a key role in logistics research. The U.S. has widespread research collaborations with countries in Asia and Europe, emphasizing automation and sustainable logistics. China, as a global manufacturing hub, also focuses on logistics optimization and outsourcing services, with research often centered on smart logistics and artificial intelligence. Countries like Vietnam, Indonesia, Taiwan, and Malaysia have limited involvement in outsourcing logistics services research, as evidenced by the small node sizes and weak connections in the network. These countries may face resource constraints, lack of investment from businesses, or limited international collaboration capabilities. While strategically positioned for logistics development, they have not yet fully leveraged their potential in research and global collaboration.



***Source*:** VOS-viewer Software Analysis Results

Fig 2: Keyword Map in Outsourcing Logistics Service Research by Year



***Source*:** VOS-viewer Software Analysis Results

Fig 3: Map of Countries Conducting Research on Outsourcing Logistics Services

The network shows the distribution of research clusters, often reflecting countries with close economic and strategic ties, such as the European cluster (Germany, Italy, the Netherlands) and the Asian cluster (China, Hong Kong, Singapore). The thickness of the connecting lines reflects the level of collaboration. Strong connections between the U.S., Germany, and China indicate robust cooperation, while thinner lines between Southeast Asian countries reflect less developed collaborative relationships.

Overall, the map highlights the uneven distribution of research and international cooperation in outsourcing logistics services, dominated by developed nations, while developing countries face limitations in participating in the global research network. However, this trend is changing, as countries like China and India begin to emerge as new research hubs. This suggests a shift in research collaboration from the West to Asia, signaling Asia's growing influence in global logistics research.

Conclusion

The analysis of the keyword maps in logistics research clearly highlights the evolving trends and growing complexity of the logistics industry. The interconnected clusters of keywords-ranging from logistics service provider management and supply chain innovation to sustainability, urban logistics, and reverse logistics-demonstrate the industry's ongoing transformation. Research trends from 2015 to 2020 show a shift from traditional optimization processes to a stronger focus on digital technologies, innovation, and sustainability, reflecting the industry's response to market demands and environmental concerns. Furthermore, the global distribution of research shows that while developed countries, such as Germany, the U.S., and China, continue to dominate logistics research, emerging nations in Asia are increasingly becoming influential research hubs. This shift signifies the growing role of Asia in shaping the future of global logistics. As the logistics sector continues to grow in complexity and scope, collaboration and innovation will be essential to drive efficiency and sustainability across the supply chain.

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