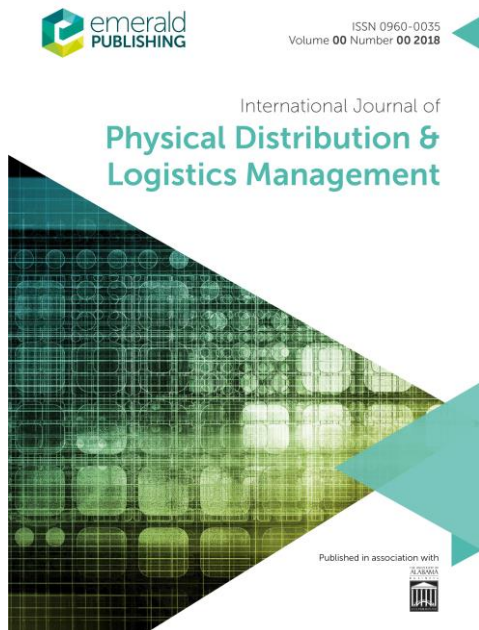


# Digital service innovation: Challenges, issues and opportunities for Logistics and Supply Chain Management



## Overview

Product firms are currently experiencing two significant disruptive changes that are prompting them to place greater emphasis on logistics as a source of competitive advantage (Monios and Bergqvist, 2020). Firstly, digital technologies have facilitated and accelerated direct customer sales (Pizzichini et al., 2023), assuming logistical functions previously managed by wholesalers and retailers (Winkelhaus and Grosse, 2020). E-commerce serves as a prime example of this ongoing transformation, wherein digital infrastructures and the integration processes needed present challenges for logistics firms (Krasnyuk et al., 2021; He et al., 2023). As an instance, Nike has established a robust e-commerce infrastructure that allows customers to purchase products directly from the company. This shift has enabled Nike to assume logistical functions such as inventory management, order fulfilment, and shipping, which were previously managed by wholesalers and retailers. Platforms provide an additional example of how producers can engage directly with consumers, thereby bypassing traditional logistical and retailing functions (Kwark et al., 2017). In like manner, Warby Parker disrupted the traditional eyewear industry by selling glasses directly to consumers through its online platform. By utilizing digital technologies, Warby Parker manages the entire sales process, from virtual try-on features and prescription verification to order fulfilment and direct shipping. We label this concept as online-induced logistics. Secondly, services, particularly knowledge-intensive ones, are reshaping the

focus of logistics from products to people. For example, when GE Power is contracted to service a gas turbine at a power plant in a foreign country, employees are frequently flown in from headquarters to provide these services (Boehmer et al., 2020). More generally, this means that when product companies integrate complex services into their offerings, they are compelled to coordinate the mobilization of personnel closer to the client (Shleha et al., 2023). This concept is known as knowledge logistics (Wijnhoven, 1998). The current special issue aims to integrate these two perspectives—online-induced logistics and knowledge-based logistics—in the disruption of digital services, more widely known as Digital Service Innovation (DSI).

Underpinned by the literatures on servitization (Vandermerwe and Rada, 1988), technological innovation (Christensen, 1995), and digitalization (Rai et al., 2006), DSI has emerged as a new paradigm of industrial competitiveness to boost value creation in business ecosystems (Opazo-Basáez et al., 2022). It represents a new and independent paradigm in service research, drawing on an increasingly established literature to consolidate its narrative while also being open to non-production business contexts and other ontologies (Opazo-Basáez et al., 2024a). Concretely, DSI arises from an updated and innovative perspective on service provision, in which both the service offering and the technological components that support it conform to a single entity that can be adapted in terms of both the service itself and the technology it relies on (Narvaiza et al., 2023). Hence, DSI represents a pioneering source of technological innovation in which digital technologies, interconnectivity, data and learning promote the development of new digital service offerings (based on analytic patterns) in multiple business contexts, enabling firms to align business model component configurations dynamically with users'/customers' needs (Rabetino et al., 2023).

Although recent literature recognizes the potential of DSI to enhance operation processes, innovation capacity, customer-supplier relationships and environmental performance (Kowalkowski, 2023; Opazo-Basáez et al., 2023, 2024b), there is a scarcity of literature regarding the potential of DSI to promote efficiency and effectiveness in logistics and supply chain management (L&SCM). However and even though there are calls and emerging research considering the role of digitalization in L&SCM (e.g., Albrecht et al., 2023; Modica et al., 2023), these do not specifically center on the role of digital service innovation; i.e., how new digital technologies can boost service delivery across business settings. This can be attributed to the recent emergence of DSI as an academic concept and/or the dispersion of its research across service management and technological innovation research streams—streams that are merged by the DSI concept (Opazo-Basáez et al., 2022). Something that highlights the need to thoroughly investigate this new digitally-enhanced service paradigm and its repercussions, even more so, considering its feasible co-existence and convergence with innovative business concepts such as Industry 4.0 (Hofmann et al., 2019), Logistics 4.0 (Winkelhaus and Grosse,

2020), Smart logistics (Ding et al., 2021), and Green logistics (Jazairy et al., 2021), to name a few. By drawing on the literature on service innovation (Singh et al., 2020) and digital servitization (Gebauer et al., 2021), we assert that DSI represents an innovative strategy in L&SCM. This is because it can provide product firms with the necessary means to effectively (re)adapt their operations in response to the individualized demands of consumers/users, leading to continuous innovation in logistics service provision (Rabetino et al., 2023; Opazo Basáez et al., 2024a), including online-induced logistics (e.g., e-commerce fulfillment and shipping solutions services) and knowledge-based logistics (e.g., mobile workforce of logistics professionals) and beyond (e.g., their combinations). As a result, this could enable logistics firms to respond individually and innovate (both operations and services) based on consumer needs and technological opportunities, ultimately leading to an enhanced service experience for their consumers and, consequently, greater value creation (Vargo et al., 2024).

Accordingly, a primary goal of this special issue is to specifically elucidate the existing, and so far, vaguely analyzed, relationship between DSI and L&SCM, to thus unravel the nature and significance of this relationship in logistics organizations and operations. Therefore, its main focus is to connect these research streams and promote the development of this research direction from the logistics viewpoint encompassing multiple areas such as logistics services, supply chain services, servitization, service innovation, and service management, among others. In addition, this special issue aims to expand knowledge by providing insights into the challenges, issues, and opportunities of DSI for L&SCM. As a result, the second main focus of this special issue is on theory building and understanding how DSI impacts L&SCM differently across (i) resources, sectors, and contexts, (ii) the organizational information processing requirements and structures involved in DSI-enabled L&SCM contexts, and (iii) the institutional factors (such as systems, structures, functions, practices, and culture) that could either facilitate or hinder the success of DSI in L&SCM. Consequently, we contemplate four main areas for contribution:

- **Resources, sectors, and contexts** : The literature demonstrates significant differences in the technological adoption capacity among companies of varying sizes, that is, small, medium, and large (Mathauer and Hofmann, 2019). Furthermore, the adoption of digital technologies appears to be strongly influenced by the specific sector (manufacturing v/s services) and/or region (industrialized v/s industrializing) in which a company operates (Schmidt et al., 2021). Therefore, understanding the nature and extent of these differences in DSI within L&SCM is essential.
- **Organizational information requirements**: The impact of digital technologies on L&SCM activities has been widely documented in the literature (Richey et al., 2023; Zhou et al., 2023). Among the benefits derived from their implementation, it is worth

highlighting their ability to enable the collection, transmission, and sharing of information in a fast, reliable, and secure manner (Pereira et al., 2021). This capability allows companies to optimize inventory holding costs, reduce delivery times, and improve replenishment and forecasting (Kucukaltan et al., 2022), thereby helping logistics firms, including logistics service providers (LSPs) and third-party logistics (3PLs), make timely decisions on how to monitor, route, and deliver goods to their customers (Mathauer and Hofmann, 2019; Rey et al., 2021). However, while L&SCM literature has made an effort to scrutinize the potential of emerging digital technologies, such as artificial intelligence (AI), internet-of-things (IoT), Big Data (BD), etc., on logistics processes (Guida et al., 2023; Zhan et al., 2022), little, if anything, is known about the technological requirements necessary to leverage the adoption of DSI in L&SCM fully. Therefore, it is necessary to understand the technological requirements that play a pivotal role in the implementation and execution of DSI within L&SCM.

- **Institutional factors:** It is highly relevant to examine which organizational factors would yield the best fit between DSI and L&SCM (Marcon et al., 2022). Additionally, it is important to investigate whether DSI can create tensions in L&SCM processes and activities, potentially leading to a paradox of DSI (Gebauer et al., 2005). In this regard, it is crucial to elucidate whether the transition to the DSI arena could bring positive outcomes or could also lead to problems for logistics organizations, such as structural inertia, third-party or technological dependency, or the inability to access the necessary talent to realize the expected benefits of DSI within L&SCM.
- **Placing logistics at the forefront:** This involves examining multiple strategies adopted for L&SCM that increase firm agility and competitiveness (Pfaff, 2023). It is critical to analyze how product firms use digital technologies and services to enhance value extraction (Monios and Bergqvist, 2020; Winkelhaus and Grosse, 2020). This process requires a shift within the company, transitioning from externalizing logistics functions to retailers, to adopting a more internalized focus on logistics. Additionally, it is important to analyze how LSPs offer digital capabilities to optimize the supply chain and streamline workflows and processes for other businesses. This includes automating logistics tasks, speeding up order fulfillment and shipping, and connecting online stores to fulfillment centers for efficient retail fulfillment (Cichosz et al., 2020). Finally, it is crucial to investigate the technological and organizational needs of enterprises that employ a combination of proprietary logistics and third-party logistics to oversee their supply chain, shipping, and delivery operations. This often involves collaboration with a freight forwarding entity, the utilization of warehouse services for inventory control, and the integration of digital technologies to enhance transportation strategies (Aslam et

al., 2023; Nand et al., 2023). These strategic considerations position logistics as a central source of competitive advantage.

The Guest Editors invite papers with an original perspective and advanced thinking on DSI challenges, issues and opportunities for L&SCM.

In line with the scope of the IJPDLM, we invite contributions that address these research issues empirically while also offering innovative theoretical perspectives and insights for L&SCM. Quantitatively oriented mathematical and modeling research papers are considered out of scope and not suitable for IJPDLM

This special issue is restricted to original contributions that have not been published yet and are not under consideration by any other journal. Also, this special issue is connected – but not restricted – to the International Conference on Business Servitization (ICBS). The participants of the 11th ICBS to be held on Nova SBE (Lisbon) on November 7-8, 2024, are invited to submit their work on the theme of this special issue. This should be considered a valuable opportunity to engage with the guest editors, who will be available to discuss the themes of this call in depth and to provide guidance on better aligning the authors' proposals with the special issue. Attending the conference is neither a prerequisite nor a guarantee for publication in the special issue.

### **List of topics**

All researchers worldwide working on the abovementioned topics are also invited to contribute. Such studies might be focused on, but not limited to, the following areas of research and related topics. In all research areas, DSI connection to L&SCM is mandatory. Theoretically-sound and empirically-based papers are encouraged for submission. Moreover, we recommend that authors explicitly pay attention to the managerial implications of their findings for theory development, as this holds significant importance for the IJPDLM audience. Only papers that explicitly integrate digital service innovation with supply chain management and logistics will be considered for this special issue. Additionally, literature reviews or purely conceptual papers will not be accepted; contributions are expected to include an empirical component. As a guidance we expect these papers to follow one (or more) of these empirical designs:

- Empirical case studies examining fundamental principles required for the orchestration and oversight of DSI within L&SCM operations, catering to both domestic and global contexts.
- Qualitative studies (e.g., grounded theory) aimed at comprehensively understanding the mechanisms that cause DSI to influence L&SCM operations. This may include single or

comparative case studies that depict how firms transition into online-induced and/or knowledge logistics enabled by DSI.

- Quantitative studies (e.g., experiments, surveys) analyzing factors leading to DSI adoption. Factors of interest may include the need to transition into online-induced and/or knowledge logistics; or alliances between logistics and manufacturing firms.
- Quantitative studies (e.g., longitudinal, matching) analyzing the impact of DSI adoption on L&SCM outcomes. Outcomes of interest may include improvements in online-induced or knowledge logistics outcomes, better forecast of bottlenecks, or, better management of supply chain disruptions.

Regarding specific topics to be addressed, we are interested in the four main areas discussed above. More particularly, we seek papers that include one or more of the following elements:

- Sectoral, industrial, and/or regional differences, as well as, organizational factors influencing the implementation of DSI in logistics organizations and operations.
- Explore how and when integrating digital-induced and knowledge-based logistic approaches facilitates firms in leveraging new sources of competitive advantage.
- Collaborative production-logistics strategies (Co-creation, Co-innovation, and Co-production) for advancing DSI in L&SCM operations.
- Service innovation strategies (single, dual, and treble) to enhance performance of DSI in logistics service providers operations.
- Examine the role of DSI as an enabler for data-driven decision-making in logistics value chain, including inbound/outbound operations, shipping, and last-mile delivery, among others.
- The role of digital technologies such as Artificial Intelligence, Internet of Things, Blockchain, Machine Learning, and Big Data in DSI for providing flexibility in logistics operations (e.g., end-to-end visibility, streamlining processes such as transportation, warehousing, distribution, processing, and information services). Analysis of how these technologies interact is encouraged.
- Critical technological requirements for adopting and implementing DSI in logistical operations [(e.g., Augmented Reality (AR), Internet of Things (IoT), Cloud Computing (CC), Artificial Intelligence (AI), Digital Twins (DT), RFID, wireless sensor networks, among others.)]

- How can DSI be leveraged to improve resilience and sustainability across distribution and logistics networks.

For a better understanding of the journal expectations and the most common reasons for rejection at IJPDLM, please consider reading the recent [editorial](#) written by Russo and Wong (2024).

### **Submission Information**

Submissions open: 1<sup>st</sup> December 2024

Submissions deadline: 31<sup>st</sup> May 2025

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### **References**

- Albrecht, T., Baier, M. S., Gimpel, H., Meierhöfer, S., Röglinger, M., Schlüchtermann, J., & Will, L. (2023). Leveraging digital technologies in Logistics 4.0: Insights on affordances from intralogistics processes. *Information Systems Frontiers*, 1-20.
- Aslam, J., Saleem, A., & Kim, Y. B. (2023). Blockchain-enabled supply chain management: integrated impact on firm performance and robustness capabilities. *Business Process Management Journal*, 29(6), 1680-1705.
- Boehmer, J. H., Shukla, M., Kapletia, D., & Tiwari, M. K. (2020). The impact of the Internet of Things (IoT) on servitization: an exploration of changing supply relationships. *Production Planning & Control*, 31(2-3), 203-219.

- Christensen, J. F. (1995). Asset profiles for technological innovation. *Research policy*, 24(5), 727-745.
- Cichosz, M., Wallenburg, C. M., & Knemeyer, A. M. (2020). Digital transformation at logistics service providers: barriers, success factors and leading practices. *The International Journal of Logistics Management*, 31(2), 209-238.
- Ding, Y., Jin, M., Li, S., & Feng, D. (2021). Smart logistics based on the internet of things technology: an overview. *International Journal of Logistics Research and Applications*, 24(4), 323-345.
- Gebauer, H., Fleisch, E., & Friedli, T. (2005). Overcoming the service paradox in manufacturing companies. *European management journal*, 23(1), 14-26.
- Gebauer, H., Paiola, M., Saccani, N., & Rapaccini, M. (2021). Digital servitization: Crossing the perspectives of digitization and servitization. *Industrial Marketing Management*, 93, 382-388.
- Guida, M., Caniato, F., Moretto, A., & Ronchi, S. (2023). Artificial intelligence for supplier scouting: an information processing theory approach. *International Journal of Physical Distribution & Logistics Management*, 53(4), 387-423.
- He, P., He, Y., Tang, X., Ma, S., & Xu, H. (2022). Channel encroachment and logistics integration strategies in an e-commerce platform service supply chain. *International Journal of Production Economics*, 244, 108368.
- Hofmann, E., Sternberg, H., Chen, H., Pflaum, A., & Prockl, G. (2019). Supply chain management and Industry 4.0: conducting research in the digital age. *International Journal of Physical Distribution & Logistics Management*, 49(10), 945-955.
- Jazairy, A., von Haartman, R., & Björklund, M. (2021). Unravelling collaboration mechanisms for green logistics: the perspectives of shippers and logistics service providers. *International Journal of Physical Distribution & Logistics Management*, 51(4), 423-448.
- Kowalkowski, C., Wirtz, J., & Ehret, M. (2023). Digital service innovation in B2B markets. *Journal of Service Management*, (ahead-of-print).
- Krasyuk, I., Kolgan, M., & Medvedeva, Y. (2021). Development of an ecosystem approach and organization of logistics infrastructure. *Transportation Research Procedia*, 54, 111-122.
- Kucukaltan, B., Saatcioglu, O. Y., Irani, Z., & Tuna, O. (2022). Gaining strategic insights into Logistics 4.0: expectations and impacts. *Production Planning & Control*, 33(2-3), 211-227.
- Kwark, Y., Chen, J., & Raghunathan, S. (2017). Platform or wholesale? A strategic tool for online retailers to benefit from third-party information. *MIS Quarterly*, 41(3), 763-A17.
- Marcon, É., Soliman, M., Gerstlberger, W., & Frank, A. G. (2022). Sociotechnical factors and Industry 4.0: an integrative perspective for the adoption of smart manufacturing technologies. *Journal of Manufacturing Technology Management*, 33(2), 259-286.
- Mathauer, M., & Hofmann, E. (2019). Technology adoption by logistics service providers. *International Journal of Physical Distribution & Logistics Management*, 49(4), 416-434.



- Modica, T., Colicchia, C., Tappia, E., & Melacini, M. (2023). Empowering freight transportation through Logistics 4.0: a maturity model for value creation. *Production Planning & Control*, 34(12), 1149-1164.
- Monios, J., & Bergqvist, R. (2020). Logistics and the networked society: A conceptual framework for smart network business models using electric autonomous vehicles (EAVs). *Technological Forecasting and Social Change*, 151, 119824.
- Nand, A., Sohal, A., Fridman, I., Hussain, S., & Wallace, M. (2023). An exploratory study of organisational and industry drivers for the implementation of emerging technologies in logistics. *Industrial Management & Data Systems*, 123(5), 1418-1439.
- Narvaiza, L., Campos, J. A., Martín-Peña, M. L., & Díaz-Garrido, E. (2023). Characterizing digital service innovation: phases, actors, functions and interactions in the context of a digital service platform. *Journal of Service Management*, (ahead-of-print).
- Opazo-Basáez, M., Monroy-Osorio, J. C., & Marić, J. (2024b). Evaluating the effect of green technological innovations on organizational and environmental performance: A treble innovation approach. *Technovation*, 129, 102885.
- Opazo Basáez, M., Vendrell-Herrero, F., Bustinza, O. F., & Raddats, C. (2024a). Guest editorial: Digital service innovation: ontology, context and theory. *Journal of Service Management*, 35(2), 129-140.
- Opazo-Basáez, M., Vendrell-Herrero, F., & Bustinza, O. F. (2022). Digital service innovation: a paradigm shift in technological innovation. *Journal of Service Management*, 33(1), 97-120.
- Opazo-Basáez, M., Vendrell-Herrero, F., Bustinza, O. F., Vaillant, Y., & Marić, J. (2023). Is digital transformation equally attractive to all manufacturers? Contextualizing the operational and customer benefits of smart manufacturing. *International Journal of Physical Distribution & Logistics Management*. 53(4), 489-511
- Pfaff, Y. M. (2023). Agility and digitalization: why strategic agility is a success factor for mastering digitalization—evidence from Industry 4.0 implementations across a supply chain. *International Journal of Physical Distribution & Logistics Management*, 53(5/6), 660-684.
- Pereira, V., Narayanamurthy, G., Ishizaka, A., & Yassine, N. (2021). Decision making in logistics management in the era of disruptive technologies. *The International Journal of Logistics Management*, 32(2), 305-319.
- Pizzichini, L., Temperini, V., Caboni, F., & Papa, A. (2023). The role of digital knowledge servitization in supply chain management. *International Journal of Physical Distribution & Logistics Management*, 53(5/6), 589-611.
- Rabetino, R., Kohtamäki, M., & Huikkola, T. (2023). Digital service innovation (DSI): a multidisciplinary (re) view of its origins and progress using bibliometric and text mining methods. *Journal of Service Management*, (ahead-of-print).
- Rai, A., Patnayakuni, R., & Seth, N. (2006). Firm performance impacts of digitally enabled supply chain integration capabilities. *MIS quarterly*, 225-246.
- Rey, A., Panetti, E., Maglio, R., & Ferretti, M. (2021). Determinants in adopting the Internet of Things in the transport and logistics industry. *Journal of Business Research*, 131, 584-590.

- Richey Jr, R. G., Chowdhury, S., Davis-Sramek, B., Giannakis, M., & Dwivedi, Y. K. (2023). Artificial intelligence in logistics and supply chain management: A primer and roadmap for research. *Journal of Business Logistics*, 44(4), 532-549.
- Russo, I. and Wong, C.Y. (2024), "Editorial: Navigating excellence: understanding and overcoming common causes of manuscript rejections in logistics and supply chain management research", *International Journal of Physical Distribution & Logistics Management*, Vol. 54 No. 2, pp. 211-228
- Schmidt, M. C., Veile, J. W., Müller, J. M., & Voigt, K. I. (2021). Ecosystems 4.0: redesigning global value chains. *The International Journal of Logistics Management*, 32(4), 1124-1149.
- Shleha, W., Vaillant, Y., & Vendrell-Herrero, F. (2023). Entry mode diversity and closing commercial deals with international customers: the moderating role of advanced servitization. *International Business Review*, 32(1), 102053.
- Singh, S., Akbani, I., & Dhir, S. (2020). Service innovation implementation: a systematic review and research agenda. *The Service Industries Journal*, 40(7-8), 491-517.
- Vandermerwe, S., & Rada, J. (1988). Servitization of business: adding value by adding services. *European management journal*, 6(4), 314-324.
- Vargo, S. L., Fehrer, J. A., Wieland, H., & Nariswari, A. (2024). The nature and fundamental elements of digital service innovation. *Journal of Service Management*, 35(2), 227-252.
- Wijnhoven, F. (1998). Knowledge logistics in business contexts: analyzing and diagnosing knowledge sharing by logistics concepts. *Knowledge and Process Management*, 5(3), 143-157.
- Winkelhaus, S., & Grosse, E. H. (2020). Logistics 4.0: a systematic review towards a new logistics system. *International Journal of Production Research*, 58(1), 18-43.
- Zhan, J., Dong, S., & Hu, W. (2022). IoE-supported smart logistics network communication with optimization and security. *Sustainable Energy Technologies and Assessments*, 52, 102052.
- Zhou, H., Wang, Q., Wang, L., Zhao, X., & Feng, G. (2023). Digitalization and third-party logistics performance: exploring the roles of customer collaboration and government support. *International journal of physical distribution & logistics management*, 53(4), 467-488.