Invited Session Proposal – MIM 2025

IMPLEMENTING LOGISTICS 5.0: APPROACHES FOR ADVANCING SUPPLY CHAIN SYSTEMS

Keywords: Industry 5.0, Logistics 5.0, Industry 4.0, supply chain management, human-centricity, sustainability, resilience, performance

Short Presentation

Logistics 5.0 is an emerging concept that represents the next stage of evolution within logistics and supply chain management. It combines cutting-edge technologies, often taken from the Industry 4.0 solutions (e.g., AI, IoT, Blockchain, etc.), with sustainability principles, resilience, and a human-centered approach. This concept builds upon the foundations of Industry 5.0, which emphasizes collaboration between humans and machines to create smarter, resilient, and sustainable supply chains able to anticipate and mitigate risks effectively. Industry 5.0 promotes the integration between workers and machines, fostering a more adaptive and responsive environment. Additionally, Logistics 5.0 promotes the deployment of technologies that reduce waste, lower carbon footprints, enhance energy efficiency, and support a circular economy by optimizing resource use throughout the supply chain. Logistics 5.0 offers significant opportunities, but it also comes with technological, operational, and ethical challenges. The transition from Logistics 4.0 to 5.0 involves a complex integration of advanced technologies, which can lead to operational disruptions and increased costs during the adaptation phase. As companies must guarantee compliance with regulations while ensuring effective technology utilization, this might raise data privacy concerns. From an operational point of view, on the one hand, current supply chains often struggle with visibility and trust among stakeholders, which can be exacerbated by the introduction of new technologies without adequate frameworks. On the other hand, the workforce must develop new digital skills to effectively interact with advanced technological systems, which can be a barrier to their implementation. Finally, while Logistics 5.0 emphasizes human-centricity, there is a risk of neglecting human factors in favor of automation, potentially leading to job displacement and ethical dilemmas.

However, as the practical implementation of the Industry 5.0 notion itself is still not well established, clear approaches about how to achieve Logistics 5.0 are currently missing in scientific literature.

This invited session would like to bring together researchers and practitioners to develop a comprehensive exploration of how the Industry 5.0 notion, and its three constituting pillars, human-centricity, resilience, and sustainability, can be practically applied to logistics and supply chain systems and how they can improve their performances.

As such, the goal of this session is to contribute to the design and management of logistics and supply chain systems that can advance the theoretical concept of Logistics 5.0 and put it into practical use to improve the effectiveness of procurement, warehousing, material handling, delivery, and reverse logistics processes. We welcome high-quality contributions, such as

literature reviews, conceptual frameworks, and case studies, related, but not limited to, the following topics:

- Supply chain design and management based on Industry 5.0 principles.
- Supply chain resilience based on Industry 5.0 principles.
- Implementation of sustainable, energy efficient and green logistics practices.
- Design of logistics equipment compliant with Industry 5.0 principles.
- Assessment of Industry 5.0 effect on the performance of logistics systems.
- Development of digital skills in logistics workforce.
- Regulatory and compliance issues in Logistics 5.0.
- Ethical and social implications of Logistics 5.0

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