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A BOOK

ON

NATIONAL LOGISTICS POLICY-2022 TRANSFORMATION IN LOGISTICS SECTOR

Contents

MOVING FROM INDUSTRY 4.0 TO INDUSTRY 5.0: ANALYSING THE IMPLICATIONS ON THE LOGISTICS SECTOR

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ABSTRACT

The emerging concept of Industry 5.0 has pushed forward the research frontier of the technology-focused Industry 4.0 to a smart and harmonious socio-economic transition driven by both humans and technologies, where the role of the human in the technological transformation is predominantly focused on. Several studies discuss the impacts of disruptive technologies on smart logistics operations in Industry 4.0. However, since Industry 5.0 is a new concept and still in its infancy, its implications for smart logistics have not been discussed. Methods: To fill this gap, this paper presents shows the connection and differences between Industry 4.0 and Industry 5.0 and their implications on logistics. Compared with Industry 4.0, the research of smart logistics in Industry 5.0 puts more focus on the interaction between humans and technology in the digital transition, with the increasing adoption of collaborative technologies, e.g., human-machine systems, collaborative robots, and human-robot collaboration.

INTRODUCTION:

Industry 4.0 defines the fourth industrial revolution. This involved an intelligent, connected industry where we are currently experiencing digital technologies, including Business Intelligence, ERP, IoT, Big Data, Cloud Computing, and Managing data extraction in real-time. Logistics and supply chains within Industry 4.0 can be defined as collaborative cyber-physical systems. Logistics as an industry pops-out in Industry 4.0, which is key to the optimization of supply chains for factories and small organizations. The impact of Industry 4.0 on Logistics 4.0 led to introducing new scope within supply chains that essentially could track the movement of freight and products.

This happened due to the digital technological advances giving transparency to all involved parties, starting from dispatch until the end of the product‘s life cycle. If Logistics 4.0 includes the revolutionary IoT, Big Data, BI & Cloud Computing, then Logistics 5.0 will emphasize reconciling the human & machine, which will further enable the industries to improve the means and efficiency of production. Logistics 4.0 will be complemented by Logistics 5.0 through three pillars of Industry 5.0, i.e., Human Centric, Resilient &

Sustainability. Logistics 5.0 will consider the highly automated, connected & intelligent digital ecosystem to thrive along with a human touch.

INDUSTRY LOGISTICS 4.0:

Industry Logistics 4.0 refers to the digitization and automation of logistics processes using advanced technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), robotics, blockchain, cloud computing, and Big Data Analytics within the industrial sector. The goal of Industry Logistics 4.0 is to make logistics processes more efficient, cost-effective, and reliable. Here are some of the key characteristics of Industry Logistics 4.0:IoT: Industry Logistics 4.0 uses IoT technology to connect physical objects to the internet, enabling real-time data collection and analysis. This allows for greater visibility and traceability in logistics operations.AI: Industry Logistics 4.0 uses AI technology to automate decision-making processes, enabling more efficient and effective logistics operations. Robotics: Industry Logistics 4.0 uses robotics to automate repetitive tasks such as loading and unloading of goods, reducing the need for human labor and increasing efficiency. Blockchain: Industry Logistics 4.0 uses blockchain technology to create a secure and transparent record of transactions, enabling greater trust and accountability in logistics operations. Cloud Computing: Industry Logistics 4.0 uses cloud computing to store and analyze large amounts of data, enabling faster and more efficient logistics operations.

INDUSTRY LOGISTICS 5.0:

Industry Logistics 5.0 is an extension of Industry Logistics 4.0 that goes beyond the integration of advanced technologies to include the integration of human intelligence and creativity. It combines the efficiency of Industry Logistics 4.0 with the human touch of creativity and empathy to achieve higher levels of customer satisfaction and sustainable growth within the industrial sector. Here are some of the key characteristics of Industry Logistics 5.0: Human-Centred Approach: Industry Logistics 5.0 puts humans at the centre of logistics processes, taking into account their needs and preferences to provide personalized logistics solutions. Co-creation: Industry Logistics 5.0 promotes co-creation between logistics service providers, customers, and other stakeholders, enabling the development of innovative and sustainable logistics solutions. Agile Logistics: Industry Logistics 5.0 emphasizes agility in logistics operations, enabling companies to respond quickly to changing market conditions and customer demands. Creativity and Innovation: Industry Logistics 5.0 encourages creativity and innovation in logistics operations, enabling companies to develop unique logistics solutions that meet the needs of their customers. Sustainability: Industry Logistics 5.0 prioritizes sustainability in logistics operations, promoting the use of eco-friendly technologies and practices to reduce the environmental impact of logistics activities. The

benefits of Industry Logistics 5.0 include improved customer satisfaction, increased flexibility, improved product quality, faster response time, enhanced collaboration, increased efficiency, and improved safety. With the implementation of Industry Logistics 5.0, industrial companies can achieve sustainable growth and ensure long-term success in the competitive market.

COMPARATION BETWEEN 4.0 AND 5.0:

Logistics 4.0 and Logistics 5.0 are two terms that refer to the latest advancements in logistics management and supply chain management. While Logistics 4.0 is the current state of the art in logistics, Logistics 5.0 is an emerging concept that builds upon the principles of Logistics 4.0. Here is a comparative study on Logistics 4.0 and Logistics 5.0.

- **DEFINITION**: Logistics 4.0: It refers to the digitization and automation of logistics processes using advanced technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), robotics, and block chain. Logistics 5.0: It refers to the integration of Logistics 4.0 technologies with human intelligence and creativity to achieve higher levels of efficiency and customer satisfaction.
- **FOCUS**: Logistics 4.0: It focuses on optimizing the logistics processes to make them more efficient, cost-effective, and reliable. Logistics 5.0: It focuses on achieving a higher level of customer satisfaction by combining the efficiency of Logistics 4.0 with the human touch of creativity and empathy.
- **KEY TECHNOLOGIES**: Logistics 4.0: IoT, AI, robotics, blockchain, cloud computing, and Big Data Analytics. Logistics 5.0: The same technologies used in Logistics 4.0 with the addition of human creativity, empathy, and collaboration.
- **KEY BENEFITS**: Logistics 4.0: Improved efficiency, reduced costs, enhanced reliability, and increased visibility and traceability in logistics operations. Logistics 5.0: Higher customer satisfaction, improved product quality, faster response to changing market conditions, and greater flexibility in logistics operations. Implementation: Logistics 4.0: The implementation of Logistics 4.0 requires significant investment in advanced technologies, infrastructure, and human resources. Logistics 5.0: The implementation of Logistics 5.0 requires not only advanced technologies but also a culture of creativity, empathy, and collaboration among the logistics workforce.

CONCLUSION:

Industry Logistics 4.0 and Industry Logistics 5.0 are both aimed at improving logistics management and supply chain management within the industrial sector. While Industry Logistics 4.0 focuses on digitization and automation, Industry Logistics 5.0 seeks to integrate

human intelligence and creativity with the latest technologies to achieve higher levels of efficiency and customer satisfaction within the industrial sector. Both concepts require significant investment in advanced technologies, infrastructure, and human resources for successful implementation within the industrial sector.

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