
ISSN: 2321-2152
IJMECE
International Journal of modern
electronics and communication engineering
E-Mail
editor.ijmece@gmail.com
editor@ijmece.com
www.ijmece.com

ISSN 2321-2152
www.ijmece.com
Vol 13, Issue 2, 2025

The Importance of AI for Logistics and Supply Chain Management

[1] Dr. B. Sai Venkata Krishna, [2] T. Rani Rudrama

[1]Assistant Professor, Megha Institute of Engineering & Technology for Women, Ghatkesar.
[2] MCA Student, Megha Institute of Engineering & Technology for Women, Ghatkesar.

Abstract—

The field of supply chain management and international logistics relies heavily on artificial intelligence. In the supply chain, it opens the door to possibilities for cost savings in demand forecasting, buy requirement planning, operations (both within and across departments), and process units, all with the goal of improving the business operations of the individual units and the chain as a whole. offering a leg up in the market via strategic planning for manufacturing, inventory, packaging, shipping, warehousing, distribution planning, customer service, information services, financing, and marketing and sales. There is great potential for AI to improve decision-making and boost efficiency with its remarkable capabilities.

Keywords- Artificial Intelligence; global logistics; supply chain management; decision-making

INTRODUCTION

Intelligent Machines (AI) In the late 1970s, artificial intelligence (AI) was first presented. Learning, reasoning, and perception are among of its aims, and its most notable characteristic is the experimentation and extension of "thinking machines" that can mimic, grasp, solve problems, and mimic human brains. Theory of mind, limited memory, self-awareness, and reactive machinery are the main categories. Managing resources encompasses all aspects of procurement, storage, warehousing, inter-and intra-transportation, and logistics (B. Logistics). Finding possible wholesalers, retailers, and distributors is an important part of logistics management, as is determining how efficient and easy it is to work with them. Managing the Supply Chain (SCM) Management of the flow of goods and services from point A to point B is known as supply chain management (SCM). IEEE D. Intelligent Robots for Supply Chain Management and Logistics In order for logistics and supply chain management to have a significant impact on business units, they work to guarantee that necessary goods arrive at their destination on time and in the best possible shape. In logistics, the web-like structure of industries provides the right foundation for implementing and scaling AI and growing SCM components autonomously in global supply chains. In the long term, the enterprises face the danger of becoming outdated due to the efficiency with which other companies that adopt SCM tactics manage their operations. Every day, more and more companies and units are reaping the benefits of AI as it continues to evolve. The majority of industrial machinery is multipurpose. Along with mathematics, information technology, linguistic, and psychological abilities, they also possess other traits that are similar. At its heart, AI is about flows and algorithms. When it comes to basic, medium, and complicated applications, their complexity levels vary. The digitalization of the supply chain is aided by AI. The use of AI improves logistics since it makes the whole process more visible. Every day, the supply chain generates a massive amount of data. Structured and, sometimes, unstructured material like this is likely to go unused. By facilitating a digital transformation by means of a shift from legacy ERPS to analytics, AI aids logistics organizations in digitalizing their supply chain and operations. This change is made easier by advancements in automated systems, robots, and mobile computers.

OBJECTIVES

The goals of this study are as follows: • To learn how AI can help with supply chain management and logistics costs • To learn how AI can help with distribution network and route selection Aiming to learn about inventory-related AI applications

REVIEW OF LITERATURE

Artificial intelligence (AI) is supposedly going to have a renaissance soon. Contrary to previous fads and disappointments, the present state of technology, businesses, and society is more conducive than ever

ISSN 2321-2152
www.ijmece.com
Vol 13, Issue 2, 2025

to widespread AI adoption, says Ben Gesing. When it comes to consumers, AI is already firmly established. Many companies have already begun their AI journey, especially those in the top sectors. Logistics and other industrial business sectors are starting theirs in a big way. In their 2002 study, Yu et al. found that a framework system combining data mining methods with human expertise might benefit from a dynamic pattern matching approach for anticipating the demand for future items. The amount of investment and the need for improvement provide excellent justification to anticipate this expansion to continue long into the future, according to Steve, and "a considerable progress has been made with respect to core AI technologies." Dr. Dirk claims that the use of AI in engineering and manufacturing heralds a departure from the digital world. With the aid of AI, we can mold our environment.

ADVANTAGES AND DISADVANTAGES OF AI IN LSCM

The benefits

1)The informative flow is kept rich by the integration of artificial intelligence with the information system.

2) Real-time pricing is where it really shines.

3) AI methods are used to construct profiles of different in-sources and out-sources.

4) Contract choices and logistics outsourcing might both benefit from rule-based systems.

5) Exploring the location and using machine learning via artificial intelligence might help with supplier evaluation and assortment concerns.

Negative Points

1) Because they are nebulous and hard to understand, AI solutions are not straightforward to implement.

2) Since AI is software dependent, it may sometimes show erroneous judgments. Thirdly, information acquisition constraints mean that AI can't deal with the risks and uncertainties of a cross-functional nature.

APPLICATIONS OF AI IN LOGISTICS AND SCM

Buying Things Using AI in procurement aims to support operations, efficiently manage purchasing, develop, select, and maintain supply sources, support organizational goals and objectives, build strong relationships with other units and organizations, and develop purchase strategies that help organizations maintain their strategies.

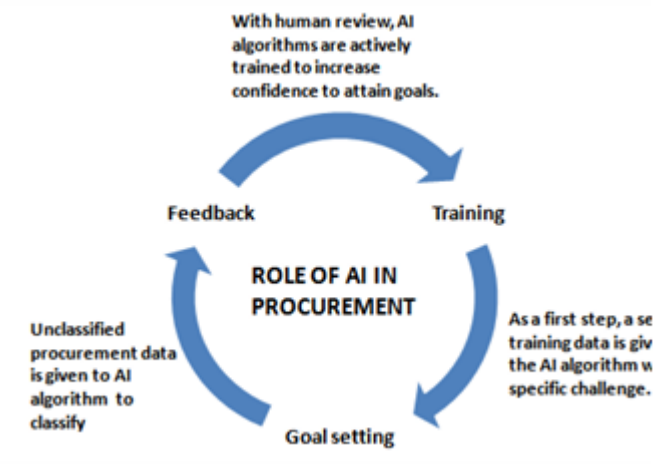

Figure 1. Role of Artificial Intelligence in Procurement

Manufacturing Every technological advancement since the beginning of the industrial revolution in the 1700s has resulted in a dramatic shift in the way goods are produced. The four most well-known revolutions are: First, in the year 1970, there was the industrial revolution 1.0, which included mechanical automation, power generation by steam, and weaving. Second, in the year 1870, there was the industrial revolution 2.0, which included mass production, process lines, and power generation by electric charge flow. The third industrial revolution occurred in 1969 with the advent of computers and electronics. The fourth revolution is now underway and is characterized by advancements in networking, the internet of things (IOT), cyber physical systems, and artificial intelligence (AI). During pandemics that included widespread lockdowns, labor shortages, time span restrictions, and supply chain abnormalities, the need for machine-driven production surged. AI-powered technologies facilitate digital transformation

while making judgments based on facts quickly. Thirdly, storage Warehouse management system (WMS) regulates the administration of inventories of products kept in warehouses that are received from vendors and suppliers. Can bans are tracked by AI-based systems. They help with client order processing by locating inventories in processing, manufacturing, and production divisions. Integrating with SAP technology allows for stock and location monitoring as well. 4) Automated Packaging Protection, product identification and information provision, efficiency enhancement, product handling and distribution, and

ISSN 2321-2152
www.ijmece.com
Vol 13, Issue 2, 2025

density modification are all areas where artificial intelligence (AI) finds use in packaging. With the use of barcodes and EDI, it facilitates simple return handling. 5) Distribution AI streamlines and simplifies physical distribution, communication, and facilitation processes. In order to streamline operations and increase revenues, tools gather the necessary data and provide solutions. AI is useful for forecasting consumer needs, which allows businesses to better meet those needs. sixthly, CRM, or customer relations management With the use of AI, CPFR (collaborative planning, forecasting, and replenishment) may be implemented in vendor management inventories. client engagement with an emphasis on revenue creation and client retention, learning about customers on an ongoing basis, managing consumers differently, anticipating their requirements, and developing rules to drive business are all aided by this.

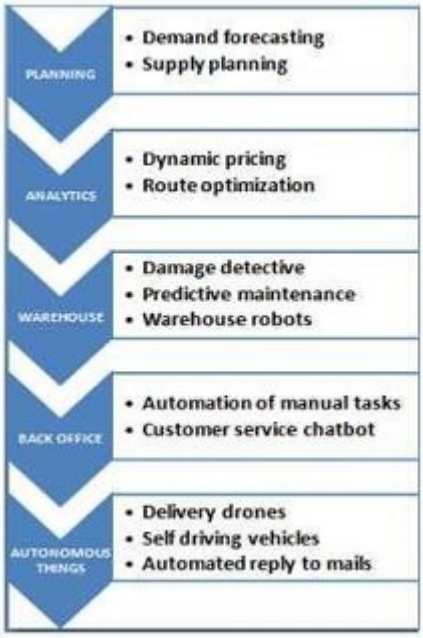

Figure 2. Allied applications of Artificial Intelligence

choices and facilitating the exchange of information between businesses to ensure the efficient administration of consumer interactions. Other uses Using AI, logistic hubs and e-commerce platforms may anticipate when their busiest periods will occur. It improves HRIS (human resource information systems) and workplace communication. As a further use case, it has potential in healthcare logistics for usage as third- or fourth-party outsourcing. As far as cyber defense is concerned, it is crucial.

CONCLUSION

Logistics and supply chain management powered by AI enables time- and distance-optimized network optimization. This is useful for generating income, which is difficult to do only via human decision-making. As a result, it aids the logistics sector in reimagining day-to-day operations, making prudent operations, planning (including demand and seasonal forecasts), processing (by the automation of hitherto human-only tasks), and customizing procedures.

REFERENCES

[1]. Chou, T. (2016)- Precision: Principles, Practices and Solutions for the Internet of Things.
[2]. Curran, C. (2017)- Putting AI to Work in the Enterprise.
[3]. Francis, S. (2017)- GreyOrange launches new AI for logistics robots and warehouse automation.
[4]. Ben Gesing, Steve J. Peterson, Dr. Dirk Michelsen- Artificial Intelligence in Logistics
[5]. Hokey Min- Artificial intelligence in supply chain management: theory and applications
[6]. Russell, S. and Norvig, P., 1995- Artificial intelligence: a modern approach. Upper Saddle River, NJ: Prentice-Hall
[7]. Timme, S.G. and Williams-Timme, C., 2003- The real costs of holding inventory. Supply Chain Management Review, 7, 30–37.
[8]. Tarver, M. and Fae, M.I., 2007. Applications of multiagents in transport and logistics. International Journal of Logistics Systems and Management, 3 (4), 405–418.