

# Information Technology In Logistics And Supply Chain Management: Prospect Vis-À-Vis Challenges

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## **Abstract**

One of the key foundations of the world economy is the "supply chain and logistics" sector. Information technology (IT) has advanced throughout the twenty-first century and now permeates every aspect of our lives. 'Supply chain and logistics' sector is no exception to that. All logistics and supply chain operations must be digitalized in this age of rapid technological innovation. IT has a lot to offer in this sector. Giant corporations all over the world are progressively implementing different kinds of IT systems to guarantee improved services, effective storage management, and precise and prompt delivery at the user's doorstep. At this backdrop, in this paper, an endeavor has been taken to accumulate the likely areas for IT system employment, listing down various types of IT systems/software with chronicles of pros and cons, likely Challenges and the mitigating options for 'supply chain and logistics' sector.

**Keywords:** IT, VIS-À-VIS Challenges, supply chain Management and logistics.

Date of Submission: 09-03-2024

Date of Acceptance: 19-03-2024

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## **I. Introduction**

The dictionary meaning of the term 'Information Technology' (IT) refers to the study or use of systems (especially computers and telecommunications) for storing, retrieving, and sending information [1]. IT has already taken huge advancement in other sectors. IT can also play crucial role in the logistics and supply chain sector for their successful and efficient management. The traditional manual management system poses number of challenges in terms of correctness in decision making and determining delivery and other important aspects [2]. An integrated IT function can eradicate the challenges and more efficient management can be achieved. With this back drop this paper will describe various IT options for logistics and supply chain management system, their likely challenges and mitigations.

### **IT in Logistics and Supply Chain Management:**

Proving its worth in terms of efficiency and accuracy, IT has spread significantly in logistics and supply chain arena. Few mentionable are:

- **Automation:** Automation is the prime utilization in logistics and supply chain management. Customers order fulfillment, customers billing, inventory level monitoring, tracking shipments, and determining delivery routes etc can be made more efficient by means of automation. Cost reduction can be achieved by reduction of manual labor and by automation [3].
- **Data Management:** Data management is another important utilization of IT. For storing and analyzing the data IT can play major role. Identifying patterns, streamlining the procedures, and enhanced management in decision making can be some of the use in data management [4].
- **Networking:** Networking is another method to apply IT in supply chain management and logistics. Warehouses can utilize networking technologies like cloud computing and virtual private networks (VPNs) to connect different parts of their operations. As a result, they may communicate data more readily between departments or locations, which can help them decide how best to run their operations [5].
- **Web-Based Services:** The management of supply chains and logistics depends heavily on the usage of web-based services in IT. To oversee customers' orders companies can use web-based services like customer relationship management (CRM) systems or e-commerce platforms to track shipments more efficiently. They can also provide clients with real-time and up-to-date information on their orders or shipments by using web-based services [6].

### **Various IT Systems in Logistics and Supply Chain Management:**

The management of the supply chain and logistics is one of the most important aspects of every business. To ensure that products and services are delivered on schedule and in the right amount, companies must have an efficient system in place. In this case, IT systems can be useful. Inventory levels, customer orders, and the transportation of goods and services between locations are all monitored by IT systems [7]. IT systems

are used in supply chain and logistics management and come in many different forms. These include customer relationship management (CRM), warehouse management systems (WMS), transportation management systems (TMS), and ERP systems [7]. Every one of these systems has unique features and benefits that can help companies to improve how they operate.

- **Enterprise Resource Planning (ERP) Systems:** An ERP system is a kind of software that helps organizations to manage their resources, such as employees, money, and inventories. It is designed to integrate every facet of an organization's activities into a solitary system. ERP systems can help companies to reduce expenses, improve customer service, and streamline processes. Additionally, they can provide real-time information on consumer orders, stock levels, and other important factors [8].
- **Warehouse Management Systems (WMS):** One kind of computer software that helps companies to manage their warehouses is called a WMS. Its goals are to improve warehouse operations, track inventory levels, and handle orders. WMS solutions can help companies to reduce expenses by improving warehouse productivity and accuracy. Additionally, they can provide real-time information on consumer orders, stock levels, and other important factors [9].
- **Transportation Management Systems (TMS):** TMS is a type of software that helps companies to manage their transportation operations. Its goals include route optimization, shipment tracking, and cost management for transportation [10]. TMS solutions can help firms in cost cutting by improving the efficiency and accuracy of their transportation operations. They can also provide up-to-date information on delivery windows, shipping status, and other important factors.
- ✓ TMS Software: The planning, carrying out, and monitoring of transportation are automated and optimized via TMS solutions. They make load planning, route optimization, carrier selection, and real-time tracking possible. This results in lower expenses, quicker transit times, and increased effectiveness [10].
- ✓ Fleet Management Software: GPS and telematics are used by fleet management systems to track driver behavior, vehicle performance, and maintenance requirements. These solutions improve asset usage, safety, and fuel efficiency [11].
- **Customer Relationship Management (CRM) Systems:** A CRM system is one type of software that helps companies to manage their client interactions. Its goals are better customer service practices, manage customer data, and record customer interactions. CRM systems help businesses to improve customer service by giving real-time information on client interactions, orders, and other important data [6].
- **Supply Chain Visibility Systems:** Businesses can monitor their supply chains with the help of a software program known as a Supply Chain Visibility System [12]. Its goals are to improve supply chain operations, monitor inventory levels, and track shipments. Businesses can reduce costs by using Supply Chain Visibility System to improve the accuracy and efficiency. They can also provide up-to-date details on delivery windows, shipping status, and other important information.
- ✓ Radio-Frequency Identification (RFID): Companies can use RFID technology to track merchandise in real time by affixing RFID tags to products or containers. This reduces mistakes in shipment tracking and tracing and enables accurate inventory management [13].
- ✓ Global Positioning System (GPS): GPS technology is essential for tracking the whereabouts of goods, cars, and containers. It guarantees precise delivery projections, optimized routes, and enhanced client support [14].
- **Blockchain and Smart Contracts:** Blockchain is a distributed ledger system that creates transparent, tamper-proof records of transactions across several machines. Smart contracts are self-executing agreements with preset parameters that, when satisfied, cause actions to be taken automatically. Blockchain and smart contracts improve trust, traceability, and transparency in supply chains and logistics [15].

#### **Advantages of IT Systems in Logistics and Supply Chain Management:**

The importance of information technology (IT) systems in supply chain management and logistics has increased recently. IT solutions can improve supply chain and logistics operations' efficacy and efficiency while reducing expenses.

#### **Suppliers Benefits:**

- **Suppliers Improved Visibility:** One of the key benefits of IT systems in supply chain management and logistics is improved visibility. By using IT solutions to track shipments in real-time, suppliers can enhance inventory management and ensure on-time order delivery [11]. The enhanced visibility also helps suppliers to see possible problems before they become more serious ones, allowing them to take prompt action to resolve them. IT systems can also be utilized to automate certain processes, such as billing and order processing, which can increase productivity and reduce expenses [10].
- **Suppliers Improved Communication:** Another benefit of IT systems in supply chain management and logistics is improved communication. By leveraging IT systems, suppliers may interact with consumers

more efficiently and provide them with up-to-date information about their orders and shipments. Improved communication can lead to better relationships and increased customer loyalty by building trust between suppliers and customers [6]. IT solutions can also be used to assist suppliers and customers collaborate on projects more successfully.

- **Offering Enhanced Customers Service:** Finally, customer service can be enhanced using IT systems. Suppliers can offer better customer service and more accurate information about orders and shipments by using IT systems. Increased customer satisfaction may result from this better customer service, which may boost supplier's sales and profits [7].

#### **Customers Benefits:**

- **Customers Improved Visibility:** From the perspective of the client, one of the key benefits of IT systems in logistics and supply chain management is improved visibility [11]. IT systems allow customers to track their orders in real-time, helping them to manage their inventories better and ensure on-time delivery of their orders. Additionally, consumers can use IT systems to access current information about their orders and shipments, empowering them to make informed purchasing decisions [10].
- **Customers Improved Communication:** Another benefit of IT systems in supply chain management and logistics is improved communication. By employing IT systems, customers may provide suppliers with current information about their orders and shipments and engage with them more successfully. Suppliers and consumers may be able to forge closer ties and increase client loyalty via improved communication [6]. Technology systems can also be utilized to assist suppliers and customers to collaborate on projects more successfully.
- **Attaining Satisfactory Customer Service:** IT can improve customer service. Consumers have access to more detailed order information. Suppliers can provide clients better customer service by using IT systems to track shipments and logistics [7]. Better customer service may increase client satisfaction, which could lead to greater repeat business for the supplier.

#### **Challenges of IT Systems in Logistics and Supply Chain Management:**

Supply chain and logistics industry is one of the main pillars of the global economy. It is in charge of making sure that products and services are moved from one place to another without fail. IT systems are required to ensure that this process runs smoothly. Nonetheless, there are significant number of difficulties while utilizing IT systems for logistics and supply chain management. These include:

- **Security of Data:** One of the primary problems with the application of IT systems in supply chain management and logistics is data security. The more data that is used, stored, and communicated, the greater the chance that it will be compromised or stolen. Companies need to ensure that any data held on their IT systems is safe and secure from unauthorized access [16].
- **Integration:** It might be difficult to integrate IT systems into supply chain and logistics management. Companies need to ensure that data can be exchanged and communications can take place between their IT systems without any problems [17]. Achieving this can be difficult since separate systems may employ different communication protocols or standards.
- **Expense:** The cost of deploying and maintaining IT systems can be a major barrier for companies in the supply chain and logistics industries. Companies need to ensure that they have the resources to maintain the staff, software, and hardware needed to keep their IT systems operational [6].
- **Scalability:** As companies grow to satisfy demand, IT systems need to be scalable. This can be challenging since companies have to ensure that their IT systems can handle growing demand without malfunctioning [18].
- **Flexibility:** Additionally, companies need to guarantee that their IT systems are flexible enough to accommodate modifications to their business or operational procedures. This can be difficult since companies have to ensure that their IT systems can swiftly adjust to changing conditions without compromising reliability or performance [6].
- **Training:** Finally, companies need to guarantee that employees have received the necessary training to operate their IT systems. This can be challenging since employees may not have the skills or knowledge required to run the system efficiently [8]. Companies must fund training initiatives to guarantee that staff members are proficient in using IT systems.

#### **Mitigation Options to Overcome the Challenges:**

Companies need to face a variety of difficulties pertaining to supply chain management and logistics and the usage of IT technologies. To eliminate the challenges few mitigation options are:

- **Investing in Security Measures:** Companies need to invest in security measures like firewalls, encryption, and authentication systems to prevent data theft or unauthorized access. Additionally, they should routinely inspect their networks for anomalies in behavior or security flaws [19].
- **Adopting Standards:** Companies should use standards like XML (Extensible Markup Language) or EDI (Electronic Data Interchange) to make it easier for different IT systems to communicate with one another. This will ensure that there are no compatibility issues and that data is moved across different systems safely and efficiently [20].
- **Investing in Infrastructure:** To make sure that their IT systems can handle rising demand without getting overwhelmed or crashing, companies should invest in infrastructure including servers, storage devices, and networking equipment [20].
- **Investing in Training Programs:** Companies should pay for employee training so that employees are capable of using IT systems in an efficient and productive manner [8]. As a result, errors will decrease and the organization's production will rise.
- **Employing Cloud Computing:** Companies may consider using cloud computing services like Microsoft® Azure or Amazon® Web Services to run apps and store data instead of building hardware on-site. This will lead to lower hardware maintenance costs and greater flexibility in terms of scaling up or down in response to demand [5].

## II. Conclusion:

Information technology (IT) is a broad phrase that refers to the storage, processing, and communication of data via computers, networks, and other digital technologies. Supply chain management and logistics employ IT tools to help companies to operate more efficiently. Order management, route planning, inventory management, and customer service monitoring are all possible with these systems. Additionally, they can be utilized to automate processes such as order fulfillment and delivery.

In logistics and supply chain management, IT systems can boost output, reduce expenses, improve customer support, and give a clearer perspective of the situation. By automating procedures, businesses can save labor expenses while increasing accuracy. IT systems can also provide companies with up-to-date information on stock levels, order status, and delivery timetables, allowing them to provide better customer service.

Although IT systems in logistics and supply chain management have many advantages, there are drawbacks as well. These include the expense of setup and upkeep, the requirement for trained personnel to use them, and the danger of data breaches or system failures. IT systems may also need frequent updates to stay current with evolving technology and client needs. Investing in security measures, adopting standards language, investing in infrastructure development and maintenance, investing in training programs and employing cloud computing services can be few effective mitigating options to overcome the challenges.

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