Utilizing logistics Information Management System in logistic companies

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Abstract

Great advancement occurring in technology and information flow has already made myriads of changes in all industries of the world economy especially in logistics and supply chain sector. Some said this is a result of true contemporary globalization happening in the world while others think huge increasing demand in service and manufacturing have brought all these changes. Simultaneously, In the moment of fast development of information, with the widely-use of computers, the advancement in science and technology, and the continuous growth of IT techs and business, programming of information flow has become a real trend in world economy, nowadays. A fast data transfer can be taken a fruit of information technology in supply chain management eventually resulting in increased cooperation. Information technology helps to reconstruct the entire business system set up to achieve higher service levels and lower inventory and lower supply chain costs. So, establishing a logistics management information system is an important means for all logistic companies to improve their logistics efficiency. This article focuses the role of programming of information flow in logistic sector.

Keywords: Programming of information flow; IT technology; Inventory management.

1. Introduction

In a basic viewpoint, logistics is believed as a set of complex operation in economy. This can include both long and short-term logistics operations. Logistics management indeed is considered inseparable cursor of the supply chain network. It involves planning, implementing, and overseeing the effective storage of goods and their transportation from the point of origin until the final customer. Having a wide knowledge and understanding of the key parts of logistics management is crucial as the industry changes and pushes for faster and more effective logistics to get a product into the hands of the consumer or distributor. Even though the aim of every logistics company is at least to make a profit through numerous services and cost-effective activities, some companies still suffer from inefficiency and insecurity due to an omission of information flow processes in their daily activities. As logistics chain becomes bigger and more complex, it will be more difficult to keep up with efficient and effectiveness of information flow. So, there is a real need to improve on the implementation of logistics in reducing waste such as inventory and prime time from suppliers to end consumers. In order to provide more transportation and bigger information management for cooperation between companies, logistics information management based on information, automation, network is the most eminent feature of modern logistics information management. With the continuous development of logistics companies, the company's logistics information management has also developed simultaneously. At the same time, modern business development is inseparable from many partners in today's business management. The entire business supply chain is a thing that enterprises need to focus on supply chain management. Today, economic globalization is growing faster, and the depth and breadth of commercial product development are also increasing. This puts another forward new requirements for technological development, requiring

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companies to meet their needs. At the same time, logistic companies need to continuously improve, improve competitiveness, improve logistics management methods, and improve logistics management levels [1].

2. The Concept of Logistics Management

For better understanding the pure concept of logistics management everyone should know that all operations that assist product flow from the point of raw material acquisition to final consumption, as well as the information flow that sets the production in action, are referred to as logistics. So, one of main goals of logistics is to provide appropriate levels of customer service at a fair cost. The theories that are applied to the transportation industry include the material flow theory. According to Lianguang and Hertz (2017), "The logistics industry is constantly growing due to the growth of logistics firms and market integration. Some logistics companies are even among the largest in the world today." (Page 1004). Hou et al. (2017) gave a lot of examples in the role of logistics management in logistic companies. He described how raw materials are transported and used to become a final output by giving optimal calculated norms. According to his theory, supply chain management, which are resource-based view (RBV), strategic choice, and knowledge-based view (KBV). RBV allows examining the resources that a firm has and how these can be utilized for competitive advantage (Yang & Lirn, 2017)[2]. Hence, investment in resources can allow logistic companies to be more competitive in the market if they are managed properly.

In the Concept of Logistics Management logistics can be formed by several parts which are supportive in nature. Transportation, warehousing, inventory, packaging, and information technology are all integrated. The main functions of logistics system here is to be getting the right product to the right customer at the right time at the right place. According to J.C. Coyle, E.J. Bardi, and C.J. Langley [3] "The logistics information system is a structure of interconnected people, equipment and procedures to ensure logistics managers for the relevant information needed for planning, execution and control of logistics activities".

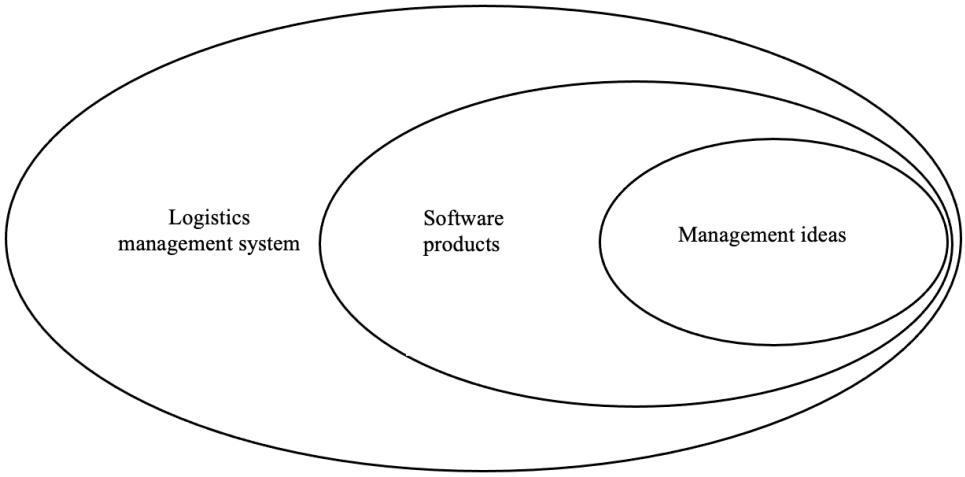

Figure 1: The conceptual hierarchy of Programming of information flow [4].

To develop and strengthen the position of the logistics information system contributed to the development of computer technology, computer tools have been applied, so that it becomes possible to the functioning of the logistics information system as part of enterprise-wide information system. It can be divided into three levels: management ideas, software products, and management systems. The conceptual hierarchy of a new generation of management information system [5] that manages information at the enterprise level can be shown in Figure 1 above.

3. Components of Logistics Management

The market is unpredictable and highly susceptible to the imbalances between supply and demand. Supply can be steady, but the demand for goods from consumers is not. It is directly affected by different factors, making it unpredictable.

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Logistics management plays a key role in ensuring a constant and continuous supply of goods from the manufacturer to the consumer. Great planning becomes essential to maintain a healthy supply chain.

During the fluctuation of supply and demand, there can be an insufficient supply of goods, or a surplus of goods produced. In such cases, storage units and warehouses become part of assuring all elements of the process are coordinated and implemented successfully. It creates systems and processes to achieve timely delivery of products.

There are several essential components of logistics management to run the supply chain efficiently and scale up your organization. Optimizing the operations is important for the cost-controlled running of logistics processes. Therefore, it has become imperative for business owners to analyze the major components of logistics as its magnitudes processes and ensures client satisfaction.

Here are the 6 major components of logistics management:

1. Demand Planning

Determining all the aspects of logistics is important to maintain a balance between demand and supply. The |ow of goods is not interrupted by logistics management as it ensures that operations are well-planned. Therefore, facilitating the management logistics process allows organizations to evaluate and forecast the demand for goods and services in supply chain management.

Proper planning is a major component of the supply chain that can eliminate the insufficient or improper supply of goods. It involves activities like warehousing, material handling, and storage for managing the logistics functions effectively. Similarly, goal is to analyze historical data, statistical forecasting, and overall product lifecycle for staying in front of market shifts.

2. Storage and Material Handling

In the contemporary world, the demand in the market is volatile so it is essential that there should be surplus goods to fulfill the sudden requirements of the customers. The goods or materials should be stored and preserved correctly. Warehouse management systems (WMS) are extremely important to ensure that goods are easy to store, move, and transport.

WMS optimizes the storage capacities, and equipment, and lowers the distribution and transportation costs which is beneficial for the smooth running of supply chain operations. Also, the goods which are not handled properly can get |awed which can cause redundant financial loss to the business. Therefore, it is an essential component of logistics management.

3. Inventory Management

Inventory levels are checked regularly by the companies to monitor the |ow of goods in and out of a warehouse. It evaluates and identifies how much stock to order at what time and where it should be stored. Therefore, maintaining an efficient inventory level is majorly crucial to fulfilling customer requirements.

Therefore, with proper inventory management, companies can ensure that they do not have too much or too little stock on hand. It even predicts the consumer demand which leads to efficient order planning and organizing.

Automated inventory control and management control the operations within the supply to make processes easy and convenient. Also, inventory management systems play a crucial role in optimizing stock levels. Strategic planning and real-time monitoring of inventory are one of the most important components of logistics.

4. Fleet Management

Managing and monitoring commercial vehicles is an essential component of logistics as it involves activities like asset utilization, improving maintenance planning and managing costs. Nowadays, companies are investing in feet management software for improving the efficiency of the fleets and drivers.

It provides real-time updates and insights to feet owners by using technological advancement solutions. Also, it is an effective way of improving the safety conditions of drivers and vehicles. Therefore, the fleet management system tends to provide all the information associated with the fleets through predictive analytics and accurate reporting.

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5. Transportation Management

It is the most important component of logistics management as it plans and supports the distribution of goods to their final destination. It can be delivered via freight trains, road vehicles, shipping, and so on. Optimizing the transportation ensures that the goods or items have reached the end-user on time.

It even manages the reverse |ow of goods so investing in a transport management system can be beneficial for the organization's growth. It yields several benefits such as cost reduction, reduced carbon footprints, timely deliveries, and so on. Some organizations also prefer consolidation as it is a process of combining multiple smaller shipments in one. Therefore, this can enhance customer services as they can receive the products on time or even before time.

6. Information and Control

Implementing new age technologies is the future of the logistics industry. Software and processes provide data-driven insights that help companies to manage supply chains more efficiently. It tends to forecast demands, and transportation times, and allow companies to make better cost-effective decisions. Maintaining the |ow of information is necessary to get useful insights and manage the demand more accurately. However, businesses are embracing advanced technologies like Artificial Intelligence, the Internet of Things, Big Data, and Blockchain to achieve transparency in the entire supply chain. Therefore, getting the right information and control over the logistics operations plays a pivotal role in executing each one of these components.

4. Types of logistics information systems

digital programs operate on one or more levels of the supply chain and can be coordinated with each other. These are the most common:

Transportation management system (TMS): logistics information software charged with optimizing the planning of order distribution routes to increase efficiency in shipping and eliminate the risk of error.

• Manufacturing execution system (MES): digital solution deployed in warehouses and production centers to organize, control, and monitor manufacturing processes on production lines.

• Distributed order management (DOM) software: logistics information system specializing in order fulfillment. The program coordinates the operations that take place from the time a customer places an order until it is distributed.

Although these information systems are widely deployed in facilities, the intricacies of supply chain operations have driven many forward-looking logistics program developers to add new functionalities to adapt to the changing demands of the sector.

To sum up, these are some of the major components of logistics management that help the companies to reduce operational costs and enable proper execution of key supply chain functions. Therefore, an effective logistics strategy provides top-notch features and functionalities for improving the customer experience. Advancements in the transportation industry play a crucial role in shaping the components of logistics management.

Benefits of Logistics Information Flow

Logistics information systems bring multiple benefits, namely [6]:

• Process automation: logistics management programs do away with manual data entry. They also automate the generation of the necessary documentation for logistics operations, minimizing the risk of error in processes such as inventory control and order fulfillment.

• Automated information flows: logistics software extracts information from operations to coordinate warehouse processes and the different levels of the supply chain with each other. The most cutting-edge programs analyze logistics activity to obtain information in real time on the throughput of the facility.

• Improved logistics planning: information systems make it possible to monitor a product across the supply chain and collect data, equipping logistics managers with all the information they need to carry out logistics planning.

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Ultimately, logistics programs ramp up the efficiency of warehousing operations, syncing the facility with other levels of the supply chain, e.g., the building that houses the production lines or the distribution center, among others.

5. Managing the process of developing a digital information management

According to the description of the architecture, the realization of the physical architecture of the system is divided into three layers based on the business structure, which are the view layer, the business layer, and the data layer in turn.

The workflow of the logistics system is as follows: First, the user may have multiple browsers. When the user's browser sends a request to the middleware, the system judges whether the user has the authority to perform the corresponding operation according to the current user's login information session. If it meets the requirements, the web application server will process the browser-side request, find the corresponding processing method, start the data layer service, process the data, and return the processed data and results to the web server container, and the web server container returns to the web server container. Request support for concurrent operations.

Enterprise logistics systems have certain characteristics, such as consistency and convenience of projects, unification and sharing, decision-making flexibility, unification of advanced simulation and forecasting, capital flow and information flow, etc. These functions indicate business logistics based on information system. The information system is a complete pillar logistics management system. Realize the overall benefits of production and logistics services in effective management and enhance the company's overall competitiveness. Although this statement is a bit exaggerated, computers can only function if the information is correct, complete, and timely, otherwise, they will produce wrong results. In other words, the product database is the basis for the operation of enterprise logistics IT systems with strong capabilities. The application scope and depth of the based business logistics system depend on the company's needs, coverage, and information content. Therefore, it is very important to prepare and maintain a product database. From the above operations, the network topology of the logistics system is shown in Figure 3 [7].

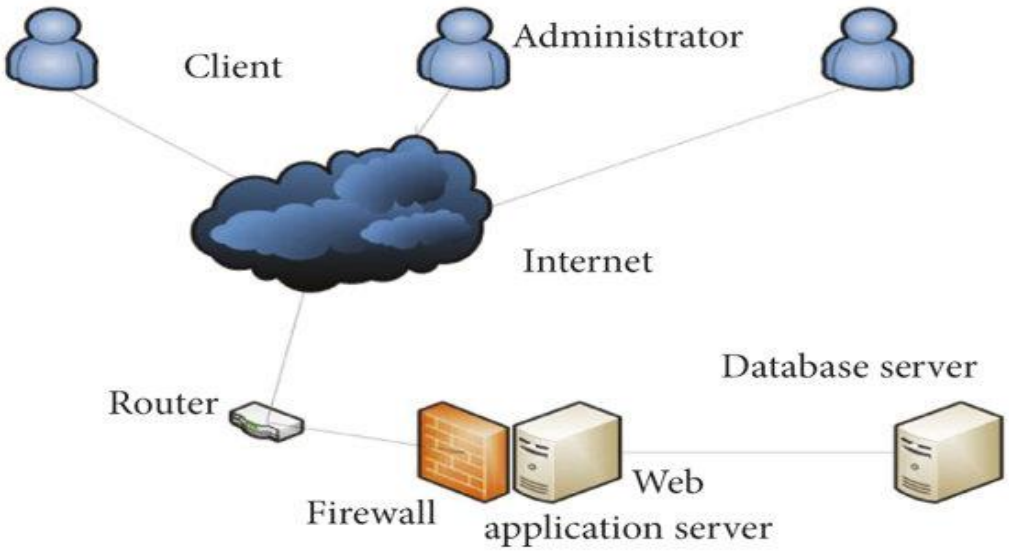

Figure 2 :The network topology of the logistics management system.

Implementing a successful digital logistic management information system requires careful planning and adequate resources. Software development and, more specifically, computerization of a logistics management information system should follow project management and information technology (IT) best practices. Before moving forward, it is important to make sure certain factors are in place to ensure the project's success:

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• Strong existing logistics business processes, or a commitment to the time and resources needed to improve business processes before or during automation.

• A strong multidisciplinary team

• Long-term political and institutional support

• The resources to go the distance

The following graphic provides a high-level overview of the process.

The purpose of collecting and reporting data is to use them for decisions and actions. Data can be used for a variety of purposes: routine operations, performance management, continuous improvement, and strategic planning. Operational decisions involve the core business functions of a supply chain, including inventory control, replenishment, order fulfillment, forecasting, and procurement. Performance management involves monitoring how well the supply chain is performing and finding root causes of problems. Continuous improvement uses data to identify recurring problems and system inefficiencies, and to guide interventions to address those problems. Finally, strategic decisions involve supply chain resources and governance, stakeholder coordination, and system design options such as outsourcing supply chain functions, optimizing distribution, or introducing new products.

Figure 3. Successful digital logistics management information system.

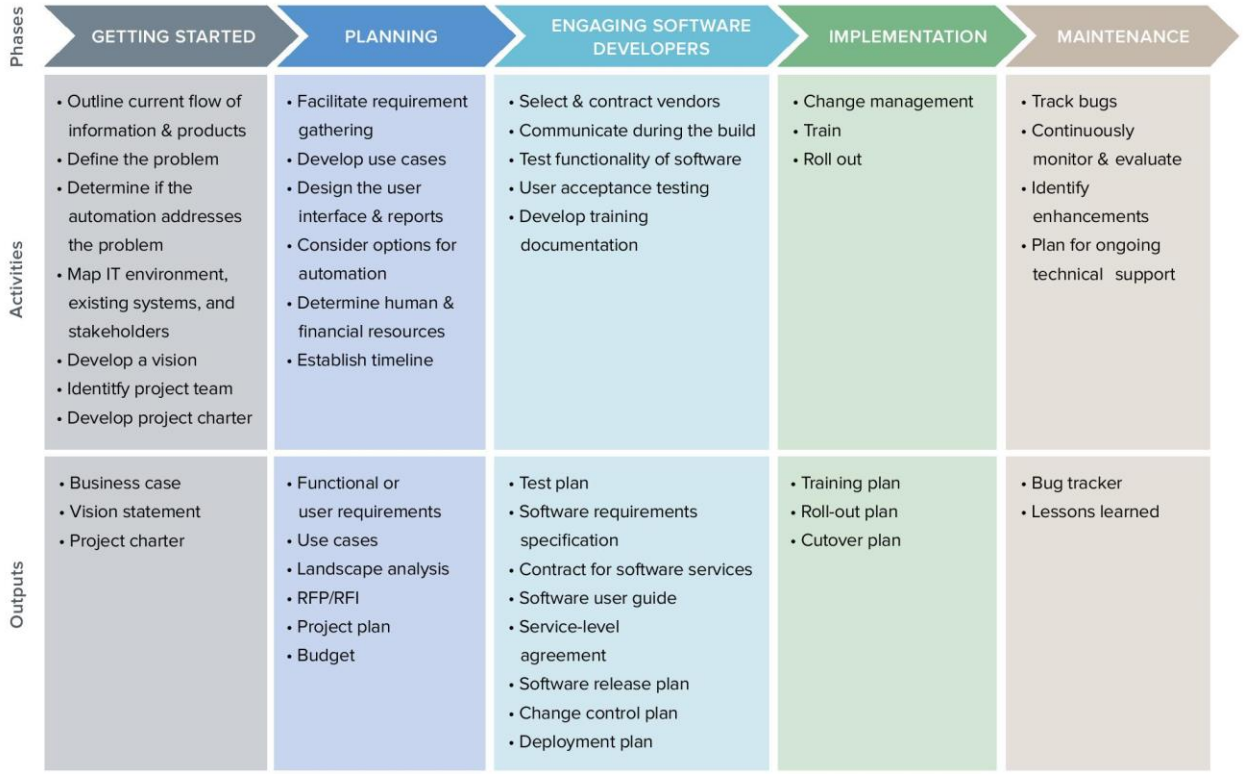

Figure 3: Successful digital logistics management information system.

The assessment of information flow within a logistics chain can be referred to as the accomplished profits which surpass the charges convoluted. This cost mentioned includes communication and administration costs, costs by suppliers for providing new information and information systems investment. These costs can be compressed significantly, as reported by new

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effective information flow in logistics chain can help improve logistics disruptions, optimize inventory levels, achieve higher efficiency, deliver products to customer on time and analytics on business partner performance.

6. Conclusion

The implementation of logistics processes in supply chains operating today relies heavily on the shaping of an effective system of information, ensuring collaboration in the supply chain partners to implement a common policy on the exchange of information, choice of tools related to streamlining the supply chain processes and methods for their monitoring. The implementation of information policy as formulated in the supply chain entails the need to implement standardized procedures and to identify clear directions for action. Furthermore, it is also planning the development of applied information systems based on the proper choice of software and sets of clearly defined procedures for the control and flow of information. The main tasks in terms of availability of information faced by companies in supply chains include:

– application systems that allow the implementation of chain operation principles on a partnership basis, which allows for overcoming the prevalence of information gaps, – the use of an information system allowing for the collection, processing, sharing and analyzing data that are processed into useful information,

– having staff training, which is considered as a decisive factor in the increase or decrease the quality of information,

– accuracy and availability of information,

– configuration of information systems architecture for the development in line with future business needs with regards to information. Implementation of the above requirements for systems used to support the management process allows one to ensure the efficient flow of information, which is essential to the proper execution of business processes.

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