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Review Paper on Progressive Role of ICT in Supply Chain Management

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Abstract: *At all levels, supply chain management has been essential in enhancing organisational effectiveness. Over the past 20 years, it has attracted the interest of various scholars and educators. A large amount of study has been done on supply chains and supply chain management (SCM), according to the literature review. All physical supply chains have been disrupted by the COVID-19 epidemic, but soft supply networks—like those in data, software, and finance—are leading the pack. It demonstrates the significance of ICT generally. Real-time information exchange and connectivity between Supply Chains and their respective stakeholders are crucial, but this is a difficult task. Information and communication technology (ICT) has a huge impact on how supply chains are integrated and managed as a whole. This essay attempts to explain the function of ICT in supply chain management. This study's main drawback is that it relies heavily on earlier research from newspapers, magazines, reports, books, journals, and other electronic and digital sources.*

Keywords: Information & communication technology, ICT, supply chain, supply chains, supply chain management

I. INTRODUCTION

The information and communication technology (ICT) sector is one of the leading employers worldwide. The demand for products has increased along with the consumer's expectations for more features, making supply chains more complicated than ever. In order to remain competitive and efficient in day-to-day supply chain operations, businesses must now employ novel and creative methods (D. Elmuti, 2008). This can be done by properly managing supply networks. In order to create the right product, in the right quantity, in the right condition, and to be delivered to the right place, at the right time, and at the right cost, efficient and effective supply chain management ensures that the appropriate data is in place, for the correct forecast, at the right resources. These rights are referred to as the nine rights (9Rs) in supply chain management (Jagdeep Singh, 2019).

Understanding the "Role of Information & Communication Technology in Supply Chain Management" is the purpose of the essay.

II. LITERATURE REVIEW

According to (Bhandari, 2013), SCM refers to the network of companies connected to one another by one or more information and communication technologies, whereas IT halts analysis and gives information as needed. ICT applications in SCM provide transparency to customers for supply chain activity.

According to a 2012 study by Imran, investing in information systems helps gain market share, lower operational costs, improve customer service, and help banks launch new goods and services. (M. Fasanghari, 2008) assessed the direct influence of ICT on SCM and found that the use of ICT significantly improves communication both inside and outside of organisations, or among stakeholders. Additionally, it was claimed that ICT fosters the development of a cooperative network for inclusive growth and reduces total cycle time (Radjou, 2003). ICT helps to grow markets around the world in addition to enhancing teamwork and customer relationship management (CRM) activities. In order to have a better and more effective control over complicated supply chains, it is strongly recommended that information and communication technology be used (Radjou, U.S. Manufacturers' Supply Chain Mandate, 2003). Information and

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communication technology (ICT) is also said to help shorten cycle times, increase supply chain agility and efficiency, and provide on-demand product delivery online (Radjou, 2003; M.J. Tippins, 2003). The collaboration and integration of ICT to supply chain management emphasises the long-term benefits to all stakeholders throughout the supply chain through cooperation and information sharing, according to (Z. Yu, Benefits of Informationsharing with Supply Chain Partnerships, 2001). This suggests the reputation and necessity of ICT in supply chain management. (D. Simchi-levi, 2003) suggested the following goals for IT in SCM:

- Information accessibility
- visibility; data SPOCs; and
- decisions based on supply chain information.
- Collaborations

The idea of information technology as a firm capability was introduced by (Bharadwaj, 2000), and the results suggest that the firms with higher IT capabilities perform better than others. IT development may have acted as a catalyst or facilitator in the planning and management of supply chains, according to S. Walton (1999). According to (A Bayo-Moriones, 2013), businesses with cutting-edge work practises, innovative processes, and high levels of information and communication technology have a favourable effect on a number of factors and boost organisational performance. (A report by Price Waterhouse Coopers on Transport and Logistics, Volume 1, 2013) Logistics is an industry where ICT has been successfully applied for many years in managing the flow of goods between end points to reduce theft, identify route tampering, provide equipment tracking, reduce production delays, and increase the security of products. The ICT aids in investigating corporate growth, income generating, expense reduction, and client reach (Bethapudi A., 2013).According to (K.L. Choy, 2014), effective ICT deployment increases service quality and fosters competition among peers.According to (Z. Yu, Benefits of Information Sharing with Supply Chain Partnerships, 2001), SCM and partnerships offer long-term benefits to all stakeholders, internal and external, along the entire supply chain pipeline. This is due to information sharing, desired product delivery on time, customer service, and all possible cooperation, and this highlights the significance of ICT in SCM. According to a report by "Forrester Research," American firms are becoming increasingly dependent on ICT's benefits, which aid to increase supply chain agility, shorten cycle times, and deliver goods to clients on schedule. Information and communication technology (ICT) has reportedly become a key and essential component of every industry and business in practically every sort of economy, whether it is underdeveloped, developing, or developed (Nadim Ahmad, 2004). This is because ICT increases productivity at all levels of the organisation by assisting in the reduction of all forms of transaction expenses. It provides immediate connectivity, whether it be vocal or visual, boosts productivity, and gives accuracy and transparency to the entire system. Studies by Nadim Ahmad (2004) and Leonard Waverman (2005) have shown that investments in mobile and information technology have a positive and notable impact on gross domestic products, and that this positive impact extends to both developed and developing nations.In a study of Iranian banks' technical competency levels (R.S. Safari, 2014), it was discovered that publicly owned banks had lower technical efficiencies on average than private banks. As a result, the experimental findings indicated that effective ICT use enhances efficiency and, in turn, operational performance. "The world bank's survey reveals that the use of ICT shows the faster sales growth, higher productivity, and faster employment growth," claims (M. Khalil, 2008). (Dherange, 2013) asserts that ICT has the potential to fundamentally impact people's lives all around the world. ICT has an impact on a variety of areas, including company operations, government institutions and the government itself, as well as a person's daily life.The world's society and economy are undergoing a profound shift towards what is known as the "knowledge society" as a result of the significant impact that new technologies, notably information and communication technology, have had on all facets of life. ICT encompasses any product that will store, retrieve, manipulate, transmit, or receive information electronically in a digital form, according to (Dherange, 2013). In enterprises, ICT networking is very prevalent. It is divided into the traditional and contemporary categories. While more current ICTs use digital communication technologies that send information digitally, traditional ICTs are PC-based technologies that use computers at home and at work. Examples of supply chain-related technologies include mobile computers used in warehouses, ERP, CRM, SRM, and SCM. Many manufacturing businesses, particularly those in the automobile industry, have gaps in their level of ICT adoption and agreement, but they are nevertheless eager to do so in the near future. Numerous business software programmes could enhance information sharing, effectively manage corporate operations, and boost organisational performance overall.

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Kevin (2003) claims that the availability of knowledge to a large population and decreased production costs as a result of improved efficiency are the two main advantages of ICT. According to (D. Rooney), everyone can contribute and exchange knowledge across borders because it is created, disseminated, and generally available. It increases openness and drives down costs.

ICT's Role in Supply Chain Management

The main objectives of ICT in supply chain are to manage supply chain-related data and activities and to facilitate information flow among all stakeholders at functional and organisational levels. ICT serves as the medium for cooperation and the connecting thread between the major participants in the transport and logistics industry through supply chains. According to A Bayo-Moriones (2013), information technology has a favourable effect on supply chain performance. Implementing ICT increases supply chain visibility, lowers theft, enhances delivery, and shortens supply chain pipeline delays. Additionally, it enhances material and product security on all fronts. The ICT aids in investigating corporate growth, income generating, expense reduction, and client reach (Bethapudi A., 2013). According to (K.L. Choy, 2014), the use of ICT directly improves the service quality provided by "logistics as well as SCM" organisations. increases "service quality," which increases competition.

According to (Z. Yu, Benefits of Information Sharing with Supply Chain Partnerships, 2001), "SCM" emphasises the "long-term" benefits of collaboration and information sharing for all chain stakeholders. The place of ICT in "supply chain management and logistics" is what should be understood. In order to effectively regulate "modern but very complex supply chains," (Radjou, U.S. Manufacturers' Supply Chain Mandate, 2003) urged that the deployment of ICT be well-thought-out. a study carried out in the US by the research company "Forrester Research". The study was done for manufacturing companies who recognised the advantages such as greater supply chain agility, shorter cycle times, increased efficiency, and improved delivery of goods and materials at the point of demand. ICT has a favourable effect (role) on supply chain management and performance, according to (X. Zhang, 2011).

III. CONCLUSION

The study looked into a variety of academic works and attempted to summarise its main points. Through a generic model of supply chain management for manufacturing companies, various information and communication technologies and examples, business objectives and various ICT functions, advantages and disadvantages of ICT in general, the roles of ICT in general, and finally the roles of ICT in supply chain management, the study has investigated and explained the supply chain and supply chain management. ICT facilitates the integration of all conceivable organisational operations both inside and outside the organisation, and this improves the flow of information and/or supply chain-related data and activities between and among all stakeholders. Information and supply chains connect the major actors in the transportation and logistics industries.

Their methods of cooperation and the thread that holds them together are communication technology. The study has described how ICT plays a part in SCM. ICT has a favourable effect on the performance of the supply chain, according to (X. Zhang, 2011).The comprehensive explanation and comprehension of the roles of information and communication technology in supply chain management plainly defeat the study's goal.

The study's main finding is that information and communication technologies play a crucial role in today's complicated supply chains and cannot be overlooked because they are a crucial component of contemporary supply chain management. Even if a company produces top-notch items, it will go out of business if it refuses to use ICT since it cannot compete in the market. In order to optimise company processes and manage your supply chain effectively and efficiently, the report advises using ICT wherever it is possible.

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