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Impact of Technology Innovation on Logistics and Supply Chain Management

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Abstract: *This work explores the transformative influence of technology innovations on the field of logistics and supply chain management. In an era marked by rapid advancements in digitalization, automation, and data analytics, the logistics and supply chain industry has witnessed significant changes. This abstract provides a glimpse into the key themes addressed in the seminar, including the adoption of IoT and blockchain, the role of artificial intelligence, and the integration of e-commerce. The research discusses how these technological developments have enhanced efficiency, transparency, and sustainability in the logistics and supply chain domain. It also examines the challenges and opportunities that arise from these innovations, shedding light on their potential to reshape the future of global trade and commerce.*

Keywords: *Technology innovation, Logistics, Supply chain, Management, Automation, Transformation.*

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INTRODUCTION

In today's digital world, emerging technologies are altering the majority of organizational procedures. To stay globally competitive, industries need strategic worldwide networks that can respond quickly and with high quality to demands from anywhere in the world market. The world of business is currently undergoing a significant upheaval. Globalization, integrated logistics, and ICT advancements are all transforming international trade, which is transforming the physical flow of business (Vasiliauskas, 2017). Organizations are seeking to reform their supply chain management (SCM) processes in order to achieve a smooth information flow and improve the value chain (Srinivas, 2022). The efficient and well-coordinated management of these kinds of activities is known as supply chain management or global logistics, and it has developed into the core of the global competitive advantage (Salviotti, 2018). The management of the supply chain

involves many partners and moving parts, making it a complex operation. Modern supply chains can involve a great deal of complexity, several different organizations, and several phases.

The success and financial gain of any business are intimately related to supply chain management. Low product costs are not as important as satisfied customers, which is mostly determined by the supply chain management procedure. The main strategy used by businesses to increase revenue and maintain a competitive edge has been to improve supply chain operations. Procedures for supply chain management that address how people, the environment, technology, and resources interact get increasingly complex every year. Think about how logistics operations need to adjust to different changes in the context of continuous improvement, such as those pertaining to lean, total quality management, agility, etc. (Nilsson, 2021). This suggests that errors are more likely than ever to occur, and errors now lead to supply chain failures. SCM systems have also been implicated in a number of cases of general management bottlenecks in businesses (Nemoto & Koichiro, 2020). By removing these obstacles, costs can be reduced overall and customer service quality can be improved.

From a societal standpoint, an efficient logistics system can offer opportunities to reduce traffic bottlenecks and environmental pollution, perhaps resulting in higher economic productivity (Bowl, 2019). Numerous inventions have contributed to the advancement of the supply chain and logistics systems. These innovations fall under two general categories: individual process improvement and supply chain and logistics system enhancement.

The Proceedings of Industrial Management have featured advances in supply chain management and Third-Party Logistics (3PL) that have effectively garnered industry interest (Vasiliauskas, 2017). A lot of supply chain executives react to developments brought about by omnichannel marketing, supply chain digitization, and big data convenience. Supply chain patterns are directly impacted by the state of the economy (Zheng, 2018). Determining the best way to convey manufactured goods from the manufacturer to the final consumer is the main problem in building a successful supply chain, according to Kwon (2019), in the quickly expanding fields of logistics and supply chain management. It is widely accepted that implementing new technology, particularly information technologies, creates competitive benefits for the logistics and supply chain sector in addition to increasing operating efficiencies (Lin & Lin, 2019).

Tailor (2020) asserts that logistics service providers need to give priority to deploying more efficient technology in order to provide their clients with exceptional services. Numerous advantages come with technology, including greater flexibility, reduced expenses, improved production, and higher-quality services (Lin & Lin, 2019).

1.2. Statement of the Problem

Increased complexity, unpredictability, and fragility in supply chains are the results of globalization and rising interconnection in supply chains. Though digitization is moving quickly, low levels of trust and insufficient transparency still plague the supply chain. The majority of providers are not technically qualified to do their tasks. This has resulted in circumstances where the chosen supplier is unable to meet the company's capacity and logistical needs. Another problem is inadequate supplier selection and this is one of the most important decisions in the purchasing process. There is also the problem of lack of good contractual arrangement and a clear description of the product or supplier requirements may not be available. Also, there are delivery problems; Suppliers deliver too late, deliveries are not complete, products are damaged or may not meet

quality requirements, packaging of the product is not sound and information labels in most cases cannot be read. The reason for this can be traced back to unclear specifications or careless supplier specifications.

The purchasing and supply departments of many business organizations lack clear rules and guidelines with regard to procurement and supply governance. The purpose of this research study is to address these issues. As a result, supply chain management gains expertise in addressing these issues. This conceptual work concentrated on identifying the common strategies for creating and maintaining a competitive advantage in supply chain management and logistics, as well as the technical innovations now in use to address these issues.

REVIEW OF RELATED LIERATURE

2.1 Review of Concepts

The aim of this sub-section is to categorise and describe key concepts used in this study and outline its relationships.

2.1.1 Technology Innovation

Technological innovation is the creation of novel scientific methods and procedures that are implemented into practical tools and applications to help adopters and organizations seize significant opportunities and address issues and environmental risks (Moore, 2021). Technology innovation is a component of the intricate system of technology meant to meet adopters' demands, accomplish their objectives, and resolve their issues (Theirer, 2022). The primary goal of technological innovation is to promote the development of human societies and the generation of wealth (Zhang, 2020). Technology innovation is the use of recently developed or vastly enhanced technology. Technology innovation is defined by Babich and Hilary (2021) as the creation or application of new technology with the goal of maximizing efficiency and outcomes. The partial or complete replacement of an existing technology with a new one in order to increase productivity, quality, and competitiveness of goods or services is another definition of technology innovation (Gallino, 2018). The goal of technical innovations is to enhance a good or service by adding new features that set it apart from the competition in a market that is highly competitive (Jonas, 2021). Businesses need to focus on using technological breakthroughs to stay afloat in the highly competitive market, since success can only come from superior and scientific technologies (Ni, 2018).

Moreover, entrenched interests may oppose change by attempting to sabotage chances for technological innovation and entrepreneurship that may ultimately result in higher productivity, greater growth, and wealth (Broughel & Theirer, 2022). In order to support corporate, industrial, economic, and social change for the competitive advantage of businesses and nations, as well as to advance human progress generally, technological innovations play a significant role in society by meeting needs, accomplishing goals, and resolving adopters' issues (Zchalat, 2021). Businesses make innovations investments to stay alive, hold onto their market share, expand their footprint, and boost productivity and profitability (Tapscott, 2017). Innovation gives a company stability and growth, enabling it to take big steps, get an advantage over rivals, and maintain its competitiveness over time (Edward, 2019). As a result, rivals with more advanced technological procedures typically enjoy greater commercial success. Technology innovation is a strategic issue, so a

company shouldn't innovate just for the sake of doing so if the costs associated with creating or deploying a particular technology outweigh the benefits (Edwards, 2021). Otherwise, it may be counterproductive to proceed. Technology innovation has several advantages, such as higher productivity, large profit margins, better products and services that raise citizens' general standards of living, and overall economic growth (Boute, 2021). Despite all of its advantages, technology may also bring about temporary disruptions that could be disturbing because it could replace an outdated business model and result in job losses.

2.1.3 Supply Chain Management (SCM)

The management of resources, information, and financial flows in a network made up of suppliers, manufacturers, distributors, and customers is the focus of supply chain management. In order to deliver goods to clients, a wider network of external companies—including vendors, shipping companies, call centres, warehouse operators, and others—coopers. The Hofmann, 2022. Supply chain management's primary goal is to link all supply chains so they cooperate to maximize productivity, create value, cut costs, and raise customer happiness, all of which increase an organization's competitiveness (Amos, 2018). As per the Council of Supply Chain Management Professionals (CSCMP, 2018), supply chain management (SCM) encompasses two main functions: (i) organizing, coordinating, and managing the main activities that generate and provide value for the final consumer (such as manufacturing, procurement, and logistics); and (ii) integrating and coordinating related business processes both within and between organizations. The coordination of procedures and systems to facilitate the alignment of material, financial, and information flows along the SC is the "technical" implementation of these flows, whereas integration refers to the administrative and organizational issues of creating a network of primarily autonomous enterprises (Salviotti, 2018).

According to (Wiley, 2012), the ability of businesses, whether they be public, private, or military, to effectively control the flow of resources—including money, information, and materials—into, out of, and into their organizations is essential to their success. We call this kind of flow a supply chain management or distribution. We commonly observe issues with the operation of the supply chains because they may be lengthy, complex, and involve a variety of different business partners. These issues could cause hold-ups, unhappy customers, missed revenue, and expensive repair costs once the issues arise. Product distribution or supply to customers in the marketplace is necessary when production and pricing are completed. Distributing and supplying goods is what all organizations do. Because it supplies the commodities and services that consumers want, the distribution function is essential to the economic health of society. Time, place, and ownership are common ways that economists define the value of distribution. By delivering the goods to the customer at the ideal time and location and by offering a means of ownership transfer, the marketer adds value to the product. Businesses that struggle to efficiently carry out the distribution role typically collapse. There are job chances through distribution as well. In distribution, there are salespeople, warehouse managers, truck drivers, stevedores, and forklift operators.

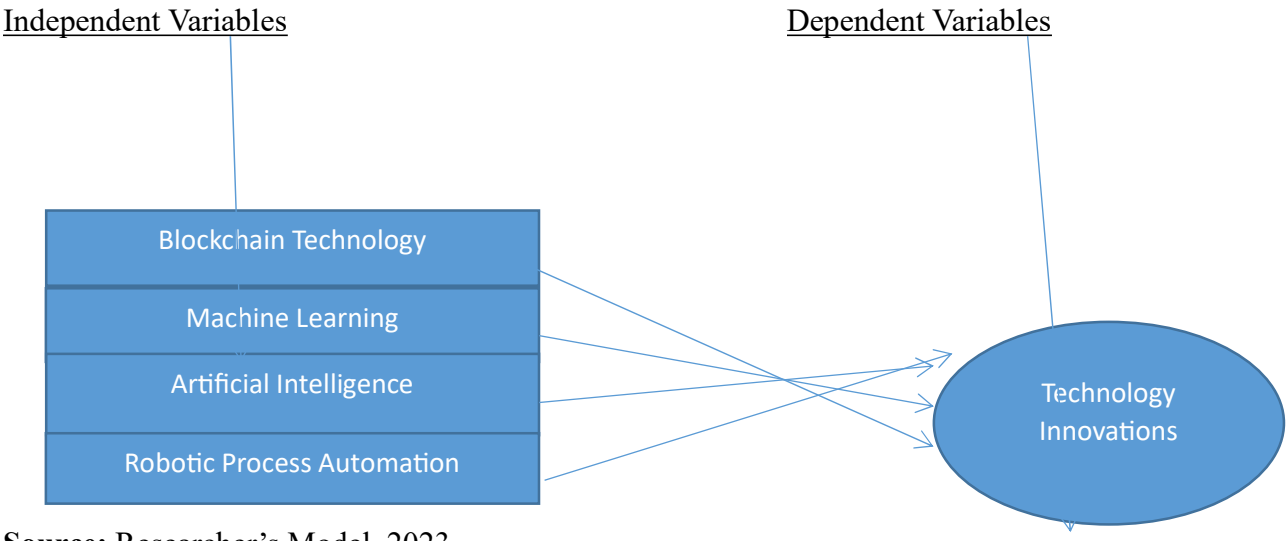
Through a network of distribution, other people supply product service. Serving several other economic sectors is the primary responsibility of the majority of those working in distribution, who are categorized as service personnel. An very helpful tool for managing an organization's activities is the technological system. For the purpose of distributing products quickly and effectively, customer records must be thoroughly examined and documented. This study is being conducted because technological systems are important for product distribution and monitoring.

The process of supply chain management follows a fundamental framework. Despite the fact that every supply chain faces a different set of operating difficulties and market demands, the problems are essentially the same. Businesses in any supply chain have five areas to decide on their course of action, both individually and collectively:

1. Production: What goods is the market interested in? When and how much of these things should be produced? Master production schedules that account for plant capabilities, workload balance, quality assurance, and equipment maintenance are created as part of this process.
2. Inventory: What kind of goods ought to be kept on hand at every point in the supply chain? What proportion of raw materials, semi-finished goods, and final goods should be kept in inventory? Keeping inventory on hand serves as a safeguard against supply chain unpredictability. What are the ideal inventory levels and reorder points, though, given that keeping inventory can be costly?
3. Location: Where should production and inventory storage facilities be situated? Where are the most economical places to produce goods and store inventory? Is it better to employ already-existing facilities or build new ones? Following these decisions, potential routes for the product to follow in order to reach the end user are identified.
4. What kind of inventory ought to be kept on hand at every stop along a supply chain? What proportion of raw materials, semi-finished goods, and final goods should be kept in inventory? Keeping inventory on hand serves as a safeguard against supply chain unpredictability. What are the ideal inventory levels and reorder points, though, given that keeping inventory can be costly?
5. Location: Where should production and inventory storage facilities be situated? Where are the most economical places to produce goods and store inventory? Is it better to employ already-existing facilities or build new ones? Following these decisions, potential routes for the product to follow in order to reach the end user are identified.
6. Transportation: How should inventory be transferred between locations in the supply chain? Although they are more costly, truck transport and air freight are typically dependable and quick. Although shipping by rail or the sea is far less expensive, there is typically greater uncertainty and lengthier transit periods. Higher volumes of inventory must be stocked in order to offset this uncertainty. When is a particular form of transportation preferable to use?
7. Information: What is the appropriate amount of data to gather and share? Better decision-making and coordination are possible with timely and accurate information. People are able to make informed decisions regarding where to locate inventory, how much to manufacture, and the most efficient way to convey it when they have access to reliable information. The sum of these decisions will define the capabilities and effectiveness of a company’s supply chain.

The performance of a company's supply chain has a significant impact on the actions it may take and how it can compete in its markets. A business needs an efficient supply chain if its goal is to compete on the basis of price and cater to a large consumer base. A company needs an efficient supply chain if its goal is to cater to a certain market niche and compete on the basis of convenience and customer service. Markets and supply chains have a significant impact on a company's identity and capabilities.

2.2 Conceptual Framework



Source: Researcher's Model, 2023.

2.2.1 Blockchain Technology and Logistics & Supply Chain Management

Blockchain technology essentially offers efficiency and transparency in supply chain and logistics management. Because blockchain technology enables businesses to conduct transactions directly and without the involvement of third parties, it improves the efficiency of the global supply chain. Additionally, it makes it easier for financial and logistical services to integrate, fostering greater stakeholder collaboration on data. By shortening the time between placing an order and processing payment, integrated payment systems guarantee the efficient and timely delivery of goods. Furthermore, smart contracts and blockchain technology assist businesses in improving compliance, lowering legal costs and penalties for late tax payments, and preventing fraud and counterfeiting. Because data on Blockchain is irreversible, it facilitates transparent supply chains. Additionally, since every stage of the supply chain is safely recorded, logistics problems may be quickly traced back to their origin. The same is true for procuring raw materials or components, which may be tracked back to their place of origin, enhancing transparency and accountability while reducing legal action.

2.2.2 Machine Learning Technology and Logistics & Supply Chain Management

Supply chain management may become a difficult undertaking when dealing with a large network of suppliers, warehouses, and logistic service partners. Machine learning technology can assist with supply chain management at every level. Global market competition has raised the bar for logistics operations in terms of dependability and speed. Specifically, inventory levels, quality, supply and demand, production planning, and transport management can all be impacted by machine learning in supply chain management. Going forward, supply chain management will need to consider this, especially in the context of warehouse management.

i. Among its advantages are the following: i. By optimizing the movement of goods between locations, MLT enables businesses to employ inventory planning more effectively. It

enhances supplier relationship management with administrative procedures that are data-driven

ii. It lowers operating costs by enabling waste reduction and quality improvement across various components.

iii. It helps to obtain actionable insights for speedy problem solutions and continuous improvement.

2.2.3 Artificial Intelligence and Logistics & Supply Chain Management

Artificial intelligence (AI) and the Internet of things (IoT) can work together to track items across the entire logistical chain. Supply chain experts can use it to monitor the whereabouts of items and shed light on the handling circumstances. By using sensors, transportation-related critical elements like temperature and humidity may be better understood. Artificial intelligence (AI) can be utilized to provide real-time route optimization recommendations and so save travel times and expenses by monitoring weather and traffic conditions. Autonomous vehicles possess the capacity to revolutionize logistics by reducing reliance on human intervention. According to Gartner (2019), companies such as Tesla, Google, and Mercedes-Benz are making significant investments in the notion of autonomous automobiles.

Both the effectiveness and quality of logistics have been greatly enhanced by artificial intelligence. Artificial Intelligence (AI) can continuously optimize and improve the current operating processes and the warehouse planning based on historical data through big data analysis and machine learning. In contrast, artificial intelligence technology has the ability to optimize the distribution path and enhance the efficiency of delivery. Artificial intelligence (AI) in supply chain management ensures the effectiveness of client delivery and high-quality logistics operations by removing many uncontrollable aspects from the process and making it traceable, controllable, and predictable overall.

2.2.4 Robotic Process Automation and Logistics & Supply Chain Management

A business process is a collection of quantifiable actions that follow a predetermined order, are guided by explicit rules, and are intended to produce a particular outcome. Conversely, a robot is a piece of software that, when a particular business process is implemented, faithfully reproduces certain human-performed tasks at the user interface level or in the background through automation (Carson, 2020). It is important to note that robotic process automation helps standardize and optimize business operations in many organizations. The current information technology infrastructure is typically not severely impacted when robotic process automation is selected, which lowers expenses.

Above all, robotic process automation is crucial for developing a competitive edge, providing customers with value-added services, developing competencies, and creating an automated culture within the company (Van der et al., 2018). Use the extra time you save to focus on more significant projects and duties requiring creativity and judgment. Consequently, this will assist companies in improving their capacity to respond to shifts and novel commercial prospects.

2.3 Theoretical review

2.3.1 Theory of the Innovative Firm

This theory was put forward by William Lazonick an economist to help explain superior performance in the wake of imperfect markets. According to the theory, the function of a firm is to transform productive resources into goods and services that can be commercialized. A firm can accomplish this by engaging in innovation. Accordingly, superior economic performance results from innovative enterprises creating products of higher quality at lower cost (Susanto, 2018). Innovative firms have the ability to transform productive resources into higher quality, lower cost goods and services translating to a gain for the customers and other participants in the economy (Zhang, 2020).

The notion states that a company can use innovation to both establish and maintain its competitiveness, allowing it to effectively compete in its industry. These businesses innovate to maintain or increase their competitiveness. In addition, a creative company could innovate to acquire a strategic position in the market or to maintain its market share against a creative rival (Schmidt, 2021). Instead of using differentiating factors like price and quantity, innovative organizations can compete through innovation. This idea is still important today since innovation economics suggests that a firm's innovative activities can be attributed to its increased output, rather than just the continuous expansion of inputs in the production process (Boute & Moore, 2021). By investing in both quantity and quality of output, innovative businesses can become more competitive.

This makes it possible for businesses to create better goods and services as well as more effective organizational, production, and marketing strategies (Gallino & Moreno, 2018). An innovative company does not allow short-term cost increases to control it; instead, it generates high-quality products that lower unit costs and grow market share (Van Mieghem, 2021). Due to the varying purchasing power of different market segments, innovation allows the innovating firm to gradually infiltrate them. This gives the businesses a foundation on which to build their capacity to reach other market groups (Amos, 2019). The creative company can also employ innovation to stand out from the competition by providing distinctive clients with unique goods and services. Innovation strategy helps businesses to compete in this way. Innovation-driven businesses differentiate themselves by ongoing product, process, and method development, which raises their firm competitiveness (Rainer, 2021).

This idea was helpful in elucidating the function of innovation and how it boosts business competitiveness by generating better goods and services for the marketplace. Additionally, innovation creates differentiation, a crucial component of competitiveness that gives rise to novel goods, services, marketplaces, and organizational structures. This helps firm’s deal with competition.

2.3.2 The Resource Based Theory

One of the best theories in the field of innovation and competitiveness research is the Resource Based theory, which was developed by others after being proposed by Penrose in 1959 (Mulligan, 2018; Tascott, et al. 2017). According to the principle, businesses have resources that they can use to gain a competitive edge. According to the notion, a company can obtain a competitive edge by having unique resources or competencies that are valuable, hard to duplicate, and uncommon in

the industry (Hazell, 2020). This viewpoint's proponents contend that businesses should use internal rather than external sources of competitiveness (Tascop, et al. 2020).

Proponents of RBV contend that it is far more practical to take advantage of outside chances by repurposing already-existing resources than it is to try to learn new skills at every opportunity. Businesses value their resources and procedures because they have an impact on their behavior and operations. According to Carson (2018), a resource is an asset, skill, organizational procedures, information, knowledge, or capability. It is deemed unique if it is priceless, uncommon, challenging to duplicate, and lacks a close equivalent. Unique resources are what give businesses long-term competitiveness and greater profits (Goldfarb, 2018; Autor, 2018). A company is viewed as a well-coordinated collection of resources that it may use to gain a long-term competitive advantage (Barney, 2019). Firm resources encompass human, social, technological, knowledge-based, physical, and financial assets that are semi-permanently attached to it (Zhu & Scott, 2018). Businesses that own uncommon and difficult-to-copy valuable resources get a long-term competitive edge through the development of creative new goods (Warren, 2018). By supplying the inputs that are integrated and transformed to produce innovations that increase firm competitiveness, organizational resources have a positive impact on the innovation process (Walsh, 2018). By producing valuable, uncommon, and difficult-to-imitate outputs, innovation gives a company a competitive advantage (OECD, 2019).

One of the most crucial sets of resources that a company may utilize to promote innovative operations, particularly research and development, is money. Human capital is also a crucial factor in determining the competitiveness and performance of a company. Knowledge-based resources are another important asset for a company's competitiveness. Understanding makes it easier to find inspiration and take advantage of chances for innovation. As a result, it helps with the development, manipulation, and transformation of other resources for competitiveness (Wiklund & Shepherd, 2019; Lee & Sukuco, 2019; Wang et al., 2019; Idenedo et al., 2020).

2.4 Empirical Review

Fouad et al. (2018) investigated the innovation process impact on the new product performance in Morocco fish industry. The organisation strives to establish a modernised value chain that supports product innovation in its performance generation. The underlying objective of the study was to measure the impact of value chain on the performance of new product, taking into account the initial stages of development. The empirical implications of the study shows that accelerating the execution of innovation activity is enormously favoured to increase the performance of the innovative product over the medium term. This enables an organisation to be efficient in terms of market entry with good quality of new product (Fouad et al., 2018).

Sawng et al. (2018) examined technology adoption and company performance a correlation analysis with evidence of Korean export companies. The study purpose was to examine the useful implications for Korean export companies adopting smart technology for the improvement of their performance in the era of industrial convergence. The researchers adopted five-stage procedure and methods. The study established that the effects of technology on export companies performance was still unsatisfactory and Organizational Performance proved to be top priority area, the study also established that strategic decision-making is required for adoption smart technology in the perspective of technology convergence to improve the performance of companies among heterogeneous firms. The practical implications of the study findings are in the global market, not only technology convergence in the same sector but also industrial convergence

in different organisations is essential for service firms with a perspective of innovation (Sawng et al., 2018).

Zhu et al. (2018) conducted a comparative study of the effects of different factors on firm technological innovation performance in different high-tech organisations, the study examined six variables using semi-parametric models based on data of GEM listed firms between 2010-2015. The model used ensured that influencing factors of firm technological innovation performance are no longer restricted to a particular aspect but can provide a comprehensive comparative analysis of the factors. Study finding shows that research and development expenditure have positive impact on organisational technological innovation performance, investment and government subsidies have a significant and positive impact on an organisation's technological innovation performance in knowledge oriented industries. Technology diversity has a significant and positive impact on organisational innovation performance (Zhu et al., 2018).

Schniederjans, (2018) examined business process innovation on quality and supply chains and the main objective of the study was to assess the role of business process innovation on the relationship between supply chain performance and social quality management. The study further distinguished social quality management from soft quality management and refines the impact of level of business process innovation that is radical and incremental on the relationship. The research data was collected using a questionnaire that was distributed to manufacturing organisations in the United States. The study adopted hierarchical moderated regression to examine the research hypothesis. The study finding shows that there is positive association between social quality management and supply chain performance. The results also confirmed a positive moderating relationship with incremental business innovation process between social quality management and supply chain performance. Radical process innovation was found to have negative moderating role on this relationship. The practical implication of the research study is that it distinguishes social quality management from soft quality management thus making it easier to determine which aspects of soft quality management will enhance supply chain performance and provides evidence of the differentiating models in which business process innovation moderates the relationship between social quality management and supply chain performance by identifying the positive and negative moderating roles of incremental and radical business process innovation (Schniederjans, 2018).

Huesig & Endres, (2018) explored the digital innovation process the role of functionality for adoption of innovation management software by innovation managers. The research purpose was to explore the influencing factors on the adoption of specific software tools to support innovation management methods that is referred to innovation management software. The study used an online questionnaire that was distributed to 99 managers of a German industrial organisation in data collection. The study findings indicated that adoption of innovation management software has positively influenced the innovation management and that software tools offer support functionality for ideas and portfolio management but decreased for idea generation and scenario management. The study findings show that digitalisation of the innovation process through information technology tools is more finely nuanced than the more logic often promoted in the digital context and proposed in the study of innovation management software (Huesig & Endres, 2018).

Milewski et al. (2020) explored technological process innovation from a lifecycle perspective.

Technological process innovation is a distinctive organisational phenomenon that is characterised by an organisation's internal and underlying components such as mutual adaptation of modern technology and technological change. The main objective was to investigate modern technology and technological change in different stages of the innovation life cycle. The study adopted an exploratory case based research design and conducted a multiple case studies of five large successful manufacturing companies operating in different industries. Fifty-five semi structured interviews were used for data collection. The study adopted a cross case synthesis and replication logic to identify patterns of how companies address process innovation components at different stages. The study established that modern technology and technological change identify differences between development of core and non-core process and based on the findings the study describes asymmetric adaption as a theoretical construct and propose that organisation's seek different level of process standardisation that depends on the types of processes developed which affects to a great extent technological and organisational change (Milewski et al., 2020).

Empirical research has also shown that the effect of technology on supply chain performance is moderated by factors such as a commitment of relation, key partner, interaction, and uncertainty (Kim et al., 2015). Vijayasarathy, (2010) conducted a research on process innovation (e.g., crossdocking to collect and enhance exchange processes among chains), collaboration quality (commitment and effective interaction among partners), and uncertainty (in price, input supply, and competitors actions (Vijayasarathy, 2010). For using technology, innovation processes are needed while there are a few evidence to examine it as moderator (Dehning et al., 2017). Moreover, a few research has conducted to show the effects of uncertainty on technology relationship and SCM performance, and equally important partnership quality more often considered as mediator or outcomes, then as moderator (Vijayasarathy, 2010).

Sanders and Premus (2020) offered an empirical research to show the direct effect of technology and supply chain performance. In addition, they reported that organizations can attain operational benefits such as decreasing costs and cycle time by using IT across supply chain management (Sanders &Premus, 2020). As evidence, Chrysler Company has saved least $220 million in annual by using Electronic Data Interchange (EDI) in the supply chains, which has improved information flow and cost reduction (Mukhopadhyay et al, 1995). An empirical research conducted in 123 manufacturers to examine the effect of IT-oriented supply chain management systems on financial and operational that shows, there is a strong relationship among them (Dehning et al, 2017). Lai, *et al*. (2008) found out that the result of interaction between electronic integration and logistic performance was limited to decreasing cost but the service development was not improved by them (Lai, et al., 2018).

The numbers of researches have conducted that shows some factors such as geographical, environmental, organizational interaction are as mediator or moderator on the relationship between usage of technology and supply chain performance (Vijayasarathy, 2019). A research was done among 135 companies that confirm environment as a factor moderate relationship between the role using IT and SCM (do Carmo Caccia-Bava, *et al*, 2019). In a study, were found by Fawcett *et al.* information flow positively effects operational performance, also this effect is stronger when there are connectivity and satisfaction to share information (Fawcett *et al*, 2017). So running information system to improve connectivity among chains, a trust is needed to information transaction to understand better performance (Vijayasarathy, 2010). Devaraj, *et al.'s* research, which was on integration, investigated that integration of

suppliers and E-Business Technologies cover customers. While, integration of suppliers positively affected on cost reduction, improving quality, flexibility, and on time delivery, but the positive relationship between the customers and performance was not observed (Devaraj *et al*., 2017). A survey shows that only 33% of suppliers of automotive companies had a systematic process to plan and develop technology (Ulusoy, 2013). Furthermore, fifty percentages of new technology in fifty years ago, have transferred from outside of the industry itself (Drucker, 1995). 57% of companies in a study, emphasized that their current technologies were monitored and 52% of them emphasized that their programs to develop technologies for future were monitored and lower 29% of them reported that competitors' technologies were monitored by them (Ulusoy, 2018).

SUMMARY AND CONCLUSION

3.1 Summary

Modern logistics and supply chain management process is a technologically based system that enables organizations to effectively monitor the distribution of products to different customers. The information it provides enables the organization to know who has been serviced and who has not been serviced. Good distribution can be used to achieve a variety of supply chain objectives ranging from low cost to high responsiveness. The following are the benefits of applying technology in product distribution: It saves time, it keeps record of customers, records can be retrieved from the database, and customers can book for products to be delivered easily. Furthermore, industries organise competitive strategies in the global network that can effectively deliver high quality response to demand from any part of the word market using integrated logistics and the development of information and communication technology thereby reshaping the words trading patterns and the physical trade flow. Supply chain management process is a relation between humans, nature, resources and technology which means more opportunities for errors than ever before and by eliminating these errors or bottlenecks there is a potency of reducing total cost and improve the quality of service provided. Adoption of new technologies improves the operation efficiency of the company and also generates competitive advantage in the logistics and supply chain industry, the advantages provided by technology includes; improved service delivery, flexibility, cost savings and efficiency.

Globalization has given birth to greater complexity, uncertainty and vulnerability in supply chains despite the advent of digitalisation which has led to logistic inefficiency.

This conceptual study was objectively carried out to examine the overall impact of technology innovations and logistics and supply chain management using technology parameters such as; Blockchain, Machine Learning, Artificial Intelligence and Robotic Process Automation with a sole aim of determining its positive influence on logistics and supply chain management. The importance of this study cannot be over-emphasized because it will be useful to the governments, academics, researchers, industries, companies and other business entities to adapt and develop modern technology method of product distribution that will minimize logistic and supply chain expenses and maximise the overall profit of the organisation. The findings of the study will also be used as a base for future research by scholars.

3.2 Conclusion

Supply management is a very important system for organizations. It enables management to get instant reports of distribution activities. Utilizing computerized software to track down supply functions enables better management and efficiency. It gives the organization a professional approach to managing information of customers. When customers place order it will aid in monitoring the status of distribution thereby enabling them know if ordered product has been supplied. It reduces risk and increase efficiency in the overall logistics and supply chain channels. Proper implementation of the technology paradigms will definitely enhance a companies' competitive advantage in the global market and also impart positively in its customer satisfaction and effectiveness. The improvement of supply chain management stands to be the main source for businesses to make profits and sustain competitive advantage among rivalries.

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