



Impact of mobility solutions on logistics services

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ABSTRACT

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Logistics and supply chain have improved globally over the past few years. There has been significant evolution in logistics, because many logistics companies have adopted technology in their structures, which has enhanced their ability to respond to modern logistics needs and market demands. The fourth industrial revolution has brought changes with technological innovations that have created efficiency in the logistics sector globally (Sauvage, 2003). Technological development and innovation in the logistics sector by creating efficiency and ease of movement of goods and services have enhanced proper and smart logistics.

In this study, the general conclusion is that technology in logistics has enhanced efficiency by creating more transparency by logistics companies and customers. Manufacturing companies and producers can concentrate on producing product while subletting the role of logistics and transport to specialized logistics companies. The most common types of logistics companies are 3PL logistics companies that have increased in popularity and presence worldwide (Sauvage, 2003). Such companies utilized advanced technologies to enhance the visibility of their product, communication with their customers, and warehouse management. Examples of companies that have utilized this type of logistics include Amazon, Auto Store, Google, Uber, and Tesla.

This study has also concluded that technology has a crucial role in the logistics sectors future. Several technological developments have been used in logistics to date, which provides context to understand that it will continue to create efficiency and speed. Examples of technological developments that have been used in the logistics sector include robots, artificial intelligence, drones, cargo space sharing platforms, customer-to-customer transport platforms, navigation services, mobility as a service, and cloud logistics (Liao & Wang, 2018). These services are expected to expand in use and popularity with companies like Tesla investing in smart technology and smart trucks that ensure proper use of technology is merged with logistics to create efficient modern logistics.

Key words: logistics, technology, smart logistics, innovations, mobility

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ABBREVIATIONS AND TERMS

IoT	Internet of things
ANT	The Actor network theory
SCOT	The social construction of technology
CPS	Cyber-physical system
RFID	Radio frequency identification
C2C	Customer to customer
GPS	Global positioning system
Maas	Mobility-as-a-service
1PL	First party logistics
2PL	Second party logistics
3PL	Third party logistics
4PL	Fourth party logistics
5PL	Fifth party logistics

1 INTRODUCTION

The consumer value chain is a complex process that involves the production of goods and their movement until they reach the consumer, and where possible, until they returned to the seller. The effectiveness of the local supply of goods and services depends on the effectiveness and efficiency of the logistic services are available to supply these goods and services. The fourth industrial revolution has revolutionized how production and distribution companies operate. There is more use of technology in the production and supply of goods and services worldwide (Kumari & Bharti, 2021). Furthermore, the local supply chain depends on the efficiency with which people cannot produce and avail the goods that are needed at the right time without delay because any delay means that the customers can move from one business to another with low switching costs and high availability of information due to technological advancements. Quickly and effectively, logistics and supply chain have become the competitive ground for most businesses because customers demand efficiency, which can only be delivered through official cladistics and supply chain.

Several factors have affected the operation of the logistics and supply chain sector globally. The most notorious factors include information technology and the Internet of Things, globalization, and the onslaught of e-commerce among nearly all businesses operating in the global era. Selling across the world no longer needs a business to be a multinational corporation with new forms of logistics (Kumari & Bharti, 2021). These businesses can sell across their borders without necessarily having offices in the countries they sell. Globalization and the 4th industrial revolution mean that the logistics and supply chain sector has become one of the most critical sectors for the success of these businesses and the satisfaction of their customers (Kumari & Bharti, 2021).

Logistics and supply chain have also been majorly affected by the entry of different players in the market, especially third parties that have helped in offering a new lease of life to companies by taking their logistics for them. Production companies want to produce the products, while distribution companies want to develop strategies to help their products get to their customers (Wang, Jie, &

Abareshi, 2018). However, logistics companies have made each of the processes more manageable by providing intermediary services that have facilitated the faster movement of the goods and services to their customers. Insurance has also increased in the recent past, meaning logistic services are safer and more secure, especially with the global movement and transport means that as susceptible to accidents. There is more confidence from both customers and businesses that their transactions will be completed, and the goods delivered to the rightful owners, who are their customers.

Mobility in logistics and supply chain refers to the movement of goods and services from production to consumption, including all the intermediaries facilitating this movement. With the evolution in technology and logistics, mobility in logistics and supply chain has advanced over the past few years (Wang, Jie, & Abareshi, 2018). Therefore, one of the most relevant and impacting areas is the dynamic shift in transportation and the allied innovations making mobility a new experience. E-Commerce has also advanced with developments like mobility shifts towards big data management and IoT-based operations, with mobility leaning towards high technology used to deliver high demand (Pham et al., 2019). Also, there is increased globalization and competition in E-Commerce, necessitating an inquiry into how high transportation innovations affect the mobility of goods and services in the supply chain. Because of such development, there is more technology in logistics and supply chain, more use of big data, and more globalization of trade due to the fourth industrial revolution and the logistics revolution. There is an increased focus on efficiency, timesaving, and quality products and services with less focus on the physical interaction between the buyer and the seller.

1.1 Problem statement

The evolution in technology and logistics means that there is potential for more use of technology to facilitate more efficient logistics and supply chain management in organizations. Yet, the literature that has been studied in this area is diverse and not specific to increasing mobility in logistics and supply chain. This research problem is significant cause access to such data about the effect

of mobility solutions, especially technology and IoT on logistics, will help inform logistics companies on their choices in logistics and transportation for their goods and services (Pham et al., 2019). Logistics companies have focused on various elements in the past few years, including cost reduction, revenue maximization, customer service, and customer satisfaction. There has also been increased focus on automation and tracking services to ensure that customers are happy and that companies can be aware of their product (Pham et al., 2019). The insurance sector has also been more involved, especially by ensuring goods on transit, increasing especially for global trade. These developments have been enabled by advancements in logistics and supply chain technology, which often receives less focus in research and analysis. This study, therefore, focuses on understanding the role of mobility solutions, especially technology-based solutions in enhancing the efficiency and operationalization of the logistics and supply chain sector.

1.2 Purpose and expected outcome.

This study aims to use literature to narrative analyze the available solutions in logistics, especially mobility solutions that enhance the efficiency and effectiveness of logistics and supply chain companies. The study uses narrative analysis of literature to understand any trends and technologies that have been applied in different logistic settings that have improved the operations of those sectors.

The expected outcome of this study is a research paper that analyzes the various technological advancements in mobility in logistics that have improved the sector and created better results for logistics companies. The study also developed a framework to analyze the satisfaction of different stakeholders with their mobility solutions and the effect that they have created within the logistics sector. Finally, recommendations on how mobility solutions can be incorporated in the logistics sector to create more effectiveness and efficiency are also developed through this study.

1.3 Research objectives and research questions

General Objective:

- To determine how technologically enabled mobility solutions create or distort effectiveness in the logistic services through the analysis of literature to find researched information about technologies that have positively or negatively transformed the logistics sector.

Specific Objectives:

- To develop a theoretic approach towards analysis of the logistics and supply chain moving technologies that have transformed the sector.
- To analyse and critically appraise the available technologies that have been used to tell from the logistics sector, especially in global logistics.
- To provide recommendations on how different technological solutions can be incorporated in the logistic services to enhance effectiveness within the sector and promote satisfaction for all the stakeholders involved.

General Question:

Which moving technologies and solutions in the market can improve the logistics service sector and have transformation impacts on satisfaction in the sector?

Specific Questions:

What is the most effective theoretical approach towards analysing the logistics and supply chain moving technologies that have transformed the sector?

What are the examples of available technologies that have been used to tell from the logistics sector, especially in global logistics?

1.4 Research methods

This study adopts a narrative literature review approach in analysing the available technologies and systems that have positively affected the logistic services sector

globally. A narrative literature review is important because it helps by fast creating a theoretical model that can be used to analyse information in a particular context. The information is then analysed by collecting data from secondary sources and analysing it against theorists and models identified within the study.



PICTURE 1. E-Commerce (www.dreamstime.com). Flat design modern vector illustration infographic outline concept of purchasing internet product, mobile shopping communication and delivery service.

1.4.1 Kaizen

The doctrine of Kaizen is a Japanese theoretical application that refers to continual improvement to achieve better results repeatedly. According to Kaizen, improvement in productivity in any sector is a gradual and continuous process that should be undertaken over time to allow the organization to adjust and allow

the change to be understood by the stakeholders (Cherrafi et al., 2019). This theory applies to the development of mobility solutions in logistics because it helps understand the evolution of these solutions, especially with the inflow of innovative technology in logistics and the urge to have better solutions for better delivery of services. It helps to evaluate the framework strategically and critically within which technological solutions in the IoT have developed in logistics and how they have affected the supply chain (Cherrafi et al., 2019). It helps to understand the value of different stakeholders, their satisfaction, and their inputs in developing solutions that continually improve logistics and supply chain for key commodities worldwide.

1.4.2 The Stakeholder Theory

The stakeholder theory posits that many people with different interests affect the operations of any business unit that must be satisfied for the business units to operate efficiently and effectively. The stakeholder theory is drawn from the perception that every person is interested in the business if the business affects them or affects the business in one way or the other (Jones, Harrison, & Felps, 2018). Ensuring the satisfaction of every stakeholder is important in the development of a business and satisfaction of its market and potential.

The theory is relevant to this study because it helps understand different stakeholders that have contributed to the rapid development of technology in logistics globally. It helps to understand how these stakeholders have contributed to the development, continued satisfaction and how they can be motivated and kept interested in the business long term. Stakeholder satisfaction is important in adopting moving technologies in logistics because stakeholders from different companies across different sectors are involved in adopting these technologies.

1.4.3 The Actor-network theory (ANT)

The ANT defines the existence of everything in the social and natural worlds and asks interconnected through several types of complexes and aligned relationships. Everything in this system can be affected by factors internally or externally, forming a complex relationship between the variables within the ecosystem (Crawford, 2020). The forces between people in a social system do not exist in dependently, meaning people determine what relationships and interactions they have within their social system. In logistics, customers' influence each other through different media, making businesses recognize trends and demands from the customers, thus offering them specific services to meet their demands. There are innovations in technological developments that are influenced by social pressure and demand from the customers, which makes businesses transform the way they offer their services to meet the customer needs. This theory is relevant because it will help to understand how technology in logistics and supply chain has been influenced by both the demand from the customers and the need for effectiveness and efficiency by the businesses. It helps to understand the delicate relationship between producers and consumers and the interaction with technology, especially from the point of view of the demand origin of such interactions.

1.4.4 The social construction of technology (SCOT)

This theory argues that technology does not determine how humans act. It argues that human beings and their actions determine the advancement and development in technology because people developing these technologies only respond to the market needs and trends (Dhamale et al., 2017). Proponents of this theory father argued that the market determines innovation and technological development rather than technological development determining how people act. Therefore, the adoption of technology in any sector depends largely on how people within that sector behave towards technology and perceive its role within the sector.

The theory is relevant to this study because it helps understand that logistics and supply chain companies, along with the consumers have determined the development in technology within the sector. It helps understand that this technological development, especially moving solutions within logistics, is likely to continue advancing as long as consumers and businesses seek better ways of doing business and interacting. Demand for better logistics and supply chain solutions is increasing, meaning advancements in technology will continue. Therefore, understanding the details of technological development in logistics and supply chain is important in understanding the evolution of this sector.

2 LOGISTICS SERVICES STANDARDS IN THE DIGITAL AGE

2.1 Logistics 4.0

Logistics 4.0 refers to using technology and tracking features to interconnect, network, and integrate logistic services within and outside the production company to link better the customers. Logistics 4.0 refers to the evolution of logistics where technology has been continually adopted in logistics to the point that it is one of the main facilitators of logistic services (Winkelhaus & Grosse, 2020). It includes embedded logistics systems interconnected through communication technology and other networking technology that allows different logistics players to participate in the market from strategic locations. Manufacturers, producers, distributors, and consumers need to be connected to understand the movement of the goods and services from the point of production to the point of consumption. According to Winkelhaus and Grosse (2020), logistics 4.0 integrates technology and the Internet of Things in ensuring that all the parties in the value chain are connected through communication and networking solutions, ensuring that they all access information about the goods and services as they move.

A critical element of logistics 4.0 is Cyber-Physical Systems (CPS), a system of technologies and interconnected systems that enable communication and interaction between different stakeholders' team they are distich value chain (Glistau & Coello Machado, 2018). These stakeholders can interact, communicate, decision-making, and other functions within the logistics volunteer. Logistics 4.0 includes decision support systems, customer assistant systems, artificial intelligence, and other systems that automate and facilitate all the decisions and processes within the logistics value chain. Therefore, it is an advancement of technology within the logistics space, creating an efficient system that can serve customers and meet the customers' needs. According to the social construction of technology, the technological advancement leap into logistics 4.0 has been inspired by the needs of people to receive more efficient and timely updates on the logistics and supply chain of their products (Glistau &

Coello Machado, 2018). There is more demand for automation within logistics, which has led to more technology being used as the onset of logistics 4.0.

One of the most curious decisions and questions in logistics 4.0 is whether this new type of logistics needs people. Arguably, logistics 4.0 creates more transparency in logistics, especially in the movement of goods and services, because every stakeholder can see the position of the goods and services in real-time. However, it does not remove the fact that fewer people are needed in logistics to see the system's movement, yet the skills needed are continually different. Applications to help track commodities, create orders, or get with customers, real-time delays communication, and ensuring efficiency are necessary within logistics 4.0 cause off the automation and transparency that the system offers. Logistics for 4.0 also offers autonomous decision-making, which creates a good element for decision-making cause customers and businesses can make decisions in an environment that is integrated with multiple businesses also integrated into the system. Autonomous decision-making is critical because it helps serve time in the decision-making and considers all variables within the decision-making framework to make the best decision in a particular situation. Therefore, logistics 4.0 facilitates real-time decision-making by creating autonomy and ensuring all the stakeholders involved.

2.2 4PL and 5PL logistics

4PL and 5PL Logistics include complete logistics management by an external company that acts as a real agent and partner to the customer (Gruchmann et al., 2020). In both 4PL and 5PL Logistics, this company undertakes the entire supply chain value chain from the point of departure from the production zone to the point of delivery to the customer. Therefore, a manufacturer will outsource their entire logistics value chain to an external business, normally a 4PL and 5PL Logistics entity, to deal with the customers directly. Consequently, all activities outside the real manufacturing of the goods and services fall into the logistics business's hands.

4PL and 5PL Logistics firms such as intermediaries between the manufacturer and the consumer, meaning the need for communication and integration is higher than 1PL and 2PL logistics (Gruchmann et al., 2020). The use of technology, including moving technology, is common in 4PL and 5PL Logistics because these companies need to have real-time communication with all the stakeholders they facilitate. No logical innovations are high in this type of logistics, especially with changing demands and needs from the customers, quality concerns, and the need for more visibility to their products in transit.

5PL aims to active complete competitive advantage and efficiencies through adoption and incorporation of advanced technologies in logistics and supply chain. Some of the common technologies used include Radio Frequency Identification (RFID) devices, automation, robotics, Bluetooth beacons, and block chain technology. It creates efficiency and creates the ultimate integration that both the customer and the manufacturers desire. For many businesses, this type of logistics offers them efficiency and the ability to fully delegate their supply chain roles to another business that often takes up ensuring the goods reach their customers efficiently and visibly. It also builds better trust because customers can see where their goods are and interact with them in terms of confirming their quality. Mobile applications and other forms of technology have also been integrated in this form of logistics.

The effect of 4PL and 5PL Logistics is more efficiency in the market, increased customer satisfaction, increased business efficiency and satisfaction, and faster decision making within the business entity (Gruchmann et al., 2020). In the 4th industrial revolution, this type of logistics is necessary because it helps in leveraging each innovation to create more efficiency for their customers. The customers also have a higher level of mobility especially switching from one business to another due to loss switching costs and more access to information. This type of logistics ensures that such switching does not happen because the customers are increasingly satisfied and can see their products in real-time.

3 INTRODUCTION TO 3PL LOGISTICS

Manufacturing businesses want to focus on other elements of their business, such as production, labour management, resource management, efficiency creation, and automation. Customer service and customer management are extensively different forms of business that such marketing businesses do not want to focus on. Elements such as the technology end logistics involved in ensuring that the customer knows where their products are at any time create significant challenges in the operation of manufacturing firms because they do not have the relevant skills and labour to deal with such issues. It is the opposite of the challenges that lead to a new form of logistics called third-party logistics (3PL Logistics) (Happonen & Minashkina, 2019). 3PL Logistics refers to a business arrangement where a manufacturing or production company outsources all its logistics from warehousing to delivering the products to the customers, enabling the manufacturing business to focus on the other necessary elements' skills available to them. 3PL Logistics creates autonomy and efficiency while giving the customers a point of reference and communication that is specifically forecast on logistics and delivery.

Businesses provide 3PL Logistics because of a range of factors. Businesses prefer the arrangement because it has specialists in the supply chain, reduces costs, allows businesses to scale up their services faster, allows for specialized warehousing (Happonen & Minashkina, 2019). Still, it gets rid of the risks associated with logistics and supply chain and allows for international logistics to be undertaken by the business.

3.1 Practical examples of 3PL logistics companies

3.1.1 Amazon

Amazon has invested significantly in 3PL logistics through the usage of drones, e-commerce, and leveraging C2C logistics. When the company gained the license to operate drone best deliveries, it is acquired a major competitive

advantage because it could deliver the product faster and safer. Amazon, therefore, takes products, services from businesses, and facilitates their logistics from packaging to delivery using drones that ensure the products are delivered faster (Aćimović, Mijušković, & Milošević, 2020). The licensed drones can transport up to 3.3 pounds, with major companies leveraging the use of drones to increase delivery efficiency.

C2C logistics is also a major element of the 3PL logistics within Amazon. The company allows customers to trade with each other through the online platform and facilitates it through its logistics side. As a C2C business, Amazon undertakes fulfilment of the orders made on the eCommerce platform while allowing the customers to exchange products among themselves (Aćimović, Mijušković, & Milošević, 2020). They facilitate logistics for the products while allowing the manufacturers, customers, and other stakeholders to focus on their primary business. Amazon uses several types of technologies, including warehouse management technologies, robotics, artificial intelligence, GPS (Global Positioning System) tracking, and satellite tracking. The company also plans to move into other elements through innovation, including a customer-to-customer transport platform and cargo space sharing.

3.1.2 Google

Google supports 3PL logistics through the provision of cloud computing services that allow logistics companies to interact with their products in transit and communicate with their customers efficiently. There have been numerous rumours that Google will get directly into the logistics and supply chain business, which have not materialized (Singh, Gunasekaran, & Kumar, 2018). However, the company is actively involved in logistics by providing services such as GPS tracking, satellite imaging, and other services that provide visibility to the product on transit.

Logistics companies of any use Google Earth as one of their most efficient tools in locating their products, while Google Maps and would image help understand where the products are and record their movements (Singh, Gunasekaran, &

Kumar, 2018). Google is, therefore, a facilitator of logistics rather than an active player in the logistics and supply chain sector. A widely reported meeting by Google in 2019 that included representation from logistics companies such as FedEx, JD.com, and a former Walmart executive was the clearest indication that Google would move into the logistics sector. The company has also patented driverless trucks, an indication of its intention to move into the logistics sector.

3.1.3 Auto Store

Auto Store is a technology company that has invested in retail, logistics, and storage technology that allows the business to 'redefine retail and fulfilment using technology to improve speed and efficiency. The company has introduced two critical elements that are redefining the logistics sector (Hofmann & Osterwalder, 2017). First, the company uses robots in its retail stores, which improves their fulfilment speed, accuracy, and logistics within the store through proper inventory management. Sorting and packaging have also been improved through the usage of robotics.

There has also been increased investment in logistics and fulfilment technology, including tracking technologies that have been adopted by the business to ensure proper service of their customers and efficiency in its logistics. By adopting artificial intelligence and robotics, Auto Store has positioned itself as a major player in the logistics sector, especially by providing efficient fulfilment services (Hofmann & Osterwalder, 2017). It is safe to place the business as one of the leading companies in logistics and supply chain, especially leveraging logistics 4.0 and the 4th industrial revolution.

3.1.4 Uber

For a long time, 3PL logistics companies have compared their desired models to the operation of Uber. However, the company itself moved into the logistics sector through the introduction of UberEATS, a logistics section of the business that did leave us food on behalf of restaurants and other eateries to customers. The

company uses radical technology to ensure that it delivers value to its customers while ensuring that the restaurants and eateries can continue with their core business of preparing quality food for their customers. Uber has enhanced the use of various elements of smart logistics, which enhance the position of UberEATS in the market as a food logistics company. Uber also deals in the parcel and package delivery through its logistics and tracking business section (Davis & Lucido, 2017). The movement of packages works the same way as major logistics companies like FedEx and DHL.

Uber uses several elements of smart logistics such as remote tracking technology, geo-location, and artificial intelligence. Key customer communication technology and bar-coding are also used to enhance Uber's logistics services.

3.1.5 Tesla

Tesla has enabled 3PL logistics companies to operate optimally through the provision of technology and facilities that have enhanced the work of the 3PL logistics companies. Tesla launched a fully electric semi-truck that has attracted attention from major logistics companies such as DHL, FedEx, and many others (Chukurna, Pylchenko, & Dobrovolskyi, 2019). This attention means that the company is in partnership with major logistics providers to supply them the truck to ensure that Tesla becomes a major player in the logistics and supply chain sectors. The trucks are fitted with artificial intelligence systems that enable businesses to track their products and enhance visibility smartly (Chukurna, Pylchenko, & Dobrovolskyi, 2019). There are also bar-coding systems that ensure the visibility of the products throughout their transit time. Tesla is focusing on the provision of smart transport services that will significantly boost the logistics sector globally.

3.2 Practical examples of 3PL logistics application

3.2.1 Drones

Logistics and supply chain has become a major competitive front to the point that some businesses have launched technological innovations that help them to un-attended deliveries faster than others. The use of drones in the logistics and supply chain is a major trend because it has enabled businesses to be more efficient, more productive, and deliver their products and services faster (Nier, Wahab, & Daud, 2020). Do not allow the businesses to reach their customers faster and guarantees have delivery if the operation of the drones can be maintained and can be operationalized from a central unit. Many drug companies have come up that help in offering logistic services, especially third-party logistics. Most of these companies are Internet companies that specialize in technological advancements and leverage the 4th industrial revolution to positively affect the logistics and supply chain sectors.

The most prominent case study of the use of drones in part but logistics is the case of Wing. The first company to be licensed to use drones in delivery services was called Wing. By January 2021, the pod party logistics company had undertaken over 100,000 flights on their drones, saving many customers across the world. This means that the company had increased its delivery speed and efficiency by using technology in drones. Advanced move in technology in Piper to logistics is an effective way to ensure that small packages can be delivered to the customers faster while the larger packages use traditional forms of logistics as well as emerging forms of logistics as discussed in 4.0 below.

Several elements and the use of drones in the logistics market have creative account changes in the organization of the markets. There is a higher level of satisfaction Among the customers, which has enabled the logistics businesses to profit because the manufacturers continually engage them to gain their trust and loyalty of the customers (Nier, Wahab, & Daud, 2020). For them, drones have increased manufacturing companies' ability to facilitate effective and efficient logistics for perishables, which were formerly hard for businesses to manage.

This is a greater sense of reliability in the Netflix and supply chain for such products because drones can move them fast, preventing them from perishability. However, one element that the drug companies are yet to figure out is the transport of delicate and fragile products. Set an advancement will ensure that all marketers and companies that deal with several types of products can use drugs in the logistics ability to satisfy a broader market spectrum. Continued use of drones in the logistics and supply chain is also environmentally sustainable, making it attractive to ethical consumers because it leads to significantly fewer emissions than traditional logistics services such as trucks and planes (Nier, Wahab, & Daud, 2020). As a moving technological advancement in logistics, the use of drones is expected to expand because of popularity among both customers and the manufacturers.

3.2.2 Robotics

Logistics companies often endeavour to create more competitive advantage and efficiency within their systems. The use of robotics in logistics has advanced the speed of undertaking different tasks and the efficiency with which they are done. Several robotic systems have been advanced in 3PL logistics, including driverless transport systems (AGVs), mobile robots (AMRs), and electric forklifts (Hanson, Medbo, & Johansson, 2018). The introduction of these technological advancements aims to ensure that the speed and accuracy within the logistics and supply chain sectors are enhanced. The introduction of robots in packaging, for example, has increased the speed and accuracy of packaging processes, meaning customers often get their products on time with accurate packaging and labelling. Robots have also enhanced the ability of businesses to meet the needs of multiple customers at the same time because robots can undertake different activities simultaneously. Their programming also means that they do not require Human Services such as arrest and meals, making it possible to operate without stoppages that are often causes of lugs and inefficiency in logistics.

Unlike drones that are already in wide use in logistics and supply chain, several companies have floated the idea of using robots in their logistics and supply chain services. Still, few have gone forward with the idea. It is seen as an idea that will

increase efficiency, yet scepticism is still on whether it will perform effectively as required. Its interaction with the human system. advanced logistics, and automation mean that companies can use robots within the supply chain value chain because they fit well within the framework of technologies leveraging the 4th industrial revolution (Hanson, Medbo, & Johansson, 2018). Robots are a form of moving technology because they help ensure that product moves between production and consumption. Therefore, consumers can enhance the liability of their supplies because they have technological advances that help them leverage different elements of technology and provide more efficient supply chain services.

3.2.3 Artificial Intelligence

Artificial intelligence is one of the most prominent technological developments in the logistics sector that has facilitated extensive development. Manufacturing businesses believe that the investments that the logistics companies in artificial intelligence have made allow them to collect specific information for the customers, which is necessary for facilitating efficient customer relations and movement of products to the customers (Wilson, Paschen, & Pitt, 2021). Artificial intelligence is an important method in collecting data that allows businesses to make critical logistics and supply chain decisions.

One of the biggest issues in logistics and supply chain is the ability of businesses to make accurate predictions, especially predictions in demand and supply. Artificial intelligence has enabled logistics businesses to unlock the power of big data, which enables businesses to predict customer information and customer behavior accurately. There is a huge investment in the logistics sector towards ensuring that businesses can understand the customer better. This is an example of a moving technology that facilitates understanding the customer, meaning businesses can produce effectively and efficiently to meet the customer needs without having too much wastage. For example, in the United States, UPS has shown significant trial and belief in big data, enabling the company to operate effectively. With these artificial intelligence elements, the organization has shown that using moving technology can save time, costs and exclude safety risks. There is more efficiency and timeliness in their operations of the organization.

3PL Logistics companies have been proactive in developing logistics technology that can allow them to gain a competitive advantage by significantly influencing the understanding of the consumer and the manufacturers. These companies often operate as intermediaries between the producers and consumers. Therefore, a deep understanding of the relationship between these two parties and their behavior is necessary to operate effectively. Artificial intelligence has provided an Ave for these businesses to understand each other, making it easier to ensure that products are delivered on time and that customers are increasingly satisfied. Manufacturing and production companies save their costs in terms of transport, warehousing, packaging, and related costs because the logistics companies can accurately predict the behavior and demand patterns of the consumers. Therefore, understanding consumer dynamics has helped these businesses increase their profitability by decreasing the amount of time they spend in understanding and evaluating consumers. And big data companies have brought their innovations into logistics to enable businesses to operate at a more efficient level than their normal profitability levels.

3.3 Why 3PL logistics?

3PL logistics are preferred because they save costs for the business. Businesses want to engage in activities that they are familiar and comfortable with. Their main activity is production for production businesses, meaning they are interested in engaging in more productive activities rather than diversifying and engaging in logistics (Happonen & Minashkina, 2019). When they engage in such activities, they often incur many costs because they do not have the facilities to undertake logistics and supply chain activities; hence, they spend a lot of money acquiring these facilities. With 3PL logistics, these businesses can focus on their primary production activities and leave the logistics services to those specialized in logistics. The result is fewer costs for the manufacturing companies and more efficiency in their supply chain for their products.

As explained above, 3PL logistics allows manufacturing companies and customers to get specialized and expert logistics providers, which ensures that

they get the best services, and their products are handled in the best way possible (Happonen & Minashkina, 2019). 3PL logistics providers often have personnel trained specifically in logistics and supply chain. This means that they have tailored skills towards ensuring products and services in logistics and supply chain are handled in the best way possible. They also can and attack logistics and supply chains for multiple providers, meaning they are strategically placed to deliver value and quality to all business entities. Access to these services ensures professionalism in handling logistics and supply chains for both the manufacturing companies and their customers.

Manufacturing companies prefer 3PL logistics because they can scale their operations and operate on both national and international markets. Unflattering companies often can scale up their production without having the absolute ability to scale up their operations because of the challenges in delivering their products to target customers. However, with 3PL logistics, these businesses can scale up their operations because they have professionals that can handle their logistics and supply chain activities.

3PL logistics Are also effective because of the presence of technology in the market. 3PL logistics Technology is extensive because they have the intense application of knowledge areas such as enterprise resource planning and other knowledge management sections that allow them to leverage applications from the 4th industrial revolution to deliver value for their customers (Happonen & Minashkina, 2019). Technology such as tracking technologies, stock management technologies, transport management technologies, fleet management technologies, warehouse management technologies, and enterprise resource planning are effective in ensuring that 3PL logistics not only deliver value to the customer and deliver specific product types for their customers.

Businesses have found third-party logistics as an effective way to gain value from all the operations without necessarily disrupting any of their income streams. There is, indeed, increased activity in modernizing mobility. Tesla and Uber, for instance, have ventured into autonomous cars and drone services. There are increased GPS-controlled unmanned vessels both for air and water transport.

These create a new niche in logistics services, and changes significantly impact how these services are delivered, start a new customer service area, and transform entire supply chain management. Also, shared logistics help of reduces water, road, and air transport-based pollution and creates more sustainable solutions to environment-friendly logistics. All these innovations mean that companies must understand how innovative mobility systems affect logistics services to integrate them effectively into their business.

3.4 3PL vs. 4PL logistics

One of the most common debates in the logistics sector today is whether businesses should use 3PL or 4PL logistics in their operations. Both 3PL and 4PL logistics I'm good and effective depending on the type of business that is applying them (Gencer, 2019). They both involve manufacturing companies delegating their logistics and supply chain services to external companies, which ensure that they run these services and deliver the goods to their customers. The main difference between the two is that 3PL logistics is suited to both small and large businesses, while 4PL logistics is mostly suited to large businesses, especially multinational corporations (Gencer, 2019). Medium to large businesses will prefer 3PL logistics because they are suited to technologies and instruments that serve their needs better. There are more businesses that use this type of logistics because of its ability to fit within different frameworks other types of logistics.

In 4PL logistics, this a larger focus on integration at a higher level and automation, which means that this business is focused on large and periodic activities within a large framework of business. In this type of arrangement, the logistics company might not be aware of the daily challenges that a business faces in reaching its customers or the challenges that the customers face in obtaining the satisfaction that they desire from the goods and services of the company. There is, therefore, ignorance of the daily challenges that could be faced in logistics and supply chain, especially the challenges that face the small suppliers. In contrast, 3PL logistics forecast daily activities within a business (Gencer, 2019). There is more attention to the details of daily operations, including the challenges that customers face in accessing their products on time. There is also more focus on the daily risks that

are faced in the process of logistics and moving products between the producer and the consumer. Economic issues such as inflation affect their business because they work on daily transactions. There is higher-level automation in the business because of the number of transactions that the logistics company must undertake innovation, such as sharing logistic services in this type of logistics.

In terms of choice, none of the two is necessarily better than the other because they both perform the same function and have the same level of efficiency. Therefore, when choosing the type of logistics to use in your business, it is important to choose the one that fits the type and size of the business rather than the one that is being commonly used in the market. While competitors might use one of the two, it is not necessarily the best for your business because these competitors choose what fits their business better. For smaller businesses, 3PL logistics support them better (Gencer, 2019). However, MNCs are better served by 4PL logistics.

4 BUSINESS AND EMERGING PLATFORMS FOR LOGISTICS SERVICES AND TRANSPORTATION

4.1 Customer to customer transport platform (C2C)

Third-party logistics have evolved to involve the businesses working to deliver products to the customers and customers trading among themselves. In 3PL, logistics, moving technology, and other forms of technology have enabled customers to exchange products among themselves with a logistics company, especially an Internet company, a transaction facilitator. The most known Internet companies that have enabled C2C logistics include eBay, Etsy, and Craigslist. On these platforms, customers can buy and sell from each other while the platform only facilitates the transaction by providing a means through which the customers can communicate, exchanges products, and verify the value of the products (Akaber, Hughes, & Sobolev, 2021). It is a form of 3PL logistics synonymous with the logistic company only offering a platform for the customers to trade and facilitate the movement of goods and services from one customer to another.

C2C business matches the concept of the sharing economy and a business by ensuring that customers can share the products and services that they have while also trading them on an online trading platform through an E-Commerce website (Akaber, Hughes, & Sobolev, 2021). There is an effective transfer of products between the customers while the third-party logistics company only engages in facilitating the transaction and moving their products from one customer to another. In this example, each of the customers delegates the role of logistics to the third-party company, which facilitates all the transactions between them, and ensures that the product or service moves between them. It is a modern form of third-party logistics that ensures that each of the parties in the transaction does not have to undertake the role of logistics and supply chain but worries only about the transaction elements (Akaber, Hughes, & Sobolev, 2021). The customers can then focus on their businesses while letting the logistics company deal with logistics, including warehousing, transportation, safety, risk management, and delivery.

In some cases, the third-party logistics company also undertakes customer service on behalf of each customer because the customers are extending products. They are not necessarily businesses that focus on customer service. There is high technology integration using different forms of technology, including enterprise resource planning, decision support systems, product display systems, web technology, communication systems, and tracking technology. All the technological integrations ensure that the movement of the goods from one seller to another is as efficient as possible with no delays and no chances of fraud. The company also undertakes verification to provide confidence to each of these parties in the transaction because it is the role of the third-party logistics company to mediate between the two parties.

An example of such a business is eBay. One customer selling a particular product lists it on eBay while another customer who is in demand of the products bids on it or places an order. For example, if one customer is selling a book, they would put it on eBay, while another customer who is looking for the same book will buy it from eBay (Akaber, Hughes, & Sobolev, 2021). eBay does not own the book but only under text the logistical elements, including warehousing, transportation, risk management, and safety. eBay will ensure fulfilment of the order by ensuring that the book moves from the customer selling it to the customer buying the book. All the logistical elements are delegated, with eBay getting a Commission for the service offered in the logistics transaction. This example demonstrates the efficiency of working of the third-party logistics in Internet technologies that combine elements of e-commerce and the sharing economy.

4.2 Cargo space sharing platform

The sharing economy has increased and advanced over time, with more businesses looking at unusual ways to enhance sharing in all sectors. In logistics, the sharing economy has been facilitated by the demand for logistics, especially long distances with customers like do not have enough cargo to fill up large trucks and transport spaces. The sharing logistics, in many cases, involves customers

that come together and transport or move their products using the same provider, with the same means, and sharing the same space. For many customers, the sharing economy allows them to reduce their logistics costs while also providing them with a means to co-check on their products, especially when they are in transit (Hess & Schubert, 2019). The main advantage of the sharing economy for these customers is the efficiency, time management, and safety provided by ensuring that multiple customers have access to the same information within a supply chain system. It is facilitated by technology, including a range of solutions from enterprise resource planning systems, communication systems, tracking technologies, risk management technologies, and decision support systems. Artificial intelligence is also a major facilitator of the sharing economy logistics because of the need for the logistics partners and businesses to understand different decisions and the basis of these decisions from analysing data within our decision supports framework.

The connection between different customers sharing logistics space and that business is facilitating their logistics, especially when they are 3PL logistics companies, is undertaken through various technologies that the 4th industrial revolution has facilitated (Hess & Schubert, 2019). Several types of technologies have been integrated, including technologies that allow customers to find the logistics providers, book their logistics providers, buy their goods, and ensure that these providers collect them. Technologies also connect customers to enable them to share out space within the logistics companies, especially when transferring small products that might not fill up the entire logistic space. Logistics companies, on-demand warehousing, have been one of their major boosts in ensuring that they can offer the sharing services while also having space to store their products (Hess & Schubert, 2019). Storage was always a major concern because traditional warehousing solutions did not offer a viable solution with different elements not integrating well with the sharing economy. Therefore, on-demand logistics helps to ensure that there is a space for storage and warehousing as the goods are in transit from the seller to the buyer.

An example of a business facilitating cargo space sharing platforms is DHL. Through the 2017 DHL Customer Solutions and Innovation report, "Sharing Economic Logistics" by Ben Gesing, the company outlined its desire to provide

logistics that would facilitate lower costs and enable customers to interact more and engage 3PL logistics (Hess & Schubert, 2019). The sharing economy for DHL is undertaken by customers finding the logistics company and sharing the space within the logistic services to move their products from one point to another. The company acts as an intermediary while the customers move their products from one point to another. In this example, DHL is a 3PL logistics company that facilitates add but logistics through the sharing economy for customers.

5 SUPPLY INNOVATIONS TRENDS

The district companies have improved the services by enhancing the ability to deliver products to customers efficiently and in a timely manner. There is more focus on technological solutions that can enable these companies to serve customers better while focusing on their ability to integrate different production techniques and rules of the manufacturing companies in the value chain. Logistics companies are focused on ensuring that they have innovations that facilitate faster movement and easier integration of technologies from different stakeholders in the delivery of their services and products. These companies have focused on some of the elements that include communication, deliveries, customer service, updates, tracking, and mobility. Globally, logistics businesses increasingly applied the concept of *Kaizen*, which means continuous improvement until the businesses can reach a level where they effectively serve the customers. As intermediaries between the manufacturers and the customers, the businesses adopt several supply-side innovations and trends that help in facilitating the movement of goods and services to the customers.

5.1 Mobility as-a-service (MaaS)

MaaS allows customers to plan, book, schedule, and pay for different mobility services that allowed them to move product analysis from the point of production to their point of consumption. MaaS provides an avenue for customers to interact with their products by determining when the products will reach them in scheduling and logistics planning. The global population is condensed in urban centres (Jittrapirom et al., 2017). This trend is projected to grow in the coming years because we live in a band alias, meaning logistics and supply chain services will fulfil cities even more. MaaS provides an avenue to decongest the cities while ensuring that customers get their products on time (Jittrapirom et al., 2017). By scheduling the logistics effectively, MaaS ensures that every customer has a specific time when they receive their products and services, limiting the amount of movement and transportation necessary to deliver these products. Every customer will have a specific time when they are attended, meaning they

will test their services and products at specific times and reduce movement of the goods and services at the same time.

MaaS is necessary in moving technologies because it enables companies to effectively apply all the other moving technologies by scheduling and planning for their movements ahead of time. Planning also helps to avoid potential delays that unforeseen events can cause. Logistic suppliers and other supply chain companies can understand the risks with prior planning and advise them on the best times to deliver their products.

5.2 Navigation services

Advancements in navigation technology and navigation services have enabled the movement of products and services in logistics because they have enabled customers to have a real-time understanding of where their products are. Navigation technology has increased transparency in logistics while creating more accountability on the suppliers' side. Therefore, when factoring companies end logistics, companies must collect to ensure that the products reach their customers on time and stuck their navigation on time (Hoeft et al., 2021). There are several types of navigation technologies that have been advanced recently to help in easing the logistics challenges for businesses. Understandably, this navigation technologies benefit their customers more because they enable them to become a co-creator of their logistics value chain. They enable the customer to understand and participate in their goods and services while also managing the expectations by showing them their expected time to deliver.

5.3 GPS tracking

GPS tracking is a real example of navigation service technology that has improved the ability of customers to see where their products are and the ability of the businesses to interact with the remains of the logistics value chain. There is a deeper understanding of the relationship between the customers and their products and a careful relay of information about the product's location only to

customers interested in the product. GPS tracking has enabled customers to participate in the movement of their own goods and services and understand the challenges that logistics companies face in ensuring that their goods and services are delivered on time. Therefore, through GPS tracking technology, customers are Co-creators in the delivery of their services.

Many GPS tracking companies have established themselves as leaders in the logistics market by collaborating with logistics companies and offering tracking services that help these companies strike the products and ensure that they are monitored for quality apps exactness of their quantity. For example, a GPS tracking service can help know the location of a product while also knowing whether the door to the truck carrying the product has been tampered with. GPS tracking technology has been improving over time with more features, including the exact location and the estimated time to delivery related to the customer and the logistics company (Hoeft et al., 2021). Tracking and timely delivery have continually been included in businesses' key operational and earnings deliverables in ensuring profitability for the businesses. In the digital age where customers have no switching costs between brands and can easily affect the business's reputation online, ensuring customers understand where their products are, and half timely delivery is important for their business because it enables the business to keep a competitive advantage keeping the customers happy. Therefore, GPS tracking technology is an important competitive element in business. It enables logistics companies to build positive brands online and develop better relationships with their customers.

5.4 Satellite navigations

Advancements in logistics technology have enhanced the development of satellite navigation, which is instrumental in enabling businesses to know where their products are and under tickle time monitoring. Logistics companies engage in rigorous activities that enable them to look at all their products and understand their specific locations in terms of transit (Hoeft et al., 2021). Set like navigation is a global system that allows the transmission of signals from multiple locations simultaneously to communicate certain forms of messages. In logistics, these

messages represent the products that are being moved and the information connected to this product. Logistics companies have invested in satellite navigation communication because it enables them to know where their products are and protect against theft and burglary (Hoeft et al., 2021). Customer satisfaction includes the element of knowing where their products are and understanding that their products are safe from any form of theft and burglary. It is also critical for customers to have the confidence that those goods will not be damaged when in transit. Therefore, at least navigation and logistics companies understand where the products are and give advice where necessary in terms of weather conditions and other elements that might damage the goods.

5.5 Warehouse navigations

3PL logistics includes delegation of all logistics activities to artistic company band mate factoring company, including warehousing and packaging. Warehousing is a complex process because logistics companies do not keep products for only one manufacturer but keep products for multiple manufacturers (Beul et al., 2017). The companies that are supposed to be delivered to multiple customers, meaning losing a product within the warehouse is high. For example, the DHL warehouse has products from companies across the United States, meaning it has many products that need to be managed in delivered on time. One of the Britons for adopting 3PL logistics is to save time in the movement of products from the producer today consumer. Therefore, wasting time in the warehouses is against the essence of adopting 3PL logistics.

Warehouse navigation technology helps warehouse management to understand where products are in the warehouse and move effectively across the warehouse (Beul et al., 2017). It enables the manager to know the layout of the warehouse, the location of the products, their delivery times, and any specific information necessary to ensure they are safe and effectively delivered. The technology helps create precise locations for the commodities within the warehouse and manage the movement across the warehouse to ensure efficiency in the logistics and supply chain activities. In modern, such technology ensure satisfaction by

ensuring reminders are sent to the logistics manager and the customer to create more visibility and transparency in the logistics value chain.

5.6 Barcoding

Barcoding is a technological identification system that allows an individual or a group of people to identify a product using a unique number assigned to each product (Beul et al., 2017). Bar codes are important because they help ensure that products can be identified uniquely and planned, especially in logistic movement. All right, just call systems involving transportation and movement of individual products to involve certain forms of barcodes or identification that enabled the movers of these products to understand where their products are and identify them uniquely. Many of the other moving technologies rely on barcodes and unique identifiers as methods of knowing where their products are. Companies have improved their identification procedures by investing in radio frequency identification and near frequency identification technologies (Beul et al., 2017). These technologies allow the identification of a product by using either the barcode or other unique identifiers and software that can read these identifiers. Therefore, these identifiers are important in ensuring that a product can be dressed and transparency between the customer, factory, and logistics partner can be enhanced.

The unique location identifier is tracked using a GPS tracker in GPS tracking. This implies that the barcode could be the unique identifier tracked by the logistics company to identify their position of the product or service. Instead, like navigation, barcodes are often used to relay information to satellite communication networks, which enhances recording by the logistics company and sharing in a way that crystal enhances efficiency in the movement of the products to the customer. Warehouse management end navigation also relaxed on the bar codes, which have unique information that help the warehouse manager to identify each product within the warehouse. Therefore, barcoding is an essential element of logistics and supply chain because it helps in ensuring that every product has a unique identifier with which all are processes can be

undertaken. Barcodes are essential in identification and operation within the warehouse and all other elements of the 3PL logistics.

Barcodes facilitate effective and efficient logistics because they help ensure security for the goods as the logistics manager to ensure that all goods are properly checked in the system and delivered on time. Customers understand that they have this ability within the warehouses with bar codes. Such visibility is enhanced by the ability of the logistics company to communicate the status of all deliveries because all products are recorded with a barcode system and can be monitored according to their intended days of delivery (Beul et al., 2017). Furthermore, proper customer monitoring for their products will be undertaken because the logistics company and attacks regular evaluation of their stock to determine the efficiency of their logistic services. Barcoding, therefore, facilitates the creative movement of products within the warehouse and effective supply chain management through the fast movement of goods outside the warehouse as necessitated by the booking system within the logistics company.

5.7 Cloud logistics

Moving logistics to the cloud is an effective way to ensure that global logistics can be managed from anywhere by having a real-time understanding of every aspect of their logistics value chain. Logistics companies can operate globally because all members of the company can see this cloud computing and all data kept on cloud servers. Cloud logistics uses web-based and application-based APIs to ensure that every user of the system has access to the central database and can understand every product's position (Glistau & Coello Machado, 2018). Cloud logistics creates efficiency by ensuring that all logistic services Sky while we can also be manipulated externally from anywhere.

In global logistics, cloud logistics is advantageous because it creates real-time scheduling of movement for products within the logistics value chain. There is also an understanding of transparency from all parties because all products can be seen by all parties while there is real-time monitoring of stock levels to determine whether the logistics company should access from manufacturing

companies or not. A critical element of the logistics value chain is synchronizing information, making predictions, and synchronizing activities within the logistics value chain. Cloud logistics allow these activities to end because all changes and manipulations to the cloud data can be done from any point.

The only difference is that different people have different access levels within the system, meaning those who can edit all data will be necessary. Cloud logistics also allows for periodic updating of oil data, which is important because stock inflows and outflows need to be recorded while recording transaction activities and employee activities (Glistau & Coello Machado, 2018). There is better monitoring of the logistics and employee activities with the system, ensuring that logistics values and quality are not compromised. Cloud logistics creates efficiency while keeping costs low and ensuring synchronization and monitoring on a global scale.

6 TREND LOGISTICS SERVICE PRACTICES IN MODERN BUSINESS: RESULT OF APPLIED ANALYSIS

Results collected in this study have demonstrated that global logistics have banned the logistics companies' efficiency because manufacturing companies are continually moving away from logistics and delegating the logistics activities to third-party companies. This has led to the development of 3PL, 4PL, and 5PL logistics companies (Wang, 2021). Although they are all similar because of the level of automation and technology they used and their relationship with their customers, these companies operate in different circumstances. They are all close to the customer and use technology that allowed them to manage inventory and employees within the value chain. Therefore, the results have shown that mobility technology is important in logistics because it helps in facilitating easy movement of products and people within the logistics value chain. The results of this study are much dimensional, as discussed below.

The first result is that different forms of mobility technologies have been adopted in the logistics sector and continually influence the value delivered within the sector. The technologies are implemented across business lines, including 3PL, 4PL, and 5PL logistics companies. Examples include the use of drones, robotics, artificial intelligence, warehousing technology, barcoding common GPS tracking, cargo space sharing platforms, and customization platforms (Wang, 2021). All these platforms are enabled by technology, which is a product of the fourth industrial revolution. The results indicate that all these forms of logistical efficiency systems help him deliver value to the customer. The theories discussed in this study show that technology develops because the customers wanted to develop and have more efficiency and not because their business wanted to develop. These results relate to the social construction of technology because they showed that technological innovation cost by the 4th industrial revolution has cause to realize that logistics can also benefit by having more efficiency. This has led to more customers demanding to have better logistics services hence the development of technology within the logistics sector.

The results also indicated that the logistics sector is extremely competitive, with businesses innovating and developing innovative solutions regularly. These innovations in solutions are important because they help understand the competitive scope that majority of these businesses use (Wang, 2021). It helps in understanding the need to improve the technology used by these businesses. The concept of Kaizen is prevalent within logistics companies because of the need to improve on a continuous basis to remain competitive in the market. Therefore, many businesses developed innovative solutions and new ways of delivering value to the customer because of the need to ensure that they retain their customer and continue to provide them value (Wang, 2021). The logistics technologies are creating more efficiency designed to ensure that the customer gets as much value for their money as possible, meaning they will continue to demand services from the logistics company and the manufacturer.

Different forms of technology in this study have also demonstrated that the logistics sector is and interacts within the logistics value chain (Tiwari, 2021). Therefore, it is important for the business to ensure that they are good relationships with all stakeholders because they will determine the business setting it is such a company does and the customers that it attracts. The stakeholder theory is not that they are different stakeholders within a business that is interested in the business. Each stakeholder has an end goal in mind for their business, meaning they need to satisfy all the stakeholders increases the pressure on senior management. For example, six companies dealing with government bonds will have their own needs that need to be fulfilled, meaning businesses will have to consider the government's interests in decision-making. The stakeholder theory is important because it helps in understanding different players within the market, and there are that they took in the development of a certain logistics budgeting.

The results also showed companies that have used advanced mobility services such as Amazon, Tesla, and Uber, which has enabled them to improve their logistic services and deliver their services to their customers. Mobility services among the technology companies have been improving and increasing over time (Tiwari, 2021). These companies have leveraged mobility services to ensure that they serve their customers better and more efficiently, providing better

competitive advantage and more reliability in the service they provide to their customers. Therefore, these companies have enhanced their capacity to serve customers and reach a global audience through different logistics services enabled by the 4th industrial revolution and the onset of technology. Leveraging technology has also improved the customer service of these companies through elements like GPS tracking and warehouse management services that have enabled these companies to become more efficient and effective over time.

7 CONCLUSION AND FUTURE OF SMART LOGISTICS

As demonstrated through the study, smart technologies have become commonplace in the logistics sector, with several technologies developed to enhance efficiency and speed in the sector. In the global supply chain, businesses have adopted a range of systems that ensure stakeholders in logistics, including communication, warehouse management, customer relations, and enterprise resource planning systems. This makes the supply chain framework more efficient and transparent in the global logistics sector. This study has shown examples of businesses that have successfully employed technological advancements in improving their logistics services. The fourth industrial revolution and logistics 4.0 have interacted effectively to ensure that developments create more efficiency in the supply chain and customer satisfaction.

With the technological advancements in companies like Tesla, Uber, and Amazon, there is a potential for more technological infusion in logistics and supply chain, which means more development in smart logistics. There have been critical advancements in robotics, which means businesses can enhance the efficiency of their services through the usage of new logistics and supply chain robotic technologies. There has also been increased use of artificial intelligence in logistics businesses, which has enhanced the ease of tracking and communication with the customers. Barcoding and other warehouse technologies have also enhanced the warehouses' ability and improve security. These technologies will expand in the nearest future in the logistics business. The main challenge that logistics businesses face with these technologies is incorporating human beings in technological development. Ensuring that the role of human labor is clearly defined is important while the logistics sector takes on more technology and automation.

Before Covid 19 pandemic spread to the world, online commerce was not so wide and popular. In face of the lock-down situation, with the closure of most of the stores, more customers turn to online shopping, especially increasing demand for basic consumer goods. This trend will increase due to the convenience of this

type of purchase. To be able to meet the growing needs for transportation of online purchased goods, the logistics sector must and will maintain and expand its resources, to be able to integrate suitable mobility solutions for fulfilling the required number of shipments to its customers, manufacturers, and traders. Logistics is evolving. Continuous innovations completely change the work processes. Logistics is becoming an open global system, connecting all logistics networks in one, as well as workflows, are upgraded by business innovations. Digitalization plays a leading and key role, leading to sustainability in the supply chain.

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