Adoption of Digital Technology in Global Third-Party Logistics Services Providers: A Review of Literature

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ABSTRACT

Tech-focused third-party logistics providers have developed solutions to streamline shipping and order fulfilment to meet sellers’ needs, often leveraging state-of-the-art information technology tools to do so. The logistics solutions that third party logistics services providers offer include receiving, storing, packing, and shipping services, including inventory management, kitting and assembly, postponement packaging, procurement and others. Digital technology has heavily revolutionized the logistics industry. The article highlights digital technology and third-party logistics service providers to understand how technology improves efficiency in the field of third-party logistics and supply chain industries. It includes GPS, Barcode, RFID, IoT, Cloud computing, Artificial Intelligence, and Blockchain. The framework suggests that performance will be higher when digital technology is used in logistics with the strengths inherent in the firm’s logistics. The methodology adopted in this paper involves the review of published literature and discussing the opportunities for further research.

Keywords: Digital Technology; 3PL; Warehouse; Freight forwarders; Transportation.

1.0 Introduction

The logistics provider is a service provider capable of assuming some or all of a firm's logistics activities. The development of logistics capabilities and their exploitation in the market via the provision of services plays a central role in the evolution of logistics providers (Sink & Langley 1997). Logistics is an integration of information, transportation, material handling, stock and storage, and packaging operations.

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Logistics activities contain purchasing, transportation, quality, control, customs and insurance, handling, warehousing, inventory management, order processing, sales-demand forecast, logistics information management, distribution, labeling, packaging, fleet management, and management of separate parts, product returns, and shipment planning (Tanyas & Serdar 2003).

Logistics outsourcing started with services (e.g. transportation and warehousing) that were seen by enterprises as non-core and easily available in the market (Sink & Langley, 1997). Logistics players are into three groups depending on the range of services they offer. The first group includes standard, logistics-critical services suppliers for pattern, transport, and storage (2PL, second-party logistics). The second group consists of entities offering service packages, i.e. standard services combined with value-added services (for example, packaging, labeling, fulfillment), prepared on the customer’s request (3PL, third-party logistics). The third group of entities is operators who offer comprehensive tailored logistics solutions (Delfmann et al., 2002). In the early stages of logistics outsourcing, transport, and warehousing activities came into focus (Sink & Langley, 1997). 3PL users are satisfied with the current level of services provided by 3PL service providers as it has led to a positive impact on business results. As a result, the usage of third-party logistics services is likely to increase substantially (40 percent) in the future (Sahay & Mohan, 2006).

Bhandari (2014) determines the various technologies used in logistics and supply chain management including information technology, communication technology, and automatic identification technology. Recently, many logistics service providers have tried to improve their operation efficiency by continuously adopting new technologies (Sauvage, 2003). They improve their service efficiency by continuous adoption of information or automation technologies. With the rapid development of digital technologies such as everywhere computing, digital meeting, web 2.0, service-oriented structural design, cloud computing, and the open-source revolution (Bresnahan, 1995) a significant and attractive aspect of endeavor improvement is the aptitude and skill to use digital novelty. Logistics 4.0 are summarized according to the technologies: internet of things (IoT), cyber-physical systems, big data, CC, mobile-based systems, social media-based systems, and further technologies (Winkelhaus & Grosse, 2020). Managerial implications are outlined and open research issues are examined.

Digital Technologies resembling cloud computing, the internet of things, 3D printing, artificial intelligence, big data analytics, blockchain, automation, robotics, drones, machine learning, augmented reality, self-propelled vehicles, and digital platforms to show the association linking the risk of implement digital technologies & logistics management; this impact is branch out, depending on the variety of digital
technology. Barczak et al. (2019) classified four types of logistics technologies: data acquisition technologies, information technologies, warehousing technologies, and transportation technologies (Lin, 2007). The effects of passing over the transport operation to the third party are obvious for those with moderate volumes of goods and widespread distribution areas, regions, or countries (Sink & Langley, 1997) According to various reports, the Indian third-party logistics (3PL) market is slated to witness high growth in the coming years (Bhardwaj, 2021). According to a report by the UK-based market research firm Technavio, the 3PL market in India is balanced to grow by US$10.74 billion in the period 2021-2025, progressing at a compound yearly growth rate (CAGR) of almost eight percent, and witnessing an incremental enlargement of US$81.73 million by 2024.

The transport and logistic sector is an integral part in terms of facilitating international trade as it allows firms to effectively complete imports and exports of goods and services and associated transactions. By integrating new technologies into logistics, companies can plan, forecast, and replenish inventories and keep up with customer demands. The application of information technology in logistical approaches helps businesses improve delivery time and accuracy. Logistics is an important element of a successful supply chain that helps increase the sales and profits of businesses that deal with the production, shipment, warehousing, and delivery of products. Moreover, a reliable logistics service can boost a business’s value and help in maintaining a positive public image. A major element of logistics that most will recognize is transportation. This includes all modes of transport including road vehicles, freight trains, cargo shipping, and air transport. Without transport, goods would be unable to move from one stage to another within a supply chain. International logistics, therefore, refers to the integration and management of activities including inventory databases and shipping schedules, material handling, production, packaging, inventory, transportation, distribution, storage, and security for the resources of organizational supply chains. Four important elements of international logistics are critical to cargo movements: integrity, pedigree, chain of custody, and track and trace.

2.0 Innovation in Logistics: Market Analysis

Gartner experts suggest that the financial impact of the pandemic will vary between $2T and $4.5T on a global scale. Figure 1 represented the 1 (2016), 2 (2017), 3 (2018), 4 (2019), 5 (2020), 6 (2021), 7 (2022), and 8 (2023). While the pre-pandemic
estimation set the market growth for the logistics industry at $19B in 2023, it is now projected to reach $12.9B by 2027, registering a CAGR of 6.5% from 2020 to 2027.

**Figure 1: Logistics Market Growth of 2016 – 2023**

Logistics innovation has been defined as “any logistics-related service from the basic to the complex that is seen as new and helpful to a particular focal audience. The audience could be internal where innovations improve operational efficiency or external where innovations better serve customers.” (Flint et al., 2005).

Innovations are usually classified into two broad groups: technical/technological and administrative/non-technical. The former refers to technologies for data acquisition, information management, warehousing, and transportation; the latter is to changes in structures, business processes, customer and supplier relationship management, and knowledge management issues that lead to innovation. The following two sub-sections summarise the most influential technical and administrative innovations respectively.

**3.0 Review of Literature**

**3.1 Combination of technologies in the logistics sector**

Effective logistics tracking and tracking can be performed using barcodes, QR codes, WSN, RFID, and GPS (Jedermann et al., 2006). All these systems automatically
and continuously collect essential tracking data such as temperature, humidity, and location (Wang et al., 2008). Three technologies were adopted for monitoring the real-time situation and providing a visualized interface, including Radio Frequency Identification (RFID), Geographical Information System (GIS), and Global Positioning System (GPS) (Schrauf & Bertram, 2016). Logistics gains a greater vision in the mass adoption of smart and connected digital technologies and applications (e.g. mobile, cloud, sensors, data analytics, machine learning, blockchain, IoT) and enhances vertical and horizontal integration among the supply chain partners (Helo & Shamsuzzoha, 2020). RFID (Radio Frequency Identification) and IoT (Internet of Things) provide real-time information or data, while blockchain technology is used to provide a chain of immutable transactions (Wirth, 2018).

Usage of Artificial Intelligence (AI), Machine Learning (ML), and Deep Learning (DL) in the context of smart logistics in industrial enterprises are currently missing in the scientific literature. Büyüközkan & Göçer, (2018) identified eleven novel technologies and analytical methods which supply chain leaders could use to achieve competitive advantage and delight their customers. These include Robotics, Sensor Technology, Augmented Reality (AR), Big Data, the Internet of Things (IoT), Cloud Computing Technology (CCT), 3D Printing, Omni Channel, Self-Driving Vehicles, Unmanned Aerial Vehicle, and Nanotechnology (Kayikci, 2018). In the digitization era, transport systems and the provision of goods gain increasing significance in terms of mass adoption of smart and connected digital technologies and applications (e.g. cloud computing, big data analytics, machine learning, blockchain, internet of things – IoT), since they allow enhancing vertical and horizontal integration within supply chains (Senthil et al., 2020).

Global Positioning System (GPS), barcode, Radio Frequency Identification (RFID), drones, Internet of Things (IoT), Artificial Intelligence (AI), cloud computing, robotics, and blockchain technologies and to offer feasible suggestions for the adoption of the new technology by 3PL service providers (Raja & Venkatachalam, 2020). Machine learning, the internet of things, artificial intelligence, cloud computing, and as well as other enabling technologies move forward with implication as more and complementary organizations diagonally the earth is outsourcing logistics conduct to the 3PL service provider. (Koleshnia & Zhaldak,2021) using technologies such as the Internet of Things, RFID technology, wireless sensor networks (WSN), warehouses in digital format; autopilot cars, drones, which minimize human participation in the processes of delivery and transportation; blockchain, Big Data, Data Lakes, artificial intelligence. (Raja & Venkatachalam, 2020).
Third-party logistics (3PL) is of advanced significance as more and supplementary organizations across the globe are outsourcing logistics activities to the 3PL service providers (Koleshnia & Zhaldak, 2021). Those reviews are combinations of digital technologies while using the warehouse, transport, and freight forwarders in the logistics and supply chain industries. The need to deliberate the interdependencies of multiple technologies arises to strategize a comprehensive approach to executing the exponential technologies (Ruthramathi et al., 2022). Third-party logistics take care of the delivery sequence process. Nowadays, many companies are outsourcing their logistics functions to 3PL services providers (Ruthramathi et al., 2022).

3.2 Global positioning system and third-party logistics (GPS)

GPS now has been a part of supply chain visibility, which entails an information system that provides more diligent and detailed tracking details of assets across a whole network. (Habjan & Andriopoulos, 2009). GPS thus benefits highly in logistics operations, especially for businesses dealing with fleet vehicles (Vyas, 2018). Global Positioning System (GPS) technology changed the traditional aspect of logistics businesses and it has emerged as an important factor in the business of transportation and logistics in recent years. GPS positioning, mobile maps, location services, and emergency alarm, to get real-time logistics and cost-optimal and extremely enhance the degree of information on logistics (Wannaporn, 2021).

The system will strengthen the logistics supervision modernization, increase the transparency of administrative business and enhance the government's rapid response capability (Chen et al., 2010). Using these technologies is of considerable value in global supply chain management, look at the application of GPS-based in sequence technologies to optimize operations of companies provided that logistics services, these technologies assist to enhance the effective and efficient management of their businesses. (Zhong & Zhou, 2011). The requirements of scientifically managing the Logistics business and e-government are completed met. Chen et al (2010). (Vyas, 2018). GPS technology is an undeniable tool for every logistics company to leverage and bring their business to the next level. Willis (2016) replacement GPS is tranquil a long way off, but researchers continue to work hard on improving overall accuracy and dependability to assist in the enlargement of other technology. Global view, transparency of each phase during the realization of logistics processes, and comprehensive control over the crucial data are imposed as a priority in contemporary logistics (Ilin et al., 2013).
3.3 Barcode

The codes are read by barcode readers that identify the essential information. Barcodes are by far the most common form of tagging items used in postal services, supermarket chains, and supply networks, and their advantages are indisputable (Scornavacca & Barnes, 2006). The wireless barcode scanner is extremely beneficial for a business. These devices by scanning a barcode on a product package which then transmits data back to a host computer depending on how it is set up. (Garg, 2012).

Currently, the top 3PL providers are capable of offering a wide range of management functions, including inbound and outbound freight, bar-code/RFID implementation, cross-docking, shipment tracking and tracing, imports and exports, warehouse management, order fulfillment, packaging, distribution, fleet management, product returns, systems planning, web-based applications, and logistics information services (Napolitano, 2008; Barrett, 2005; Cooke, 2005; Lieb, 2005; Morton, 2005; Tompkins et al., 2006). Predictions expect this to grow at a Compound Annual Growth Rate (Cagr) of 4.7% from 2019 to 2025. Using barcodes in third-party fulfillment centers (3pl) is at the core of successfully fulfilling your product orders and shipments (Pang, 2020).

3.4 Radio-frequency identification (RFID)

Radio-frequency identification (RFID) is a newer barcode technology. Barcodes and RFID are different, but also similar in many ways (Lopienski, 2020). Challenges and obstacles to RFID’s quick adoption, the potential resolutions, and approaches (Wu et al., 2006). RFID technology offers some unique advantages over both codes in terms of faster reading and writing capabilities with a comparatively shorter distance, and it provides higher visibility by reducing inventory, shrinkage, and out-of-stock situations (Lee & Özer, 2007) The contributions of the RFID industry and forecasts of technological trends were also analyzed, concluding that RFID will be more ubiquitously diffused and assimilated into our daily lives soon (Chao et al., 2007). Better inventory management is also one driver of keeping track of the goods through the transportation processes, improving inventory accuracy, and allowing collaboration on inventory management, planning, forecasting, and replenishment (Frazelle et al., 2002), (Sivakumar & Ruthramathi, 2019). RFID is easier to read than barcodes and can be read in batches, but requires much more high-end tech to read (Lopienski 2020).

3.5 Internet of thing

The Internet of Things (IoT) has inspired many innovative applications of logistics and supply chains in recent years (Gershenfeld et al., 2004). IoT, physical
entities can generate and share information, often based on radio-frequency identification (RFID) (Grüninger et al., 2010; Ustundag 2010). GPS /GIS, and high-speed internet to realize the information updated in real-time, improve the operation and intelligent management, rich logistics operation management, and improve business efficiency (Buckley, 200), (Stefansson & Lumsden, 2008). Focusing on the IoT in transportation management, investigated a smart transportation management system based on case studies. Smart goods, vehicles, and infrastructure lead to better visibility and information accessibility revealing opportunities for time savings in warehouse and transportation tasks and communications with customers. Internet of things in the logistics industry as the innovation point, to investigate the identification technology, network structure, and middleware technology support, which is used in the Internet of things, and also to analyze the bottleneck of technology (Yuqiang et al., 2010).

Internet of things (IoT): IoT refers to the network interconnection that possibly connects millions of physical objects with the Internet (Xia et al., 2012). It allows different smart devices to be interconnected, monitored, communicated and controlled based on standard communication protocols to facilitate the transition of goods, services, and information (Barreto et al., 2017). Logistics is one area where IoT is predicted to have an extremely significant impact, as transportation systems evolve and vehicles are fitted with an increasing level of sensing, networking, and communication capability, enabling vehicles to interact with each other and their environment (Da Xu et al., 2014). IoT can be used in every industry and every business. Nowadays, it is innovative infrastructure, healthcare, supply chain, security, energy, production, and related industry sectors and enterprises (Roblek et al., 2016).

(Tu, 2018) Internet of Things technology and the external motivating force to embrace technology to the IoT technology. Two technologies will improve efficiencies, provide new business opportunities, address regulatory requirements, and improve transparency and visibility (Miller, 2018). Blockchain and IoT solutions in the industrial sector will need to address regulatory, legal, and insurance requirements for goods transferred on the supply chain, autonomous vehicles, and manufacturing plant equipment. Despite these implications, the combination of blockchain and the Internet of Things (IoT) will bring business value to the industrial sector. Impact of Big Data Analytics (BDA), and the Internet of Things (IoT), in supporting a large logistics firm’s strategy to improve driver safety, lower operating costs, and reduce the environmental impact of their vehicles (Hopkins & Hawking, 2018).

Smart logistics based on the internet of things (IoT) include smart freight transportation, warehousing, and delivery, Ding et al. (2020) also studied transportation and warehouse management using the IoT and developed smart integrated multiple
tracking systems for logistics companies, integrating materials, personnel, and inventory, improving accuracy and reliability by reducing location errors (Kim et al., 2015). Enhancing operational efficiency and effectiveness of warehousing, transportation, and logistics through the sharing of information (Lee et al., 2018; Qian et al., 2017) and physical assets, besides providing revenue opportunities are the main reasons for deploying IoT in supply chains (Gershenfeld et al., 2004). IoT will have far-reaching influences on future supply chain management. The Internet of Things (IoT) is a major driver of digital transformation. Particularly in the logistics industry. For example, sensors inside smart mailboxes can detect if they’re empty or full. Delivery drivers then know in real-time which mailboxes to focus on. So, the IoT supports the logistics business in the transportation process and lets them optimize their drivers’ schedules; decreasing delivery times and increasing their efficiency. The evolution of the internet of things (IoT) has been widely accepted throughout the universal supply chain and how logistics management is catered for throughout its orchestration (Teece, 2018).

The supply chain (SC) is a crucial make-up of any organization and its structural design is heavily dependent on the type of venture that is being operated (Zhong et al., 2017). The logistical managerial aspects of the supply chain play their part in the movement of materials, stock items, and resources from the entry point into a business right through to the exit point where the completed product or stock item makes its way through to the end consumer (Mulky, 2013). Logistics management is a vital component of the supply chain (SC) (Christopher, 2004) and in this digital age of global technology it has been brought to the forefront of businesses and this is something that is constantly being addressed (Taliaferro et al., 2018). A contributing factor of the SC is being ability to operate on a lean basis, to be efficient, effective, relevant, and current (Hübner et al., 2016), (Zhong et al., 2017; Jianguo Ma, 2014; Witkowski, 2017) it encompasses all businesses, organizations, and institutions within its realms (Razzaque et al., 2015).

3.6 Artificial intelligence

Artificial intelligence in the warehousing operations enhances the potential of the warehousing functioning in logistics, management, and coordination. The application of artificial intelligence in warehousing to make it a smart environment for automated logistics is proposed by Pandian (2019). Artificial intelligence (AI) and automation are technologies that make a global impact by optimizing manual and time-intensive processes using Foster & Rhoden, (2020) data analytics and robotics, thus making the task more efficient, effective, and less time-consuming. Preset storage and the retrieval using the internet of things, artificial intelligence, and Pandian (2019) the CC technology to have any time access to the supply obtainable in the warehouse.
AI refers to the computer systems and applications that perform tasks needing human intelligence (Pesapane et al., 2018), and it also has the capacity of learning and improving thinking, perception, and action through training from data and algorithms (Helm et al., 2020). AI algorithms are widely used in many areas, e.g., routing, traffic management, maintenance, and security (Matlou & Abu-Mahfouz, 2017). The logistics and supply chain sector consist of numerous partners and stakeholders, and despite the limited inclusion of automation and AI within the sector, there are still many manual and repetitive tasks (Foster & Rhoden, 2020). The proposed system of smart warehousing logistics shows higher performance and enhanced efficiency for the warehouse that holds a vast range/types of goods that are available in huge numbers. The modern machines enabled by AI platforms are capable to gather information from their surroundings; using logic and probability choosing to act with the highest likelihood of success. These machines are made to learn, and act intelligently based on the big-data sets and recognize objects or sounds with considerable precision (Mnih et al., 2015; Esteva et al., 2017).

3.7 Cloud computing

Cloud technologies provide a central platform for the storage and integration of configurable information technology (IT) resources, which enable the accessibility of data and resources from decentralized locations. Cloud technologies form the service-oriented architecture that links the concepts of Platform-as-a-Service (PaaS), Software-as-a-Service (SaaS), and Information-as-a-Service (IaaS) (Benotmane et al., 2017). Logistics was built based on cloud computing and IoT, this platform can improve the efficiency of logistics circulation, and enterprises can organize the logistics activities reasonably; (Lu & Teng, 2012) which can be reasonably used as resources, efficient logistics services, and regional economic coordination and development. (Wang 2011) (Temjanovski et al., 2021). Cloud Computing and software and platform services are the ubiquitous appearances within the rapid transformation of business models in almost all industries and are an integral part of the business environment.

Zheng (2014), logistics open the new display place would join together logistics service information, increasing logistics’ service quality (Temjanovski et al. 2021). Among the biggest challenges logistics, companies and their end customers face in everyday operations are transportation costs, business processes, customer service, and supply chain visibility. Sivakumar et al. (2020) Cloud computing challenges of warehouse & its various operations and also discuss to improve the operational efficiency of warehouses. Cloud computing is based on the internet and it will influence the warehousing operations to improve efficiency. Integration of all the operations is the challenge faced by the warehouse operators by using cloud computing (Wang, 2011).
The deepening of research on cloud computing is exerting an even greater impact on logistics and is conducive to the rapid development of the logistics industry.

3.8 Blockchain technology

Blockchain has emerged as one of the most widely accepted technologies for trusted, secure, and decentralized intelligent transportation systems (Humayun, Jhanjhi, Hamid, & Ahmed, 2020). Blockchain-enabled performance monitoring application for logistics is possible to deploy in case of limited transit volumes already today (Kuhi et al., 2018). Technology, however, has the potential to resolve the fundamental issues and enable the applications for logistics to use cases (Francisco, & Swanson, 2018).

A conceptual model is supported by researchable propositions and balanced with supply chain management (Ganesan, & Gopalsamy, 2019). Progression of the IoT devices, smart shipping is becoming a reality (Gromovs, & Lammi, 2017). Blockchain technology and the Internet of things as emerging digitalization trends in logistics and transport are considered together with three relevant bachelor’s study programs.

Perboli et al. (2018) will help in plummeting the logistics costs and in optimizing the operation, and following a line of investigation challenges Rathee et al. (2019) together with IoT, blockchain technology has made the system of transportation and logistics very easy and transparent. Blockchain is an innovative way of implementing distributed ledger technologies that can be programmed to record and track any data by anyone without a central authority, and it is a peer-to-peer network and a nondestructive way to track data changes over time (Esmaeilian et al., 2020).

It provides scalable, transparent, and trustworthy data across the transportation and logistics system, which helps in tracking and authentication (Koh et al., 2020). While blockchain has seen many discussions in the literature as a technology that can offer many advantages, and have many success stories from the financial, supply chain, and public sectors yet, little is known about its disruption in transport and logistics, including the freight and passenger industries (Gromovs, & Lammi, 2017) learning outcomes and competencies of the future students in connection with IoT and blockchain technologies. Humayun et al., (2020) contribute to the meadow of logistics & transportation by traveling around the probable of IoT and blockchain technology in elegant logistics and transportation.
4.0 Research Gap

There are different technical problems faced by the 3PLs and the various methods of solving their bottlenecks in accomplishing their best services (Raj, & Sudalaimuthu, 2010). This research is carried out to find out the performance, prospective, and problems of 3PLs at various levels. There are many concepts of intermediary costs. Sergeev, & Dybskaya (2018) emphasizes that the world leaders in transport and logistics services and supply chain management place particular emphasis on introducing digital technologies in their supply chains, such as RFID, Mobile app, Big Data, Cloud Services, IoT, BlockChain, 3D Printing, etc. (Cichosz, 2018). Sensors, robots, automation, cloud computing, data analysis, 3D printing, autonomous vehicles, artificial intelligence, digital twins, or blockchain technology, on the one hand, enable, on the other, trigger changes in supply chains and logistics, and thus also affect the logistics services industry (Sergeev, & Dybskaya, 2018). In a modern, hyper-competitive market of logistics services with new entrants including those from the technology and automotive industries, the incumbents should undergo a transformation and develop innovative business models (Cichosz, 2018). Digital transformation of the logistics services industry is very broad and at the same time scarcely explored in the literature referred to as logistics and supply chain management (Kinkel, Rahn, Rieder, 2020).

The increasing use of advanced digital technologies is transforming production processes and product development activities (Dong et al., 2021), (Bhardwaj, 2021). The express speed of digital transformation is redefining Indian logistics, 3D print, AI, automated robots, autonomous vehicles, big data analytics, BC, drones, electric vehicles, and the IoT were identified as the upcoming technologies (Bhardwaj, 2021). Computerization, artificial intelligence, ML, data analytics, and the internet of things are considerably contributing to increasing operational efficiency. The falling cost of technologies like cloud computing, GPS trackers, IoT sensors, etc. enables small-scale logistics companies to update their systems. Further research is required in the future, that would continue with the survey on the procedures to automate the billing in goods purchase and sale in the warehouse using artificial intelligence (Pandian, 2019). Future suggestions are given to focus on the balance among different sustainability indicators through the entire lifecycle, human-centric technological transformation, system integration and digital twin, semi-autonomous transportation solutions, smart reverse logistics, and so forth (Sun et al., 2021). All those secondary data reviews analyzed the digital technologies, most used in the transport logistics service providers sector. In what way the digital technology was is aware of the nd purpose of third-party logistics services providers in the warehouse, transport, and freight forwarders in global business.
5.0 Research Methodology

A systematic literature review aims at identifying, evaluating, interpreting, and categorizing all relevant articles engaging one or more research questions and topics (Kitchenham, 2004; Ranieri et al., 2018). Information regarding industry involvement, geographic location, research design and methods, data analysis techniques, university, affiliation, publishers, authors, and year of publications is predictable. A wide collection of eight databases from 1997 to 2021 were explored using the keywords digital technologies like “GPS”, “Barcode”, “RFID”, “Internet of Things”, “Artificial intelligence”, “Cloud computing”, and “Blockchain” “Logistics”, “Transportation”, “Warehouse”, “Freight forwarders” and “Supply Chain”. There are empirical studies on benefits and challenges, namely freight forwarding logistics providers have been the hindrance for logistics effectiveness in Tuticorin (Sivakumar et al., 2020), the option of the new technology by 3PL service providers dealing with VOC port, Tuticorin, India. The need to deliberate the interdependencies of multiple technologies arises to strategize a comprehensive approach to executing the exponential technologies (Senthil, 2020). Digital technology like cloud computing is used he warehouse operations in nai (Sivakumar et al., 2020). Machine learning, the internet of things, artificial intelligence, cloud computing, and as well as other enabling technologies bring the supply chain visibility, by sharing more immediate information about products and goods. Third-party logistics (3PL) is of advanced significance as more and supplementary organizations across the earth are outsourcing logistics activities to the 3PL service providers. Raja, R., & Venkatachalam, S.(2020) challenges and benefits faced by the Robotics technology, adoption of the new technology by3PL service providers in TamilNadu. Ruthramathi et al., (2022). The major seek of the cram is the benefits & challenges of the transporters. The selected region was Chennai and Coimbatore (Ruthramathi, & Sivakumar, 2022).

From all those reviews, find out the research gap, beyond digital technologies used in transport, warehouse, and freight forwarders in global business. “An adaptation of digital technology in global third-party logistics service providers”. A total of 112 articles were found, and information on a chain of variables was gathered. Qualitative research focuses on digital technology in third-party logistics services providers. This is a focused literature review related to the logistics service provider (LSP). The source materials for analysis were taken by the authors from scientific literature consisting of white papers, journals, certified publications, articles from recognized authors, directories, databases, and articles from recognized associations and government publishing sources.
6.0 Findings and Discussion

GPS is a well-known technology in the field of the logistics and supply chain sector. The warehouse management system, transport, and freight analyzer update the data as the item progresses through the warehouse system through RFID technology. AI is used to make demand predictions, modify orders, and re-route products in transit in the warehouse. Cloud data warehouses can store copious amounts of data effectively. Blockchain for data authentication, the entire supply chain can contribute and validate data, knowing the data is not susceptible to tampering. It enables companies to increase efficiency (e.g. process automation, reduced paperwork, etc.), transparency, and traceability. The proliferation of the internet of things (IoT) is changing the picture of warehouse management at a fast pace. IoT devices like RFID tags and sensors enable warehouse managers to keep track of the exact location and progress of the product. Sometimes GPS signals aren't accurate in freight, transport, and warehousing. Implementation can be difficult & time-consuming in RFID, with the high cost of Implantation in AI. The Challenge facing the issues of security in the internet of things is high implementation costs for companies through the blockchain. The asset tracking feature of an RFID system improves the visibility of every item in third-party logistics. RFID is a type of auto-ID technology used to reduce time and labor and improve real-time data accuracy. Machine-To-Machine systems can now control all things in your warehouse and this is very significant for order fulfillment processes. Blockchain can greatly improve supply chains by enabling faster and more cost-efficient delivery of products, enhancing products' traceability, improving coordination between partners, and aiding access to financing. The devices connected to IoT can be secured by implementing active security measures in their software.

Providing security measures such as password protection for accessing the software is one of the ways to safeguard devices from threats and potential attacks. Adopting the security practices mentioned above can help prevent a variety of IoT attacks. Internet of things technology also improves connectivity while driving digitization, mobile computing, analytics, and cloud-based technology, changing how shippers and logistics providers conduct their operations. Improve efficiency, reduce costs and minimize errors with AI. It is involved in process automation and codifying business logic. Digital technology designed to improve the efficiency of logistics operations due to the transparency, availability, and immutability of digital information will lead to the fact that even if the transaction was incorrect, caused by a failure, erroneous or fraudulent, it is confirmed, it can no longer be fixed in blockchain crash.
7.0 Conclusions

Digital transformation is one of the critical goals of businesses. However, the digital transformation process cannot be completed quickly in just one or two days. No hesitation technology that enables the paperless warehouse is the way forward. Technology is at the core of the digital transformation, helping optimize business processes and increase productivity and operational efficiency. 3PL warehouses along with all the services providers in the third party must embrace technology to move from a familiar but inefficient manual environment, to harness the potential gains from technology. These types of technologies have the potential to significantly reshape operations in distribution and logistics companies while creating new value for customers. The actuality is that 70% of 3PL companies are still imperfect using the manual paper-based method and basic tools like Excel to operate.

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