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INNOVATION AND SOLUTIONS IN BUSINESS LOGISTICS

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Summary

Many logistics service providers have embraced digital technologies such as cloud computing, big data analytics, and Internet of Things (IoT) devices to improve their operational efficiency and provide better visibility into the supply chain. Responses received from the respondents explained that logistics service providers need to leverage technology to improve their operational efficiency, provide better visibility into the supply chain, and enhance the customer experience. Overall, by incorporating innovative technologies into their logistics operations, businesses can increase efficiency, reduce costs, and enhance service quality, ultimately leading to improved customer satisfaction and loyalty.

Keywords: logistics, innovation, internet of things.

Introduction

The logistics industry is at the centre of many facets of the economy. It has a close nexus with issues such as globalisation, employment, economic development, international security, pollution, greenhouse gas emissions, congestion, and traffic accidents among others. Furthermore, it is essential to the operation of many other industries, having an impact on key performance indicators such as cost, service delivery, responsiveness, and reliability.

Logistics has evolved from being a tactical requirement into a strategic activity that links customers and suppliers by managing the flows of goods, services, and information from point of origin to point of consumption. The most common activities associated with logistics are transport and warehousing. However, other activities such as forwarding, customs clearance, packaging, labelling, and various aspects of information management are also considered part of logistics.

However, increasing customer needs and new business models in trade and industry offer various chances to develop new markets by means of innovative logistics services. Technology improvements also enable logistics processes to be created more efficiently. Sustainable innovations in logistics services and transportation can be defined as a required improvement that satisfies the wants of the current present-day and not endangering the capability of the next generations to satisfy their needs.

Studies carried out recently on Industry 4.0 have emphasized that changes in the fourth industrial revolution will affect both the transportation sector and other industries as well as their corresponding supply chains. Delfmann et al. (2018) emphasized that Logistics 4.0 is an indispensable component of the envisioned Industry 4.0 vision in the logistics sector. Without logistics networks that span the world, the globalization of the economy would be unthinkable. Hence, it can be inferred that the digital transformation of the economy and society can only be sustained if innovative solutions in business logistics are not neglected, and then will the logistics performance of companies be appropriately fulfilled.

Research aim: to identify challenges and innovative solutions in business logistics.

The following **objectives** have been set to achieve the aim:

1. To assess the impact of innovative approach to logistics services.
2. To identify the current challenges encountered by logistics businesses and offer innovative solutions to overcome these challenges.

Research object and methods

Research object: innovation and solutions in business logistics.

Research Methods: The current research utilised primary data, gathered using quantitative method with semi-structured surveys that employed open-ended questionnaires distributed to a targeted, random group of 10 logistics experts using online survey, since with this method it is easier to gather information from the respondents in a timely manner within a month and to get quality information. The survey started with a short introduction about the author and the purpose and then progressed to the formulation of the questions. The questions used in the survey were structured to get understanding of the respondents age, educational qualification and the rest of the questions are based on the details of the data collection from the theoretical part with respects to the theme of this study.

Secondary data information used for this research was gathered using official data websites like Francis and Taylor, since from this official academic site, important information can be collated after reading the valuable and most appropriate articles.

Table 1. Questions included in the questionnaire (developed by author)

Themes	Questions	Nr. of questions
Perceived service quality	Which major factors are responsible for determining the service quality of logistics service providers, in contrast to other logistics firms?	3
	What major efforts have been put in place by most logistics service providers to sustain the existing quality of their logistics services?	
	What developments have occurred within the organization that could be beneficial in terms of the quality of logistical services provided?	
Structure of the logistics industry	Which areas within the logistics industry require urgent upgrades for improving the innovative approach to service quality?	2
	How do logistics service providers determine the logistics performance index in terms of its service quality?	
Challenges in the logistics industry	Which key constraints or challenges are encountered in business logistical services and activities?	2
	How are these specific challenges currently influencing the service quality logistics industry?	
Age	To determine the age of the logistics experts.	1
Educational Qualification	To determine the logistics expert's educational qualifications.	1
Impact of advancements of, innovative solutions on perceived service quality	How can innovation and technology revive the logistics sector, and consecutively improve the service quality of the logistics industry?	1

The following questions were developed and distributed to the logistics experts as shown in the table below.

In Table 1, you can see six important questions that have been developed to identify innovative solutions and address challenges in business logistics.

Research results and discussion

In this section of the paper the results of a questionnaire survey that was conducted among 10 randomly selected logistics experts are presented. The study relies heavily on the experiences of the respondents to gain valuable insights into the research topics under investigation.

Through their responses there was revealed key areas of interest and shed light on potential innovative solutions in business logistics.

The age of the respondents that participated in the survey: 60% of the participants aged between 61 years and above, participants between 50-60 years at 20%, participants between the ages of 41-50 years at 10% and participants from 30-40 years at 10% respectively. Educational qualification of the respondents: with 70% of Masters level educational level and 30% being of bachelor level educational qualification.

Table 2. Respondents opinion about perceived service quality (made by author)

Themes	**Perceived service quality**
Questions	**Respondents responses**
Which major factors are responsible for determining the service quality of logistics service providers, in contrast to other logistics firms?	1. Respondents explained that automation has been implemented in many aspects of logistics, from warehouses to transportation. This includes the use of robots and autonomous vehicles in warehouses, and automated order processing and dispatching. And by automating manual tasks, logistics service providers can reduce costs, improve efficiency, and reduce errors greatly. 2. Most Logistics service providers have also focused on providing excellent customer service by offering real-time tracking, proactive notifications, and self-service portals. This helps to improve the customer experience and increase customer loyalty. 3. Many logistics service providers have embraced digital technologies such as cloud computing, big data analytics, and Internet of Things (IoT) devices to improve their operational efficiency and provide better visibility into the supply chain. This has led to better communication, faster response times, and increased accuracy. 4. Many logistics service providers mentioned the importance of sustainability in logistics and spot ways of implementing measures to reduce their environmental impact. This includes using cleaner transportation modes, optimizing routes to reduce fuel consumption, and using environmentally friendly packaging materials. 5. Implementation of lean logistics has led to logistics focused on reducing waste and optimizing the supply chain to improve overall efficiency. This approach involves streamlining processes, reducing inventory levels, and improving logistics network design to eliminate bottlenecks and reduce lead times.
What major efforts have been put in place by most logistics service providers to sustain the existing quality in business logistics?	

In Table 2. Logistics service providers have implemented several efforts to sustain existing quality in business logistics. By embracing digital technologies, automating processes, adopting lean principles, focusing on sustainability,

and providing excellent customer service, logistics service providers can improve their operational efficiency, reduce costs, and provide better service to their customers.

Table 3. Respondents opinion about the structure of the logistics industry (made by author)

Themes	**Structure of the logistics industry**
Questions	**Respondents responses**
In your opinion which major factors are responsible for determining the service quality of logistics service providers, in contrast to other logistics firms?	1. The following responses received from the respondents explained that logistics service providers need to leverage technology to improve their operational efficiency, provide better visibility into the supply chain, and enhance the customer experience. This includes using technologies like big data analytics, Internet of Things (IoT) devices, and cloud computing. 2. Timeliness: Logistics service providers need to ensure that shipments are delivered on time as delays can disrupt supply chains and impact the customer's operations. Hence, timeliness is a critical factor that can determine the service quality of logistics service providers. 3. Responsiveness: Logistics service providers need to be responsive to their customer's needs by providing timely updates, resolving issues quickly, and maintaining open communication. This requires strong customer service skills and effective communication channels. 4. Reliability: Logistics service providers need to be reliable in terms of delivering shipments consistently and accurately. This requires reliable transport, efficient handling, and accurate information flow, which are essential for maintaining a good reputation in the industry. 5. Cost-effectiveness: Logistics service providers need to provide services that are cost-effective for their customers while maintaining profitability. This requires efficient operations, streamlined processes, and optimized logistics networks.
What major efforts have been put in place by most logistics service providers to sustain the existing quality in business logistics?	

Overall, in Table 3. The service quality of logistics service providers is determined by a combination of factors, including timeliness, reliability, flexibility, responsiveness, cost-effectiveness, and technology. By excelling in these areas, logistics service providers can differentiate themselves from other logistics firms and provide superior service to their customers. Respondents' opinions in the above Table 4 addressed issues being encountered in the logistics sector and how these factors directly affect the logistics processes and operations.

Table 4. Respondents opinion about the challenges in the logistics industry (made by author)

Themes	**Challenges in the logistics industry**
Questions	**Respondents responses**
Which key constraints or challenges are encountered in business logistical services and activities?	The respondents enumerated the following challenges that are being encountered in business logistics. 1. Regulatory compliance which is related to safety, security, and customs. Compliance with these regulations can be complex and time-consuming, requiring significant resources and expertise. 2. Information management which involves managing and tracking information related to logistics, such as inventory levels, transportation schedules, and customer orders, can be a significant challenge 3. Cost management: Most of the respondents reckoned that the cost of logistics can be significant, and organisations must continuously monitor and manage costs to ensure that they remain competitive. This requires careful analysis and optimization of logistical processes, as well as an ongoing focus on cost reduction and efficiency. 4. Inventory management: The efficient management of inventory is crucial to the success of any logistics operation. Maintaining an appropriate level of inventory while minimizing excess stock and the costs associated with it can be challenging. 5. Transportation: The cost of transportation can be high, and the availability of suitable modes of transport can be limited. The transportation of goods also involves risks such as delays, damages, and theft.
How are these specific challenges currently influencing the service quality logistics industry?	

Overall in Table 5, by incorporating innovative technologies into their logistics operations, businesses can increase efficiency, reduce costs, and enhance service quality, ultimately leading to improved customer satisfaction and loyalty.

Table 5. Respondents opinion about the Impact of advancements of innovative solutions on perceived service quality (made by author)

Themes	**Impact of advancements of innovative solutions on perceived service quality**
Questions	**Respondents responses**
How can innovation and technology revive the logistics sector, and consecutively improve the service quality of the logistics industry?	The respondents responded with the following responses. 1. Predictive Analytics can be used to forecast demand, improve inventory management, and optimise routes. By analysing data, businesses can better understand their customers' needs and preferences, leading to more efficient logistics planning and service delivery. 2. Automation in logistics can reduce manual labour and increase efficiency, speed, and accuracy. Automated systems can also help to reduce errors, increase productivity, and optimize processes. 3. Cloud Technology can help businesses to streamline their logistics operations by enabling real-time data sharing and communication across the supply chain. This can lead to faster decision-making, reduced costs, and improved service quality. 4. Internet of Things (IoT) technology can be used to monitor goods in transit, track vehicles, and containers, and optimize warehouse operations. This can help businesses to reduce costs, improve delivery times, and enhance customer satisfaction. 5. Blockchain technology can improve transparency and traceability in the logistics sector by creating a secure and decentralised system for tracking goods and transactions. This can help businesses to reduce fraud, minimize disputes, and improve supply chain visibility.

A prerequisite for producing large-scale logistics data is that several components, such as logistics elements, logistics tools and logistics processes, can be fully digitised. This requires the widespread use of the Internet of things, mobile Internet, and other advanced technologies to collect relevant logistic data for all scenarios and operations (Kataria, Mittal, 2014). The digitization of logistics elements is simply the digitization of goods, packaging, logistics documents and personnel. Digitization of logistics facilities is the digitization of fleets, terminals, cargo terminals, warehouses, shelves, sorting and transportation systems, etc. Digitization of logistics tools includes digitization of operational tools such as vehicles, forklifts, pallets, stackers and so on (Zhong et al., 2016).

The latest scientific and technological advances continue to foster the deep integration of the Internet and the logistics industry. The next generation of information technologies, such as big data analytics, cloud computing and the Internet of things, is expected to enter a mature period over the next five to ten years, and full-coverage logistics networks will be formed (Aliresearch, 2017).

Only a planned and organised transport system can provide better logistics efficiency, reduce operating costs, and promote the quality of services, and thus greater competitiveness in global markets. Improving transport systems strengthens the public and private sectors. A well-managed logistics system can significantly increase and strengthen the competitiveness of public enterprises and private companies. Companies' efficiencies and transformation in ongoing global processes and implementation of high-tech are imperative for a better market position. Those new technological models as well as Cloud computing system has become a new standardised norm across dynamic industries such as the logistics sector.

Conclusions

1. Improvement of various logistics processes is crucial with the implementation of innovative practices which will help in resolving issues and challenges being experienced by logistics service and offer a lasting solution.
2. Transportation optimisation will bring about the cooperation of various transporting means and will assist in the realisation of integration of the logistic chain and reduce cost.
3. There must be increased investment in innovative solutions and technologies as it will be a source of competitive advantages and allows enterprises not only to increase competitiveness but also to minimise the impact on the environment, and develop the social responsibility of their businesses.

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