THE ROLE OF 3RD PARTY LOGISTICS IN BRINGING EFFICIENCY & EFFECTIVENESS AMONG THEIR DISTRIBUTION CENTERS

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ABSTRACT

This paper intelligible discusses the overall structure of the Sort center in a warehouse with challenges and issues. This project it had included the operations which supposed to optimize as well as new procedures & up-gradations should be done. And also provided a systematic view and classification of the literature to provide a more coherent view of Sort center activities in the warehouse.

Objective: *To understand the role of 3PL in bringing efficiency and effectiveness to their Distribution centers. In supply chain management, the latest warehousing and distribution centers are overcome with activities that relate to the smooth flow, storage and while distribution centers have additional services such as product mixing, order fulfillment, cross-docking, and packaging too. This helps in improving customer silicification and also reduces costs. Ware House Management (WMS) plays an important role in the smooth flow of these operations. The current research explains the Role of 3^{rd} party logistics in these warehouse operations and to brink efficiency and effectiveness in these distribution centers. In today's competitive market companies are forced to increase and improve their warehousing operations and techniques.*

Methodology: *The research is conducted with SLR and Bibliometric analysis using VoS Viewer to understand the research carried out in the area of study. And, the primary data collected from third-party logistics service providers were also analyzed. Most of these companies are allocating their warehousing and logistics-related operations to 3^{rd} parties so which may reduce costs and can increase efficiency in the process. This paper highlights the process, challenges and best practices to be done to overcome these challenges in 3^{rd} party logistics companies.*

Findings: *As a part of our research, we have found the following causes that hamper the efficiency and effectiveness of the 3PL operations, they are- Attrition of Vehicles, Pick Uptime, Seller Issues, Inbound Availability, Outbound Issues, Unplanned Delays, Poor Inventory Management, etc.*

Keywords: 3PL, Performance, Logistics, Outsourcing, Transportation, Framework, Coordination.

INTRODUCTION

Warehousing plays an important role in this modern-day life, most companies are storing or replenishing their stock in warehouses. This article will address – the role of third-party logistics in

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bringing efficiency and effectiveness to distribution centers. 3rd party logistics providers typically specialize in integrated operations of warehousing and transportation services that can be scaled and customized to customers' needs, based on market conditions, to meet the demands and delivery service requirements for their products (Murray & Chu, 2015; Allen et al., 2018; Gutierrez-Franco et al., 2021). Services often extend beyond logistics to include value-added services related to the production or procurement of goods, such as services that integrate parts of the supply chain (Awwad et al., 2018; Cleophas et al., 2019;). Even in the distribution of goods, raw materials and also work process i.e., associated transactions, including shipping, receiving, put-away and picking to produce finished products happen only through warehouse which plays an important role across all the supply chains.

Distribution centers that go beyond filling customer orders to provide value-added services in representing the broad range of activities that occur in modern warehouses. It often utilises Auto-ID Capture technology (AIDC), such as Barcode scanners, wireless LANs, and mobile computers for the efficient monitoring and flow of products. Warehousing is costly in terms of human resources and of the facilities and equipment ‘s required, and its performance will affect directly on overall supply chain performance. Inadequate design or managing of warehouse systems will jeopardize the achievement of required customer service levels and the maintenance of stock integrity, and result in unnecessarily high costs.

LITERATURE REVIEW

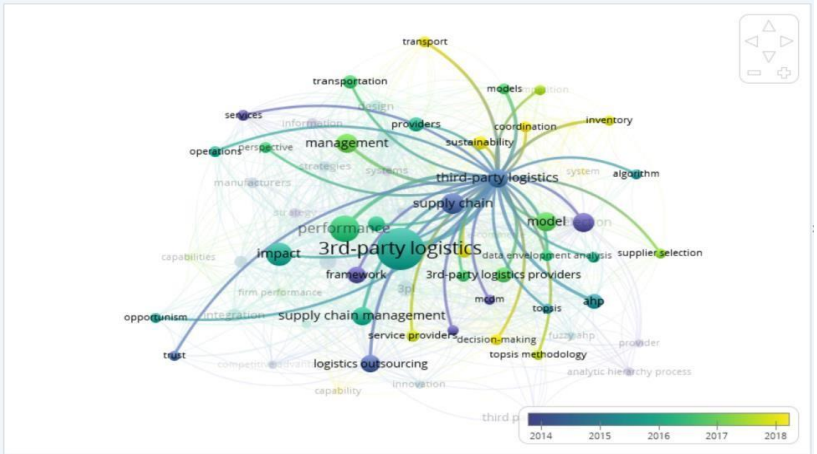

FIGURE 1
DEFINES THE OVERALL KEYWORDS W.R.T KEYWORDS IN OUR RESEARCH DOMAIN

“Third-party Logistics is simply an outside company to perform all or part of the firm’s material management and product distribution function[1].”

In the current extremely competing global business ecosphere, businesses are placing a high value on Return on Assets (ROA), and so reducing warehousing expenses has become an essential business concern. Warehousing controls around 2% to 5% of selling costs for companies. A growing number of organisations are automation their core warehouse tasks in a cost-effective effort to boost their throughput or inventory turnover rate (Olsson et al., 2017). In order to boost productivity and minimize operational costs, warehouse resources must be allocated in a manner that is reasonable and effective Figure 1. Determining proper storage places for a warehouse's thousands of vital products is a major constraint on warehouse efficiency. The size and structure of storage solutions, material handling equipment, product attributes, related business, turnover rates, and storage space requirements are just a few of the many elements that have been thoroughly examined (Rabta et al., 2018). Selecting appropriate storage assigning principles and routing techniques with supporting elements has been recommended as a feasible strategy to improve efficiency. Warehouse operational planning issues have been addressed with a variety of decision - making support models and algorithmic solutions.

Third-party logistics providers (3PLs) compete and/or survive based on their operational

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efficiency in an era of downsizing and budgetary reductions. It is the goal of this study to build a useful set of financial benchmarks that will mandate best practises for 3PLs in the growingly competitive third-party logistics market. To measure the operational effectiveness of diverse commercial or non-profit organisations, the study presents a data envelopment analysis (DEA). Methodology, design, and approach This research is the first to demonstrate the effectiveness of DEA for assessing the competitiveness of third-party logistics services in the United States using examples of prominent 3PLs. Third-party logistics (3PL) providers can also benefit from the suggested DEA model, which identifies potential inefficiencies and provides important guidance for improving operational efficiency. 3PLs can utilise the suggested DEA model to not only prioritise the utilize of monetary backing, but also evaluate the impact of financial investment on 3PL profitability. According to the findings of the DEA investigation, 3PLs' long-term financial stability appears to be connected with the quality and range of their service offerings. There is a novel use of DEA for 3PLS performance measurement in this paper's key contribution. Additionally, the suggested DEA model enables 3PLS to define specific policy guidelines for prioritising the use of financial resources, as well as evaluating the profitability of 3PLS as a result of investment in financial assets.

FIGURE 2
THE NUMBER OF RESEARCHES IN EACH DOMAIN W.R.T THIRD PARTY LOGISTICS

Methodology

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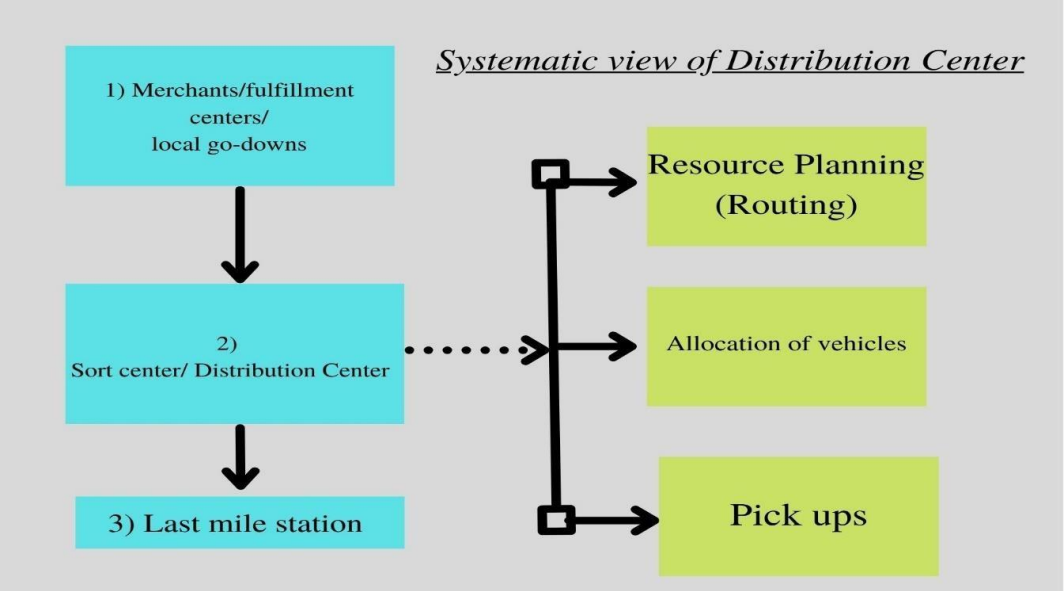
Our approach represents a strategic literature review analysis, other paper- based definitions carried using VoS Viewer on the last mile operations from 519 Web of Science papers available. Out of 519 papers the most cited 15 research papers were described in the review Figure 2. Also, the definitive 3PL characteristics and work flow in executing all the processes included in making the 3PL processes effective and efficient. Also, provides the primary information on the challenges of 3PL systems and transactions i.e. Attrition of Vehicles, Pick Up time, Seller Issues, Inbound Availability, Outbound



Issues, Unplanned Delays, Poor Inventory Management, etc. during a period of 2 months from Sept 2021 to Nov 2021 at Mahindra Logistics Limited (a 3PL service provider), Hyderabad.

FIGURE 3
THE SYSTEMATIC VIEW OF ONE OF OUR REVIEWED DISTRIBUSTION CENTER AT MAHINDRA LOGISTICS

Systematic View of Sort Centre Operations

Merchants/fulfilment centres/local go-downs: From the origin of order at the customer end, it goes to the merchant responsible for the shipment for confirmation. These centres are the main sources of orders for the Distribution centres. These play a vital role in order time, cost of supply chain, order quantity, and other future services. For Instance, when a customer places an order from any e-commerce website (Van Loon et al., 2021). They place the product type and quantity of the related product. Once the following are confirmed. The respective merchant/FC/Local production centre or warehouse receives the request for the same. They process the order based on the size, quantity and its packaging. After all the necessary process is completed for the respective product, moved to its next destination in supply chains Figure 3.

Distribution Centre/Sort Centre

All the orders that are gathered from their respective merchants/FCs/Local dispensaries are accumulated here. The main purpose of the DCs/SCs is to sort all the products based on their routes to their destinations. The main functions of these centre are;

1) **Resource planning:** Here the goal is to plan the processes like Inland goals and Objectives, Cargo demand, operating economies, and operational constrains. The priority firm will give all this process related operations to 3PL partner. The 3PL service provider will coordinate with contract vendors and pickup associates for arrangement of vehicles, drivers and pickup associates. The entire process planning for pick up shipments of a that particular day will be looked after by the 3PL partner.
2) **Allocation of vehicles:** The idea is to plan the vehicle size, vehicle capacity, type of vehicle, distance based on the order type, shape, size, quantity and fragility of the order. Proper planning of this process helps the 3PL partners to better server the parent partner as well as the customers they deal with directly or indirectly. We have vehicles called

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line-all where we can plan the routes of vehicles so that there is no duplication of station by multiple vehicles. These vehicles connect cities called the InterCitys. E.g., If there are goods to be delivered at Bangalore and we have vehicles that come from Northern part of India via Hyderabad. We can plan Hyderabad as a Hub-spot.

3) **Pick Ups:** The pick-ups include from various locations like merchants, local go-downs, factories, fulfilment centres. These are collected in-person by a **pick-up associate** from their respective geographical location. Pick Up associate makes sure that the are safely handed over to their respective DCs/SCs.

a) Last Mile Station: This is the end point before the product reaches the end users. The goods sent from the DCs/SCs reach this station for final stage of processing this includes final sorting, verification, etc., The idea of this station is to ensure the product does not misplace in the transit and it reaches to the end user promptly. For Instance: Hyderabad can be considered as DC/SC and various minor locations across the state of Andhra Pradesh/Telangana are the last mile stations like Vijayawada, Rajmundry, Tirupati etc. From these so-called last mile stations, the goods are sorted and verified and then sent to the end user.

b) So, in the later chapters of this paper, we are going to discuss the existing cases and give some examples for improving the effectiveness and efficiency of the 3PL service systems.

c) Inbound

This refers to the inflow of goods from various locations like merchants, Local Go- downs, Fulfilment centres, factories. We assign a dedicated team of pick-up associates who go to the location and scan the good to ensure error free and seamless process flow to the end user and the firms they operate for. These associates bring them to the prescribed sorting stations (Ramanathan, 2010).

Sorting

The process of sorting is done at Sort Centre, where we gather all the inbound goods and sorted according to the area and their region of delivery. They are separated in racks. The main advantages of Sorting are Speed up of delivery, improve the accuracy, efficiency, speed of operations and many more. The next station after the sorting at the distribution centre is the Last mile station.

Outbound

The outbound refers to goods that have left the DCs/SCs and are in transit towards the last mile station. This is the end point before the product reaches the end users. The goods sent from the DCs/SCs reach this station for final stage of processing this includes final sorting, verification, etc., The idea of this station is to ensure the product does not misplace in the transit and it reaches to the end user promptly (Ranieri et al., 2018). For Instance: Hyderabad can be considered as DC/SC and various minor locations across the state of Andhra Pradesh/Telangana are the last mile stations like Vijayawada, Rajmundry, Tirupati etc. From these so-called last mile stations, the goods are sorted and verified and then sent to the end user.

Return to Station

Failure of delivery can be of various reasons. The reasons are due to in-availability of customer, cancellation, wrong location. If in case there is a failure of delivery to the end user, usually the product is ensured that it reaches the last mile station and then to the Distribution centres or Sorting Centres. This process entire process is known as return to station.

C-Returns

The products that get back to the DCs/SCs from the last mile are known as C-Returns.
This process can also be defined in a way when the goods that are received from last mile station, are sent back to the origin station from DCs/SCs is known as CPT (Critical Pull Time).

Challenges in Sort Centers

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Attrition of Vehicles:

1. Delay in line-all vehicles.
2. Faulty vehicles.
3. Vehicle accidents.
4. Route deviation.
5. Miscommunications.
6. Pick Up time:
7. Lack of coordination between sort centre and pick up point.
8. Delayed pick up due to improper invoice processing.
9. Seller Issues:
10. Delayed issue of Delivery challan.
11. Dock unavailability.
12. Inbound Availability:
13. Issues related to Yard management system due to rush hours.
14. Missing shipments leads to delay in YMS.
15. Outbound Issues:
16. Delayed CPT can cause delay in outbound goods.
17. Unplanned Delays
18. Irregular warehouse layout
19. Poor Inventory Management
20. Lack of Preparation for seasonal demands
21. Unsatisfactory order management
22. No damage controls

Findings

Afterall the process analysis and the understanding of various aspects and issues in the 3PLs respective distribution centres. Some of them are: Attrition of vehicles- this is a major and most influential problem of all. This mainly occurs due to Delay in line-all vehicles, faulty vehicles, vehicle accidents, route deviation and mostly human error-based miscommunication. These can be avoided following some standards in the DC itself like adding a hold on day in between delivery to delivery for all the line all vehicles also ensuring backup if in case of accidents and any other mishaps and likewise. Another major issue is Pick Up time, this is caused by two major reasons to our understanding they are one lack of coordination between sort centre and pick up point, two delayed pick-ups due to improper invoicing. This can be avoided by one major technological leap by automating the entire process by AI/ML based Invoice filling and recognition process. There are various organisations in the market that do this kind of automation to our specific needs. The automation overall also ensures redundancy back up and avoids unnecessary mis types. Third major issue is Seller issues can be due to delayed issue of delivery receipts and dock unavailability for the Heavy and unloading vehicles at the DC.

These issues can be taken care by one making the delivery receipt process using a single QR code and mostly carrying a soft copy of the same can streamline the entire process and speed up the flow of operations at DC. Dock unavailability can be addressed by defining proper protocols by understanding the flow of traffic over a period of time and doing the seasonal calculation for the same and also taking inspiration from other DCs in the market to design our DC plan. Inbound Availability is also a concern which is due to yard management system in heavy traffic hours and missing shipments. These can be taken care by having strict protocols by following lean methodologies for effective management of flow of operations of DCs. Outbound issues are due to delayed CPT. Critical pull time refers the process of transferring the cancelled orders to the source station (Suguna et al., 2021). This can be avoided by maintaining dedicated teams for the CPT process and implementation of Lean flow for inbound and outbound processes. Some other issues can be- Unplanned delays, Irregular warehouse layouts, Poor Inventory Management, Lack of preparation for seasonal demands, Unsatisfactory order management and No damage control. These can be avoided by previously mentioned ways like by automating the entire flow in places where required like maintaining soft copies of invoices and enabling quick print feature wherever required also implementation of contemporary technology-based solutions for simplifying the Process like enabling QR scans and quick scan and checker-based error back up with

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a manual assistance if required. These should on strict timelines and should follow lean principles (Wang et al., 2017). However, there no is system that is completely error free and its highly difficult for a semi-automated like ours to be completely smooth. So, we would suggest that careful understanding to the processes over a period and then taking considerable action plan to make the 3PL service effective is one way. The other way to take up section wise updating policy and plan a tailor-made process for each and individual section. The second process can be tedious and time taking as we need to observe each section specifically and plan accordingly (Yan et al., 2019).This process can be effective and making it merge with the overall flow with same process planning can bolster the Effectiveness and efficiency of the 3PL DCs.

CONCLUSION

We have various places and organisations that we can draw inspiration from in order to design an effective and efficient plan for smooth DCs operation at the 3PLs. Some can be like Jayem warehousing ltd., This organisation has 25 years of experience in end-to-end logistic services including warehousing, distribution, logistics, Fulfilment, first mile, long haul, express, last mile and packing with 70 warehouses in operation with 2 million sq. Ft of space in and around 30 cities in India. FM logistics-they can be considered as the one of the priority players in the logistics domain. This firm has almost 90+ warehouses in about 30+ sites in India. All these and many more papers and research journals shall provide many inputs for the scope of improving the effectiveness and efficiency of the DCs for the 3PL.

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